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

KCID No.	Ref.	Type	Topic	Date completed	Question/CI	Answer	Attachment
98	10/2.4.2.3	Question	PSM	2006/10/5	Other StructureIt is understood that small intermediate brackets, i.e. docking bracket, bilge bracket which are not PSMs may be regarded as tripping brackets	You are correct. For such isolated brackets, 10/2.4.2.3 may be applied.	
99	10/2.4.2.3	Question	Tripping bracket	2006/10/5	Tripping bracket:No requirement is given for the thickness of tripping bracket when its edge is stiffened.	The thickness requirement of tripping brackets is given in form of a minimum thickness requirement given in Table 8.2.1.	
101	Table 10.3.1	Question	buckling assessment	2006/10/5	It is understood that the ratios, da/(ala) and db/la are not to be taken greater than 0.7.	It is correct that Case 6 is applicable for ratios equal or less than 0.7. This case is buckling assessment of the entire panel with opening. For cases where the ratio exceeds 0.7 it is no longer relevant to asses the panel but than the plate fields next to the opening are to be assessed using case 5 and with stresses corrected due to the presence of the opening.	
134	Table 10.3.1	Question	axial Compressive Stresses	2007/6/21	In Case 6, where da/α la>0.7, is it OK to use Case 3 or 4 for the panel outside opening (with considering free edge effect)?	Case 3 and Case 4 are for axial compressive stresses and not for shear stresses. Therefore, Case 3 and Case 4 cannot be used for shear buckling. Where a cut out has a size beyond the limit of d_a/al_a<=0.7 or d_b/l_a<=0.7, only small strips are left beside the opening. The whole shear is transformed in a S-shape deformation of the strips. This behavior is not comparable to the assumption that the elementary plate field acts as one buckling field. An extrapolation of the formulae of BLC 6 is not designated. Up to now we are not able to provide any additional shear buckling criteria for such panel.	
145	10/2.4.2	Question	Proportions of brackets	2006/9/27	May this requirement be dispensed with if the end bracket need not be taken into account in the bending span correction?	The requirement of Section 10/2.4.2.1 may be dispensed with if all other strength and fatigue requirements (if applicable) including compensation for non-continuous flange or web are satisfied without the end bracket. The requirement of Section 10/2.4.2.3 needs to be complied with.	

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146	10/3.2	CI	Buckling capacity requirements	2006/10/9	Reference: a.) CSR for Tankers Section 10/3.2. b.) ABS Rules Part 3 c.) National Advisory Committee for Aeronautics (NACA, Report Tn 3783) The subject buckling capacity requirements of Ref. (a) for determining the acceptable elastic behavior of the vessel's structural plate panels is considered to be extremely conservative, and should be rectified. The criterion is based upon the assumption of a simple supported panel mode with a resulting (K) buckling coefficient value equal to only (4) for long plates. The stated criteria should be amended with consideration being provided for the actual edge support conditions, utilizing the rotational stiffness of the structural boundary members in question. The Bureau's previous boundary (K) values of Ref. (b) implemented in the mid 1990's were similar to those adopted by NACA as released in the year of 1957 for the aircraft industry per Ref. (c). The resulting ABS plate (K) values as derived from the boundary sectional profiles were later reduced for "specific vessel types", but were not eliminated as is the case for CSR. Hence, assuming that adequate (net) axial compression and bending is provided by the plate boundary members, the corresponding buckling coefficients should be increased with consideration to the proportional limit or transition point. The net thickness of the plate panels should be based upon the example as denoted herein without the additional stated CSR "so-called" reduction factor of (C). Example: Net Thickness Requirements (tnet)for Flat Plate Panels tnet = [fp/ 185,400 (Ki)].5 x S Where; fp = Hull- Girder compressive stress expressed in N/mm2 K = Buckling coefficient S = Spacing between members C1 = Long plate or shear increase per the boundary member sectional profile C2 = Wide plate increase per the boundary member sectional profile Ki = (K) x C1or C2 It is respectfully requested that the Bureau's concurrence and/or comments thereto be expedited.	It is correct that the buckling coefficient given in Table 10.3.1 is representative for a simply supported plate, without consideration of the rotational stiffness imposed by the edge stiffeners. However, it should be noted that the buckling requirements of 10/3.2 are ultimate strength criteria. Although the rotational stiffness of the boundary elements will have some influence on the theoretical elastic buckling load of a perfectly flat plate panel, nonlinear finite element analyses of stocky plates typically used in shipbuilding have shown that the effect on the ultimate strength is quite small. It is therefore our opinion that the buckling factors specified in Table 10.3.1 are appropriate for the Prescriptive Buckling Requirements (section 10/3), which is intended as a simple and conservative check. However, it should be noted that in the Advanced Buckling Analyses (section 10/4) used for plates subjected to combined stress fields, the interaction between plates and stiffeners is accounted for.	
162	10/2.2.2.1	Question	Minimum moment of inertia for stiffeners	2006/10/9	It seems that requirement of minimum moment of inertia (Inet) is very small (about 10% of actual moment of inertia, in general). Is this requirement, especially unit of the parameters, correct?	The formula and the unit are correct. This requirement is intended to provide a minimum level of scantlings for stiffeners at locations where the loads are small. It is not critical for the stiffeners fitted on tight boundaries in general, where the lateral pressure usually will be dimensioning for the stiffeners. However, this requirement may be sometimes critical for the stiffeners fitted on non-tight members, where no lateral pressure is acting.	
168	10/3.3.3.1, Table 10.3.2	Question	Net sectorial moment of inertia of built-up stiffeners	2006/10/9	When calculating Iw-net of L2 or L3 type built up stiffeners, can we use the formula for "bulb flat and angles"?	Yes, the formula for "bulb flat and angles" may be used for L2 or L3 type built up stiffeners.	

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201	10/2.2.2	Question	stiffness and proportions	2006/11/10	Application of the rules in “2 Stiffness and Proportions” should be reconsidered. Since at least longitudinal structural members, such as deck plating, skin plating, longitudinal bulkhead plating, inner bottom plating and longitudinal stiffeners attached to them, are to be complied with “3 Prescriptive Buckling Assessment” and “Direct Buckling Assessment by PULS”, it is not necessary to check the buckling strength of the structure members above using the rules in “2 Stiffness and Proportions” in which actual working stresses are not taken into account.	For plates and stiffeners subjected to longitudinal stress due to hull girder bending, the requirements of 10/2 will usually not be governing. The minimum stiffness requirements are included in order to ensure that members with small design stresses will have a certain minimum stiffness. This is considered as an additional safety measure, in the case of loads that is not explicitly accounted for in the design phase. This is similar to the use of minimum thickness requirements	
202	10/2.2.2	Question	stiffened panel	2006/11/21	Concerning the clarification that reference yield stress of the stiffened panel is to be taken to the minimum yield stress of the attached plate, in case that in-plane stress is dominant, this clarification is reasonable.However, in case that it is determined based on the bending stress such as panel strength subject to the lateral pressure, it is unreasonable for the purpose of ensuring the minimum stiffness of stiffeners. Therefore we ask you to reconsider the application of the reference yield stress taking into account the above.We propose that reference yield stress is to be taken to the minimum yield stress of the stiffener as original text or to be taken to the specified minimum yield stress of the material of the attached plate when the in-plane stress is dominant.	The requirement is intended to provide a minimum stiffness with respect to column buckling due to in-plane stress. In this context, the yield stress of the plate is relevant. For a stiffener subjected to lateral pressure, the scantling requirements of Section 8 will usually be governing.	
238	10/3.4.1	Question	PSM	2006/11/7	Buckling of web plate of PSM in way of openingsRegarding the buckling strength of the concerned area, the procedure of evaluation is complicated and the number of loading conditions for evaluation is large. This will make it a very hard work to evaluate the buckling strength of the concerned area even by using software like Excel. We request that the procedure be simpler like "buckling control of the previous rule of DNV class".	The feedback is noted and understood however at the moment we consider the requirement sufficiently clear and workable. Improvements will be continuously considered as we gain experience with the use of the rules.	
242	10/2.2.2.1	Question	Stiffness of stiffeners	2006/11/7	Application of the rules in Section 2 "Stiffness and Proportions" should be reconsidered. At least longitudinal structural members(such as deck plating, skin plating, inner bottom plating and longitudinal stiffeners attached to them) are to comply with "3 Prescrpitive Buckling Assessment" and "Direct Buckling Assessment by PULS". Since the rules in "2 Stifness and Proportions" do not take account of actual working stresses, it is unnecessary to check the buckling strength of those structural members using the rules in "2 Stiffness and Proportions".	For plates and stiffeners subjected to longitudinal stress due to hull girder bending, the requirements of 10/2 will usually not be governing. The minimum stiffness requirements are included in order to ensure that members with small design stresses will have a certain minimum stiffness. This is considered as an additional safety measure, in the case of loads that is not explicitly accounted for in the design phase. This is similar to the use of minimum thickness requirements	

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254	8/2. 10/2	Question	Enlarged stiffeners	2007/2/23	What criteria are to be applied to the enlarged stiffeners without web stiffening used for PMA?	Enlarged stiffeners (with or without web stiffening) used for Permanent Means of Access (PMA) are to satisfy the following requirements:1) Buckling strength including proportion (slenderness ratio) requirements for Primary Support Members (PSM) as follows: For stiffener web: 10/2.3.1.1(a) slenderness for PSM 10/3.2 plate buckling For stiffener flange: 10/2.3.1.1(b) slenderness for PSM 10/2.3.3.1 tripping brackets For web stiffeners: 10/2.3.2.1 slenderness for Local Support Members (LSM) 10/2.3.2.2 web stiffener inertia 10/3.3 stiffener buckling Note: Note 1 of table 10.2.1 is not applicable. 2) All other requirements for Local Support Members as follows in general (except that PSM (or part of it) is used for PMA platform, for which the requirements for PSM should be applied): Corrosion additions: Requirements for LSM Minimum thickness: Requirements for LSM Fatigue: Requirements for LSM Note: The answer in the previous KC ID 152 is superseded by the above answer.	
296	10/2.2.1.1 & 10/2.3.1.1	Question	Stiffness and Proportions	2006/12/8	CSR rules define “Rounding of Calculated Thickness” according to Sec.3.5.4. In general, requirement value is set as “tnet = “, however, section 10.2.2/2.3 is set as “tnet >= ”.We assume that “Rounding of Calculated Thickness” can’t apply to Sec.10.2.2/2.3, since this requirements give minimum proportion. (For example)If the calculated thickness is tnet=10.20mm, (a)Required net thickness will be 10.5mm in Sec 10.2.2/2.3. (b)Required net thickness will be 10.0mm except 10.2.2/2.3. Please kindly confirm.	“Rounding of Calculated Thickness according to Sec.3.5.4" is to be applied to Section 10/2.2 and 2.3 also.	
297 attc	Table 10.3.4 & 10/3.5.1	Question	Cross Ties	2006/12/19	In the Table 10.3.4, typical section of cross ties are listed. However, in some cases, flange of cross ties aren’t Type A but Type B (see attachment).In this case, can we use calculation formula for “Type A” also to “Type B”? Or other calculation formula will be added especially for “Type B” in the future?Please kindly confirm.	Formula for “Type A” may not fit "Type B" shape. We will update the Rules to allow direct calculation of torsional properties or to include formulation for "Type B".	Y
430	10.2.2	Question	Stress Level	2007/5/1	Should case (a) & (b) are to be applied regardless of stress level?	Yes. The inertia requirements of (a) and (b) in Table 10.2.2 are to be applied regardless of the stress level.	

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488	10/3.3.3.1	Question	torsional buckling mode	2007/7/4	There is a difference (other than “unit” difference) between CSR Tanker and CSR Bulk Carrier in the formula of “epsilon” (degree of fixation) of torsional buckling mode. Please explain the reason for the difference.	The difference is not intentional and the "epsilon" is correct in the CSR bulk carrier. "epsilon" in CSR tank is identical to the source criteria however the factor was upgraded to account for the net scantling approach used in CSR and this update is not included in CSR tank. We will correct CSR tank in line with CSR bulk.	
496	Table 10.3.2	Question	Difference in Equation	2007/6/29	In the torsional buckling rules we have noticed a difference in the equation for St. Venant's moment of inertia. I will just show the part of the equation that is different (the other parts match). CSR-BC (6.3/Table 5)IT = {…. 1 - 0.63*tw / hw …} CSR-DHOT (Section 10 / Table 10.3.2) IT = {…. 1 - 0.63*tf / (ef-0.5tf) …} The difference here is that for CSR-BC tw is used and for CSR-DHOT tf is used.	CSR/Tanker contains a typographical error and will be amended to correspond with CSR-BC.	
555	10/2	CI	Stiffness and proportions applied to Deckhouse and Superstructure	2007/9/28	Please advise if the stiffness and proportions requirements in SECTION 10/2 are to be applied to Deckhouse and Superstructure.	Section 10 does not apply to deckhouse and superstructure.	
779 attc	Table 10.2.2	Question	stiffness criteria	2008/8/29	Table 10.2.2 specifies the stiffness criteria for two cases where web stiffeners are provided in parallel and normal to compression stress. Please confirm which criteria is to be applied to those stiffeners marked (a) and (b) in the attached sketch.	For stiffener (a), mode (a) is applicable. Table 10.2.2. is not applicable for stiffener (b).	Y

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806	Text 10/2.2.1.1	Question	proportion requirements	2008/8/29	With regard to the proportion requirements in Sec10/ 2.2.1.1, please confirm if the requirements should apply to both flanges and webs of corrugated bulkheads. According to our studies, there are some cases where the requirements may cause considerable scantling increases in the upper web plates of corrugation. With reference to the answer given in KC242, proportion requirements should be “additional safety measures” for structural members with small amounts of design stress and should not cause such scantling increases with respect to corrugation plates with considerable amounts of stress. So, we consider that these proportion requirements need not be applied to corrugated bulkheads, especially to the web plates of corrugation.	The proportion requirements in Section 10/2.2.1.1 are not applicable to corrugated bulkheads. Prescriptive buckling requirements for corrugated bulkheads are covered in Section 8/2.5.6 and 10/3.5.2.	
824	Table 10/2.1	Question	plate panel thickness	2008/9/23	In Table 10.2 .1 of Section 10, the coefficient "C" for plate panel net thickness calculation is fixed at 100 for "hull envelope and tank boundaries" and 125 for "other structures". The definition of "tank boundaries" seems to be not enough clear: Does it include all watertight boundaries such as for example watertight girders / floors, or should it include only the boundaries of cargo tanks? Please clarify	The term "tank boundaries" is meant to be taken as all watertight boundaries.	
916	10/2.3.3.1 & Table 10.2.1 & 8/2.1.4.8	Question	enlarged stiffeners	2009/4/14	The 8/2.1.4.8 (Corrigenda 1 to July 2008 CSR-T) specifies that enlarged stiffeners for PMA should comply with the buckling/proportion requirements for either Local Support Member or Primary Support Member. Particularly against torsional buckling consideration, there are following requirements: 1. For PSM (with web stiffeners) criteria, "tripping brackets" are required in accordance with 10/2.3.3.1. 2. For LSM (without web stiffeners) criteria, "flange width" requirement (bf=0.25dw) is to be applied in accordance with Note 1 in Table 10.2.1. Now, if tripping brackets are provided but without web stiffeners, can the requirement of "flange width" (bf=0.25dw) from Note 1 Table 10.2.1 be waived? The flange that complies with 10/2.3.3.1.1 (b) will be fitted and the other criteria for LSM will be complied with. Please confirm.	Your proposal is acceptable.	

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1010	Table 10.3.1 & 10/3.2.1	Question	Correction factors for panel buckling calculations	2010/1/19	Is it possible to apply for the correction factors C1 = 1.3 etc. similar to IACS UR S11 or CSR Bulk Carriers Rules for transverse panel supported by floor in double bottom of engine room for buckling calculations under CSR Tanker Rules? Please note that c of IACS UR S11 buckling is as follows: F1 factors of CSR Bulk Carriers in Chapter6 Sec3/Table3 show similar factors. c = 1.3 when plating stiffened by floors or deep girders c = 1.21 when stiffeners are angles or T sections. c = 1.10 when stiffeners are bulb flats c = 1.05 when stiffeners are flat bars Your prompt reply on this matter would be highly appreciated.	The correction factor for CSR Tanker had been deliberately set to 1.0 only. Please refer to Sec10/3.2.1.b of the TB for CSR Tanker..	
1037	10/3.2.1	RCP	Correction factors for panel buckling calculations	2010/4/28	Reference is made to KC ID 1010 regarding correction factor for panel buckling calculations. The answer given for KC ID 1010 is as follows: “The correction factor for CSR Tanker had been deliberately set to 1.0 only. Please refer to Sec 10/3.2.1.b of TB for CSR Tanker.” We are not satisfied with this answer because Sec10/3.2.1.b of the technical background for CSR Tanker does not provide detailed results of comparison studies made using the advanced buckling method. Could you give us the detailed technical background of this requirement such as detailed results of comparison studies and the reasons why the correction factor has been set to only 1.0? In addition, where VLCC is designed in accordance with CSR Tanker, the thickness for the shell platings of double bottoms in engine rooms adopting a transverse system required is more conservative than the thickness required by existing designs using one of the correction factors specified in UR S11. Moreover, existing ships which are designed using aforementioned correction factors have reported less damage due to buckling of plate. We consider that the rule should take into account realistic scantlings and the sufficient experience based on existing designs without damage. Therefore, please change the rule to apply the correction factors given in UR S11.	The harmonisation project is currently ongoing and is considering the buckling requirements of the two CSR Rules. You proposal will be retained and included in the project.	

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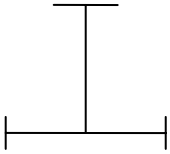

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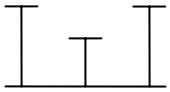

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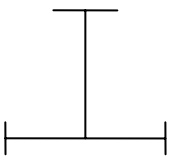

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