Structural Rules for Container Ships

NR 625

AMENDMENTS

July 2020

These sheets contain amendments within the following Sections of January 2020 issue of the *Structural Rules for Container Ships.*

These amendments are effective from July 1st, 2020.

Chapter	Section / Appendix
Chapter 4	Sec 4, Sec 6
Chapter 6	Sec 4, Sec 5
Chapter 7	Sec 3
Chapter 8	Sec 1
Chapter 14	Sec 1

BUREAU VERITAS MARINE & OFFSHORE

GENERAL CONDITIONS

1. INDEPENDENCE OF THE SOCIETY AND APPLICABLE TERMS

1.1 The Society shall remain at all times an independent contractor and neither the Society nor any of its officers, employees, servants, agents or subcontractors shall be or act as an employee, servant or agent of any other party hereto in the performance of the Services.

1.2 The operations of the Society in providing its Services are exclusively conducted by way of random inspections and do not, in any circumstances, involve monitoring or exhaustive verification.

1.3 The Society acts as a services provider. This cannot be construed as an obligation bearing on the Society to obtain a result or as a warranty. The Society is not and may not be considered as an underwriter, broker in Unit's sale or chartering, expert in Unit's valuation, consulting engineer, controller, naval architect, designer, manufacturer, shipbuilder, repair or conversion yard, charterer or shipowner; none of them above listed being relieved of any of their expressed or implied obligations as a result of the interventions of the Society.

1.4 The Society only is qualified to apply and interpret its Rules.

1.5 The Client acknowledges the latest versions of the Conditions and of the applicable Rules applying to the Services' performance.

1.6 Unless an express written agreement is made between the Parties on the applicable Rules, the applicable Rules shall be the Rules applicable at the time of entering into the relevant contract for the performance of the Services.

1.7 The Services' performance is solely based on the Conditions. No other terms shall apply whether express or implied.

2. DEFINITIONS

2.1 **"Certificate(s)"** means classification or statutory certificates, attestations and reports following the Society's intervention.

2.2 **"Certification"** means the activity of certification in application of national and international regulations or standards, in particular by delegation from different governments that can result in the issuance of a Certificate.

2.3 **"Classification"** means the classification of a Unit that can result or not in the issuance of a classification Certificate with reference to the Rules. Classification is an appraisement given by the Society to the Client, at a certain date, following surveys by its surveyors on the level of compliance of the Unit to the Society's Rules or to the documents of reference for the Services provided. They cannot be construed as an implied or express warranty of safety, fitness for the purpose, seaworthiness of the Unit or of its value for sale, insurance or chartering.

2.4 **"Client"** means the Party and/or its representative requesting the Services.

2.5 **"Conditions"** means the terms and conditions set out in the present document.

2.6 **"Industry Practice"** means international maritime and/or offshore industry practices.

2.7 **"Intellectual Property"** means all patents, rights to inventions, utility models, copyright and related rights, trade marks, logos, service marks, trade dress, business and domain names, rights in trade dress or get-up, rights in goodwill or to sue for passing off, unfair competition rights, rights in designs, rights in computer software, database rights, topography rights, moral rights, rights in confidential information (including know-how and trade secrets), methods and protocols for Services, and any other intellectual property rights, in each case whether capable of registration, registered or unregistered and including all applications for and renewals, reversions or extensions of such rights, and all similar or equivalent rights or forms of protection in any part of the world.

2.8 **"Parties"** means the Society and Client together.

2.9 **"Party"** means the Society or the Client.

2.10 **"Register"** means the public electronic register of ships updated regularly by the Society.

2.11 **"Rules"** means the Society's classification rules and other documents. The Society's Rules take into account at the date of their preparation the state of currently available and proven technical minimum requirements but are not a standard or a code of construction neither a guide for maintenance, a safety handbook or a guide of professional practices, all of which are assumed to be known in detail and carefully followed at all times by the Client.

2.12 **"Services"** means the services set out in clauses 2.2 and 2.3 but also other services related to Classification and Certification such as, but not limited to: ship and company safety management certification, ship and port security certification, maritime labour certification, training activities, all activities and duties incidental thereto such as documentation on any supporting means, software, instrumentation, measurements, tests and trials on board. The Services are carried out by the Society according to the applicable referential and to the Bureau Veritas' Code of Ethics. The Society shall perform the Services according to the applicable national and international standards and Industry Practice and always on the assumption that the Client is aware of such standards and Industry Practice.

2.13 **"Society"** means the classification society **'Bureau Veritas Marine & Offshore SAS'**, a company organized and existing under the laws of France, registered in Nanterre under number 821 131 844, or any other legal entity of Bureau Veritas Group as may be specified in the relevant contract, and whose main activities are Classification and Certification of ships or offshore units.

2.14 **"Unit"** means any ship or vessel or offshore unit or structure of any type or part of it or system whether linked to shore, river bed or sea bed or not, whether operated or located at sea or in inland waters or partly on land, including submarines, hovercrafts, drilling rigs, offshore installations of any type and of any purpose, their related and ancillary equipment, subsea or not, such as well head and pipelines, mooring legs and mooring points or otherwise as decided by the Society.

3. SCOPE AND PERFORMANCE

3.1 Subject to the Services requested and always by reference to the Rules, the Society shall:

- review the construction arrangements of the Unit as shown on the documents provided by the Client;
- conduct the Unit surveys at the place of the Unit construction;
- class the Unit and enter the Unit's class in the Society's Register;
- survey the Unit periodically in service to note whether the requirements for the maintenance of class are met.

The Client shall inform the Society without delay of any circumstances which may cause any changes on the conducted surveys or Services.

3.2 The Society will not:

- declare the acceptance or commissioning of a Unit, nor its construction in conformity with its design, such activities remaining under the exclusive responsibility of the Unit's owner or builder;
- engage in any work relating to the design, construction, production or repair checks, neither in the operation of the Unit or the Unit's trade, neither in any advisory services, and cannot be held liable on those accounts.

4. RESERVATION CLAUSE

4.1 The Client shall always: (i) maintain the Unit in good condition after surveys; (ii) present the Unit for surveys; and (iii) inform the Society in due time of any circumstances that may affect the given appraisement of the Unit or cause to modify the scope of the Services.

4.2 Certificates are only valid if issued by the Society.

4.3 The Society has entire control over the Certificates issued and may at any time withdraw a Certificate at its entire discretion including, but not limited to, in the following situations: where the Client fails to comply in due time with instructions of the Society or where the Client fails to pay in accordance with clause 6.2 hereunder.

4.4 The Society may at times and at its sole discretion give an opinion on a design or any technical element that would 'in principle' be acceptable to the Society. This opinion shall not presume on the final issuance of any Certificate or on its content in the event of the actual issuance of a Certificate. This opinion shall only be an appraisal made by the Society which shall not be held liable for it.

5. ACCESS AND SAFETY

5.1 The Client shall give to the Society all access and information necessary for the efficient performance of the requested Services. The Client shall be the sole responsible for the conditions of presentation of the Unit for tests, trials and surveys and the conditions under which tests and trials are carried out. Any information, drawing, etc. required for the performance of the Services must be made available in due time.

5.2 The Client shall notify the Society of any relevant safety issue and shall take all necessary safety-related measures to ensure a safe work environment for the Society or any of its officers, employees, servants, agents or subcontractors and shall comply with all applicable safety regulations.

6. PAYMENT OF INVOICES

6.1 The provision of the Services by the Society, whether complete or not, involve, for the part carried out, the payment of fees thirty (30) days upon issuance of the invoice.

6.2 Without prejudice to any other rights hereunder, in case of Client's payment default, the Society shall be entitled to charge, in addition to the amount not properly paid, interests equal to twelve (12) months LIBOR plus two (2) per cent as of due date calculated on the number of days such payment is delinquent. The Society shall also have the right to withhold Certificates and other documents and/or to suspend or revoke the validity of Certificates.

6.3 In case of dispute on the invoice amount, the undisputed portion of the invoice shall be paid and an explanation on the dispute shall accompany payment so that action can be taken to solve the dispute.

7. LIABILITY

7.1 The Society bears no liability for consequential loss. For the purpose of this clause consequential loss shall include, without limitation:

- Indirect or consequential loss;
- Any loss and/or deferral of production, loss of product, loss of use, loss of bargain, loss of revenue, loss of profit or anticipated profit, loss of business and business interruption, in each case whether direct or indirect.

The Client shall defend, release, save, indemnify, defend and hold harmless the Society from the Client's own consequential loss regardless of cause.

7.2 Except in case of wilful misconduct of the Society, death or bodily injury caused by the Society's negligence and any other liability that could not be, by law, limited, the Society's maximum liability towards the Client is limited to one hundred and fifty per-cents (150%) of the price paid by the Client to the Society for the Services having caused the damage. This limit applies to any liability of whatsoever nature and howsoever arising, including fault by the Society, breach of contract, breach of warranty, tort, strict liability, breach of statute.

7.3 All claims shall be presented to the Society in writing within three (3) months of the completion of Services' performance or (if later) the date when the events which are relied on were first discovered by the Client. Any claim not so presented as defined above shall be deemed waived and absolutely time barred.

8. INDEMNITY CLAUSE

8.1 The Client shall defend, release, save, indemnify and hold harmless the Society from and against any and all claims, demands, lawsuits or actions for damages, including legal fees, for harm or loss to persons and/or property tangible, intangible or otherwise which may be brought against the Society, incidental to, arising out of or in connection with the performance of the Services (including for damages arising out of or in connection with opinions delivered according to clause 4.4 above) except for those claims caused solely and completely by the gross negligence of the Society, its officers, employees, servants, agents or subcontractors.

9. TERMINATION

9.1 The Parties shall have the right to terminate the Services (and the relevant contract) for convenience after giving the other Party thirty (30) days' written notice, and without prejudice to clause 6 above.

9.2 In such a case, the Classification granted to the concerned Unit and the previously issued Certificates shall remain valid until the date of effect of the termination notice issued, subject to compliance with clause 4.1 and 6 above.

9.3 In the event where, in the reasonable opinion of the Society, the Client is in breach, or is suspected to be in breach of clause 16 of the Conditions, the Society shall have the right to terminate the Services (and the relevant contracts associated) with immediate effect.

10. FORCE MAJEURE

10.1 Neither Party shall be responsible or liable for any failure to fulfil any term or provision of the Conditions if and to the extent that fulfilment has been delayed or temporarily prevented by a force majeure occurrence without the fault or negligence of the Party affected and which, by the exercise of reasonable diligence, the said Party is unable to provide against.

10.2 For the purpose of this clause, force majeure shall mean any circumstance not being within a Party's reasonable control including, but not limited to: acts of God, natural disasters, epidemics or pandemics, wars, terrorist attacks, riots, sabotages, impositions of sanctions, embargoes, nuclear, chemical or biological contaminations, laws or action taken by a government or public authority, quotas or prohibition, expropriations, destructions of the worksite, explosions, fires, accidents, any labour or trade disputes, strikes or lockouts.

11. CONFIDENTIALITY

11.1 The documents and data provided to or prepared by the Society in performing the Services, and the information made available to the Society, are treated as confidential except where the information:

- is properly and lawfully in the possession of the Society;
- is already in possession of the public or has entered the public domain, otherwise than through a breach of this obligation;
- is acquired or received independently from a third party that has the right to disseminate such information;
- is required to be disclosed under applicable law or by a governmental order, decree, regulation or rule or by a stock exchange authority (provided that the receiving Party shall make all reasonable efforts to give prompt written notice to the disclosing Party prior to such disclosure.

11.2 The Parties shall use the confidential information exclusively within the framework of their activity underlying these Conditions.

11.3 Confidential information shall only be provided to third parties with the prior written consent of the other Party. However, such prior consent shall not be required when the Society provides the confidential information to a subsidiary.

11.4 Without prejudice to sub-clause 11.1, the Society shall have the right to disclose the confidential information if required to do so under regulations of the International Association of Classifications Societies (IACS) or any statutory obligations.

12. INTELLECTUAL PROPERTY

12.1 Each Party exclusively owns all rights to its Intellectual Property created before or after the commencement date of the Conditions and whether or not associated with any contract between the Parties.

12.2 The Intellectual Property developed by the Society for the performance of the Services including, but not limited to drawings, calculations, and reports shall remain the exclusive property of the Society.

13. ASSIGNMENT

13.1 The contract resulting from to these Conditions cannot be assigned or transferred by any means by a Party to any third party without the prior written consent of the other Party.

13.2 The Society shall however have the right to assign or transfer by any means the said contract to a subsidiary of the Bureau Veritas Group.

14. SEVERABILITY

14.1 Invalidity of one or more provisions does not affect the remaining provisions.

14.2 Definitions herein take precedence over other definitions which may appear in other documents issued by the Society.

14.3 In case of doubt as to the interpretation of the Conditions, the English text shall prevail.

15. GOVERNING LAW AND DISPUTE RESOLUTION

15.1 These Conditions shall be construed and governed by the laws of England and Wales.

15.2 The Parties shall make every effort to settle any dispute amicably and in good faith by way of negotiation within thirty (30) days from the date of receipt by either one of the Parties of a written notice of such a dispute.

15.3 Failing that, the dispute shall finally be settled under the Rules of Arbitration of the Maritime Arbitration Chamber of Paris ("CAMP"), which rules are deemed to be incorporated by reference into this clause. The number of arbitrators shall be three (3). The place of arbitration shall be Paris (France). The Parties agree to keep the arbitration proceedings confidential.

16. PROFESSIONAL ETHICS

16.1 Each Party shall conduct all activities in compliance with all laws, statutes, rules, economic and trade sanctions (including but not limited to US sanctions and EU sanctions) and regulations applicable to such Party including but not limited to: child labour, forced labour, collective bargaining, discrimination, abuse, working hours and minimum wages, anti-bribery, anti-corruption, copyright and trademark protection, personal data protection (https://personaldataprotection.bureauveritas.com/privacypolicy).

Each of the Parties warrants that neither it, nor its affiliates, has made or will make, with respect to the matters provided for hereunder, any offer, payment, gift or authorization of the payment of any money directly or indirectly, to or for the use or benefit of any official or employee of the government, political party, official, or candidate.

16.2 In addition, the Client shall act consistently with the Bureau Veritas' Code of Ethics. https://group.bureauveritas.com/group/corporate-social-responsibility

Amendments to NR 625

Ch 4, Sec 4

Replace Table 1 and Table 2 by:

Table 1 : Vertical wave bending moment M_{wv-LC} for dynamic load cases

$C_{WV} \geq 0$	$M_{wv-LC} = f_\beta C_{WV} M_{wv-h}$
$C_{WV} < 0$	$M_{wv-LC} = f_\beta C_{WV} \lvert M_{wv-s} \rvert$
Note 1:	
C_{WV} : Load combination factor for vertical wave bending moment, to be taken as specified in Sec 2	
M_{wv-h}, M_{wv-s}: Hogging and sagging vertical wave bending moments taking account of the considered design load scenario, as defined in [3.1.1]. For strength assessment with OHM and OHS load cases, f_{nl-h} and f_{nl-s} are to be taken equal to 1,0.	

Table 2 : Vertical wave shear force Q_{wv-LC} for dynamic load cases

$C_{QV} \geq 0$	$Q_{wv-LC} = f_\beta C_{QV} Q_{wv-pos}$
$C_{QV} < 0$	$Q_{wv-LC} = f_\beta C_{QV} \lvert Q_{wv-neg} \rvert$
Note 1:	
C_{QV} : Load combination factor for vertical wave shear force, to be taken as specified in Sec 2	
Q_{wv-pos}, Q_{wv-neg}: Positive and negative vertical wave shear forces taking account of the considered design load scenario, as defined in [3.2.1]. For strength assessment with OHM and OHS load cases, f_{nl-h} and f_{nl-s} are to be taken equal to 1,0.	

Ch 4, Sec 6, [1.2]

Replace the existing requirement [1.2.3] by:

1.2.3 Sequential ballast water exchange

The static pressure P_{ls} due to liquid in ballast tanks associated with ballast water exchange operations by sequential method is to be taken as defined for normal operations at sea in [1.2.1].

Insert a new requirement [1.2.4] as follows:

1.2.4 Ballast water exchange by dilution

The static pressure P_{ls} due to liquid in ballast tanks associated with ballasting operations by means of dilution is to be taken as defined for sequential ballast exchange in [1.2.3].

The ship designer has to inform the Society if the ballast water exchange system implies additional pressure to be considered such as P_{drop}, in addition to the pressure defined in [1.2.3].

Ch 4, Sec 6, [3.2]

Replace the requirement [3.2.1] by:

3.2.1 When a unit cargo is carried on a deck, a concentrated load is to be applied. The static and dynamic concentrated forces due to this unit cargo are to be considered, when a direct analysis is applied for stiffeners or for primary supporting members, such as in Ch 6, Sec 5, [1.3] or in Ch 6, Sec 6, [2.2], respectively.

The concentrated force F_{u-s}, in kN, due to this unit cargo for the static design load scenarios is to be taken, in the z direction, as:

$F_{u-s} = -m_U g$

The concentrated force F_{u-d}, in kN, due to this unit cargo for the static + dynamic design load scenarios is to be derived from the dynamic load cases, with components to be taken as defined in Tab 2.

Ch 4, Sec 6, Table 2

Replace Table 2 and Table 3 by:

Table 2 : Force F_{u-d} due to unit cargo

Direction	F_{u-d}, in kN, on exposed deck	F_{u-d}, in kN, on non-exposed deck
x	$-m_U\ a_X$	$-m_U\ a_{X\text{-}env}$
y	$-m_U\ a_Y$	$-m_U\ a_{Y\text{-}env}$
z	$-m_U\ (a_Z + g)$	$-m_U\ (a_{Z\text{-}env} + g)$

Note 1:

m_U : Mass of the unit cargo carried, in t

a_X, a_Y, a_Z: Accelerations, in m/s^2, at the centre of gravity of the unit cargo carried for the considered load case, to be obtained according to Sec 3, [3.2]

$a_{X\text{-}env}$, $a_{Y\text{-}env}$, $a_{Z\text{-}env}$: Envelope of accelerations, in m/s^2, at the centre of gravity of the unit cargo carried, to be obtained according to Sec 3, [3.3].

Table 3 : Container at tier "i"
Static and dynamic forces, in kN

Static force	$F_{S,i} = -M_i\ g$	in z direction
Dynamic forces	$F_{W,X,i} = -M_i\ a_{X\text{-}env}$	in x direction
	$F_{W,Y,i} = -M_i\ a_{Y\text{-}env}$	in y direction
	$F_{W,Z,i} = -M_i\ a_{Z\text{-}env}$	in z direction

Note 1:

M_i : Mass, in t, of the container at tier "i"

$a_{X\text{-}env}$, $a_{Y\text{-}env}$, $a_{Z\text{-}env}$: Envelope of accelerations, in m/s^2, determined at the container centre of gravity, to be obtained according to Sec 3, [3.3].

Ch 6, Sec 4, [1.1]

Replace the requirement [1.1.1] by:

1.1.1 Plating

The net thickness t, in mm, is not to be taken less than the greatest value for all the applicable design load sets, as defined in Sec 2, [2.1.3], given by:

$$t = 0,0158\ \alpha_p\ b \sqrt{\frac{|P|}{\chi\ C_a\ R_{eH}}}$$

where:

C_a : Permissible bending stress coefficient for plate, taken equal to:

$$C_a = K_{corr}\beta - \alpha\ \frac{|\sigma_L|}{R_{eH}}$$

without being taken greater than $K_{corr}C_{a\text{-}max}$

K_{corr} : Coefficient to take into account the corrosion:

- for tank testing to be taken equal to 1,2
- otherwise to be taken equal to 1,0

β, α : Coefficients as defined in Tab 1

$C_{a\text{-}max}$: Maximum permissible bending stress coefficient, as defined in Tab 1.

Ch 6, Sec 5, Symbols

Add the definition of "K_{corr} as" follows:

K_{corr} : Coefficient to take into account the corrosion:

- for tank testing to be taken equal to 1,1
- otherwise to be taken equal to 1,0.

Ch 6, Sec 5, [1.1]

Replace the requirements [1.1.1] and [1.1.2] by:

1.1.1 Web plating

The minimum net web thickness t_w, in mm, is not to be taken less than the greatest value calculated for all applicable design load sets as defined in Sec 2, [2], given by:

$$t_w = \frac{f_{shr}\ |P|\ s\ \ell_{shr}}{d_{shr}\ K_{corr}\chi\ C_t\ \tau_{eH}}$$

with $\chi\ C_t$ not to be taken greater than 1,0

where:

f_{shr} : Shear force distribution factor taken as:

- for continuous stiffeners with fixed ends, f_{shr} is to be taken equal to:
  - f_{shr} = 0,5 for horizontal stiffeners and upper end of vertical stiffeners
  - f_{shr} = 0,7 for lower end of vertical stiffeners
- for stiffeners with reduced end fixity, variable load or being part of grillage, the requirement in [1.3] applies.

C_t : Permissible shear stress coefficient for the design load set being considered, as defined in Tab 2.

1.1.2 Section modulus

The minimum net section modulus, Z in cm^3, is not to be taken less than the greatest value calculated for all applicable design load sets as defined in Sec 2, [2.1.3], given by:

$$Z = \frac{|P| \, s \, \ell_{bdg}^2}{f_{bdg} \, \chi \, C_s \, R_{eH}}$$

with $\chi \, C_s$ not to be taken greater than K_{corr},

where:

f_{bdg} : Bending moment factor taken as:

- for continuous stiffeners with fixed ends, f_{bdg} is to be taken equal to:
  - f_{bdg} = 12 for horizontal stiffeners and upper end of vertical stiffeners
  - f_{bdg} = 10 for lower end of vertical stiffeners
- for stiffeners with reduced end fixity, variable load or being part of grillage, the requirement in [1.3] applies

C_s : Permissible bending stress coefficient as defined in Tab 1 for the design load set being considered

σ_L : Hull girder normal stress, in N/mm^2, as defined in Sec 2, [1.1], calculated at the load calculation point as defined in Ch 3, Sec 6, [2.2]

β_s , α_s , $C_{s\text{-}max}$: Coefficients as defined in Tab 2.

Ch 6, Sec 5

Replace Table 1 by:

Table 1 : Definition of C_s

Sign of hull girder bending stress σ_L	Lateral pressure acting on	Coefficient C_s
Tension (positive)	Stiffener side	$C_s = K_{corr}\beta_s - \alpha_s \frac{\lvert\sigma_L\rvert}{R_{eH}}$ but not to be taken greater than $K_{corr}C_{s\text{-}max}$
Compression (negative)	Plate side	
Tension (positive)	Plate side	$C_s = K_{corr}C_{s\text{-}max}$
Compression (negative)	Stiffener side	

Ch 6, Sec 5, [1.3]

Replace the requirement [1.3.2] by:

1.3.2 Stress criteria

The stress is to comply with the following criterion:

$$\sigma_{eq} \leq \chi \, K_{corr} C_{comb} \, R_{eH}$$

where:

σ_{eq} : Equivalent Von Mises stress, in N/mm^2:

$$\sigma_{eq} = \sqrt{\sigma^2 + 3\tau^2}$$

C_{comb} : Permissible combined stress coefficient for the design load set being considered, as defined in Tab 2.

Ch 7, Sec 3,Table 3

Replace the row "Connection of primary members" by:

Type of details	Screening factors λ_{sc}	Permissible screening factors λ_{scperm}	
		AC-2 **(2)**	AC-1 **(2)**
Connection of primary members	2,00 λ_y	1,50	1,20

Ch 8, Sec 1, [3]

Replace the Sub Article [3.1] by:

3.1 Application

3.1.1 General

The requirements in this Article are to be taken into account for application of NI615, Sec 5.

3.1.2 Partial safety factor

The partial safety factor S, defined in NI615, Sec 5, is to be replaced by:

$$\frac{S}{K_{corr}}$$

where:

K_{corr} : Coefficient to take into account the corrosion:

- for tank testing to be taken equal to 1,1
- otherwise to be taken equal to 1,0.

Ch 14, Sec 1, [2.2.3]

Add the following item in the bulleted list in item a):

- 40′ containers on top may be full or empty.

Ch 14, Sec 1, [4.3]

Replace the requirements [4.3.2], [4.3.3] and [4.3.4] by:

4.3.2 Still water forces

For the container at tier "i", still water forces are to be taken, in kN, equal to:

$F_{S,i} = -M_i\ g$

where:

M_i : Mass, in t, of the container considered at the tier "i" (see also Ch 4, Sec 6, [4.2.2])

g : Gravity acceleration, in m/s^2, taken equal to:

$g = 9{,}81$ m/s^2.

4.3.3 Inertial forces in upright condition

For the container at tier "i", inertial forces in upright condition are to be taken, in kN, equal to:

$F_{W,X,i} = -\beta\ M_i\ a_X$ in x direction

$F_{W,Z,i} = -M_i\ a_Z$ in z direction

where:

M_i : Mass, in t, of the container considered at the tier "i" (see also Ch 4, Sec 6, [4.2.2])

β : Coefficient equal to:

- $\beta = 1{,}2$ for containers of the forward block, when the centre of gravity of this block is located forward of 0,75 L from the aft end and is not protected by breakwater structures deemed effective by the Society
- $\beta = 1{,}0$ in the other cases.

a_X, a_Z : Accelerations, in m/s^2, for the upright ship condition, determined according to [4.3.5].

4.3.4 Inertial forces in inclined condition

For the containers at tier "i", the inertial forces in inclined condition are to be taken, in kN, equal to:

$F_{W,Y,i} = -M_i\ a_Y$ in y direction

$F_{W,Z,i} = -M_i\ a_Z$ in z direction

where:

M_i : Mass, in t, of the container considered at the tier "i" (see also Ch 4, Sec 6, [4.2.2])

a_Y, a_Z : Accelerations, in m/s^2, for the inclined ship condition, determined according to [4.3.5].

Ch 14, Sec 1, [4.3.5]

Replace the definition of "LC1" by:

LC1 : Upright condition, maximizing positive or negative longitudinal acceleration, as defined in Tab 5.

Ch 14, Sec 1, [5.1]

Replace the requirement [5.1.4] by:

5.1.4 The wind loads are applied totally or partially in the same direction as the transverse or longitudinal inertial forces. The wind loads are not considered when acting in the opposite direction of the inertial forces.

Ch 14, Sec 1

Replace the Table 13 by:

Table 13 : Coefficients for total weight of 20' container stack topped or not

Number of 20' containers	F_1 Topped	F_2 Not topped
6 or less	590	536
7	548	500
8	506	464
9	464	428
10	422	392
11	380	356
12	–	320

Ch 14, Sec 1, [6.1]

Replace the requirement [6.1.2] by:

6.1.2 Mixed stowage within cell guides

When it is intended to carry 20 feet containers within 40 feet cells, in hold or on deck, the total weight of the 20' container stack (excluding the 40' container at the top of the stack) is to be not greater than W_{MAX}, in t, obtained, for the relevant case, from the following formula:

a) In case of 20' containers topped at least by one 40' container on single cones:

$$W_{MAX} = \frac{F_1}{a_Y} \text{ not to be greater than 240t}$$

b) In case of 20' containers connected with single cones:

$$W_{MAX} = \frac{F_2}{a_Y} \text{ not to be greater than 210t}$$

where:

F_1, F_2 : Coefficient depending on the number of tiers as defined in Tab 13

a_Y : Transverse acceleration, in m/s^2, determined according to [4.3.5].

For ships with the service notation **container ship**, a_Y is to be taken as the maximum absolute value of the transverse acceleration from load cases LC2 and LC3 defined in Tab 6.

For ships assigned with the additional service feature **equipped for carriage of containers**, a_Y is to be taken as defined in Tab 4.

Ch 14, Sec 1, [6.2]

Replace requirement [6.2.1] by:

6.2.1 For ISO 20, 30, 40 and 45 feet containers, the lashing arrangement is to be such that maximum loads on each container frame (end and intermediate), in kN, are less than the values indicated in:

- Fig 11 for transverse and longitudinal racking
- Fig 12 and Fig X for transverse and vertical compression
- Fig 13 for transverse and vertical tension.

Ch 14, Sec 1, [6.2]

Add the following new requirement [6.2.4]:

6.2.4 Oversized containers topped on 40' containers

For oversized containers topped on 40′ containers, the maximum vertical compression load on each container frame, in kN, is to be less than the values indicated in:

- Fig Y for 45′ ISO containers
- Fig Z for 48′, 49′ and 53′ containers, where $F_{COMP\ PERM}$ is defined in [6.2.3] a).

Ch 14, Sec 1

Replace the titles of existing Figure 11 to Figure 13 by:

Figure 11 : Permissible transverse and longitudinal racking loads on end frames of 20', 30', 40' and 45' ISO containers

Figure 12 : Permissible transverse and vertical compressions on end frames of 20', 30' and 40' ISO containers

Figure 13 : Permissible transverse and vertical tensions on end frames of 20', 30', 40' and 45' ISO containers

Insert the new Figures X, Y and Z:

Figure X : Permissible transverse and vertical compressions on end and intermediate frames of 45' ISO containers

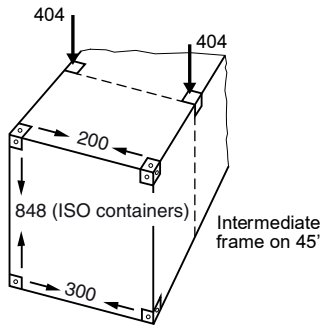


Figure Y : Permissible vertical compression on frames of 45' ISO containers topped on 40' containers

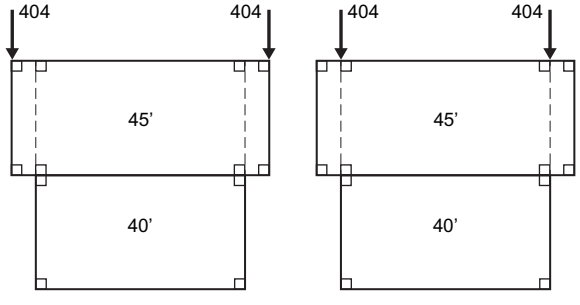
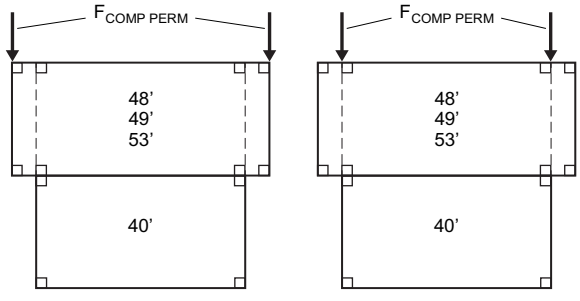


Figure Z : Permissible vertical compression on frames of 48', 49' and 53' containers topped on 40' containers



Ch 14, Sec 1

Replace Table 5, Table 7 and Table 8 by:

Table 5 : Load case LC1 in upright condition

Transversal stack location	LC1	
	Max	Min
Portside	OVA1-S	OVA2-S
Starboard side	OVA1-P	OVA2-P
Note 1: Stack with centre of gravity located at centreline is considered to be on portside		

Table 7 : Load case LC4 in inclined condition with stack located on portside

Longitudinal stack location	LC4	
	Max	Min
x/L ≤ 0,25	SPLC **(1)**	SPLC **(1)**
0,25 < x/L ≤ 0,65	BP2-P	BP1-P
x/L > 0,65	OVA2-S	OVA1-S
Note 1: Stack with centre of gravity located at centreline is considered to be on portside. **(1)** SPLC is the specific load case for vertical acceleration as defined in Ch 4, Sec 3, [3.3.3] and with the transverse acceleration a_Y taken equal to 0.		

Table 8 : Load case LC4 in inclined condition with stack located on starboard side

Longitudinal stack location	LC4	
	Max	Min
x/L ≤ 0,25	SPLC **(1)**	SPLC **(1)**
0,25 < x/L ≤ 0,65	BP2-S	BP1-S
x/L > 0,65	OVA2-P	OVA1-P
Note 1: Stack with centre of gravity located at centreline is considered to be on portside. **(1)** SPLC is the specific load case for vertical acceleration as defined in Ch 4, Sec 3, [3.3.3] and with the transverse acceleration a_Y taken equal to 0.		

Ch 14, Sec 1, [7.2]

Replace the requirements [7.2.1] and [7.2.2] by:

7.2.1 Necessary software inputs

The following data are necessary for the calculation to be carried out:

- ship intended speed
- GM and draught values resulting from the loading condition (no default value to be considered)
- description of the container loading (type, weight, position, allowable stack weight at 1.8g as indicated on the CSC plate and racking test load as indicated on the CSC plate)
- description of the associated securing and lashing devices (type, quantity, total length of rod and turnbuckles).

Their value might either be input by the user or be direct outputs from an associated loading instrument. In any case, the information is to be clearly accessible to the user.

7.2.2 Requested software outputs

For any loading condition defined, the software is to derive the following results in way of each stack of containers:

- total stack weight
- location (x, y and z) of the considered centre of gravity
- considered accelerations at the centre of gravity
- displacement in way of the four lower corners of each container
- vertical reaction in way of the four lower corners of each container
- racking forces in way of both container sides (door and wall)
- reactions in the associated lashing bars (door and wall)
- design roll and pitch angles associated with ship loading condition and intended passage. The design angles are the values used for the lashing assessment and are not to be greater than those given by the rules.

Ch 14, Sec 1, [7.3]

Replace the requirement [7.3.2] by:

7.3.2 Documents to be submitted

Different test cases are to be submitted for review (including all types of containers as detailed in [6.2] for which the lashing software and cargo securing manual are being approved).

They shall include, as a minimum, two different loading conditions with different GM values. The conditions are to be designed so that one of them yields a small value of GM and the other one yields a high value of GM.

Each loading condition is to show container bays on deck and in hold, located aft, amidships and forward.

Among the different stacks, the following is to be provided:

- stacks including containers exposed to wind and stacks including containers protected from wind
- stacks made of 20 feet containers and stacks made of 40 feet containers
- stacks where allowable criteria as given in [7.2.4] are exceeded.

In the case of a ship granted with the additional class notation **LASHING-WW**, results of one of the loading conditions at least are to be given for both unrestricted and worldwide environmental conditions.

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