RULES FOR CARGO HANDLING APPLIANCES

RULES

2021 AMENDMENT NO.1

Rule No.31 30 June 2021

Resolved by Technical Committee on 27 January 2021

An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

Rule No.31 30 June 2021
AMENDMENT TO THE RULES FOR CARGO HANDLING APPLIANCES

"Rules for cargo handling appliances" has been partly amended as follows:

Amendment 1-1

Chapter 1 GENERAL

1.1 General

1.1.1 Application*

Sub-paragraph -1 has been amended as follows.

1 The Rules for Cargo Handling Appliances (hereinafter referred to as "the Rules") apply to the power operated cargo handling appliances which are installed on the ships classed with NIPPON KAIJI KYOKAI (hereinafter referred to as "the Society"), and which are intended to be registered under **Chapter 3 of the Regulations for the Classification and Registry of Ships**.

Chapter 2 SURVEYS

2.2 Surveys of Cargo Handling Appliances

2.2.1 Kinds of Surveys

Sub-paragraph (2) has been amended as follows.

The kinds of Surveys for cargo handling appliances are as follows:

(1) Surveys for registration (hereinafter referred to as "Registration Survey")
  (a) Registration Surveys during Construction
  (b) Registration Surveys of Cargo Handling Appliances not built under Survey
(2) Periodical Surveys for maintaining registration
  (a) Annual Thorough Surveys (Periodical Survey)
  (b) Load Tests (Periodical Survey)
  (c) Occasional Surveys
  (d) Unscheduled Surveys

2.2.2 Timing of Surveys*

Sub-paragraph (3) has been amended as follows.

The timing of the Surveys of cargo handling appliances are to be in accordance with the followings:

(1) A Registration Survey is to be carried out when the safety working load, etc. are assigned for the first time.

(2) Annual Thorough Surveys are to be carried out at the dates not exceeding 12 *months* from the date of completion of the Registration Survey or the previous Annual Thorough Survey.

(3) Load Tests are to be carried out ~~at the Registration Survey and at the dates not exceeding 5 *years* from the date of completion of the Registration Survey or the previous Load Test~~ when the cargo handling appliances fall under any of the following.
   (a) At the Registration Survey
   (b) At the dates not exceeding 5 *years* from the date of completion of the Registration Survey or the previous Load Test
   (c) At the Occasional Survey when deemed necessary by the Society

(4) An Occasional Survey is to be carried out when the cargo handling appliances fall under any of the following conditions at the time other than Periodical Surveys. To implement the survey, in lieu of the traditional ordinary surveys where a surveyor is in attendance, the Society may approve survey methods which it considers to be appropriate.
   (a) When serious damage is caused on the structural members and the repair or conversion is made
   (b) When major conversion is made in the cargo handling procedures, rigging arrangements, operation and control methods
   (c) When the assignment and marking of safe working load, etc. is altered
   (d) Other cases when considered necessary by the Society

(5) The classed ships may be subject to Unscheduled Surveys when the confirmation of the status of appliances by survey is deemed necessary in cases where the Society considers the appliances to be subject to **1.4-3** of the **Conditions of Service for Classification of Ships and Registration of Installations**. At Unscheduled Surveys, investigations, examinations or tests are to be made to the satisfaction of the Surveyor with respect to the matters concerned.

2.4 Annual Thorough Surveys*

2.4.5 Loose Gears

Sub-paragraph -2 has been amended as follows.

1 At Annual Thorough Surveys, the following items in **(1)** through **(3)** of loose gears are to be visually examined and ascertained to be in good order. However, where considered necessary by the Surveyor, the items in **(2)** are to be opened up and examined.

(1) Wire ropes for their full length
(2) Cargo blocks, chains, rings, hooks, shackles, swivels, lifting beams, cramps, rigging screw, grabs, lifting magnets, spreaders, etc.
(3) Markings of the safe working load and identification symbols, and the effectiveness of the relevant certificates

2 In case where some of loose gears need to be repaired or renewed at times other than at the Periodical Surveys, the Society may accept an autonomous inspection carried out by ship's master or his representative. In this case, the personnel who carried out an autonomous inspection is to record the following **(1)** through **(6)** for the loose gears renewed in the Inspection Record Book of Loose Gear (Part II), and show this Inspection Record Book and the certificates of the loose gears concerned to the Surveyor for his approval at the next Periodical Survey or Occasional Survey.

(1) Names and identification symbols
(2) Locations in service
(3) Safe working loads
(4) Testing loads

(5) Dates of renewal or repairs and dates of commencement of use
(6) Reasons for renewal or repairs

2.5 Load Tests

2.5.1 Load Tests*

Sub-paragraph -1 has been amended as follows.

1 At Load Tests, cargo handling appliances are to be examined by applying movable weights or loads at least equal to the test loads as specified in **-2** and in the manners specified in **-3** or **-4** depending on the types of cargo handling appliances and ascertained that they are in good order. However, Load Tests of loose gears may be ~~omitted~~ replaced with tests conducted by manufacturers provided that the certificates with testing records of them are ~~examined~~submitted.

Chapter 3 DERRICK SYSTEMS

3.2 Design Loads

Paragraph 3.2.1 has been amended as follows.

3.2.1 Load Considerations*

The loads to be taken into the calculations of dimensions of the structural members are to be as specified in **(1)** through **(~~6~~7)** below:
(1) Safe working load of the derrick systems
(2) Self-weight of derrick boom and cargo fittings attached thereto
(3) Self-weight of loose gear
(4) Friction of cargo blocks
(5) Loads due to ship inclination
(6) Wind loading
(~~6~~7) Other loads considered to be necessary by the Society

Paragraph 3.2.4 has been renumbered to Paragraph 3.2.5, and Paragraph 3.2.4 has been added as follows.

3.2.4 Wind Loading

Wind loading is to be calculated according to **4.2.5**; however, the lower limit of the design wind velocity in the stowage condition is to be taken as “50 *m*/*sec*” instead of “55 *m*/*sec*”.

3.2.4~~5~~ Load Combinations

(-1 and -2 are omitted.)

Title of 3.3 has been amended as follows.

3.3 Strength and Construction of Derrick Posts, Masts, Derrick Booms and Stays

3.3.1 Strength Analysis

Sub-paragraph -1 has been amended as follows.

1 The strength of derrick posts, masts (hereinafter referred to as "posts"), derrick booms and stays are to be analyzed for the combined load specified in **3.2.45** to determine the dimensions of their members in accordance with the requirements in **3.3.2** ~~and~~, **3.3.3**, **3.3.5**, **3.3.6** and **3.3.7**.
2 The Young's modulus of the wire ropes to be used in the analysis of strength of stayed posts is to be 30.4 kN/mm^2 and 45.1 kN/mm^2 for the case of determining the dimensions of posts and stays respectively.

3.3.2 Allowable Stress for Combined Loads

Sub-paragraph -1 has been amended as follows.

1 The combined stress of derrick posts and derrick booms calculated by the following formula on the basis of the compressive stress due to bending moment, the compressive stress due to axial compression and the shearing stress due to twisting of the member is not to exceed the allowable stress σ_a given in either **Table 3.1** or **Table 3.2**.

$\sqrt{(\sigma_b + \sigma_c)^2 + 3\tau^2}$ (N/mm^2)

where

σ_b : Compressive stress due to bending moment (N/mm^2)
σ_c: Compressive stress due to axial compression (N/mm^2)
τ : Shearing stress due to twisting of member (N/mm^2)

2 The tension of the wire ropes used for stay is not to exceed the value obtained by dividing the value of breaking strength specified in **Table L4.3, Part L of the Rules for the Survey and Construction of Steel Ships** by the safety factor specified in **6.3.1(5)**.

Table 3.1 has been amended as follows.

Table 3.1 Allowable Stress σ_a (for derrick posts)

Safe working load W (t)	Allowable stress σ_a (N/mm^2)
$W<10$	$0.50\sigma_y$
$10\leq W<15$	$(0.016W+0.34)\ \sigma_y$
$15\leq W<50$	$0.58\sigma_y$
$50\leq W<60$	$(0.005W+0.33)\ \sigma_y$
$60\leq W$	$0.63\sigma_y$

Note:

σ_y : The yield point or proof stress of material (N/mm^2)

Table 3.2 has been amended as follows.

Table 3.2 Allowable Stress σ_a (for derrick booms)

Safe working load W (t)	Allowable stress σ_a (N/mm^2)
$W<10$	$0.34\sigma_y$
$10\leq W<15$	$(0.018W+0.16)\ \sigma_y$
$15\leq W$	$0.43\sigma_y$

Note:

σ_y : The yield point or proof stress of material (N/mm^2)

Title of 3.4 has been deleted as follows.

~~**3.4 Strength and Construction of Derrick Booms**~~

Paragraphs 3.4.1 and 3.4.2 have been deleted as follows.

~~**3.4.1 General**~~

~~The strength of derrick booms is to be analyzed for the load conditions specified in **3.2.4** and their dimensions are to be determined according to the requirements in **3.4.2** to **3.4.5**.~~

~~**3.4.2 Strength for Combined Load**~~

~~The combined stress calculated by the following formula on the basis of the compressive stress due to twisting of the member is not to exceed the allowable stress σ_a given in **Table 3.2**.~~

~~$\sqrt{(\sigma_b + \sigma_c)^2 + 3\tau^2}$ (N/mm^2)~~

~~where~~

~~σ_b : Compressive stress due to bending moment (N/mm^2)~~

~~σ_c : Compressive stress due to axial compression (N/mm^2)~~

~~τ : Shearing stress due to twisting of member (N/mm^2)~~

Paragraph 3.4.3 has been amended as follows.

3.4<u>3</u>.~~3~~<u>5</u> Buckling Strength

For member subjected to compression, the value obtained from the following formula is not to exceed the allowable stress σ_a given in <u>either **Table 3.1** or</u> **Table 3.2**.

$1.15\omega\sigma_a$ (N/mm^2)

where

σ_c : Axial compressive stress (N/mm^2)

ω : Coefficient calculated by the formula in **Table 3.3(a)** ~~**and Table 3.3(b)**~~ for the slenderness ratio and type of the member concerned

Table 3.3(a) Formulae for ω
(Table and Notes are omitted.)

Paragraph 3.4.4 has been amended as follows.

3.4<u>3</u>.~~4~~<u>6</u> Combined Compressive Stress

The compressive stress due to combination of the compressive stress due to axial compression and that due to bending moment is to meet the following formula:

$$\frac{\sigma_c}{\sigma_{ca}} + \frac{\sigma_b}{\sigma_a} \leq 1.0$$

where

σ_a : Allowable bending stress corresponding to the safe working load W given in either **Table 3.1** or **Table 3.2** (N/mm^2)

σ_{ca} : Allowable compressive stress to be taken as a quotient of σ_a divided 1.15 (N/mm^2)

σ_b : Compressive stress due to bending moment (N/mm^2)

σ_c : Compressive stress due to axial compression (N/mm^2)

Paragraphs 3.4.5 to 3.4.7 have been renumbered to Paragraphs 3.3.7 to 3.3.9.

3.43.57 Minimum Plate Thickness of Derrick Booms

(Omitted)

3.43.68 Reinforcement of Derrick Booms

(-1 and -2 are omitted.)

3.43.79 Derrick Boom Stopper for Dropping out

(Omitted)

Paragraphs 3.3.10 and 3.3.11 have been added as follows.

3.3.10 Effective Slenderness Ratio

The slenderness ratios of derrick posts, masts, derrick booms or other members subject to compression are to be not more than 150.

3.3.11 Ensuring stiffness

The stiffness of the main structural parts of a derrick is to be ensured to prevent any deformation that may interfere with the use of the derrick.

Section 3.5 has been amended as follows.

3.54 Simplified Calculation Method for Post and Stays of Swinging Derrick Systems

3.54.1 Application

Notwithstanding the provisions in **3.3.1** ~~through~~, **3.3.2**, **3.3.3**, **3.3.5** and **3.3.6**, the dimensions of posts and stays of swinging derrick systems may be determined according to the requirements in **3.54**.

3.54.2 Diameter of Post at the Base

The outside diameter of post at the base is not to be less than the value obtained from the following formula. For elliptic or oval section, its minor diameter is to be regarded as the outside diameter, while the short side is to be regarded as the outside diameter for rectangular cross section.

$5h$ (cm)

where

h : Vertical distance from the base of post to the topping bracket (m)

3.54.3 Section Modulus of Post at the Base

1 The section modulus of unstayed posts at the base is not to be less than the value obtained according to **(1)** through **(3)** below depending upon the arrangement of derrick booms.

(1) (Omitted)

Table 3.4 Values of C_1 and C_2

(Table are omitted.)

(2) (Omitted)

(3) Where derrick booms are supported by an independent structure other than the post, the section modulus is not to be less than obtained from the formula in **(1)** and **(2)**, multiplied by the value obtained from the following formula. In this case, the coefficient C_1 in the formula specified in **(1)** is to be taken as 1.0.

$$\frac{h}{h-h'}$$

where

h' : Vertical distance from the base of the post to the center of horizontal pin of the goose neck bracket

h : As specified in **3.~~5~~4.2**

2 The section modulus of stayed posts at the base may be the value specified in reduced by the value obtained from the following formula:

$$10\frac{h^3}{d_m}\sum R \quad (cm^3)$$

where

h : As specified in **3.~~5~~4.2**

d_m : (Omitted)

$\sum R$: (Omitted)

3 (Omitted)

4 (Omitted)

5 The section modulus of the short side post at the base supporting the derrick boom is not to be less than the value obtained according to **(1)** or **(2)** below:

(1) When a derrick boom is fitted on either of the forward or aftward side of the side post, the section modulus is to be the value obtained from the following formula:

$$85\frac{h'}{h-h'}\rho W \quad (cm^3)$$

where

W and ρ :As specified in **-1(1)**

h' : As specified in **-1(3)**

h : As specified in **3.~~5~~4.2**

(2) (Omitted)

3.~~5~~4.4 Dimensions of Post other than at the Base

(-1 and -2 are omitted.)

3.~~5~~4.5 Outriggers

(Omitted)

3.~~5~~4.6 Portals

1 The section modulus of the portal of uniform section fitted to the king post is not to be less than the values obtained from **(1)** to **(3)** below:

(1) The section modulus about the vertical axis is to the value obtained from the formula given in **3.~~5~~4.3-1(1)** multiplied by the coefficient obtained from the following formula. Where this coefficient exceeds 0.2, it may be taken as 0.2.

$$0.1 + 0.235\frac{r}{c}$$

where

r : As specified in **3.~~5~~4.3-3(1)**

c : Ratio of the actual section modulus (cm^3) of the post at the base about the axis parallel to the athwarship direction of the ship to that obtained from the formula in **3.~~5~~4.3-1(1)**

(2) Notwithstanding the requirements in **(1)**, the section modulus of the portal about the vertical

axis may be reduced to a half of the value in **(1)** where a derrick boom is fitted ~~only~~ on ~~one side~~either of ~~the~~forward or aftward side of the post.

(3) The section modulus about the horizontal axis is to be the value obtained from the formula in **3.~~5~~4.3-1(2)** multiplied by the coefficient obtained from the following formula. Where this coefficient exceeds 0.2, it may be taken as 0.2.

$$0.25\frac{r'}{c'}$$

where

r' : As specified in **3.~~5~~4.3-3(2)**

c' : Ration of the actual section modulus (cm^3) of the post at the base about the axis parallel to the longitudinal direction of the ship to that obtained from the formula in **3.~~5~~4.3-1(2)**

2 The portal is to be properly stiffened so as to prevent ~~the~~ deformation due to bending.

3.~~5~~4.7 Stays

The tension in wire ropes used for stays is to be less than the value obtained from the following formula.

$$18\frac{d_s^2 a}{l_0 l_s}\delta \ (kN)$$

where

a, d_s, l_0 and l_s : As specified in **3.~~5~~4.3-2**. In this case, a is to be measured in the same direction as in the calculation of the value of δ.

δ : Value obtained from the following formula:

$$C_s\frac{h}{h-h'}\cdot\frac{\rho W}{\frac{I}{h^2}+7.32h\sum R}$$

where

I : Moment of inertia of section (cm^4) of the post at the base about the axis parallel to the athwarship direction of the ship. For the king posts, however, the value of I divided by the coefficient C_p given in **3.~~5~~4.3-3(1)** is to be used in place of I.

h : As specified in **3.~~5~~4.2**

h', W and ρ : As specified in **3.~~5~~4.3-1(1)** and **(3)**

$\sum R$: As specified in **3.~~5~~4.3-2**, In this case, a is to be measured in all directions in the slewing range of the derrick boom in calculating $\sum R$.

C_s : Value given in **Table 3.5**. For intermediate values of W, the coefficient C_s is to be obtained by interpolation.

Table 3.5 Values of C_s

(Table is omitted.)

Section 3.6 has been amended as follows.

3.~~6~~5 Simplified Calculation Methods for Derrick Booms

3.~~6~~5.1 General

Notwithstanding the requirements in ~~**3.4.1 through 3.4.5,**~~ **3.3.1**, **3.3.2**, **3.3.5**, **3.3.6** and **3.3.7**, the dimensions of derrick booms may be determined in accordance with requirements in this **3.~~6~~5**.

3.~~6~~5.2 Derrick Booms without Whipped Rigging

1 The dimensions of derrick booms of derrick system without whipped rigging are not to be less

than obtained according to **(1)**, **(2)** and **(3)** below:

(1) The moment of inertia of derrick boom at the middle post is not to be less than obtained from the following formula:

$C_B P l^2$ (cm^4)

where

C_B :(Omitted)

l :(Omitted)

P :(Omitted)

(a) Swinging Derrick Systems

$$P = \left(\alpha_1 \frac{l}{h-h'} + f\right) Wg \quad (kN)$$

where

W and h' : As specified in **3.~~5~~4.3-1(1)** and **(3)**

h :As specified in **3.~~5~~4.2**

α_1 :(Omitted)

f :(Omitted)

Table 3.6 Values of C_B
(Table is omitted.)

Table 3.7 Values of α_1
(Table and Notes are omitted.)

Table 3.8 Values of f
(Table and Notes are omitted.)

(b) Derrick systems other than swinging derrick systems
(Omitted)

Table 3.9 Values of K
(Table and Notes are omitted.)

(2) (Omitted)

(3) (Omitted)

2 (Omitted)

3.~~6~~5.3 Derrick Booms with Whipped Rigging

The dimensions of derrick booms of derrick system with whipped rigging are not to be less than obtained according to **(1)** and **(2)**.

(1) The moment of inertia of section at an arbitrary position at a distance of x (m) from the center of eye fitting at derrick heel is not to be less than obtained from the following formula. Where a doubling plate is fitted for a sufficient length, 70 % of the doubling plate may be added to D (x) and A (x) in the formula.

$$I(x) = C_B P l^2 \left\{1 - 3.136 \left(\frac{x}{l} - 0.5\right)^2\right\} + \frac{D(x) l_1 x}{2\left(\sigma_0 - \frac{P}{A(x)} \times 10\right) l} \cdot \frac{Wg}{N} cos\theta \times 10^3$$

where

$I(x)$: Required moment of inertia of section at a distance of x (m) from the derrick heel (cm^4)

C_B : As specified in **3.~~6~~5.2**
P : Axial compression of boom specified in **3.~~6~~5.2-1(1)** (kN)
l : Effective length of boom (m)
W : Safe working load as specified in **3.~~5~~4.3-1(1)** (t)
N : (Omitted)
θ : (Omitted)
l_1 : (Omitted)
$D(x)$: (Omitted)
$A(x)$: (Omitted)
σ_0 : (Omitted)

(2) The length of parallel part at the middle, the diameter at ends and the plate thickness of the boom body are to be as specified in **3.~~6~~5.2-1(2)** and **(3)**.

Fig. 3.2 Derrick Boom with Whipped Rigging
(Figure is omitted.)

Table 3.10 Values of σ_0
(Table is omitted.)

Chapter 4 CRANES

4.2 Design Loads

4.2.1 Load Considerations

Sub-paragraph (2) has been amended as follows.

The loads to be taken into the calculation of dimensions of structural members are to be those related to the crane concerned among the items enumerated from **(1)** to **(11)** below:
(1) Safe working load of the cranes
(2) ~~Additional i~~Impact loads
(3) Self-weight of crane system and cargo fittings attached thereto
(4) Self-weight of loose gear
(5) Friction of cargo blocks
(6) Horizontal forces
(7) Wind loading
(8) Buffer forces
(9) Loads due to ship inclination
(10) Loads due to ship motion
(11) Other loads considered necessary by the Society

Paragraph 4.2.2 has been amended as follows.

4.2.2 ~~Additional~~ Impact Loads

1 The ~~additional~~ impact load is to be the product of the hoisting load and the impact load coefficient given in **Table 4.1** depending on the types of cranes or the impact load coefficient

deemed appropriate by the Society. When the stress due to hoisting of cargo and the stress due to the self weight have different signs in a member, 50 % of ~~additional~~ impact load is to be taken into account in addition to the self-weight, considering the shock due to unloading.

2 Notwithstanding the requirements specified in **-1**, ~~additional~~ impact load coefficient based on actual measurements taking into account the hoisting speed, deflections of girders, length of ropes, etc. may be used in place of the values given in **Table 4.1**.

Table 4.1 has been amended as follows.

Table 4.1 ~~Additional~~ Impact Load Coefficient

Types of cranes	~~Additional i~~Impact load coefficient
Provision handling crane, machinery handling crane, maintenance crane and hose handling crane	~~0~~1.10
Jib crane and gantry crane for cargo handling	~~0~~1.25
Jib crane and gantry crane occasionally used with hydraulically operated of rope-operated bucket, etc. for cargo handling	~~0~~1.40
Jib crane and gantry crane always using grab, lifting magnet, etc. for cargo handling and offshore jib crane	~~0~~1.60

4.2.4 Horizontal Forces

Sub-paragraph -4 has been amended as follows.

4 ~~For a system having structural members which will make slewing motions while supporting the safe working load, t~~The centrifugal force is to be considered for slewing motions and is to be determined from following formula ~~is to be taken into consideration~~.

$\frac{Wv^2}{R}$ (kN)

where

W : Safe working load (t)

R : Slewing radius (m)

v : Circular speed (m/sec)

4.2.5 Wind Loading

Sub-paragraph -1 has been amended as follows.

1 The wind loading is to be calculated by the following formula:

$F=PA\times10^{-3}$ (kN)

where

F : Wind loading (kN)

A : Sum of structural members and cargo under wind pressure in projection in respective wind direction, corresponding to respective conditions of the cargo gear (m^2). When a girder is wholly or party protected from wind by another girder, the areas of the superposed portions may be multiplied by the reduction factor (η) obtained from **Fig. 4.2**. The distance b between girders is to be as given in **Fig. 4.3**.

P : Wind pressure calculated by the following formula (Pa).

$\frac{1}{16}C_hC_sgV^2$ (Pa)

where

V : Wind velocity according to **(1)** and **(2)** below (*m*/*sec*):

(1) The velocity of wind giving effect on the structural members and cargo in the service conditions is to be the design wind velocity specified by the applicant, but not be less than 16 *m*/*sec*.

(2) The velocity of wind giving effect on the structural members in the stowage conditions is to be the design wind velocity specified by the applicant. In no case is the design wind velocity to be less than ~~51.5~~55 *m*/*sec*. In ships with restricted navigation areas, however, the design wind velocity may be decreased according to the degree of restriction as approved by the Society in the range down to ~~25.8~~27.5 *m*/*sec*.

C_h : "Height factor" to be determined according to **Table 4.2** depending on the height of the position is question from the lightweight waterline.

C_s : "Shape factor" to be determined according to **Table 4.3** depending on the shapes of various parts of the cargo gear and the cargo.

2 Notwithstanding the requirements in **-1**, the data on wind loading obtained by wind tunnel tests for the structural members and cargo may be used for calculations.

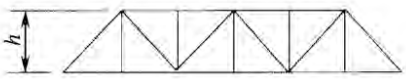
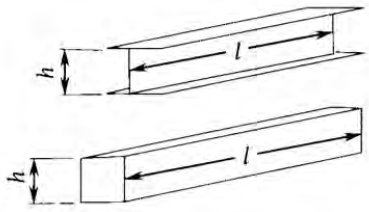
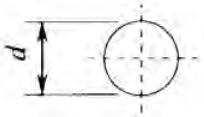
Fig. 4.2 Repleteness Ratio, ϕ versus Reduction Factor, η
(Figure is omitted.)

Fig. 4.3 Distance between two Neighbouring Girders, b
(Figure is omitted.)

Table 4.2 Height Factor C_h
(Table is omitted.)

Table 4.3 has been amended as follows.

Table 4.3 Shape Factor C_s

Type of area under wind pressure		ϕ or size ratio		C_S
Truss of angle		ϕ	$\phi < 0.1$ $0.1 \leq \phi < 0.3$ $0.3 \leq \phi < 0.9$ $0.9 \leq \phi$	2.0 1.8 1.6 2.0
Plate girder or Box girder		l/h	$\phi < 5$ $5 \leq \phi < 10$ $10 \leq \phi < 15$ $15 \leq \phi < 25$ $25 \leq \phi < 50$ $50 \leq \phi < 100$ $100 \leq \phi$	1.2 1.3 1.4 1.6 1.7 1.8 1.9
Cylinder member or Truss of cylindrical member		$d\sqrt{q}$	$d\sqrt{q} < 1.0$ $1.0 \leq d\sqrt{q}$	1.2 0.7

Notes:

ϕ : Repleteness ratio equal to the ratio of projected area under wind pressure to the projected area surrounded by the outer contour of the area under wind pressure

l : Length of plate girder or box girder (*m*)

h : Height of plate girder or box girder looked at from windward (*m*)

d : Outer diameter of cylindrical member (*m*)

q : Value calculated by the following formula:

$$\frac{1}{16} C_h \cdot gV^2 \times 10^{-3} \quad (kPa)$$

4.2.9 Load Combinations*

Sub-paragraphs -2 and-5 have been amended as follows.

1 The load to be used in the strength analysis of structural members is to be such a combined load that these members may be put in the severest loading condition considering the loads specified in **-2** through **-5** below.
2 When the wind loading is not taken into account in service condition, the sum of loads from **(1)** to **(9)** below multiplied by a work coefficient given in **Table 4.4** according to the type of crane concerned or a work coefficient deemed appropriate by the Society is to be considered.
(1) Safe working load of the cranes
(2) ~~Additional i~~Impact loads
(3) Self-weights of crane system and ~~cargo fittings~~loose gear attached thereto
(4) Self-weights of loose gear
(5) Friction of cargo blocks
(6) Horizontal loads
(7) Loads due to ship inclination
(8) Loads due to ship motion (except those intended to cargo handling in harbours only)
(9) Other loads considered necessary by the Society
3 When the wind loading are to be taken into consideration in the service conditions, the wind loading is to be added to the design load as specified in **-2**.
4 The buffer forces as given in **4.2.6** are to be taken into consideration for the track-mounted cranes.
5 In stowage condition, the loads from **(1)** to **(5)** below are to be considered
(1) Self-weights of crane system and ~~cargo fittings~~loose gear attached thereto
(2) Wind loading in the stowage conditions
(3) Loads due to ship inclination in the stowage conditions
(4) Loads due to ship motion stowage conditions
(5) Other loads considered necessary by the Society

Table 4.4 Work Coefficient of Crane Systems
(Table is omitted.)

Section 4.3 has been amended as follows.

4.3 Strength and Construction

4.3.1 General*
1 The strength of structural members is to be analyzed on the load conditions specified in **4.2.9** to determine their dimensions according to requirements in **4.3.2** through **4.3.~~9~~10**.
2 For structures connected by bolts and nuts, proper considerations are to be given to the decrease of effective sectional areas.
3 When considered necessary the Society may require the confirmation of the appropriateness of strength analyses by examination of models or the things in question.

4.3.2 Allowable Stress for ~~Combined~~ Loads
1 The allowable stress given in **Table 4.5** ~~are~~is not to be ~~used for components subjected to combined loads~~ exceeded depending on the type of stress.
2 Strength for fixed posts is to be in accordance with the requirements in **3.3.2**.

4.3.3 Buckling Strength
For members subjected to compression, the values obtained from the following formula is not to exceed the allowable compressive stress given in **Table 4.5**.

$\omega\sigma_c$ (N/mm^2)
where
ω and σ_c : As specified in **3.~~4~~3.~~3~~5**

4.3.4 Combined Compressive Stress

(Omitted)

Table 4.5 has been amended as follows.

Table 4.5 Allowable Stress σ_a

~~Load Condition~~	Kind of stress					
	~~Tension~~	Bending	Shear	~~Compression~~	Bearing	Combined stress
Condition specified in **4.2.9-2**	$0.67\sigma_y$	~~$0.67\sigma_y$~~	$0.39\sigma_y$	$0.58\sigma_y$	$0.94\sigma_y$	$0.77\sigma_y$
Condition specified in ~~**4.2.9-3**~~	$0.77\sigma_y$	$0.77\sigma_y$	$0.45\sigma_y$	~~$0.67\sigma_y$~~	$1.09\sigma_y$	$0.89\sigma_y$
~~Condition specified in **4.2.9-4** and **-5**~~	$0.87\sigma_y$	$0.87\sigma_y$	$0.50\sigma_y$	$0.76\sigma_y$	$1.23\sigma_y$	~~$1.00\sigma_y$~~

Load Condition	Kind of stress						
	Tension	Bending		Shear	Compression	Bearing	Combined stress
		Tension side	Compression side				
Condition specified in **4.2.9-2**	σ_d	σ_d	$0.87\sigma_d$	$0.58\sigma_d$	$0.87\sigma_d$	$1.41\sigma_d$	$1.15\sigma_d$
Condition specified in **4.2.9-3**	$1.15\sigma_d$	$1.15\sigma_d$	σ_d	$0.67\sigma_d$	σ_d	$1.63\sigma_d$	$1.33\sigma_d$
Condition specified in **4.2.9-4** and **-5**	$1.3\sigma_d$	$1.3\sigma_d$	$1.13\sigma_d$	$0.75\sigma_d$	$1.14\sigma_d$	$1.84\sigma_d$	$1.5\sigma_d$

Notes:

1. ~~σ_y~~σ_d: ~~The yield point or proof stress of material (N/mm^2)~~ Following values for steel material, whichever is the smaller
   (1) The value obtained by dividing the yield point or the proof stress of material by 1.5 (N/mm^2)
   (2) The value obtained by dividing the tensile strength by 1.8 (N/mm^2)
2. The combined stress is to be the value obtained from the following formula:
   $\sqrt{\sigma_x^2 + \sigma_y^2 - \sigma_x\sigma_y + 3\tau_{xy}^2}$ (N/mm^2)

where

σ_x : Applied stress in *x*-direction at the middle of plate thickness (N/mm^2)
σ_y : Applied stress in *y*-direction at the middle of plate thickness (N/mm^2)
τ_{xy} : Applied shear stress in the *x*-*y* plane (N/mm^2)

4.3.5 Fatigue Strength

(Omitted)

4.3.6 Ensuring stiffness

The stiffness of the main structural parts of cranes is to be ensured to prevent bucking and significant deformation.

4.3.~~6~~7 Minimum Thickness

(Omitted)

4.3.~~7~~8 Strength of Bolts, Nuts and Pins

(Omitted)

4.3.~~8~~9 Fixed Posts*

(-1 and -2 are omitted.)

4.3.~~9~~10 Slewing-ring Fixing Bolts

(-1 to -3 are omitted.)

Table 4.6 Allowable Stress of Fixing Bolts σ_a
(Table and Note are omitted.)

4.4 Special Requirements for Track-mounted Cranes

Paragraph 4.4.2 has been amended as follows.

4.4.2 Prevention of Upsetting

The track-mounted crane are to be designed with sufficient considerations for the stability to prevent upsetting or detaching even if the wheel shafts or wheels are damaged.

Chapter 5 CARGO FITTINGS

5.2 Cargo Fittings

5.2.2 Fittings Attached to Head of Derrick Booms

Sub-paragraph -1(1) has been amended as follows.

1 The sizes of fittings attached to the head of derrick booms are not to be less than the values given in the following **(1)** and **(3)** according to the respective purpose and shapes of the fittings:

(1) Where the shape of cargo fittings attached to the head of derrick boom are as given in **Fig.5.2**, the sizes of them are not to be less than the following values. The sizes of other parts are to be as deemed appropriate by the Society.

$d = e_2\sqrt{\frac{T}{g}}\ (mm)$

$t = e_2\sqrt{\frac{T}{g}}\ (mm)$

where

e_2: (Omitted)

T: Maximum tension applied to cargo fitting at the head of derrick boom (kN). However, in the swinging derrick system, the following value may be used:

$\alpha_1\alpha_2\ Wg$ for topping lift

$\lambda\ Wg$ for cargo fall

where

W : Safe working load (t)

α_1 : As specified in **3.~~6~~5.2**

α_2 : As given in **Table 5.3** depending on the value of $l/(h-h')$. However, for intermediate values of α_2, it is to be obtained by interpolation.

λ : (Omitted)

Fig. 5.2 Cargo Fitting Attached at Head of Derrick Boom
(Figure is omitted.)

Table 5.2 Values of e_2
(Table is omitted.)

Table 5.3 has been amended as follows.

Table 5.3 Values of α_2

$l/(h-h')$		2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2
α_2	W<10	1.99	1.90	1.81	1.73	1.65	1.57	1.49	1.42	1.35
	15≤W<50	1.82	1.73	1.65	1.57	1.49	1.41	1.33	1.26	1.19

Note:

l, h and h':As specified in **3.~~6~~5.2**

Table 5.4 Values of λ

(Table is omitted.)

Chapter 7 MACHINERY, ELECTRICAL INSTALLATIONS AND CONTROL ENGINEERING SYSTEMS

7.2 Machinery

Paragraph 7.2.2 has been amended as follows.

7.2.2 Hoisting ~~Machinery~~and Luffing Winch*

1 The construction of the ~~hoisting machinery~~winch is to comply with the following requirements **(1)** through **(6)**:
((1) to (6) are omitted.)

2 The winding of the wire rope into the winch drum is to comply with the following **(1)** and **(2)** except in cases where the winch drum is equipped with the over-winding prevention device.

(1) For grooved drums such as a hoisting winch, etc., the angle between the direction in which the wire rope is caught in the groove of the drum and the direction of the wire rope when it is caught in the groove (i.e. the fleet angle) is to be 4^{o} or less.

(2) For drums other than grooved drums, the fleet angle is to be 2^{o} or less.

~~2~~**3** The rope at its end is to be secured to the drum in such a manner that will not damage any part of the rope and to have such a length that not less than 3 complete turns in case of an ungrooved drum, or 2 complete turns in case of a grooved drum are remaining on the drum when the complete working length of rope has been paid out.

7.4 Control Engineering Systems

7.4.2 Control System

Sub-paragraph -8 has been added as follows.

8 Control systems for the track-mounted cranes (including their trolleys) are to be provided with braking devices to control travelling except for the human-powered travelling cranes.

7.4.3 Safety System*

Sub-paragraph -2 has been amended as follows.

2 In general, ~~T~~the cargo handling appliances are to be provided with suitable safety systems capable of preventing the abnormalities given in the following **(1)** through **(6)** according to kind of appliances and their motion:

(1) Over hoisting
(2) Over slewing
(3) Over luffing
(4) Excessive travelling speed
(5) Over run on the track
(6) Other items of abnormality recognized by the Society

Chapter 8 CARGO LIFTS AND CARGO RAMPS

8.3 Strength and Construction

Paragraph 8.3.2 has been amended as follows.

8.3.2 Allowable Stress for ~~Combined~~ Loads

The allowable stress prescribed in **Table 8.2** ~~are~~is not to be ~~used for components subjected to combined loads~~ exceeded depending on the type of stress.

Table 8.2 has been amended as follows.

Table 8.2 Allowable Stress σ_a

Load Condition	Kind of stress					
	Tension	Bending	Shear	Compression	Bearing	Combined stress
Condition given in **8.2.6-2**	~~0.67σ_y~~	0.67σ_y	0.39σ_y	~~0.58σ_y~~	0.94σ_y	0.77σ_y
~~Condition~~ given in **8.2.6-4** and **-5**	0.77σ_y	0.77σ_y	0.45σ_y	0.67σ_y	1.09σ_y	~~0.89σ_y~~

Load Condition	Kind of stress						
	Tension	Bending		Shear	Compression	Bearing	Combined stress
		Tension side	Compression side				
Condition given in **8.2.6-2**	~~σ_a~~	~~σ_a~~	0.87σ_a	0.58σ_a	0.87σ_a	1.41σ_a	1.15σ_a
Condition given in **8.2.6-4** and **-5**	1.15σ_a	1.15σ_a	~~σ_a~~	0.67σ_a	~~σ_a~~	1.63σ_a	1.33σ_a

Notes:

1. ~~σ_y~~σ_d: ~~The yield point or proof stress of material (*N/mm*^{2})~~ Following values for steel material, whichever is the smaller
   (1) The value obtained by dividing the yield point or the proof stress of material by 1.5 (*N/mm*^{2})
   (2) The value obtained by dividing the tensile strength by 1.8 (*N/mm*^{2})
2. The combined stress is to be the value obtained from the following formula:

$$\sqrt{\sigma_x^2 + \sigma_y^2 - \sigma_x\sigma_y + 3\tau_{xy}{}^2} \quad (N/mm^2)$$

where

σ_x:Applied stress in *x*-direction at the middle of plate thickness (*N* /*mm*^{2})

σ_y: Applied stress in *y*-direction at the middle of plate thickness (*N* /*mm*^{2})

τ_{xy}:Applied shear stress in the *x*-*y* plane (*N* /*mm*^{2})

Chapter 9 CERTIFICATION, MARKING AND DOCUMENTATION

9.5 Preservation of Documents

Paragraph 9.5.1 has been amended as follows.

9.5.1 General

The Certificates issued depend on the requirements in **9.~~5~~4** by the Society and the instruction manual for cargo handling appliances are to be preserved aboard the ship or by shipowner's responsible person in case of towing boat not manned.

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 1 July 2021.

2. Notwithstanding the amendments to the Rules, the current requirements apply to cargo handling appliances for which the application for approval is before the effective date.

Amendment 1-2

Chapter 2 SURVEYS

2.3 Registration Surveys

2.3.2 Examinations for Workmanship*

Sub-paragraph -3 has been added as follows.

3 To implement the tests and the surveys specified in **-1** and **-2** (hereinafter referred to as survey in this sub-paragraph), in lieu of traditional ordinary surveys where the Surveyor is in attendance, the Society may approve other survey methods which it considers to be appropriate.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 1 July 2021.

GUIDANCE FOR CARGO HANDLING APPLIANCES

GUIDANCE

2021 AMENDMENT NO.1

Notice No.30 30 June 2021

Resolved by Technical Committee on 27 January 2021

Notice No.30 30 June 2021
AMENDMENT TO THE GUIDANCE FOR CARGO HANDLING APPLIANCES

"Guidance for cargo handling appliances" has been partly amended as follows:

Amendment 1-1

Chapter 1 GENERAL

1.3 Arrangement, Construction, Materials and Welding

Paragraph 1.3.2 has been amended as follows.

1.3.2 General Construction

1 The cargo gear which are to comply with the additional requirements considered appropriate by the Society in applying the Rules as specified in **1.3.2-1 of the Rules** include the following **(1)** through **(4)**:
((1) to (4) are omitted.)
2 "Requirements specially made up by the Society" specified in **1.3.2-2 of the Rules** include the following requirements **(1)** through **(4)**:
((1) to (3) are omitted.)
(4) Dimensions of the members are to comply with the following requirements **(a)** through **(e)**:
- (a) (Omitted)
- (b) The minimum outside diameter of post at the base specified in **3.~~5~~4.2 of the Rules** may be as obtained from the following formula:
  $5hK$ (cm)
  where:
  h : As specified in **3.~~5~~4.2 of the Rules**
  K : As specified in **(a)**
- (c) The value of the coefficient C_2 specified in **Table 3.4** in **3.~~5~~4.3-1(1) of the Rules** may be substituted by the value of C_2 multiplied by the coefficient K specified in **(a)**.
- (d) The minimum thickness of the structural members specified in **4.3.~~6~~7 of the Rules** may be substituted by the value obtained from the following formula:
  $5.0K+1.0$ (mm)
  where:
  K : As specified in **(a)**
- (e) (Omitted)

Fig. 1.2.1-1 Derrick Systems
(Figure is omitted.)

1.3.4 Materials

Sub-paragraph -2 has been amended as follows.

2 Classification of the steel materials used in the structural members, travelling girders, tracks, etc. of cargo gear ~~regularly~~ used in ~~especially cold zones~~areas with low air temperatures or refrigerated hold chambers are to comply with **Table 1.3.4-1** according to design temperatures.

Table 1.3.4-1 Classification of Steel Materials Exposed to Low Temperature
(Table and Notes are omitted.)

Paragraph 1.3.5 has been amended as follows.

1.3.5 Welding

1 (Omitted)

Fig. 1.3.5-1 Welding for Portal and Post
(Figure is omitted.)

2 Welding for cranes is to comply with the following requirements **(1)** to **(~~5~~4)**:

~~(1) The requirements in **-1(6)** and **(7)** are to be applied to the butt welding and longitudinal seam welding of jib by constructing the words "derrick boom" as "jib".~~

(~~2~~1) In principle, the welded joints of the jib are to be both-side welding (including fillet weld). Where both-side welding ~~from both sides (including fillet weld)~~ is difficult ~~for the welded joints other than butt welding and longitudinal seam welding of the jib~~, penetration bead welding or welding with backing strip is to be carried out.

(~~3~~2) As for the welding of crane post, the requirements in **-1(1)** and **(2)** are to be applied.

(~~4~~3) The following parts are, as a rule, to be fixed by full penetration ~~type~~ welding.
((a) to (e) are omitted.)

(~~5~~4) The fillet weld applied to the primary structural members is, as a rule, to be *F*1 weld specified in **Table C1.4, Part C of the Rules for the Survey and Construction of Steel Ships**, or equivalent thereto.

3 Welding for cargo lifts and cargo ramps is to comply with the following requirements **(1)** to **(3)**:

(1) The fillet weld applied to the primary structural members is to comply with the requirements in **-2(~~5~~4)**.

(2) (Omitted)

(3) (Omitted)

4 Welding for the structural members of cargo gear used ~~regularly~~ in ~~especially cold zones~~areas with low air temperatures or refrigerated hold chambers is to be carried out in such a way that it may not give any adverse effect on prevention of occurrence of low temperature brittle fracture in consideration of the structure, working stress, etc.

5 (Omitted)

6 (Omitted)

((1) to (3) are omitted.)

Chapter 2 SURVEYS

2.5 Load Tests

2.5.1 Load Tests

Sub-paragraph -4(3) has been amended as follows.

4 Details of Load Tests and operation tests for cargo gear and cargo ramps are to comply with the following requirements in **(1)** to **(4)**, in addition to those specified in the Rules.

(1) (Omitted)

(2) (Omitted)

(3) Gantry cranes and other track-mounted cranes

(a) The crane is to run on the track within the travelling limits with the test load based on the safe working load suspended on it. In this case, the hull structure supporting the travelling track is also to be confirmed that it is free from defects.

(b) Where traveling trolley is employed, it is to run the whole travelling range through with the test load based on the safe working load suspended on it.

(c) Where sponson girder of stowing type for travelling trolley is employed, stretching and stowing operations of the girder are to be ascertained that they are in good order.

(4) (Omitted)

Chapter 4 CRANES

4.2 Design Loads

Paragraph 4.2.2 has been added as follows.

4.2.2 Impact Loads

The "impact load coefficient deemed appropriate by the Society" mentioned in **4.2.2-1 of the Rules** is the coefficient calculated from the hoisting speed of cranes specified in following **(1)** or **(2)**.

(1) For jib cranes

$\varphi = 1 + 0.3V_h$

where

$1 + 0.3V_h < 1.1$: $\varphi = 1.1$

$1 + 0.3V_h > 1.3$: $\varphi = 1.3$

(2) For other than jib cranes

$\varphi = 1 + 0.6V_h$

where

$1 + 0.6V_h < 1.1$: $\varphi = 1.1$

$1 + 0.6V_h > 1.6$: $\varphi = 1.6$

φ : Impact load coefficient

V_h : Hoisting speeds (*m/sec*)

Paragraph 4.2.9 has been amended as follows.

4.2.9 Load Combinations

1 Wind loading need not be taken into account for cargo gear mentioned in the following **(1)** and **(2)**:

(1) Cargo gear used in cargo hold, engine room, and other enclosed spaces in ship

(2) Cargo gear installed on weather deck and used only for loading and unloading articles other than cargo. The Society may, however, require to take the wind loading into account considering the construction system, method of operation, and safe working load of the machinery and gear.

2 A "work coefficient deemed appropriate by the Society" mentioned in **4.2.9-2 of the Rules** is the coefficient obtained based on the ratio of the average lifting load to the safe working load and the cargo load cycles specified in **Table 4.2.9-1** in which the coefficient is to be applied upon the agreement between the manufacturer of the cargo handling appliances and the ordering parties.

Table 4.2.9-1 has been added as follows.

Table 4.2.9-1 Work coefficient of cranes

Division (Ratio of the average lifting load to the safe working load *W(t)*)	Number of loads *N* (Cargo load cycles)						
	$N < 6.3 \times 10^4$	$6.3 \times 10^4 \leq N < 1.2 \times 10^5$	$1.2 \times 10^5 \leq N < 2.5 \times 10^5$	$2.5 \times 10^5 \leq N < 5.0 \times 10^5$	$5.0 \times 10^5 \leq N < 1.0 \times 10^6$	$1.0 \times 10^6 \leq N < 2.0 \times 10^6$	$2.0 \times 10^6 \leq N$
Less than 50 % *W*	1.00	1.02	1.05	1.08	1.11	1.14	1.17
50 % *W or more, but* less than 63 % *W*	1.02	1.05	1.08	1.11	1.14	1.17	1.20
63 % *W or more, but* less than 80 % *W*	1.05	1.08	1.11	1.14	1.17	1.20	1.20
80 % *W or more*	1.08	1.11	1.14	1.17	1.20	1.20	1.20

Note:
For the calculation of the number of uses, the service life of crane is to be the design life of the crane.

Chapter 6 LOOSE GEAR

6.5 Equivalent Requirements

6.5.1 General

Sub-paragraph -1 has been amended as follows.

1 Construction and materials of cargo blocks and hooks are to comply with the following requirements in **(1)** through **(3)**.

(1) Steel blocks are to comply with *JIS F* 3421, *F* 3422, ~~*F* 3424, *F* 3427,~~ *F* 3428, *F* 3429 or other standards considered appropriate by the Society.

(2) Wooden blocks are to comply with ~~*JIS F* 2423 or other~~ standards considered appropriate by the Society.

(3) Hooks are to comply with *JIS F* 2105 or other standards considered appropriate by the Society.

Chapter 7 MACHINERY, ELECTRICAL INSTALLATIONS AND CONTROL ENGINEERING SYSTEMS

7.2 Machinery

Title of Paragraph 7.2.2 has been amended as follows.

7.2.2 Hoisting ~~Machinery~~and Luffing Winch

Sub-paragraph -3 has been renumbered to Sub-paragraph -4, and Sub-paragraph -3 has been added as follows.

1 Winches are to be so designed that the safety factor of the structural parts based on the ultimate tensile strength of the material is not less than the value given as follows according to the safe working load of cargo gear incorporating the winches concerned:

5 for safe working load is 10*t* or less

4 for safe working load exceeds 10*t*

2 (Omitted)

(1) (Omitted)

(2) (Omitted)

3 The "fleet angle" mentioned in **7.2.2-2(1) and 7.2.2-2(2) of the Rules** is the angle α specified in **Fig.7.2.2-1** and the angle θ specified in **Fig.7.2.2-2** respectively.

Fig. 7.2.2-1 and Fig. 7.2.2-2 have been added as follows.

Fig. 7.2.2-1 Fleet angle of grooved drum

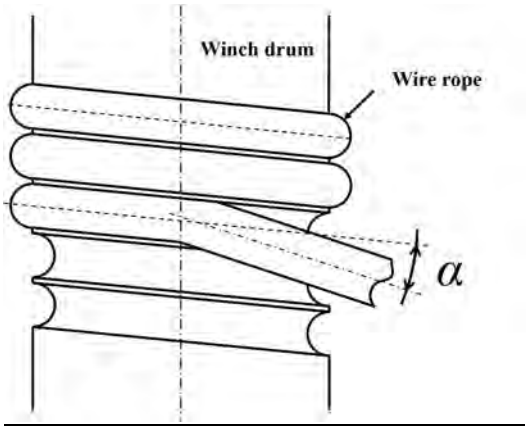
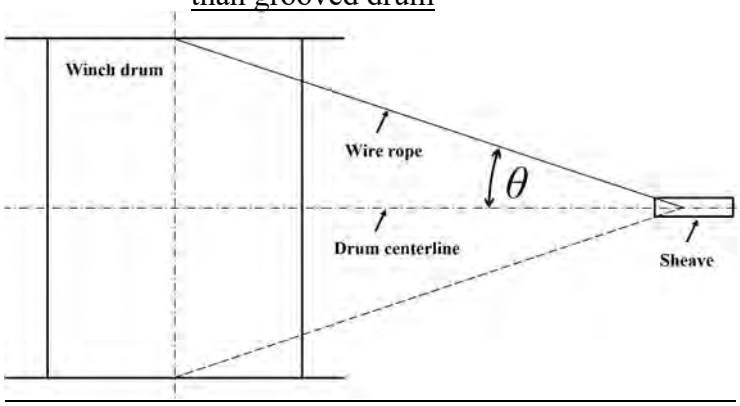


Fig. 7.2.2-2 Fleet angle of drum other than grooved drum



~~3~~4 The wording "~~T~~the rope at its end is to be secured to the drum" specified in **7.2.2-~~2~~3 of the Rules** means a force to sustain a load being double the drum load on condition that the wire rope is wound on the drum by four full turns.

7.3 Power Supply

Paragraph 7.3.1 has been amended as follows.

7.3.1 General

1 Among cables used in power circuit of 600*V* or less for electric equipment for movable cargo gear, rubber flexible cords used in portions requiring flexibility and bending strength are to be *EP* rubber insulated chloroprene cabtire cable of grade 2, 3 or 4 specified in *JIS C* 3327 or those conforming to other standards considered appropriate by the Society.

2 High pressure rubber hoses used in the hydraulic oil systems of cranes are to be approved in accordance with the requirements specified in **Chapter 12, Part D of the Rules for the Survey and Construction of Steel Ships**. However, such hoses are not required to be fire resistant when installed on exposed decks or when installed within cranes located on exposed decks.

7.4 Control Engineering Systems

7.4.3 Safety System

Sub-paragraphs -1 and -2 have been amended as follows.

1 ~~It recommended that d~~Derrick systems are to be provided with devices that indicate the degree of inclination angle of the boom at a position where easily visible to the operator. In addition, it is recommended that derrick systems be provided limit switches to prevent over winding up, slewing and over luffing.

2 Cranes are to be provided with safety devices specified in the following **(1)** through **(4)**:

(1) Overload preventive device and overload alarm. Cranes not serving cargo handling may dispense with these devices.

(2) Limit switches to prevent over winding up, over slewing over luffing except in cases where the cranes are operated by cylinders.

(3) (Omitted)

(4) (Omitted)

(5) For jib cranes that luff their jib, devices that indicate the degree of inclination angle of the jib are to be provided at a position easily visible to the operator.

3 (Omitted)

((1) to (3) are omitted.)

4 (Omitted)

5 (Omitted)

((1) and (2) are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 1 July 2021.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to cargo handling appliances for which the application for approval is before the effective date.

Amendment 1-2

Chapter 2 SURVEYS

2.3 Registration Surveys

2.3.2 Examinations for Workmanship

Sub-paragraph -4 has been added as follows.

4 The wording "the Society may approve other survey methods which it considers to be appropriate" in **2.3.2-3 of the Rules** means survey methods which it considers to be able to obtain information equivalent to that obtained through traditional ordinary surveys where the Surveyor is in attendance.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 1 July 2021.