CIRCULAR

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To : All Surveyors and whom it may concern

Subject	**9.99 Notice for Amendments to the KR Technical Rules (Effective from 1 Jan 2017)**
Application	**Refer to Effective date for each KR Technical Rules specified in Par.1**

1. Please be informed that the amendments have been made to the following KR Technical Rules 2016 as attachment to reflect IMO/IACS Resolutions which are to be applied on or after 1 January 2017. You are kindly requested to apply these amendments on the relevant works according to the relevant effective date.

Amended KR Technical Rules	Effective Date	Reflected IMO/IACS Res.
Rules/Guidance for the Classification of Steel Ships Pt 1	The contract date for ship construction or the application date for survey on or after 2017.1.1	IACS UR Z1(Rev.6) Z11(Rev.5) Z21(Rev.4) IACS UI SC273(Rev.1) SC280(New) MPC128(New) IACS PR2A & PR2B(New) PR20(Rev.2)
Rules for the Classification of Steel Ships Pt 2	The contract date for ship construction or application date for certification of material on or after 2017.1.1	IACS UR M68(Rev.2)
Guidance Relating to the Rules for the Classification of Steel Ships Pt 3	The contract date for ship constriction on or after 2017.1.1	IACS UR S6(Rev.8)
Guidance Relating to the Rules for the Classification of Steel Ships Pt 4	The contract date for ship constriction on or after 2017.1.1	IACS UI SC253(Rev.1)
Rules/Guidance for the Classification of Steel Ships Pt 5	The contract date for ship construction or application date for approval on or after 2017.1.1	IACS UR M56(Rev.3) M68(Rev.2), P2.7.4(Rev.8) P2.12(Rev.2) IACS UI SC246(Rev.1)
Rules/Guidance for the Classification of Steel Ships Pt 6	The contract date for ship construction or an application date for certification of a rotating machine on or after 2017.1.1	IACS UR E13(Rev.2)
Guidance Relating to the Rules for the Classification of Steel Ships Pt 7	The contract date for ship construction on or after 2017.1.1	IACS UR W1(Rev.3)
Rules for the Classification of Steel Ships Pt 9	The contract date for ship construction or an application for approval for the plans of BWMS on or after 2017.1.1	IACS UR M74(Rev.1)

Amended KR Technical Rules	Effective Date	Reflected IMO/IACS Res.
Guidance for Approval of Manufacturing Process and Type Approval, Etc.	The contract date for ship construction or application date for certification of material on or after 2017.1.1	IACS UR M68(Rev.2) P2.11(Rev.4), P3(Rev.4) IACS UI SC253(Rev.1)
Guidance relating to the Rules for Classification of Mobile Offshore Drilling Units	The contract date for ship construction on or after 2017.1.1	IACS UI MODU2(New)

2. Furthermore, please be informed that the amendments will be included in 2017 edition of KR Technical Rules which are published in the first half of 2017.

   Attachment: Amended KR Technical Rules --- 1 copy. (The End)

Kim Chang-wook

Executive Vice President, Technical Division

<Attachment>

<Amended KR Technical Rules>

Ⅰ. Rules/Guidance for the Classification of Steel Ships Pt 1 Classification and Surveys
Ⅱ. Rules for the Classification of Steel Ships Pt 2 Materials and Welding
Ⅲ. Guidance Relating to the Rules for the Classification of Steel Ships Pt 3 Hull Structures
Ⅳ. Guidance Relating to the Rules for the Classification of Steel Ships Pt 4 Hull Equipment
Ⅴ. Rules/Guidance for the Classification of Steel Ships Pt 5 Machinery Installations
Ⅵ. Rules/Guidance for the Classification of Steel Ships Pt 6 Electrical Equipment and Control Systems
Ⅶ. Guidance Relating to the Rules for the Classification of Steel Ships Pt 7 Ships of Special Service (CH 5)
Ⅷ. Rules for the Classification of Steel Ships Pt 9 Additional Installations
Ⅸ. Guidance for Approval of Manufacturing Process and Type Approval, etc.
Ⅹ. Guidance Relating to the Rules for the Classification of Mobile Offshore Drilling Units

Amended Rules for the Classification of Steel Ships

(Part 1 Classification and Surveys)

- Main Amendments -

(1) Effective date : 1 Jan 2017 (Date of which application for survey is submitted)

- ◉ To reflect IACS PR2A & PR2B (New Jul 2015)
- ◉ To reflect IACS PR No. 20 (Rev.2 Apr 2016)
- ◉ To reflect IACS UR Z21 (Rev.4 Oct 2015)
- ◉ To amend unreasonable contents disclosed while implementing the Rules

Present	Amendment
CHAPTER 1 Classification **Section 1 ~ Section 6 <omitted>** **Section 7 Cooperation Duties of Owners** **701. ~ 702. <omitted>** **703. Cooperation Duties** Notwithstanding the general duty of confidentiality owed by the Society to its clients as specified in 805., the Society's clients hereby accept that the Society will participate in Early Warning Scheme which requires each Society to provide the involved Societies(the Classification Societies classing a sister or a similar ship to the one involved in the incident) with relevant technical information(but not including any drawings relating to the ship which may be the specific property of another party) on serious hull structural and engineering systems failures, as defined in the Early Warning Scheme (Refer to IACS PR No.2 Procedure for Failure Incident Reporting and Early Warning of Serious Failure Incidents - Early Warning Scheme - EWS) to enable such useful information to be shared and utilised to facilitate the proper working of Early Warning Scheme. The Society will provide its client with written details of such information upon sending the same to the involved Societies. <omitted>	**CHAPTER 1 Classification** **Section 1 ~ Section 6 <same as the present>** **Section 7 Cooperation Duties of Owners** **701. ~ 702. <same as the present>** **703. Cooperation Duties *(2017)*** Notwithstanding the general duty of confidentiality owed by the Society to its clients as specified in 805., the Society's clients hereby accept that the Society will participate in Early Warning Scheme which requires each Society to provide the involved Societies(the Classification Societies classing a sister or a similar ship to the one involved in the incident) with relevant technical information(but not including any drawings relating to the ship which may be the specific property of another party) on serious hull structural and engineering systems failures, as defined in the Early Warning Scheme(Refer to IACS PR No.2A Procedure for Hull Failure Incident Reporting and PR No.2B Procedure for Early Warning of Serious Hull Failure Incidents - "Early Warning Scheme - EWS") to enable such useful information to be shared and utilised to facilitate the proper working of Early Warning Scheme. The Society will provide its client with written details of such information upon sending the same to the involved Societies. <same as the present>

Present	Amendment
CHAPTER 2 PERIODICAL AND OTHER SURVEYS	**CHAPTER 2 PERIODICAL AND OTHER SURVEYS**
Section 1 ~ Section 7 <omitted>	**Section 1 ~ Section 6** <same as the present Rules>
Section 7 Surveys of Propeller Shaft and Stern Tube Shaft, Etc.	**Section 7 Surveys of Propeller Shaft and Stern Tube Shaft, Etc.**
701. General **[See Guidance]**	**701. General** **[See Guidance]**
1. to **2.** <omitted>	**1.** to **2.** <same as the present Rules>
3. Definitions	**3. Definitions**
(1) to (18) <omitted> <Newly added>	(1) to (18) <same as the present Rules> (19) **Alternative means** are shafting arrangements such as, but not limited to, an approved Condition Monitoring Scheme and / or other reliable approved means for assessing and monitoring the condition of the tail shaft, bearings, sealing devices and the stern tube lubricant system capable to assure the condition of the propeller shaft assembly with an equivalent level of safety as obtained by survey methods as applicable in this Section. *(2017)*

Present	Amendment
702. Oil lubricated shafts or closed loop system fresh water lubricated shafts	**702. Oil lubricated shafts or closed loop system fresh water lubricated shafts**
1. Shaft survey methods 【See Guidance】	**1. Shaft survey methods** 【See Guidance】
<omitted>	<same as the present Rules>
2. Extension of shaft survey	**2. Extension of shaft survey**
<omitted>	<same as the present Rules>
3. Oil lubricated shafts	**3. Oil lubricated shafts**
(1) Survey intervals <omitted>	(1) Survey intervals <same as the present Rules>
(2) Extension of survey (A) For all types of propeller connections, extension of shaft survey specified in **Par 2** may be applied as follows: (a) Extension as per **Par 2** (1) (2.5 years extension): no more than one extension can be granted. No further extension, as per **Par 2** (2) and (3), can be granted. (b) Extension as per **Par 2** (2) (1 years extension): no more than two consecutive "1 year extensions" can be granted. No further extension, as per **Par 2** (1) and (3), can be granted. (c) Extension as per **Par 2** (3) (3 months extension): no more than one "3 months extension" can be granted. In the event an additional extension is requested, the requirements specified in **Par 2** (2) are to be carried out and the shaft survey due date, prior to the previous extension, is extended for a maximum of 1 year. (B) <omitted>	(2) Extension of survey (A) For all types of propeller connections, extension of shaft survey specified in **Par 2** may be applied as follows: (a) Extension as per **Par 2** (1) (2.5 years extension): no more than one extension can be granted. No further extension, as per **Par 2** (2) and (3), can be granted. (b) Extension as per **Par 2** (2) (1 years extension): no more than two consecutive "1 year extensions" can be granted. ~~No further extension, as per **Par 2** (1) and (3), can be granted.~~ In the event an additional extension is requested the requirements of the "2.5 year extension" are to be carried out and the shaft survey due date, prior to the previous extension(s), is extended for a maximum of 2.5 years. *(2017)* (c) Extension as per **Par 2** (3) (3 months extension): no more than one "3 months extension" can be granted. In the event an additional extension is requested, the requirements specified in **Par 2** (2) or (1) are to be carried out and the shaft survey due date, prior to the previous extension, is extended for a maximum of 1 year or 2.5 years. *(2017)* (B) <same as the present Rules>
(3) <omitted>	(3) <same as the present Rules>

Present	Amendment
4. Closed loop system fresh water lubricated shafts (1) Survey intervals <omitted> (2) Extension of survey (A) For all types of propeller connections, extension of shaft survey specified in **Par 2** may be applied as follows: (a) Extension as per **Par 2** (1) (2.5 years extension): no more than one extension can be granted. No further extension, as per **Par 2** (2) and (3), can be granted. (b) Extension as per **Par 2** (2) (1 years extension): no more than two consecutive "1 year extensions" can be granted. No further extension, as per **Par 2** (1) and (3), can be granted. (c) Extension as per **Par 2** (3) (3 months extension): no more than one "3 months extension" can be granted. In the event an additional extension is requested, the requirements specified in **Par 2** (2) are to be carried out and the shaft survey due date, prior to the previous extension, is extended for a maximum of 1 year. (B) <omitted> (3) <omitted>	**4. Closed loop system fresh water lubricated shafts** (1) Survey intervals <same as the present Rules> (2) Extension of survey (A) For all types of propeller connections, extension of shaft survey specified in **Par 2** may be applied as follows: (a) Extension as per **Par 2** (1) (2.5 years extension): no more than one extension can be granted. No further extension, as per **Par 2** (2) and (3), can be granted. (b) Extension as per **Par 2** (2) (1 years extension): no more than two consecutive "1 year extensions" can be granted. ~~No further extension, as per **Par 2** (1) and (3), can be granted.~~ In the event an additional extension is requested the requirements of the "2.5 year extension" are to be carried out and the shaft survey due date, prior to the previous extension(s), is extended for a maximum of 2.5 years. *(2017)* (c) Extension as per **Par 2** (3) (3 months extension): no more than one "3 months extension" can be granted. In the event an additional extension is requested, the requirements specified in **Par 2** (2) of (1) are to be carried out and the shaft survey due date, prior to the previous extension, is extended for a maximum of 1 year or 2.5 years. *(2017)* (B) <same as the present Rules> (3) <same as the present Rules>

Present

5. A summary of survey intervals and survey methods specified in **Par 1** to **Par 4** is given in the following:

Oil Lubricated Shaft			
Type of propeller connection / Survey interval	Flanged connection	Keyless connection	Keyed connection[c]
Every 5 years[a]	Method1, Method2 or Method3	Method1, Method2 or Method3[d]	Method1 or Method2
Extension 2.5 years[b]	Yes[e]	Yes[e]	Yes[e]
Extension 1 year[b]	Yes[f]	Yes[f]	Yes[f]
Extension 3 months[b][d]	Yes[g]	Yes[g]	Yes[g]
Closed Loop System Fresh Water Lubricated Shaft			
Type of propeller connection / Survey interval	Flanged connection	Keyless connection	Keyed connection[c]
Every 5 years[a]	Method1[h], Method2 or Method3	Method1[h], Method2 or Method3	Method1[h] or Method2
Extension 2.5 years[b]	Yes[e]	Yes[e]	Yes[e]
Extension 1 year[b]	Yes[f]	Yes[f]	Yes[f]
Extension 3 months[b][d]	Yes[g]	Yes[g]	Yes[g]

(NOTES)

(1), (2) <omitted>

(REMARKS)

(a) Unless an Extension type (Extension 2.5 years, Extension 1 year or Extension 3 months) is applied in between.

(b) Only one Extension type can be applied in between of two Methods (Extension 2.5 years, or Extension 1 year) except for what concern the Extension 3 months (see further note (g)).

(c) Method 3 not allowed.

(d) Maximum of two consecutives Method 3 surveys. The maximum interval between two surveys carried out according to Method 1 or Method 2 shall not exceed 15 years, except in the case when one extension for no more than three months is granted.

(e) No more than one extension can be granted. No further extension of other type can be granted.

(f) No more than two consecutive extensions can be granted. No further extension of other type can be granted.

(g) No more than one three months extension can be granted. In the event an additional extension is requested the requirements of the 1 year extension are to be carried out and the shaft survey due date prior to the previous extension is extended for a maximum of 1 year.

(h) The maximum interval between two surveys carried out according to Method 1 shall not be more than 15 years.

<omitted>

Amendment

5. A summary of survey intervals and survey methods specified in **Par 1** to **Par 4** is given in the following:

Oil Lubricated Shaft *(2017)*			
Type of propeller connection / Survey interval	Flanged connection	Keyless connection	Keyed connection[b]
Every 5 years[a]	Method1, Method2 or Method3	Method1, Method2 or Method3[d]	Method1 or Method2
Extension 2.5 years	Yes[d]	Yes[d]	Yes[d]
Extension 1 year	Yes[e]	Yes[e]	Yes[e]
Extension 3 months	Yes[f]	Yes[f]	Yes[f]
Closed Loop System Fresh Water Lubricated Shaft			
Type of propeller connection / Survey interval	Flanged connection	Keyless connection	Keyed connection[b]
Every 5 years[a]	Method1[g], Method2 or Method3	Method1[g], Method2 or Method3	Method1[g] or Method2
Extension 2.5 years	Yes[d]	Yes[d]	Yes[d]
Extension 1 year	Yes[e]	Yes[e]	Yes[e]
Extension 3 months	Yes[f]	Yes[f]	Yes[f]

(NOTES)

(1), (2) <same as the present Rules>

(REMARKS)

(a) Unless an Extension type (Extension 2.5 years, Extension 1 year or Extension 3 months) is applied in between.

~~(b) Only one Extension type can be applied in between of two Methods (Extension 2.5 years, or Extension 1 year) except for what concern the Extension 3 months (see further note (g)).~~

(b) Method 3 not allowed.

(c) Maximum of two consecutives Method 3 surveys. The maximum interval between two surveys carried out according to Method 1 or Method 2 shall not exceed 15 years, except in the case when one extension for no more than three months is granted.

(d) No more than one extension can be granted. No further extension of other type can be granted.

(e) No more than two consecutive extensions can be granted. ~~No further extension of other type can be granted.~~ In the event an additional extension is requested the requirements of the 2.5 year extension are to be carried out and the shaft survey due date, prior to the previous extension(s), is extended for a maximum of 2.5 years.

(f) No more than one three months extension can be granted. In the event an additional extension is requested the requirements of the 1 year extension or 2.5 years extension are to be carried out and the shaft survey due date prior to the previous extension is extended for a maximum of 1 year.

(g) The maximum interval between two surveys carried out according to Method 1 shall not be more than 15 years.

<same as the present>

Present	Amendment
CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME	**CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME**
Section 1 General	**Section 1 General**
101. Application	**101. Application**
1. <omitted>	**1. <same as the present>**
2. Procedural requirements for certain ESP surveys	**2. Procedural requirements for certain ESP surveys *(2017)***
The objective of these requirements are to improve the quality of surveys. Taking into consideration, the size of vessels and scope of surveys for vessels noted below, it is more effective to have more than one Surveyor examine the required spaces, holds or tanks and to provide mutual support and consultation during the surveys in recommending repairs and actions required for conditions of class/recommendations.	The objective of these requirements are to improve the quality of surveys. These requirements apply to surveys of hull structures and piping systems in way of cargo holds and/or cargo tanks, cofferdams, cargo pump rooms, pipe tunnels, void spaces, within the cargo length area and all ballast tanks. In the case of Bulk Carriers, selected fuel oil tanks within the cargo length area might be part of the areas to be surveyed according to the applicable provisions of the **Ch 3, Sec. 2** Bulk Carriers or **Ch 3, Sec. 6** Double Skin Bulk Carriers. Taking in to consideration, the size of vessels and scope of surveys for vessels noted below, it is more effective to have more than one Surveyor examine the required spaces, holds or tanks and to provide mutual support and consultation during the surveys in recommending repairs and actions required for conditions of class/recommendations.
(1) On ships 20,000 DWT and above, subject to ESP, starting with Special Survey No. 3, all special and intermediate hull classification surveys are to be carried out by at least two exclusive Surveyors. On bulk carriers 100,000 DWT and above of single side skin construction the intermediate hull classification survey between 10 and 15 years of age is to be performed by two exclusive Surveyors.	(1) On ships 20,000 DWT and above, subject to ESP, starting with Special Survey No. 3, ~~all~~ at special and intermediate hull classification surveys, the survey of hull structure and piping systems to which these requirements applies is ~~are~~ to be carried out by at least two exclusive Surveyors. On bulk carriers 100,000 DWT and above of single side skin construction at the intermediate hull classification survey between 10 and

Present	Amendment
(2) This requires that at least two exclusive Surveyors attend on board at the same time to perform the required survey. Where compatible with relevant laws and regulations, on dual class vessels, the requirement for two Surveyors may be fulfilled by having one Surveyor attend from each Society. (3) Though each attending Surveyor is not required to perform all aspects of the required survey, they are required to consult with each other and to do joint Overall and Close-up Surveys to the extent necessary to determine the condition of the vessel. The extent of these surveys should be sufficient for the Surveyors to agree on actions required to complete the survey with respect to renewals, repairs, and other recommendations or conditions of class. Each Surveyor is required to co-sign the survey report or indicate their concurrence in an equivalent manner. <omitted>	15 years of age, the survey of hull structure and piping systems to which these requirements applies is to be performed by two at least exclusive Surveyors. (2) This requires that at least two exclusive Surveyors attend on board at the same time to perform the required survey. Where compatible with relevant laws and regulations, on dual class vessels, the requirement for two Surveyors may be fulfilled by having one Surveyor attend from each Society. (3) Though each attending Surveyor is not required to perform all aspects of the required survey, they are required to consult with each other and to do joint Overall and Close-up Surveys to the extent necessary to determine the condition of the vessel areas to which these requirements applies. The extent of these surveys should be sufficient for the Surveyors to agree on actions required to complete the survey with respect to renewals, repairs, and other recommendations or conditions of class. Each Surveyor is required to co-sign the survey report or indicate their concurrence in an equivalent manner. <same as the present>

Amended Guidance Relating to the Rules for the Classification of Steel Ships

(Part 1 Classification and Surveys)

- Main Amendments -

(1) Effective date : 1 Jan 2017 (Date of which application for survey is submitted)

- ◉ To reflect IACS UR Z11 (Rev.5 Sep 2015)
- ◉ To reflect IACS UR Z1 (Rev.6 Apr 2016)
- ◉ To amend unreasonable contents disclosed while implementing the Rules

(2) Effective date : 1 Jan 2017 (Contracted for construction on or after 1 Jan 2017)

- ◉ To reflect IACS UI SC 280 (New Jun 2016)
- ◉ To reflect IACS UI SC 273 (Rev.1 May 2016) and UI MPC128 (New May 2016)

(1) Effective date : 1 Jan 2017

(Date of which application for survey is submitted)

Present	Amendment
CHAPTER 2 PERIODICAL AND OTHER SURVEYS	**CHAPTER 2 PERIODICAL AND OTHER SURVEYS**
Section 1 General	**Section 1 General**
<omitted>	<same as the present>
Section 2 Annual Survey	**Section 2 Annual Survey**
202. Hull, equipment and fire-fighting appliances	**202. Hull, equipment and fire-fighting appliances**
1. ~ 2. <omitted>	**1. ~ 2. <same as the present>**
3. In application to 202.2 of the Rules, the following items are to be surveyed.	**3.** In application to 202.2 of the Rules, the following items are to be surveyed.
(1) Examining the fire pumps, fire main, hydrants, hoses and nozzles and the international shore connection and checking that each fire pump, including the emergency fire pump, can be operated separately so that two jets of water are produced simultaneously from different hydrants at any part of the ship whilst the required pressure I maintained in the fire main.	(1) ~ (2) <same as the present>
(2) Checking the provision and randomly examining the condition of the portable and non-portable fire extinguishers.	(3) Confirming that the fire fighter's outfits and emergency escape breathing devices(EEBDs) are complete and in good condition and that the cylinders, including the spare cylinders, of any required self contained-breathing apparatus are suitably charged, and that on board means of recharging breathing apparatus used during drills or a suitable number of spare cylinders to replace those used are provided, and provision of two-way portable radiotelephone apparatus of an explosion-proof type or intrinsically safe. (SOLAS 74/00/12, Reg.II-2/10.10) *(2017)*
(3) Confirming that the fire fighter's outfits and emergency escape breathing devices(EEBDs) are complete and in good condition and that the cylinders, including the spare cylinders, of any required self contained-breathing apparatus are suitably charged.	(4) ~ (12) <same as the present>
(4) ~ (12) <omitted>	
<omitted>	<same as the present>

Present	Amendment
Section 7 Surveys of Propeller Shaft and Stern Tube Shaft, Etc. **701. Due range** **1.** ~ **2.** <omitted>	**Section 7 Surveys of Propeller Shaft and Stern Tube Shaft, Etc.** **701. General** **1.** ~ **2.** <same as the present> **3.** In application to **701. 3** (19) of the Rules, a ships with oil lubricated stern tube bearing applying an approved Condition Monitoring Scheme is to comply with the followings and is to be assigned an additional installation notation of STCM. *(2017)* (1) The following systems are to be provided and relevant drawings are to be submitted for approval. (A) At the aft stern tube bearing, two temperature sensors are to be provided, or if only one temperature senor is provided, a spare temperature sensor which can be replaced easily is to be provided when the using sensor is out of order.. (B) Measurement of bearing weardown is to be provided. (C) Oil seals devices are to be such that can be renewed without removal of propeller. (2) The following are carried out at each shaft survey due date required by **702. 3** (1) of the Rules (A) Survey required by **702. 1** (2) (A) or (B) of the Rules (B) Survey required by **702. 1** (2) (D), (E), (F) and (G) of the Rules (3) the Surveyor confirms at the periodical survey that parameters in the following condition monitoring records are within permissible limits. (A) lubricating oil analysis specified in **701. 3** (14) (B) Lubricating oil consumption (C) Aft stern tube bearing temperatures (D) Bearing weardown measurement

Present	Amendment
702. Oil Lubricated shafts or Closed Loop System Fresh Water Lubricated Shafts **1.** In application to **702. 1** of the Rules, the term "surface crack-detection method", in principle, means a magnetic particle test. Where it is not practicable for shafts of nonmagnetic material, etc. a liquid penetrant test may be used. **2.** In application to **702. 1** of the Rules, where the entire withdrawal of propeller shaft is not required and the survey may be carried out on the state that propeller is moved in the possible range, the propeller need not be entirely removed. However, where considered necessary by the Surveyor, the entire removal may be required. **3.** In application to **702. 1** of the Rules, where keyless propeller is force-fitted to the propeller shaft, it is to be ascertained at each time when the propeller is fitted, that the pull-up length is within the upper and lower limits of pull-up length approved by the Society in accordance with the requirements specified in **Pt 5, Ch 3, 305.** of the Guidance.	**702. Oil Lubricated shafts or Closed Loop System Fresh Water Lubricated Shafts** **1.** In application to **702. 1** of the Rules, the term "surface crack-detection method", in principle, means a magnetic particle test. Where it is not practicable for shafts of nonmagnetic material, etc. a liquid penetrant test may be used. **2.** In application to **702. 1** (2) of the Rules, where the entire withdrawal of propeller shaft is not required and the survey may be carried out on the state that propeller is moved in the possible range, the propeller need not be entirely removed. However, where considered necessary by the Surveyor, the entire removal may be required. *(2017)* **3.** In application to **702. 1** (1) and (2) of the Rules, where keyless propeller is force-fitted to the propeller shaft, it is to be ascertained at each time when the propeller is fitted, that the pull-up length is within the upper and lower limits of pull-up length approved by the Society in accordance with the requirements specified in **Pt 5, Ch 3, 305.** of the Guidance. *(2017)*

Present	Amendment
703. Open System Water Lubricated Shafts **1.** In application to **703. 1** of the Rules, the term "surface crack-detection method", in principle, means a magnetic particle test. Where it is not practicable for shafts of nonmagnetic material, etc. a liquid penetrant test may be used. **2.** In application to **703. 1** of the Rules, where the entire withdrawal of propeller shaft is not required and the survey may be carried out on the state that propeller is moved in the possible range, the propeller need not be entirely removed. However, where considered necessary by the Surveyor, the entire removal may be required. **3.** In application to **703. 1** of the Rules, where keyless propeller is force-fitted to the propeller shaft, it is to be ascertained at each time when the propeller is fitted, that the pull-up length is within the upper and lower limits of pull-up length approved by the Society in accordance with the requirements specified in **Pt 5, Ch 3, 305.** of the Guidance. <omitted>	**703. Open System Water Lubricated Shafts** **1.** In application to **703. 1** of the Rules, the term "surface crack-detection method", in principle, means a magnetic particle test. Where it is not practicable for shafts of nonmagnetic material, etc. a liquid penetrant test may be used. ~~**2.** In application to **703. 1** of the Rules, where the entire withdrawal of propeller shaft is not required and the survey may be carried out on the state that propeller is moved in the possible range, the propeller need not be entirely removed. However, where considered necessary by the Surveyor, the entire removal may be required.~~ **2.** In application to **703. 1** (1) of the Rules, where keyless propeller is force-fitted to the propeller shaft, it is to be ascertained at each time when the propeller is fitted, that the pull-up length is within the upper and lower limits of pull-up length approved by the Society in accordance with the requirements specified in **Pt 5, Ch 3, 305.** of the Guidance. *(2017)* <same as the present>

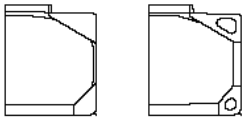
Present

Annex 1-1 Character of Classification

1. Class Notation

1.1 Ship Type and Special Feature Notations

1.~4. <omitted>

Ship Types	Special Feature Notations		Remarks
(10)	A		(10) : See examples given in **2.3.**
5-1. Bulk Carrier (Double Skin)(11-1) 'ESP'(11-2) 'ESP'(EXP)(11-2) (CSR)(11-3)	- HC(12) HC/E(13) BC-A* BC-B** BC-C***	GRAB[X]****	(11-1) : This notation shall be assigned in the following cases. (Note: The relevant requirements specified in **Pt 1, Ch 3, Sec 6** Double Skin Bulk Carriers are to be applied if applicable even if the ship has no Double Skin notation) (1) the ships, constructed before 1 July 1999, have double side skin construction (2) the ships, constructed before 1 January 2000, have double side skin construction of not less than 760 mm breadth at any location within the hold length, measured perpendicular to the side shell (3) the ships, constructed on or after 1 January 2000, have double side skin construction of not less than 1000 mm breadth at any location within the hold length, measured perpendicular to the side shell
5-2. Bulk Carrier(14) (Double Skin)(11-1) (CSR)(11-3			(11-2) : The notation "ESP" shall be assigned to ships which are constructed generally with single deck, double bottom, hopper side tanks and topside tanks and with single or double side skin construction in cargo length area and intended primarily to carry dry cargoes in bulk. For ships constructed on or after 1 July 2010, however, the notation "ESP" shall be assigned even if they lack some or all of the specified constructional feature above and (EXP) notation shall be followed. (Typical midship sections are given in **Fig 3**)  **Fig 3 Typical midship sections of Bulk Carrier 'ESP'** (11-3) : This notation shall be assigned to ships comply with the requirements specified in **Pt 11** or **Pt 13** of the Rules. <omitted>

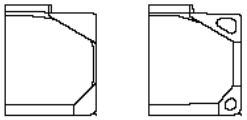
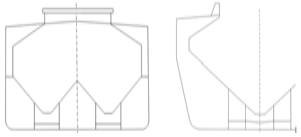
<omitted>

Annex 1-1 Character of Classification

1. Class Notation

1.1 Ship Type and Special Feature Notations

1.~4. <same as the present>

Ship Types	Special Feature Notations		Remarks
(10)	A		<same as the present>
5-1. *(2017)* Bulk Carrier (Double Skin)(11-1) 'ESP'(11-2) 'ESP'(EXP)(11-2) (CSR)(11-4)	- HC(12) HC/E(13) BC-A*1 BC-B*2 BC-C*3	GRAB[X]*4 max cargo density (t/m3)*5 no MP*6 Holds Nos. ... may be empty*7 Block loading*8	(11-2) : The notation "ESP" shall be assigned to ships which are constructed generally with single deck, double bottom, hopper side tanks and topside tanks and with single or double side skin construction in cargo length area and intended primarily to carry dry cargoes in bulk. For ships constructed on or after 1 July 2010, however, the notation "ESP" shall be assigned even if they lack some or all of the specified constructional feature above and (EXP) notation shall be followed. (Typical midship sections are given in **Fig 3-1**)
5-2. *(2017)* Bulk Carrier(14) (Double Skin)(11-1) (CSR)(11-4)			 **Fig 3-1 Typical midship sections of Bulk Carrier 'ESP'**
5.3. *(2017)* Self-Unloading Bulk Carrier 'ESP'(11-3) (Double Skin)(11-1)			(11-3) : The notation "ESP" shall be assigned to ships which are constructed generally with single deck, double bottom, hopper side tanks and topside tanks and with single or double side skin construction in cargo length area and intended to carry and self-unload dry cargoes in bulk. (Typical midship sections are given in **Fig 3-2**)
			 **Fig 3-2 Typical midship sections of Self-Unloading Bulk Carrier 'ESP'**
			(11-4) : This notation shall be assigned to ships comply with the requirements specified in **Pt 11** or **Pt 13** of the Rules.
			<same as the present>

Amendments(2/2)

Ship Types	Special Feature Notations		Remarks
(10)	A		
5-1. *(2017)* Bulk Carrier (Double Skin)(11-1) 'ESP'(11-2) 'ESP'(EXP)(11-2) (CSR)(11-4)	- HC(12) HC/E(13) BC-A*1 BC-B*2 BC-C*3	GRAB[X]*4 max cargo density (t/m3)*5 no MP*6 Holds Nos. ... may be empty*7 Block loading*8	*1 : Bulk carriers designed to carry dry bulk cargoes of cargo density of 1.0 t/m^3 and above with specified holds empty at maximum draught in addition to BC-B conditions as **Pt 7, Ch 3, Sec 2** or **Pt 11, Ch 1, Sec 1** or **Pt 13, Sub-part 1, Ch 1, Sec 1** of the Rules. *2 : Bulk carriers designed to carry dry bulk cargoes of cargo density of 1.0 t/m^3 and above with all cargo holds loaded in addition to BC-C conditions as **Pt 7, Ch 3, Sec 2** or **Pt 11, Ch 1, Sec 1** or **Pt 13, Sub-part 1, Ch 1, Sec 1** of the Rules. *3 : Bulk carriers designed to carry dry bulk cargoes of cargo density of less than 1.0 t/m^3 as **Pt 7, Ch 3, Sec 2** or **Pt 11, Ch 1, Sec 1** or **Pt 13, Sub-part 1, Ch 1, Sec 1** of the Rules. *4 : The additional notation GRAB[X] is assigned to ships with holds designed for loading/unloading by grabs having a maximum specific weight up to [X] tons in compliance with the requirements of **Pt 11, Ch 12, Sec 1** or **Pt 13, Sub-part 2, Ch 1, Sec 6** of the Rules, the GRAB[X] notation is mandatory for ships having one of BC-A or BC-B, according to **Pt 11, Ch 1, Sec 1** or **Pt 13, Sub-part 1, Ch 1, Sec 1** of the Rules and these ships are to be complied with for an unladen grab weight X equal to or greater than 20 tons. For all other ships GRAB[X] is voluntary. *5 : For additional service features BC-A and BC-B if the maximum cargo density is less than 3.0 t/m3 as **Pt 7, Ch 3, Sec 2** or **Pt 11, Ch 4, Sec 7** or **Pt 13, Sub-part 1, Ch 4, Sec 8** of the Rules. *6 : For all additional service features when the ship has not been designed for loading and unloading in multiple ports as **Pt 7, Ch 3, Sec 2** or **Pt 11 Ch 4 Sec 7** or **Pt 13 Sub-part 1 Ch 4 Sec 8** of the Rules. *7 : For additional service feature BC-A as **Pt 7, Ch 3, Sec 2** or **Pt 11, Ch 4, Sec 7** or **Pt 13, Sub-part 1, Ch 4, Sec 8** of the Rules. *8 : For additional service feature BC-A, when the ship is intended to operate in alternate block load condition as **Pt 13, Sub-part 1, Ch 4, Sec 8** of the Rules.
5-2. *(2017)* Bulk Carrier(14) (Double Skin)(11-1) (CSR)(11-4)			
5.3. *(2017)* Self-Unloading Bulk Carrier 'ESP'(11-3) (Double Skin)(11-1)			

<same as the present>

Present

1.2 Additional Installations Notations

The following Additional Installations Notations may be appended to ships complying with the relevant requirements.

Additional Installations Notations		Relevant Requirements
Machinery Items	STCM	to ships where the Stern Tube Condition Monitoring System in accordance with **Ch 2, 704.** of the Rules, which was specified until 1 January 2016, is provided onboard. However, only ships which had been contracted to be assigned this notation or which had been assigned this notations before 1 January 2016 can keep these notations, but these notations are not to be newly assigned to any ships after 1 January 2016.

<omitted>

Amendment

1.2 Additional Installations Notations

The following Additional Installations Notations may be appended to ships complying with the relevant requirements.

Additional Installations Notations		Relevant Requirements
Machinery Items	STCM *(2017)*	to ships where the Stern Tube Condition Monitoring System specified in **Ch 2, 701. 3** of Guidance is provided onboard.

<same as the present>

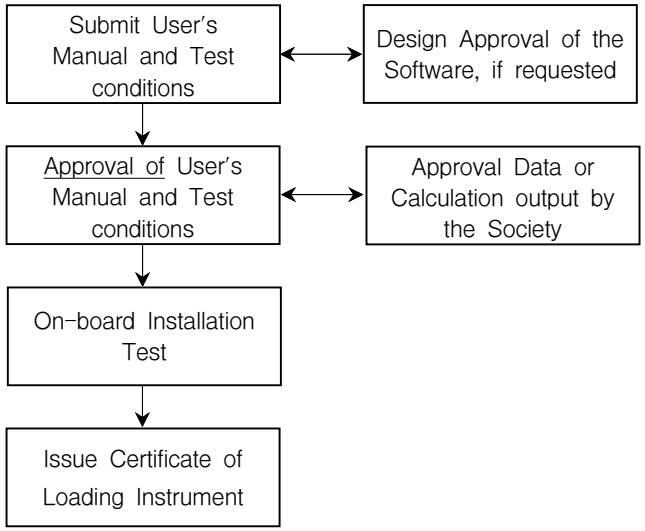
Present

Annex 1-10 Loading instrument on Stability

1. Application <omitted>

2. Approval procedure

(1) The procedure for approval of a loading instrument on stability is as illustrated in **Fig 1.**



* The approval of the software should be carried out in accordance with "**Guidance for Approval of Manufacturing Process and Type Approval, Etc.**"

Fig 1 Procedure for the approval of loading instrument on stability for a specific ship.

(A) User's operations manual and 3 copies of test conditions are to be submitted to Head Office. The loading instrument on stability may be approved provisionally if the stability information booklet is approved provisionally. A provisional certificate may be issued after on-board installation in this case.

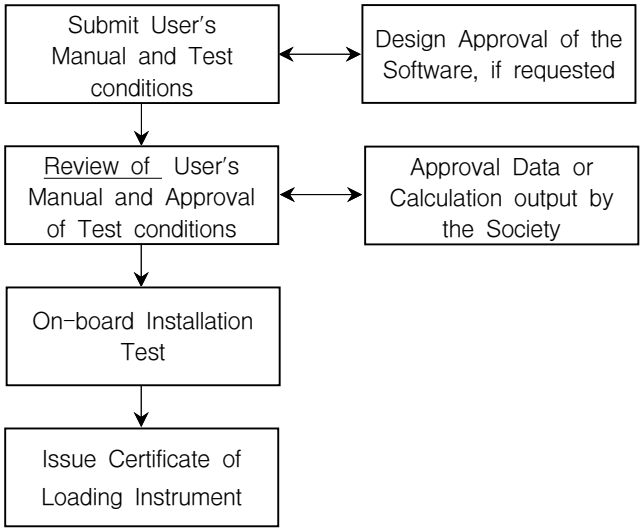
Amendment

Annex 1-10 Loading instrument on Stability

1. Application <same as present>

2. Approval procedure *(2017)*

(1) The procedure for approval of a loading instrument on stability is as illustrated in **Fig 1.**



* The approval of the software should be carried out in accordance with "**Guidance for Approval of Manufacturing Process and Type Approval, Etc.**"

Fig 1 Procedure for the approval of loading instrument on stability for a specific ship.

(A) User's ~~operations~~ manual and 3 copies of test conditions are to be submitted to Head Office. The loading instrument on stability of test conditions may be approved provisionally if the stability information booklet is approved provisionally. A provisional certificate may be issued after on-board installation in this case.

Present	Amendment
(B) The requirements which are checked during approval of the user's operation manual and test conditions are as follows: - the output of the loading instrument for the exampled test conditions are correct. - the technical contents and forms of the user's operations manual is appropriate. (2) Where the loading instrument on stability is intended for office use on shore(in such case it may be used for stability calculations for several different ships), this is acceptable provided that: - the procedure in this appendix has been satisfactorily completed. - the user's operations manual and test conditions have been approved for each of ships for which the instrument is used. - operational performance of the hardware is to be tested but environmental testing is not normally required. - the installation test is to be carried out and a certificate is issued if found appropriate. <newly added> **4. User's operations manual** (1) User's operations manual approved by the Society is to be provided for the loading instrument on stability. This manual should contain operating instructions for all stability calculations made by the loading instrument. (2) The user's operations manual must be in a language readily understood by the users. A English version, if not written in English language, should be provided if the ship on which the instrument is installed is engaged in the international voyage.	(B) The requirements which are checked during review of the user's ~~operation~~ manual and approval of test conditions are as follows: - the output of the loading instrument for the exampled test conditions are correct. - the technical contents and forms of the user's ~~oper~~ations manual is appropriate. (2) Where the loading instrument on stability is intended for office use on shore(in such case it may be used for stability calculations for several different ships), this is acceptable provided that: - the procedure in this appendix has been satisfactorily completed. - the user's ~~operations~~ manual has been reviewed and test conditions have been approved for each of ships for which the instrument is used. - operational performance of the hardware is to be tested but environmental testing is not normally required. - the installation test is to be carried out and a certificate is issued if found appropriate. (3) Where software of "loading instrument on stability" which has been type approved by the Society, the submission of User's operation manual may be waived if not specially requested. <same as the present> **4. User's ~~operations~~ manual *(2017)*** (1) User's ~~operations~~ manual reviewed ~~approved~~ by the Society is to be provided for the loading instrument on stability. This manual should contain operating instructions for all stability calculations made by the loading instrument. (2) The user's ~~operations~~ manual must be in a language readily understood by the users. A English version, if not written in English language, should be provided if the ship on which the instrument is installed is engaged in the international voyage.

Present	Amendment
(3) The manual should contain general description of the stability software together with a full description of the operational procedure for stability calculations. In this connection, there should be a list of all terms, definitions, error messages and warnings likely to be encountered by the user. In the case of error messages and warnings, there should be unambiguous user instructions for subsequent action to be taken in each case. (4) In addition to the above, the following items should also be included in the user's operations manual. <newly added> - Lightship weight and co-ordinates of center of gravity <omitted>	(3) The manual should contain general description of the stability software together with ~~a full description of the operational procedure for stability calculations. In this connection, there should be~~ a list of all terms, definitions, error messages and warnings likely to be encountered by the user. In the case of error messages and warnings, there should be unambiguous user instructions for subsequent action to be taken in each case. (4) In addition to the above, the following items should also be included in the user's ~~operations~~ manual. But, some of following items can be included in test conditions. - Where applicable, a copy of the Certificate of Design Approval of the software, if approved by the Society - Minimum hardware specification to run the loading program. - Explanation of the functionality of the loading program, the calculation method and principle. - Lightship weight and co-ordinates of center of gravity <same as the present>

(2) Effective date : 1 Jan 2017

(Contracted for construction on or after 1 Jan 2017)

Present	Amendment
Annex 1-2 Guidance for Intact Stability **<omitted>** **INTRODUCTION** **1. Purpose <omitted>** **2. Definitions** For the purpose of this Guidance the definitions given hereunder shall apply. For terms used, but not defined in this Guidance, the definitions as given in the 1974 SOLAS Convention, as amended, shall apply. 2.1 to 2.22 <omitted> 2.23 Lightship condition is a ship complete in all respects, but without consumables, stores, cargo, crew and effects, and without any liquids on board except that machinery and piping fluids, such as lubricants and hydraulics, are at operating levels. <newly added> 2.24 A lightweight survey involves taking an audit of all items which should be added, deducted or relocated on the ship at the time of the inclining test so that the observed condition of the ship can be adjusted to the lightship condition. The mass, longitudinal, transverse and vertical location of each item should be accurately determined and recorded. Using this information, the static waterline of the ship at the time of the inclining test as determined from measuring the freeboard or verified draught marks of the ship, the ship's hydrostatic data, and the sea water density, the lightship displacement and longitudinal centre of gravity(LCG) can be obtained. The transverse centre of gravity(TCG) may also be determined for mobile offshore drilling units(MODUs) and other ships which are asymmetrical about the centreline or whose internal arrangement or outfitting is such that an inherent list may develop from off-centre mass. <omitted>	**Annex 1-2 Guidance for Intact Stability** **<same as the present>** **INTRODUCTION** **1. Purpose <same as the present>** **2. Definitions** For the purpose of this Guidance the definitions given hereunder shall apply. For terms used, but not defined in this Guidance, the definitions as given in the 1974 SOLAS Convention, as amended, shall apply. 2.1 to 2.22 <same as the present> 2.23 Lightship condition is a ship complete in all respects, but without consumables, stores, cargo, crew and effects, and without any liquids on board except that machinery and piping fluids, such as lubricants and hydraulics, are at operating levels. But, the weight of mediums on board for the fixed fire-fighting system (e.g. freshwater, CO_2, dry powder, foam concentrate, etc.) shall be included in the lightweight and lightship conditions. *(2017)* 2.24 A lightweight survey involves taking an audit of all items which should be added, deducted or relocated on the ship at the time of the inclining test so that the observed condition of the ship can be adjusted to the lightship condition. The mass, longitudinal, transverse and vertical location of each item should be accurately determined and recorded. Using this information, the static waterline of the ship at the time of the inclining test as determined from measuring the freeboard or verified draught marks of the ship, the ship's hydrostatic data, and the sea water density, the lightship displacement and longitudinal centre of gravity(LCG) can be obtained. The transverse centre of gravity(TCG) may also be determined for mobile offshore drilling units(MODUs) and other ships which are asymmetrical about the centreline or whose internal arrangement or outfitting is such that an inherent list may develop from off-centre mass. <same as the present>

Present	Amendment
PART A MANDATORY CRITERIA **CHAPTER 1 GENERAL <same as the present>** **CHAPTER 2 GENERAL CRITERIA** 2.1 General <omitted> 2.2 Criteria regarding righting lever curve properties 2.2.1 The area under the righting lever curve(GZ curve) shall not be less than 0.055 $m-rad$ up to φ = 30° angle of heel and not less than 0.09 $m-rad$ up to φ = 40° or the angle of down-flooding φ_f* if this angle is less than 40°. Additionally, the area under the righting lever curve(GZ curve) between the angles of heel of 30° and 40° or between 30° and φ_f, if this angle is less than 40° shall not be less than 0.03 $m-rad$. * φ_f is an angle of heel at which openings in the hull, superstructures or deckhouses which cannot be closed weathertight immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open. <newly added> 2.2.2 The righting lever GZ shall be at least 0.2 m at an angle of heel equal to or greater than 30°. <omitted>	**PART A MANDATORY CRITERIA** **CHAPTER 1 GENERAL <same as the present>** **CHAPTER 2 GENERAL CRITERIA** 2.1 General <same as present> 2.2 Criteria regarding righting lever curve properties 2.2.1 The area under the righting lever curve(GZ curve) shall not be less than 0.055 $m-rad$ up to φ = 30° angle of heel and not less than 0.09 $m-rad$ up to φ = 40° or the angle of down-flooding φ_f* if this angle is less than 40°. Additionally, the area under the righting lever curve(GZ curve) between the angles of heel of 30° and 40° or between 30° and φ_f, if this angle is less than 40° shall not be less than 0.03 $m-rad$. * φ_f is an angle of heel at which openings in the hull, superstructures or deckhouses which cannot be closed weathertight immerse. In applying this criterion, small openings through which progressive flooding cannot take place need not be considered as open. But in applying φ_f, openings which cannot be or are incapable of being closed weathertight include ventilators (complying with ILLC 19(4)) that for operational reasons have to remain open to supply air to the engine room or emergency generator room (if the same is considered buoyant in the stability calculation or protecting openings leading blow) for the effective operation of the ship. *(2017)* 2.2.2 The righting lever GZ shall be at least 0.2 m at an angle of heel equal to or greater than 30°. <same as the present>

Present	Amendment
PART B RECOMMENDATIONS FOR CERTAIN TYPES OF SHIPS AND ADDITIONAL GUIDELINES	**PART B RECOMMENDATIONS FOR CERTAIN TYPES OF SHIPS AND ADDITIONAL GUIDELINES**
CHAPTER 1~CHAPTER 2 <omitted>	**CHAPTER 1~CHAPTER 2 <same as the present>**
CHAPTER 3 GUIDANCE IN PREPARING STABILITY INFORMATION	**CHAPTER 3 GUIDANCE IN PREPARING STABILITY INFORMATION**
3.1 to 3.3 <same as the present>	3.1 to 3.3 <same as the present>
3.4 Standard conditions of loading to be examined	3.4 Standard conditions of loading to be examined
3.4.1 Loading conditions <same as the present>	3.4.1 Loading conditions <same as the present>
3.4.2 Assumptions for calculating loading conditions	3.4.2 Assumptions for calculating loading conditions
3.4.2.1 For the fully loaded conditions mentioned in 3.4.1.2.1, 3.4.1.2.2, 3.4.1.3.1 and 3.4.1.3.2 if a dry cargo ship has tanks for liquid cargo, the effective deadweight in the loading conditions therein described should be distributed according to two assumptions, i.e. with cargo tanks full, and with cargo tanks empty.	3.4.2.1 For the fully loaded conditions mentioned in 3.4.1.2.1, 3.4.1.2.2, 3.4.1.3.1 and 3.4.1.3.2 if a dry cargo ship has tanks for liquid cargo, the effective deadweight in the loading conditions therein described should be distributed according to two assumptions, i.e. with cargo tanks full, and with cargo tanks empty.
3.4.2.2 In the conditions mentioned in 3.4.1.1.1, 3.4.1.2.1 and 3.4.1.3.1 it should be assumed that the ship is loaded to its subdivision load line or summer load line or if intended to carry a timber deck cargo, to the summer timber load line with water ballast tanks empty.	3.4.2.2 In the conditions mentioned in 3.4.1.1.1, 3.4.1.2.1 and 3.4.1.3.1 it should be assumed that the ship is loaded to its subdivision load line or summer load line or if intended to carry a timber deck cargo, to the summer timber load line with water ballast tanks empty. <u>But for tankers assigned with a tropical line, the ship should be assumed to be loaded to its tropical load line. *(2017)*</u>
<u><newly added></u>	
<omitted>	<same as the present>

Amended Rules for the Classification of Steel Ships

(Part 2 Materials and Welding)

- Main Amendments -

(1) Effective date : 1 January 2017 (based on contract date for ship construction or application date for certification of material)

◉ To reflect IACS UR M68 (Rev.2 Apr 2015)

Present	Amendment
CHAPTER 1 Materials **Section 1 ~ Section 5 <Omitted>** **Section 6 Steel Forgings** **601. Steel forgings** **1.~ 12.** <Omitted> **13. Marking** (1) ~ (4) <Omitted> (5) <New> **14.~ 16.** <Omitted> **18.** <New>	**CHAPTER 1 Materials** **Section 1 ~ Section 5 <Same as the present Rules>** **Section 6 Steel Forgings** **601. Steel forgings** **1.~ 12.** <Same as the present Rules> **13. Marking** (1) ~ (4) <Same as the present Rules> (5) Where alloy steel forgings are intended for intermediate shaft material specified in **18.**, "*I*" is to be suffixed to the marking. (e.g. *RSF* 900*AM-I*) *(2017)* **15.~ 17.** <Same as the present Rules> **18. Additional requirements for intermediated shaft material *(2017)*** (1) For alloy steel which has a minimum specified tensile strength greater than 800 N/mm^2 but less than 950 N/mm^2 for use as intermediate shaft material, where special manufacturing processes are adopted to reduce shaft dimensions or higher permissible vibration stresses(refer to the requirements in **Pt 5, Ch 3, 203.** and **Ch 4, 202.**) is to be as follows. (a) Torsional fatigue test instructed by the Society is to be performed for verifying the fatigue life at manufacturing process approval.

Present	Amendment
Table 2.1.88 <New>	(b) The steels are to have a degree of cleanliness as shown in **Table 2.1.88** when cleanliness tested. Representative samples are to be obtained from each heat of forged or rolled products. The steels are generally to comply with particular attention given to minimising the concentrations of sulphur, phosphorus and oxygen in order to achieve the cleanliness requirements. The specific steel composition is required to be approved by the Society.
<hereafter, omitted>	<hereafter, same as the present Rules>

Table 2.1.88 Cleanliness requirements(ISO 4967 method A)

Inclusion group	Series	Limiting chart diagram index *I*
Type A	Fine	1 max.
	Thick	1 max.
Type B	Fine	1.5 max.
	Thick	1 max.
Type C	Fine	1 max.
	Thick	1 max.
Type D	Fine	1 max.
	Thick	1 max.
Type DS	-	1 max.

Amended Guidance Relating to the Rules for the Classification of Steel Ships

(Part 3 Hull Structures)

- Main Amendments -

(1) Effective date : Contracted for construction on or after 1 Jan 2017

◉ To reflect IACS UR S6 (Rev.8 Dec. 2015)

Present	Amendment
CHAPTER 1 GENERAL	**CHAPTER 1 GENERAL**
Section 1 ~ 3 <omitted>	**Section 1 ~ 3 <same as the present Guidance>**
Section 4 Materials	**Section 4 Materials**
401. ~ 405. <omitted>	**401. ~ 405. <same as the present Guidance>**
406. Special requirements for application of steels	**406. Special requirements for application of steels**
1. <omitted>	**1.** <same as the present Guidance>
2. The application of steels for ships designed to operate in area with low air temperatures is to comply with the following requirements:	**2.** The application of steels for ships designed to operate in area with low air temperatures is to comply with the following requirements:
(1) For ships intended to operate in areas with low air temperatures (below and including -20°C), e.g. regular service during winter seasons to Arctic or Antarctic waters, the materials in exposed structures are to be selected based on the design temperature t_D, to be taken as defined in (5). Materials in the various strength members above the lowest ballast water line (BWL) exposed to air are not to be of lower grades than those corresponding to classes Ⅰ, Ⅱ and Ⅲ, as given in **Table 3.1.6,** depending on the categories of structural members(SECONDARY, PRIMARY and SPECIAL). For non-exposed structures and structures below the lowest ballast water line, see **405.** of the Rules.	(1) For ships intended to operate in areas with low air temperatures (below and including -20°C), e.g. regular service during winter seasons to Arctic or Antarctic waters, the materials in exposed structures are to be selected based on the design temperature t_D, to be taken as defined in (5). Materials in the various strength members above the lowest ballast water line (BWL) exposed to air are not to be of lower grades than those corresponding to classes Ⅰ, Ⅱ and Ⅲ, as given in **Table 3.1.6,** depending on the categories of structural members(SECONDARY, PRIMARY and SPECIAL). For non-exposed structures(except as indicated in Note [5] of **Table 3.1.6**) and structures below the lowest ballast water line, see **405.** of the Rules.

Present	Amendment

Table 3.1.6 Application of material classes and grades – Structures exposed at low temperatures

Structural member category	Material class	
	Within $0.4L$ amidships	Outside $0.4L$ amidships
○ SECONDARY: - Deck plating exposed to weather, in general - Side plating above BWL - Transverse bulkheads above BWL	I	I
○ PRIMARY: - Strength deck plating [1] - Continuous longitudinal members above strength deck, excluding longitudinal hatch coamings - Longitudinal bulkhead above BWL - Top wing tank bulkhead above BWL	II	I
○ SPECIAL: - Sheer strake at strength deck [2] - Stringer plate in strength deck [2] - Deck strake at longitudinal bulkhead [3] - Continuous longitudinal hatch coamings [4]	III	II

Notes :

[1] Plating at corners of large hatch openings to be specially considered. Class Ⅲ or grade *E*, *EH* 32, *EH* 36 and *EH* 40 to be applied in positions where high local stresses may occur.

[2] Not to be less than grade *E*, *EH* 32, *EH* 36 and *EH* 40 within $0.4L$ amidships in ships with length exceeding 250 m

[3] In ships with a breadth exceeding 70 m at least three deck strakes to be class Ⅲ.

[4] Not to be less than grade *D*, *DH* 32, *DH* 36 and *DH* 40.

<newly>

Present	Amendment
	Table 3.1.6 Application of material classes and grades – Structures exposed at low temperatures

Structural member category	Material class	
	Within 0.4L amidships	Outside 0.4L amidships
○ SECONDARY: - Deck plating exposed to weather, in general - Side plating above BWL - Transverse bulkheads above BWL [5]	I	I
○ PRIMARY: - Strength deck plating [1] - Continuous longitudinal members above strength deck, excluding longitudinal hatch coamings - Longitudinal bulkhead above BWL [5] - Top wing tank bulkhead above BWL [5]	II	I
○ SPECIAL: - Sheer strake at strength deck [2] - Stringer plate in strength deck [2] - Deck strake at longitudinal bulkhead [3] - Continuous longitudinal hatch coamings [4]	III	II

Notes :

[1] Plating at corners of large hatch openings to be specially considered. Class Ⅲ or grade E, EH 32, EH 36 and EH 40 to be applied in positions where high local stresses may occur.

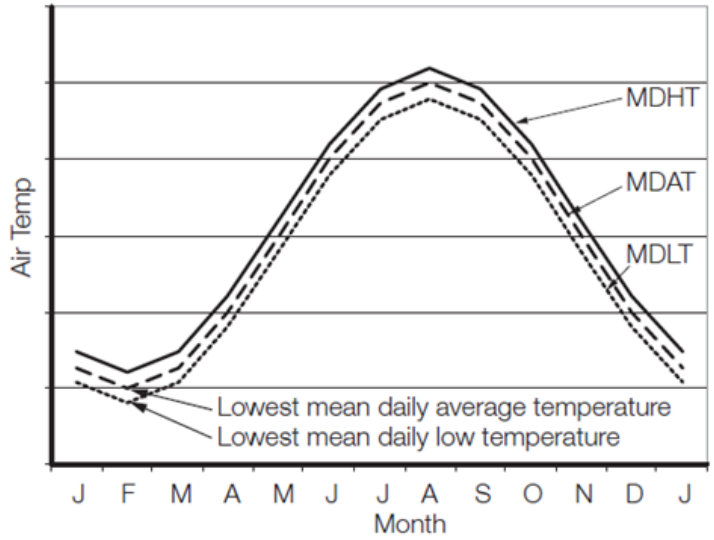
[2] Not to be less than grade E, EH 32, EH 36 and EH 40 within 0.4L amidships in ships with length exceeding 250 m

[3] In ships with a breadth exceeding 70 m at least three deck strakes to be class Ⅲ.

[4] Not to be less than grade D, DH 32, DH 36 and DH 40.

[5] Applicable to plating attached to hull envelope plating exposed to low air temperature. At least one strake is to be considered in the same way as exposed plating and the strake width is to be at least 600mm.

Present	Amendment
(2) ~ (4) <omitted> (5) The design temperature is to be taken as the lowest mean daily average air temperature in the area of operation. For seasonally restricted service the lowest value within the period of operation applies. <newly>	(2) ~ (4) <same as the present Guidance> (5) The design temperature is to be taken as the lowest mean daily average air temperature in the area of operation. For seasonally restricted service the lowest value within the period of operation applies.(**see Fig 3.1.10**) · Mean: Statistical mean over observation period (at least 20 years) · Average: Average during one day and night · Lowest: Lowest during year · MDHT = Mean Daily High (or maximum) Temperature · MDAT = Mean Daily Average Temperature · MDLT = Mean Daily Low (or minimum) Temperature For the purpose of issuing a Polar Ship Certificate in accordance with the Polar Code, the design temperature t_D shall be no more than 13°C higher than the Polar Service Temperature (PST) of the ship. In the Polar Regions, the statistical mean over observation period is to be determined for a period of at least 10 years.
Table 3.1.7 Material grade requirements for classes I, II and III at low temperatures <omitted>	**Table 3.1.7 Material grade requirements for classes I, II and III at low temperatures <same as the present Guidance>**

Present	Amendment
<newly>	 **Fig 3.1.10 Commonly used definitions of temperatures**
Section 5 ~ 8 <omitted> **CHAPTER 2 ~ 18 <omitted>**	**Section 5 ~ 8 <same as the present Guidance>** **CHAPTER 2 ~ 18 <same as the present Guidance>**

Amended Guidance for the Classification of Steel Ships

(Part 4 Hull Equipment)

- Main Amendments -

(1) Effective date : 1 Jan 2017 (Date of contract for constriction)

◉ To reflect IACS UI SC253 (Rev.1 May 2016)

Present

CHAPTER 4 BULWARKS, FREEING PORTS, SIDE SCUTTLES, RECTANGULAR WINDOWS, VENTILATORS AND PERMANENT GANGWAYS

Section 1 ~ 4 <omitted>
Section 5 Permanent Gangways

501. General

1. <omitted>

Table 4.4.3 Protection of crew (continue)

(NOTES)

1. <omitted>
2. Protection methods are to be as following (a) to (f)

(a) ~ (d) <omitted>

(e) A permanent and efficiently constructed gangway fitted at or above the level of the superstructure deck on or as near as practicable to the center line of the ship:

- located so as not to hinder easy access across the working areas of the deck;
- providing a continuous platform at least 1.0 m in width;
- constructed of fire resistant and non-slip material;
- FRP gratings used in lieu of steel gratings for safe access to tanker bows shall possess:
  (i) low flame spread characteristics and shall not generate excessive quantities of smoke and toxic products as per the FTP Code; and
  (ii) adequate structural fire integrity as per recognized standards(1) after undergoing tests in accordance with the above standards.
- fitted with guard rails extending on each side throughout its length; guard rails should be at least high with courses as required by Regulation 25(3) and supported by stanchions spaced not more than 1.5 m;
- provided with a foot stop on each side;
- having openings, with ladders where appropriate, to and from the deck. Openings should not be more than 40 m apart;
- having shelters of substantial construction set in way of the gangway at intervals not exceeding 45 m if the length of the exposed deck to be traversed exceeds 70 m. Every such shelter should be capable of accommodating at least one person and be so constructed as to afford weather protection on the forward, port and starboard sides.

<hereafter, same as the present Rules>

(Notes)

(1) for example USCG Marine Safety Manual Vol. II, Para 5.C.6 - Level 3

<hereafter, same as the present Rules>

Amendment

CHAPTER 4 BULWARKS, FREEING PORTS, SIDE SCUTTLES, RECTANGULAR WINDOWS, VENTILATORS AND PERMANENT GANGWAYS

Section 1 ~ 4 <omitted>
Section 5 Permanent Gangways

501. General

1. <omitted>

Table 4.4.3 Protection of crew (continue)

(NOTES)

1. <omitted>

2. Protection methods are to be as following (a) to (f)

(a) ~ (d) <omitted>

(e) A permanent and efficiently constructed gangway fitted at or above the level of the superstructure deck on or as near as practicable to the center line of the ship:

- located so as not to hinder easy access across the working areas of the deck;
- providing a continuous platform at least 1.0 m in width;
- constructed of fire resistant and non-slip material;
- Fibre Reinforced Plastic(FRP) gratings used in lieu of steel gratings for safe access to tanker bows shall possess:
  (i) low flame spread characteristics and shall not generate excessive quantities of smoke and toxic products as per the International Code for Application of Fire Test Procedures, 2010 (2010 FTP Code); and
  (ii) adequate structural fire integrity as per recognized standards(1) after undergoing tests in accordance with the above standards.
- fitted with guard rails extending on each side throughout its length; guard rails should be at least high with courses as required by Regulation 25(3) and supported by stanchions spaced not more than 1.5 m;
- provided with a foot stop on each side;
- having openings, with ladders where appropriate, to and from the deck. Openings should not be more than 40 m apart;
- having shelters of substantial construction set in way of the gangway at intervals not exceeding 45 m if the length of the exposed deck to be traversed exceeds 70 m. Every such shelter should be capable of accommodating at least one person and be so constructed as to afford weather protection on the forward, port and starboard sides.

<hereafter, same as the present Rules>

(Notes)

(1) For example, the Standard Specification for Fibre Reinforced Polymer (FRP) Gratings Used in Marine Construction and Shipbuilding (ASTM F3059-14).

<hereafter, same as the present Rules>

Amended Rules for the Classification of Steel Ships
(Part 5 Machinery Installations)

- Main Amendments -

(1) Effective date : 1 Jan. 2017 (Date of which contracts for construction are signed)

◉ To reflect IACS UI SC246 (Rev.1 Sep. 2015) and SOLAS II-1/29.3, 29.4
- Steering gear test with the vessel not at the full load draught (Ch 7, 503.)

◉ To reflect IACS UR M68 (Rev.2 Apr. 2015)
- Special approval of alloy steel used for intermediate shaft material (Ch 3, 203. & Ch 4, 202.)

(2) Effective date : 1 Jan. 2017 (Date of application for approval)

◉ To reflect IACS UR M56 (Rev.3 Oct. 2015)
- Introducing threshold values for power transmission systems (Ch 3, 401.)

◉ To reflect IACS UR P2.7.4(Rev.8 Mar 2016)

Present	Amendment
CHAPTER 3 PROPULSION SHAFTING AND POWER TRANSMISSION SYSTEMS	**CHAPTER 3 PROPULSION SHAFTING AND POWER TRANSMISSION SYSTEMS**
Section 2 Shaftings	**Section 2 Shaftings**
201. <omitted>	**201. <same as the present Rules>**
202. Materials	**202. Materials**
1. <omitted>	**1. <same as the present Rules>**
2. The elongation of the material(L-direction) in **Par 1** is not to be less than 16 % except when an approval is specially obtained by the Society.	**2.** The elongation of the material(L-direction) in **Par 1** is not to be less than 16 % except when an approval is specially obtained by the Society. **【See Guidance】**
3. <omitted>	**3. <same as the present Rules>**
203. Intermediate shaft and thrust shaft	**203. Intermediate shaft and thrust shaft**
The diameters of intermediate shaft and thrust shaft are not to be less than those obtained by the following formula: **【See Guidance】**	The diameters of intermediate shaft and thrust shaft are not to be less than those obtained by the following formula: **【See Guidance】**
$d_0 = F \cdot K_1 \sqrt[3]{\frac{P}{n} \times \frac{560}{(T+160)}}$ (mm)	$d_0 = F \cdot K_1 \sqrt[3]{\frac{P}{n} \times \frac{560}{(T+160)}}$ (mm)
where:	where:
P, n, F = <omitted>	P, n, F = <same as the present Rules>
T = Specified minimum tensile strength (N/mm^2) of proposed material. For the minimum specified tensile strength of carbon steels exceeding 760 N/mm^2, T is to be taken 760 N/mm^2 and for the minimum specified tensile strength of alloy steels exceeding 800 N/mm^2, T is to be taken 800 N/mm^2	T = Specified minimum tensile strength (N/mm^2) of proposed material. For the minimum specified tensile strength of carbon steels exceeding 760 N/mm^2, T is to be taken 760 N/mm^2 and for the minimum specified tensile strength of alloy steels exceeding 800 N/mm^2, T is to be taken 800 N/mm^2 unless specially approved by the Society. *(2017)*
K_1 = <omitted>	K_1 = <same as the present Rules>
(hereafter, omitted)	(hereafter, same as the present Rules)

Present	Amendment
Section 4 Power Transmission Systems	**Section 4 Power Transmission Systems**
401. General	**401. General**
1. Application	**1. Application**
The requirements of this Section apply to power transmission systems which transmit power from main propulsion machinery and prime movers driving generators (excluding emergency generator) and essential auxiliaries for propulsion and safety of ships.	The requirements of this Section apply to power transmission systems which transmit a maximum continuous power not less than 100 kW for main propulsion machinery or prime movers driving generators (excluding emergency generator) or essential auxiliaries for propulsion and safety of ships. *(2017)*
2. ~ 4. <omitted>	**2. ~ 4. <same as the present Rules>**
5. Materials	**5. Materials**
The materials used for main components of the power transmission system are to comply with the requirements in **Pt 2, Ch 1**. However, for small transmitted power, an attendance of Surveyor for material tests may be omitted. **【See Guidance】**	The materials used for main components of the power transmission system are to comply with the requirements in **Pt 2, Ch 1**. ~~However, for small transmitted power, an attendance of Surveyor for material tests may be omitted.~~ **【See Guidance】**
(hereafter, omitted)	(hereafter, same as the present Rules)

Present	Amendment
CHAPTER 4 TORSIONAL VIBRATION OF SHAFTINGS	**CHAPTER 4 TORSIONAL VIBRATION OF SHAFTINGS**
Section 2 Allowable Limit of Vibration Stresses	**Section 2 Allowable Limit of Vibration Stresses**
201. <omitted>	**201. <same as the present Rules>**
202. Intermediate shafts, thrust shafts, propeller shafts and stern tube shafts	**202. Intermediate shafts, thrust shafts, propeller shafts and stern tube shafts**
1. For ships equipped with main propulsion diesel engine, the torsional vibration stresses on the intermediate shafts, thrust shafts, propeller shafts and stern tube shafts are to be in accordance with the following requirements (1) and (2). **【See Guidance】**	**1.** For ships equipped with main propulsion diesel engine, the torsional vibration stresses on the intermediate shafts, thrust shafts, propeller shafts and stern tube shafts are to be in accordance with the following requirements (1) and (2). **【See Guidance】**
(1) For continuous operation, the torsional vibration stresses are not to exceed τ_1 given in the following formulae:	(1) For continuous operation, the torsional vibration stresses are not to exceed τ_1 given in the following formulae. Where propeller shafts and stern tube shafts are made of the approved corrosion resistant materials, the formulae is to be as deemed appropriate by the Society. *(2017)*
$\tau_1 = \frac{T_s + 160}{18} C_k C_d (3 - 2\lambda^2) \qquad (0 \le \lambda \le 0.9)$	$\tau_1 = \frac{T_s + 160}{18} C_k C_d (3 - 2\lambda^2) \qquad (0 \le \lambda \le 0.9)$
$\tau_1 = 1.38 \frac{T_s + 160}{18} C_k C_d \qquad (0.9 \le \lambda \le 1.05)$	$\tau_1 = 1.38 \frac{T_s + 160}{18} C_k C_d \qquad (0.9 \le \lambda \le 1.05)$
where:	where:
τ_1 = Allowable limit of torsional vibration stresses for continuous operation $\mathrm{N/mm^2}$.	τ_1 = Allowable limit of torsional vibration stresses for continuous operation $\mathrm{N/mm^2}$.
λ = As specified in **201. 1.**	λ = As specified in **201. 1.**

Present	Amendment
T_s = Specified minimum tensile strength of shaft material (N/mm^2). However, the values of T_s for using in the formulae is not to exceed 600 N/mm^2 for carbon steel forgings and 800 N/mm^2 for low alloy steel forgings in intermediate shafts and thrust shafts, and 600 N/mm^2 in propeller shafts and stern tube shafts. Where propeller shafts and stern tube shafts are made of the approved corrosion resistant materials or other materials having effective means against corrosion by seawater, the value of T_s for using in the formulae is to be as deemed appropriate by the Society.	T_s = Specified minimum tensile strength of shaft material (N/mm^2). However, the values of T_s for using in the formulae is not to exceed 600 N/mm^2 for carbon steel forgings, and not to exceed 800 N/mm^2 unless specially approved by the Society for low alloy steel forgings in intermediate shafts and thrust shafts, and not to exceed 600 N/mm^2 in propeller shafts and stern tube shafts. *(2017)*
(hereafter, omitted)	(hereafter, same as the present Rules)

Present	Amendment
CHAPTER 6 AUXILIARIES AND PIPING ARRANGEMENT **Section 1 General** <Omitted> **5. Mechanical joints** These requirements are applicable to pipe unions, compression couplings, slip-on joints as shown in **Fig 5.6.2.** Similar joints complying with these requirements may be acceptable.	**CHAPTER 6 AUXILIARIES AND PIPING ARRANGEMENT** **Section 1 General** <Same as the present below> **5. Mechanical joints** These requirements are applicable to pipe unions, compression couplings, slip-on joints as shown in **Fig 5.6.2.** Similar joints complying with these requirements may be acceptable.

Present

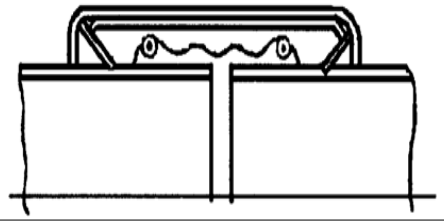
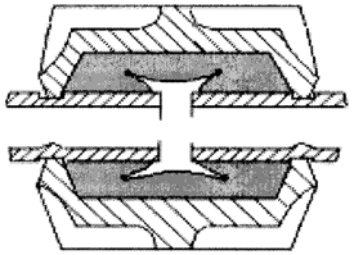
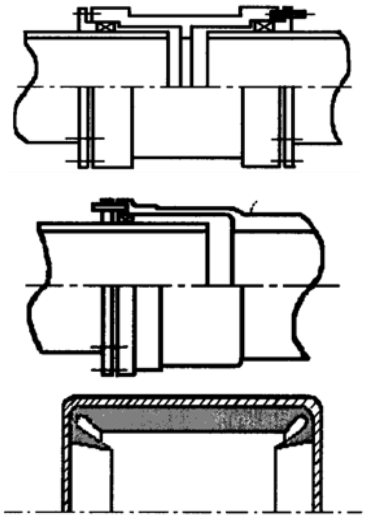
	Type of mechanical joints	Examples of mechanical joints
<Omitted>	slip-on joints	
	grip type	
	machine grooved type	
	slip type	

Fig 5.6.2 Examples of Mechanical Joints

Amendment

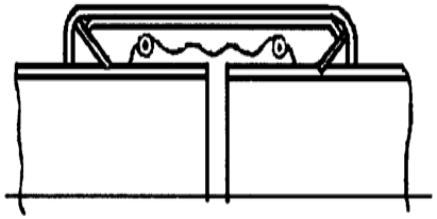
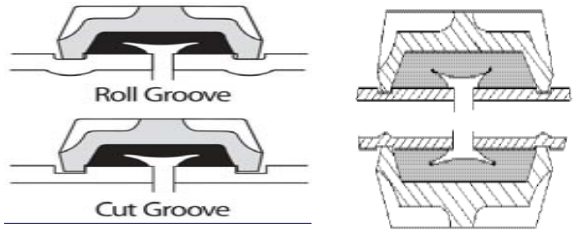
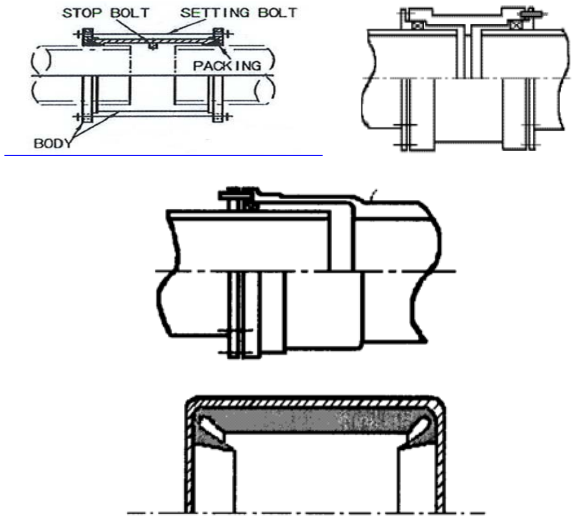
	Type of mechanical joints	Examples of mechanical joints
<Same as the present>	slip-on joints	
	grip type	
	machine grooved type	
	slip type	

Fig 5.6.2 Examples of Mechanical Joints

Present	Amendment
(1) Mechanical joints including pipe unions, compression coupling, slip-on joints and similar joints are to be of approved type for service conditions and the intended application. (2) Where the application of mechanical joints results in reduction in pipe wall thickness, this is to be taken into account in determining the minimum wall thickness of the pipe to withstand the design pressure. (3) Construction of mechanical joints is to prevent the possibility of tightness failure affected by pressure pulsation, piping vibration, temperature variation and other similar adverse effects occurring during operation on board. (4) Material of mechanical joints is to be compatible with the piping material and internal and external media. (5) Mechanical joints are to be tested where applicable, to a burst pressure of 4 times the design pressure. For design pressures above 20 MPa, the required burst pressure will be specially considered by the Society. (6) Mechanical joints are to be of fire resistant type as required by **Table 5.6.10.** (7) Mechanical joints, which in the event of damage could cause fire or flooding, are not to be used in piping sections directly connected to the sea openings or tanks containing flammable fluids. (8) The mechanical joints are to be designed to withstand internal and external pressure as applicable and where used in suction lines are to be capable of operating under vacuum.	(1) Mechanical joints including pipe unions, compression coupling, slip-on joints and similar joints are to be of approved type for service conditions and the intended application. (2) Where the application of mechanical joints results in reduction in pipe wall thickness, this is to be taken into account in determining the minimum wall thickness of the pipe to withstand the design pressure. ~~(3) Construction of mechanical joints is to prevent the possibility of tightness failure affected by pressure pulsation, piping vibration, temperature variation and other similar adverse effects occurring during operation on board.~~ (3) Material of mechanical joints is to be compatible with the piping material and internal and external media. (4) Mechanical joints are to be tested where applicable, to a burst pressure of 4 times the design pressure. For design pressures above 20 MPa, the required burst pressure will be specially considered by the Society. (5) Mechanical joints are to be of fire resistant type as required by **Table 5.6.10.** (6) Mechanical joints, which in the event of damage could cause fire or flooding, are not to be used in piping sections directly connected to the ship's side below the bulkhead deck of passenger ships and freeboard deck of cargo ships or tanks containing flammable fluids. ~~(8) The mechanical joints are to be designed to withstand internal and external pressure as applicable and where used in suction lines are to be capable of operating under vacuum.~~ (7) The number of mechanical joints in flammable fluid systems is to be kept to a minimum. (8) Piping in which a mechanical joint is fitted is to be adequately adjusted, aligned and supported. Supports or hangers are not to be used to force alignment of piping at the point of connection.

Present	Amendment
(9) The number of mechanical joints in oil systems is to be kept to a minimum. (10) Piping in which a mechanical joint is fitted is to be adequately adjusted, aligned and supported. Supports or hangers are not to be used to force alignment of piping at the point of connection. (11) Slip-on joints are not to be used in pipelines in cargo holds, tanks, and other spaces which are not easily accessible. Application of these joints inside tanks may be permitted only for the same media that is in the tanks. Unrestrained slip-on joints are to be used only in cases where compensation of lateral pipe deformation is necessary. Usage of these joints as the main means of pipe connection is not permitted. (12) Typical Application of mechanical joints and their acceptable use for each service is indicated in **Table 5.6.10;** dependence upon the Class of piping, pipe dimensions, working pressure and temperature is indicated in **Table 5.6.11.** In particular cases, sizes in excess of those mentioned above may be accepted by the Society if in compliance with a recognized national and/or international standard.	(9) Slip-on joints are not to be used in pipelines in cargo holds, tanks, and other spaces which are not easily accessible, unless approved by the Classification Society. Application of these joints inside tanks may be permitted only for the same media that is in the tanks. Usage of slip type slip-on joints as the main means of pipe connection is not permitted except for cases where compensation of axial pipe deformation is necessary. (10) Application of mechanical joints and their acceptable use for each service is indicated in **Table 5.6.10**; dependence upon the Class of piping and pipe dimensions is indicated in **Table 5.6.11.** In particular cases, sizes in excess of those mentioned above may be accepted by the Classification Society if in compliance with a recognized national and/or international standard.

Present

Table 5.6.10 Application of Mechanical Joints

The following table indicates systems where the various kinds of joints may be accepted. However, in all cases, acceptance of the joint type is to be subject to approval for the intended application, and subject to conditions of the approval and applicable Rules

	Systems	Kind of connections		
		Pipe Unions	Compression Couplings[6]	Slip-on joints
Flammable fluids (Flash point ≤ 60 °C)				
1	Cargo oil lines	○	○	○[5]
2	Crude oil washing lines	○	○	○[5]
3	Vent lines	○	○	○[5]
Inert gas				
4	Water seal effluent lines	○	○	○
5	Scrubber effluent lines	○	○	○
6	Main lines	○	○	○[2),5]
7	Distributions lines	○	○	○[5]
Flammable fluids (Flash point 〉 60 °C)				
8	Cargo oil lines	○	○	○[5]
9	Fuel oil lines	○	○	○[2),3]
10	Lubricating oil lines	○	○	○[2),3]
11	Hydraulic oil	○	○	○[2),3]
12	Thermal oil	○	○	○[2),3]
Sea water				
13	Bilge lines	○	○	○[1]
14	Fire main and water spray	○	○	○[3]
15	Foam system	○	○	○[3]

.

Amendment

Table 5.6.10 Application of Mechanical Joints

The following table indicates systems where the various kinds of joints may be accepted. However, in all cases, acceptance of the joint type is to be subject to approval for the intended application, and subject to conditions of the approval and applicable Rules.

	Systems	Kind of connections		
		Pipe Unions	Compression Couplings[6]	Slip-on joints
Flammable fluids (Flash point ≤ 60 °C)				
1	Cargo oil lines[4]	○	○	○
2	Crude oil washing lines[4]	○	○	○
3	Vent lines[3]	○	○	○
4	Water seal effluent lines	○	○	○
5	Scrubber effluent lines	○	○	○
6	Main lines[2][4]	○	○	○
7	Distributions lines[4]	○	○	○
Flammable fluids (Flash point 〉 60 °C)				
8	Cargo oil lines[4]	○	○	○
9	Fuel oil lines[3][2]	○	○	○
10	Lubricating oil lines[2][3]	○	○	○
11	Hydraulic oil[2][3]	○	○	○
12	Thermal oil[2][3]	○	○	○
Sea water				
13	Bilge lines[1]	○	○	○
14	Water filled fire extinguishing systems, e.g. sprinkler systems[3]	○	○	○
15	Non water filled fire extinguishing systems, e.g. foam, drencher systems[3]	○	○	○

Present

16	Sprinkler system	○	○	○ 3)
17	Ballast system	○	○	○ 1)
18	Cooling water system	○	○	○ 1)
19	Tank cleaning services	○	○	○
20	Non-essential systems	○	○	○
Fresh water				
21	Cooling water system	○	○	○ 1)
22	Condensate return	○	○	○ 1)
23	Non-essential system	○	○	○
Sanitary/Drains/Scuppers				
24	Deck drains (internal)	○	○	○ 4)
25	Sanitary drains	○	○	○
26	Scuppers and discharge (overboard)	○	○	-

Amendment

16	Fire main (not permanently filled)(3)	○	○	○
17	Ballast system(1)	○	○	○
18	Cooling water system(1)	○	○	○
19	Tank cleaning services	○	○	○
20	Non-essential systems	○	○	○
Fresh water				
21	Cooling water system(1)	○	○	○
22	Condensate return(1)	○	○	○
23	Non-essential system	○	○	○
Sanitary/Drains/Scuppers				
24	Deck drains (internal)(6)	○	○	○
25	Sanitary drains	○	○	○
26	Scuppers and discharge (overboard)	○	○	-

Present

Table 5.6.10 Application of Mechanical Joints (continued)

Systems		Kind of connections		
		Pipe Unions	Compression Couplings[6)]	Slip-on joints
Sounding/Vent				
27	Water tanks/Dry spaces	○	○	○
28	Oil tanks (f.p. 〉 60 °C)	○	○	○[2),3)]
Miscellaneous				
29	Starting/Control air[1)]	○	○	-
30	Service air (non-essential)	○	○	○
31	Brine	○	○	○
32	CO_2 system[1)]	○	○	-
33	Steam	○	○	○[7)]

Abbreviations ○ : Application is allowed, - : Application is not allowed

NOTES:

1) Inside machinery spaces of category A - only approved fire resistant types
2) Excluding inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions.
3) Approved fire resistant types
4) Above free board deck only
5) In pump rooms and open decks - only approved fire resistant types
6) If compression couplings include any components which readily deteriorate in case of fire, they are to be of approved fire resistant type as required for slip-on joints.
7) Slip type joints as shown in **Fig 5.6.2**, provided that they are restrained on the pipes, may be used for pipes on deck with a design pressure of 1 MPa or less.

Amendment

Table 5.6.10 Application of Mechanical Joints (continued)

Systems		Kind of connections		
		Pipe Unions	Compression Couplings[6)]	Slip-on joints
Sounding/Vent				
27	Water tanks/Dry spaces	○	○	○
28	Oil tanks (f.p. 〉 60 °C)[(2)(3)]	○	○	○
Miscellaneous				
29	Starting/Control air[1)]	○	○	-
30	Service air (non-essential)	○	○	○
31	Brine	○	○	○
32	CO_2 system[1)]	○	○	-
33	Steam	○	○	○[(5)]

Abbreviations ○ : Application is allowed, - : Application is not allowed

NOTES - Fire resistance capability

If mechanical joints include any components which readily deteriorate in case of fire, they are to be of an approved fire resistant type under consideration of the following footnotes:

1. Inside machinery spaces of category A - only approved fire resistant types.
2. Not inside machinery spaces of category A or accommodation spaces. May be accepted in other machinery spaces provided the joints are located in easily visible and accessible positions.
3. Approved fire resistant types except in cases where such mechanical joints are installed on exposed open decks, as defined in SOLAS II-2/Reg. 9.2.3.3.2.2(10) and not used for fuel oil lines.
4. Only in pump rooms and open decks - only approved fire resistant types.

NOTES - General

5. Slip type slip-on joints as shown in Fig 5.6.2. May be used for pipes on deck with a design pressure of 10 bar or less.
6. Only above bulkhead deck of passenger ships and freeboard deck of cargo ships.

Present	Amendment
CHAPTER 7 STEERING GEARS	**CHAPTER 7 STEERING GEARS**
Section 5 Testing	**Section 5 Testing**
501. ~ 502. <omitted>	**501. ~ 502. <same as the present Rules>**
503. Sea trials	**503. Sea trials**
1. The steering gears are to be subjected to the following tests during sea trials. However, the tests required in (4), (7) and (8) may be carried out at the time when a vessel is being anchored or at dockside.	**1.** The steering gears are to be subjected to the following tests during sea trials. However, the tests required in (4), (7) and (8) may be carried out at the time when a vessel is being anchored or at dockside.
(1) Tests on the steering capabilities specified in **202.** and **203.** For controllable pitch propellers, the propeller pitch is to be at the maximum design pitch approved for number of maximum continuous ahead revolution at the main steering gear trial. If the ship cannot be tested at the load draught, steering gear trials are to be conducted at a displacement as close as reasonably possible to full-load displacement on the conditions that following (A) or (B) is met. **【See Guidance】**	(1) Tests on the steering capabilities specified in **202.** and **203.** For controllable pitch propellers, the propeller pitch is to be at the maximum design pitch approved for number of maximum continuous ahead revolution at the main steering gear trial. Where it is impractical to demonstrate compliance with this requirement during sea trials with the ship at its full load draught and running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch(for the auxiliary steering gear, running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater), it may demonstrate compliance with this requirement by one of the following methods. *(2017)* **【See Guidance】**
(A) The rudder is fully submerged at zero speed waterline and the vessel is in an acceptable trim condition.	(A) During sea trials the ship is at even keel and the rudder fully submerged whilst running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch(for the auxiliary steering gear, running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater); or
(B) The rudder load and torque at the specified trial loading condition have been reliably predicted and extrapolated to the full load condition, to the satisfaction of the Society.	
In any case for the main steering gear trial, the speed of ship corresponding to the number of maximum continuous revolution of main engine and maximum design pitch applies	

Present	Amendment
	(B) Where full rudder immersion during sea trials cannot be achieved, an appropriate ahead speed shall be calculated using the submerged rudder blade area in the proposed sea trial loading condition. The calculated ahead speed shall result in a force and torque applied to the main steering gear which is at least as great as if it was being tested with the ship at its full load draught and running ahead at the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch(for the auxiliary steering gear, running ahead at one half of the speed corresponding to the number of maximum continuous revolutions of the main engine and maximum design pitch or 7 knots, whichever is greater); or (C) The rudder force and torque at the sea trial loading condition have been reliably predicted and extrapolated to the full load condition. **【See Guidance】**
(hereafter, omitted)	(hereafter, same as the present Rules)

Amended Guidance Relating to the Rules for the Classification of Steel Ships
(Part 5 Machinery Installations)

- Main Amendments -

(1) Effective date : 1 Jan. 2017 (Date of which contracts for construction are signed)

◉ To clarify the requirement of Manufacturer approval of engine manufacturer (Ch 2, 211.)
◉ To reflect IACS UI SC246 (Rev.1 Sep. 2015) and SOLAS II-1/29.3, 29.4
  - Steering gear test with the vessel not at the full load draught (Ch 7, 503.)
◉ To reflect IACS UR M68 (Rev.2 Apr. 2015)
  - Special approval of alloy steel used for intermediate shaft material (Ch 3, 202. & 203., Ch 4, 202.)

(2) Effective date : 1 Jan. 2017 (Date of application for approval)

◉ To reflect IACS UR M56 (Rev.3 Oct. 2015)
  - Introducing threshold values for power transmission systems (Ch 3, 401.)
◉ To reflect IACS UR P2.12(Rev.2 Mar. 2016)

Present	Amendment
CHAPTER 2 MAIN AND AUXILIARY ENGINES	**CHAPTER 2 MAIN AND AUXILIARY ENGINES**
Section 2 Internal Combustion Engines	**Section 2 Internal Combustion Engines**
211. Tests and inspections	**211. Tests and inspections**
1. In application to **Table 5.2.4** of the Rules, necessary actions for prohibition of arc strike are to be taken at magnetic particle test by prod method.	**1.** In the application to **Table 5.2.4** of the Rules, necessary actions for prohibition of arc strike are to be taken at magnetic particle test by prod method.
2. In the application **211. 1** (1) of the Rules, in case that the engine manufacturer has an approval of quality assurance system, the manufacturer approval may be dispensed.	**2.** In the application **211. 1** (1) of the Rules, in case that engine manufacturers or their sub-suppliers intend to obtain the acceptance of Work's certificate (W) for engine components in **Table 5.2.4** of the Rules, the manufacturer approval of engine manufacturer is required. Where the engine manufacturer has an approval of quality assurance system, the manufacturer approval may be dispensed.
3. ~ 6. <omitted>	**3. ~ 6. <same as the present>**
(hereafter, omitted)	(hereafter, same as the present Rules)

Present	Amendment
CHAPTER 3 PROPULSION SHAFTING AND POWER TRANSMISSION SYSTEMS	**CHAPTER 3 PROPULSION SHAFTING AND POWER TRANSMISSION SYSTEMS**
Section 2 Shaftings	**Section 2 Shaftings**
201. <omitted>	**201. <same as the present Rules>**
202. <new>	**202. Materials**
1. <new>	**1.** In application to **202. 2.** of the Rules, the term "when an approval is specially obtained by the Society" means that includes the cases of obtaining approval in accordance with **Pt 2, Ch 1, 601. 18** of the Rules. *(2017)*
203. Intermediate shaft and thrust shaft	**203. Intermediate shaft and thrust shaft**
1. In case the ships engaged in smooth water service area, the values of *F* in formula given in **203.** of the Rules may be taken as 95.	**1.** In case the ships engaged in smooth water service area, the values of *F* in formula given in **203.** of the Rules may be taken as 95.
2. The diameter of shafts may be reduced on the basis of the application to **204. 2** of the Rules.	**2.** The diameter of shafts may be reduced on the basis of the application to **204. 2** of the Rules.
3. <new>	**3.** In application to **203.** of the Rules, the term "specially approved by the Society" means that obtains an approval in accordance with **Pt 2, Ch 1, 601. 18** of the Rules. Specified minimum tensile strength of approved alloy steels can be used in the calculation. *(2017)*
(hereafter, omitted)	(hereafter, same as the present Rules)

Present	Amendment
CHAPTER 3 PROPULSION SHAFTING AND POWER TRANSMISSION SYSTEMS	**CHAPTER 3 PROPULSION SHAFTING AND POWER TRANSMISSION SYSTEMS**
Section 4 Power Transmission Systems	**Section 4 Power Transmission Systems**
401. General	**401. General**
1. "Small ships" given in **401. 3** of the Rules means ships having length not more than 50 m.	**1.** "Small ships" given in **401. 3** of the Rules means ships having length not more than 50 m.
2. The for small transmitted power specified in **401. 5** of the Rules means the transmitted power less than 257 kW .	**2.** The main components specified in **401. 5** of the Rules means the following. *(2017)* (1) Shafts and gears of power transmission system (2) Couplings and coupling bolts of power transmission system (3) Clutches of power transmission system
(hereafter, omitted)	(hereafter, same as the present Rules)

Present	Amendment
CHAPTER 4 TORSIONAL VIBRATION OF SHAFTINGS	**CHAPTER 4 TORSIONAL VIBRATION OF SHAFTINGS**
Section 2 Allowable Limit of Vibration Stresses	**Section 2 Allowable Limit of Vibration Stresses**
201. <omitted>	**201. <same as the presnet Rules>**
202. Intermediate shafts, thrust shafts, propeller shafts and stern tube shafts	**202. Intermediate shafts, thrust shafts, propeller shafts and stern tube shafts**
1. The allowable limit of torsional vibration stress for propeller shafts made of the approved corrosion resistance materials is to be calculated by the following formula in place of the formula for τ_1 shown in **202. 1** of the Rules.	**1.** The allowable limit of torsional vibration stress for propeller shafts made of the approved corrosion resistance materials is to be calculated by the following formula in place of the formula for τ_1 shown in **202. 1** of the Rules.
$\tau_1 = A - B\lambda^2 \quad (\lambda \leq 0.9)$ $\tau_1 = C \quad (0.9 < \lambda)$	$\tau_1 = A - B\lambda^2 \quad (\lambda \leq 0.9)$ $\tau_1 = C \quad (0.9 < \lambda)$
τ_1 : Allowable limit of torsional vibration stress at the continuos operation (N/mm^2)	τ_1 : Allowable limit of torsional vibration stress at the continuos operation (N/mm^2)
λ : Ratio of the number of revolution to the number of maximum continuos revolution	λ : Ratio of the number of revolution to the number of maximum continuos revolution
A, B, C : Constant dependent on shaft materials given in **Table 5.4.1** of the Guidance	A, B, C : Constant dependent on shaft materials given in **Table 5.4.1** of the Guidance
	2. In application to **202. 1** (1) of the Rules, the term "specially approved by the Society" means that obtains an approval in accordance with **Pt 2, Ch 1, 601. 18** of the Rules. Specified minimum tensile strength of approved alloy steels can be used in the calculation. *(2017)*
2. ~ 3. <omitted>	**3. ~ 4. <same as the present Rules>**
(hereafter, omitted)	(hereafter, same as the present Rules)

Present	Amendment
CHAPTER 7 STEERING GEARS	**CHAPTER 7 STEERING GEARS**
Section 5 Testing	**Section 5 Testing**
503. Sea trials	**503. Sea trials**
1. In Application to **503. 1** (1) of the Rules, the trials for steering capabilities may be conducted in accordance with procedures in Section 6.1.5.1 of ISO 19019.	**1.** In Application to **503. 1** (1) of the Rules, the trials for steering capabilities may be conducted in accordance with procedures in Section 6.1.5.1 of ISO 19019.
	2. For **503. 1** (1) (C) of the Rules, it is to comply with one of the following methods. *(2017)*
	(1) The rudder torque at the trial loading condition have been reliably predicted (based on the system pressure measurement) and extrapolated to the full load draught condition using the following method to predict the equivalent torque and actuator pressure at the full load draught.
	$Q_F = Q_T \cdot \alpha$
	$\alpha = 1.25(\frac{A_F}{A_T})(\frac{V_F}{V_T})^2$
	where :
	α = Extrapolation factor
	Q_F = Rudder stock moment for the full load draught and maximum service speed condition
	Q_T = Rudder stock moment for the trial condition
	A_F = Total immersed projected area of the movable part of the rudder in the full load condition
	A_T = Total immersed projected area of the movable part of the rudder in the trial condition

Present	Amendment
	V_F = Contractual design speed of the vessel corresponding to the maximum continuous revolutions of the main engine at the full load draught V_T = Measured speed of the vessel (considering current) in the trial condition Where the rudder actuator system pressure is shown to have a linear relationship to the rudder stock torque the above equation can be taken as: $P_F = P_T \bullet \alpha$ where : P_F = Estimated steering actuator hydraulic pressure in the deepest full load condition P_T = Maximum measured actuator hydraulic pressure in the trial condition Where constant volume fixed displacement pumps are utilised then the regulations can be deemed satisfied if the estimated steering actuator hydraulic pressure at the full load draught is less than the specified maximum working pressure of the rudder actuator. Where a variable delivery pump is utilised pump data should be supplied and interpreted to estimate the delivered flow rate corresponds to the full load draught in order to calculate the steering time and allow it to be compared to the required time. Where A_T is greater than $0.95A_F$ there is no need for extrapolation methods to be applied.

Present	Amendment
	(2) Alternatively the designer or builder may use computational fluid dynamic(CFD) studies or experimental investigations to predict the rudder stock moment at the full load draught condition and service speed. These calculations or experimental investigations are to be to the satisfaction of the Society.
2. <omitted>	**3.** <same as the present Rules>
(hereafter, omitted)	(hereafter, same as the present Rules)

Present	Amendment
Annex 5-9 Flexible Pipes	**Annex 5-9 Flexible Pipes**
<1. Scope omitted>	**<1. Scope same as present>**
2. Design and construction	**2. Design and construction**
<(1) ~ (5) omitted>	<(1) ~ (5) same as present>
(6) Flexible pipe assemblies constructed of non-metallic materials intended for installation in piping systems for flammable media and sea water systems where failure may result in flooding, are to be of fire-resistant type. Fire resistance is to be demonstrated by testing to **ISO 15540**(or **KS V 0820**) and **ISO 15541**(or **KS V 0821**).	(6) Flexible pipe assemblies constructed of non-metallic materials in tended for installation in piping systems for flammable media and sea water systems where failure may result in flooding, are to be of fire-resistant type except in cases where such pipes are installed on open decks, as defined in SOLAS II-2/Reg. 9.2.3.3.2.2(10) and not used for fuel oil lines. Fire resistance is to be demonstrated by testing to **ISO 15540**(or **KS V 0820**) and **ISO 15541**(or **KS V 0821**).
(hereafter, omitted)	(hereafter, same as the present Rules)

Amended Rules for the Classification of Steel Ships

(Part 6 Electrical Equipment and Control Systems)

- Main Amendments -

(1) Effective date : 1 Jan 2017 (The contract date for ship construction or an application date for certification of a rotating machine)

◉ To reflect IACS UR E13 (Rev.2 Aug 2015)

Present	Amendment
CHAPTER 1 ELECTRICAL EQUIPMENT	**CHAPTER 1 ELECTRICAL EQUIPMENT**
Section 1 ~ 2 <same as the present Rules>	**Section 1 ~ 2 <same as the present Rules>**
Section 3 Rotating Machinery	**Section 3 Rotating Machinery**
301. - 305. <same as the present Rules>	**301. - 305. <same as the present Rules>**
306. Ship's service *a.c.* generator	**306. Ship's service *a.c.* generator**
1. <same as the present Rules>	**1.** <same as the present Rules>
2. Overall voltage regulation of *a.c.* generators	**2. Overall voltage regulation of *a.c.* generators**
The overall voltage regulation of *a.c.* generators is to be such that at all loads from zero to full load at the rated power factor, the rated voltage is to be maintained under steady conditions within ±2.5 %, except that for emergency generators the limits may be increased to ± 3.5 %.	The overall voltage regulation of *a.c.* generators shall ~~is to be such that~~, at all loads from no-load running ~~zero~~ to full load ~~at the rated power factor~~, ~~the~~ be able to keep rated voltage at the rated power factor ~~is to be maintained~~ under steady conditions within ±2.5 %, except that for emergency generators the limits may be increased to ± 3.5 %.
3. - 4. <same as the present Rules>	**3. - 4.** <same as the present Rules>
307. - 308. <same as the present Rules>	**307. - 308. <same as the present Rules>**

Present

309. Testing and inspection

1. - 5. <same as the present Rules>

6. Insulation resistance test

(1) <same as the present Rules>

(2) The minimum values of test voltages and insulation resistances are given in the following.

Rated voltage Un(V)	Minimum test voltage(V)	Minimum insulation resistance(MΩ)
$Un \leq$ 250	2 × Un	1
250 < $Un \leq$ 1,000	500	
1,000 < $Un \leq$ 7,200	1,000	$1+\frac{U_n}{1{,}000}$
7,200 < $Un \leq$ 15,000	5,000	

7. - 10. <same as the present Rules>

11. Verification of steady short-circuit condition

It is to be verified that under steady-state short-circuit conditions, the generator with its voltage regulating system is capable of maintaining, without sustaining any damage, a current of at least three times the rated current for a duration of 2 seconds or, where precise data is available, for a duration of any time delay which may be fitted in a tripping device for discrimination purposes.

12. - 16. <same as the present Rules>

Section 4 - 18 <same as the present Rules>

CHAPTER 2 CONTROL SYSTEMS <same as the present Rules>

Amendment

309. Testing and inspection

1. - 5. <same as the present Rules>

6. Insulation resistance test

(1) <same as the present Rules>

(2) The minimum values of test voltages and insulation resistances are given in the following.

Rated voltage Un(V)	Minimum test voltage(V)	Test minimum insulation resistance(MΩ)
$Un \leq$ 250	2 × Un	1
250 < $Un \leq$ 1,000	500	
1,000 < $Un \leq$ 7,200	1,000	$1+\frac{U_n}{1{,}000}$
7,200 < $Un \leq$ 15,000	5,000	

7. - 10. <same as the present Rules>

11. Verification of steady short-circuit condition

It is to be verified that under steady-state short-circuit conditions, the generator with its voltage regulating system is capable of maintaining, without sustaining any damage, a current of at least three times the rated current for a duration of 2 seconds or, where precise data is available, for a duration of any time delay which will ~~may~~ be fitted in the ~~a~~ tripping device for discrimination purposes.

12. - 16. <same as the present Rules>

Section 4 - 18 <same as the present Rules>

CHAPTER 2 CONTROL SYSTEMS <same as the present Rules>

Amended Guidance Relating to the Rules for the Classification of Steel Ships

(Part 6 Electrical Equipment and Control Systems)

- Main Amendments -

(1) Effective date : 1 Jan 2017 (The contract date for ship construction or an application date for certification of a rotating machine)

◉ To reflect IACS UR E13 (Rev.2 Aug 2015)

Present	Amendment
CHAPTER 1 ELECTRICAL EQUIPMENT	**CHAPTER 1 ELECTRICAL EQUIPMENT**
Section 1 ~ 2 <same as the present Rules>	**Section 1 ~ 2 <same as the present Rules>**
Section 3 Rotating Machinery	**Section 3 Rotating Machinery**
302. - 308. <same as the present Rules>	**302. - 308. <same as the present Rules>**
309. Testing and inspection	**309. Testing and inspection**
1. ~ 4. <same as the present Rules>	**1. ~ 4. <same as the present Rules>**
5. Voltage regulation test	**5. Voltage regulation test**
(1) <same as the present Rules>	(1) <same as the present Rules>
(2) In application to **309. 8** (2) of the Rules, In the absence of precise information concerning the maximum values of the sudden loads, the following conditions may be assumed: 60 % of the rated current with a power factor of between 0.4 lagging and zero to be suddenly switched on with the generator running at no load, and then switched off after steady-state conditions have been reached.	(2) In application to **309. 8** (2) of the Rules, In the absence of precise information concerning the maximum values of the sudden loads, the following conditions may be assumed: 60 % of the rated current with a power factor of between 0.4 lagging and zero to be suddenly switched on with the generator running at no load, and then switched off after steady-state conditions have been reached. Subject to Classification Society's approval, such voltage regulation during transient conditions may be calculated values based on the previous type test records, and need not to be tested during factory testing of a generator.
6. <same as the present Rules>	**6. <same as the present Rules>**

Present	Amendment
<Newly added>	**7.** In application to **309. 11** of the Rules, in order to provide sufficient information to the party responsible for determining the discrimination settings in the distribution system where the generator is going to be used, the generator manufacturer is to provide documentation showing the transient behaviour of the short circuit current upon a sudden short-circuit occurring when excited, and running at nominal speed. The influence of the automatic voltage regulator is to be taken into account, and the setting parameters for the voltage regulator are to be noted together with the decrement curve. Such a decrement curve is to be available when the setting of the distribution system's short-circuit protection is calculated. The decrement curve need not be based on physical testing. The manufacturer's simulation model for the generator and the voltage regulator may be used where this has been validated through the previous type test on the same model.
7. ~ 8. <same as the present Rules>	**8. - 9. <same as the present Rules>**
Section 4 - 18 <same as the present Rules>	**Section 4 - 18 <same as the present Rules>**
CHAPTER 2 CONTROL SYSTEMS <same as the present Rules>	**CHAPTER 2 CONTROL SYSTEMS <same as the present Rules>**

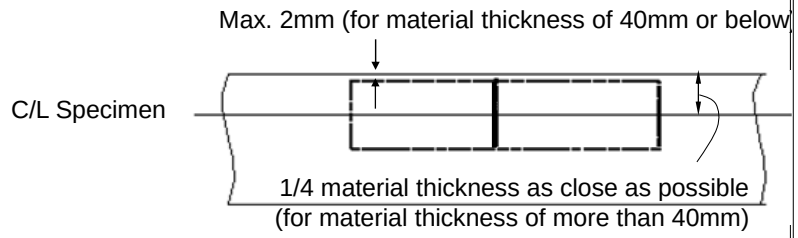
Amended Guidance Relating to the Rules for the Classification of Steel Ships

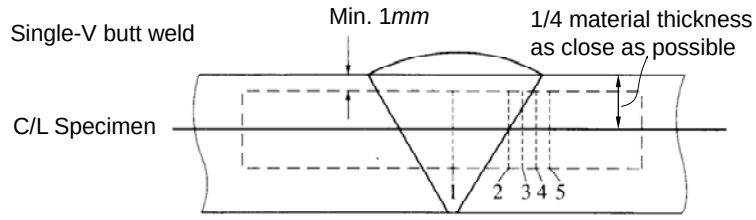
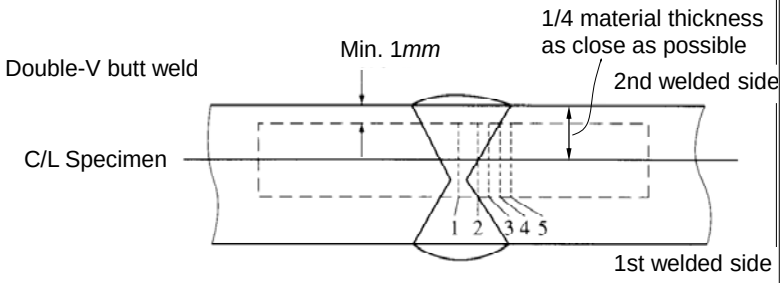
(Part 7 Ships of Special Service Ch 5)

- Main Amendments -

(1) Effective date : 1 January 2017 (based on contract date for ship construction)

◉ To reflect IACS UR W1(Rev.3 Aug 2016)

Present	Amendment
CHAPTER 1～ CHAPTER 4 <Omitted>	**CHAPTER 1～ CHAPTER 4 <Same as the present Rules>**
CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK	**CHAPTER 5 SHIPS CARRYING LIQUEFIED GASES IN BULK**
Section 1 ～ Section 5 <Omitted>	**Section 1 ～ Section 5 <Same as the present Rules>**
Section 6 Materials of Construction and Quality Control	**Section 6 Materials of Construction and Quality Control**
603. General test requirements and specifications	**603. General test requirements and specifications**
1. ～ **3.** <Omitted>	**1.** ～ **3.** <Same as the present Guidance>
4. <New>	**4. Toughness test**
	(1) For the purpose of the requirements in **603. 2** (2) of the Rules, in the case where the material thickness is 40mm or below, the Charpy V-notch impact test specimens are to be cut with their edge within 2 mm from the “as rolled” surface with their longitudinal axes either parallel or transverse to the final direction of rolling of the material as shown in **Figure 7.5.27**.
	
	Figure 7.5.27 - Sampling position of Charpy V-notch impact test spevimens(Base metal)

Present	Amendment
(2) <New>	(2) In application to **603. 2** (3) of the Rules, the position of the specimens is to be in accordance with **Figure 7.5.28**. of the Guidance.
	
	
	Figure 7.5.28 Sampling position of Charpy V-notch impact test specimens (Weld)
(3) <New>	(3) In application to **603. 2** (4) of the Rules, the re-testing of Charpy V-notch impact test specimens is to be in accordance with **Pt 2, Ch 1, 109.** of the Rules.

Present	Amendment
604. Requirements for metallic materials	**604. Requirements for metallic materials**
1. ~ **4.** <Omitted>	**1.** ~ **4.** <Same as the present Guidance>
5. <New>	**5.** For the purpose of the requirements in **604. 1** of the Rules. (1) The requirements for castings and forgings intended for cargo and process piping for design temperature above 0°C are to be accordance with **Pt 2, Ch 1** of the Rules. (2) Materials with alternative chemical composition or mechanical properties may be accepted by special agreement with the Society. (3) Where post-weld heat treatment is specified or required, the properties of the base materials are to be determined in the heat treated condition in accordance with the applicable table and the weld properties are to be determined in the heat treated condition in accordance with **605.**. In cases where a post-weld heat treatment is applied, the test requirements may be modified at the discretion of the Society. (4) Where reference is made to hull structural steels, the requirements of **Pt 2, Ch 1, 301.** of the Rules for appropriate grades apply.
605. Welding of metallic materials and non-destructive testing	**605. Welding of metallic materials and non-destructive testing**
1. General	**1. General**
(1) ~ (2) <Omitted>	(1) ~ (2) <Same as the present Guidance>
(3) <New>	(3) Welding procedure tests for secondary barriers are to be in accordance with **Pt 2, Ch 2, Sec 4** of the Rules.
2. Welding procedure tests for cargo tanks and process pressure vessels	**2. Welding procedure tests for cargo tanks and process pressure vessels**
(1) ~ (6) <Omitted>	(1) ~ (6) <Same as the present Guidance>
(7) <New>	(7) In application to **605. 3** (3) of the Rules, radiographic or ultrasonic testing may be performed at the option of the Society.
(8) <New>	(8) In application to **605. 3** (5) of the Rules, besides aluminium alloys, it may also be accepted subject to agreement with the Society that the transverse weld tensile strength is not to be less than the specified minimum tensile strength for the deposited metal, where the weld metal has lower tensile strength than that of the parent metal.

Present	Amendment
3. <Omitted> **4. Production weld tests** (1) <Omitted> (2) For the purpose of the requirements in **605. 5** (1) of the Rules, the number of test specimens for production weld tests of secondary barriers may be reduced to the extent as deemed appropriate by the Society considering the experience of same welding procedures in past, workmanship and quality control. In general, intervals of production weld tests for secondary barriers may be approximately 200 mm of butt weld joints and the tests are to be representative of each welding position. <hereafter, omitted>	**3.** <Same as the present Guidance> **4. Production weld tests** (1) <Same as the present Guidance> (2) For the purpose of the requirements in **605. 5** (1) of the Rules, the number of test specimens for production weld tests of secondary barriers may be reduced to the extent as deemed appropriate by the Society considering the experience of same welding procedures in past, workmanship and quality control. In general, intervals of production weld tests for secondary barriers may be approximately 200 mm of butt weld joints and the tests are to be representative of each welding position. Test requirements are to be in accordance with **605. 3** (5). of Rules <hereafter, same as the present Rules>

Amended Rules for the Classification of Steel Ships

(Part 9 Additional Installations)

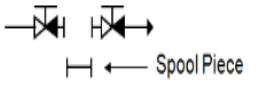
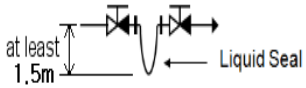
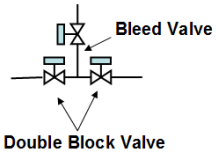
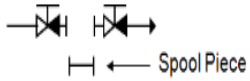
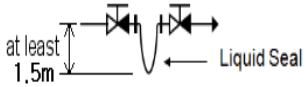
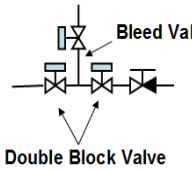
- Main Amendments -

(1) Effective date : 1 Jan 2017 (The contract date for ship construction or an application date for approval for the plans of BWMS)

◉ To reflect IACS UR M74 (Rev.1 May 2016)

Present	Amendment
CHAPTER 10 BALLAST WATER MANAGEMENT	**CHAPTER 10 BALLAST WATER MANAGEMENT**
Section 1 ~ Section 2 <omitted>	**Section 1 ~ Section 2** <same as the present Rules>
Section 3 Ballast Water Management Systems	**Section 3 Ballast Water Management Systems**
301. General	**301. General**
1. <omitted>	**1.** <same as the present Rules>
2. Definitions	**2. Definitions**
(1) **Hazardous area** means an area defined in **Pt 6, Ch 1, 101. 4** (1).	(1) **Hazardous area** means an area in which an explosive gas atmosphere is or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of equipment. The classification of hazardous area is to be in accordance with **Pt 6, Ch 1, 101. 4** (1). When a gas atmosphere is present, the following hazards may also be present: toxicity, asphyxiation, corrosivity and reactivity. *(2017)*
(2) ~ (3) <omitted>	(2) ~ (3) <same as the present Rules>
302. Ballast water management systems	**302. Ballast water management systems**
1. General	**1. General**
(1) The Ballast water management systems (BWMS) is to be operated at a flow rate which does not exceed the Treatment Rated Capacity (hereinafter referred to as 'TRC') specified in the Type Approval Certificate.	(1) The Ballast water management systems (BWMS) is to be operated at a flow rate within the Treatment Rated Capacity (TRC) range specified in the Type Approval Certificate. *(2017)*
(2) ~ (3) <omitted>	(2) ~ (3) <same as the present Rules>
2. ~ 3. <omitted>	**2. ~ 3.** <same as the present Rules>

Present	Amendment
303. Arrangement of BWMS **1.** <omitted> **2.** Ballast piping, including sampling lines from ballast tanks considered as hazardous areas, is not to be led to an enclosed space regarded as a safe area, without any appropriate measures, except ships carrying liquefied gases in bulk. However, a sampling point of ballast water containing dangerous gas may be located in a safe area for checking the performance of BWMS provided the following requirements are fulfilled: (1) The sampling facility is to be located within a gas tight enclosure (hereinafter, referred to as a 'cabinet'), and the following (A) through (C) are to be complied. (A) ~ (C) <omitted> (2) The measuring system is to be installed as close to the bulkhead as possible, and the measuring pipe is to be as short as possible in safe areas. (3) Stop valves are located in both the suction pipe and return pipe near the penetrations of bulkhead at safe side. A warning plate stating "Keep valve closed when not performing measurements" is to be provided near the valve. (4) In order to prevent the backflow, a water seal is to be installed on the hazardous area side of the return pipe. (5) A safety valve is to be installed on the hazardous area side of a sampling line.	**303. Arrangement of BWMS** **1.** <same as the present Rules> **2.** Ballast piping, including sampling lines from ballast tanks considered as hazardous areas, is not to be led to an enclosed space regarded as a safe area, without any appropriate measures, except ships carrying liquefied gases in bulk. However, a sampling point of ballast water containing dangerous gas may be located in a safe area for checking the performance of BWMS provided the following requirements are fulfilled: (1) The sampling facility(for BWMS monitoring/control) is to be located within a gas tight enclosure (hereinafter, referred to as a 'cabinet'), and the following (A) through (C) are to be complied. *(2017)* (A) ~ (C) <same as the present Rules> (2) The standard internal diameter of sampling pipes is to be the minimum necessary in order to achieve the functional requirements of the sampling system. *(2017)* (3) The measuring system is to be installed as close to the bulkhead as possible, and the measuring pipe is to be as short as possible in safe areas. (4) Stop valves are located in both the suction pipe and return pipe near the penetrations of bulkhead at safe side. A warning plate stating "Keep valve closed when not performing measurements" is to be provided near the valve. (5) In order to prevent the backflow, a water seal is to be installed on the hazardous area side of the return pipe. (6) A safety valve is to be installed on the hazardous area side of a sampling line. **3.** For the spaces, including hazardous areas, where toxicity, asphyxiation, corrosivity or reactivity is present, these hazards are to be taken into account and additional precautions for the ventilation of the spaces and protection of the crew are to be considered. *(2017)*

Present	Amendment
3. The following requirements are to be applied for tankers. (1) ~ (2) <omitted> (3) The interconnection of ballast piping between hazardous areas and in non-hazardous areas may be accepted if an appropriate isolation arrangement is applied. Means of the appropriate isolation are as follows: (A) Two(2) screw down check valves in series with a spool piece (refer **Fig 9.10.2**(a)), or (B) Two(2) screw down check valves in series with a liquid seal at least 1.5 m in depth (refer **Fig 9.10.2**(b)), or (C) Automatic double block and bleed valves (refer **Fig 9.10.2**(c))  **Fig 9.10.2(a)**  **Fig 9.10.2(b)**  **Fig 9.10.2(c)** <hereafter, omitted>	**4.** The following requirements are to be applied for tankers. (1) ~ (2) <same as the present Rules> (3) The interconnection of ballast piping between hazardous areas and in non-hazardous areas may be accepted if an appropriate isolation arrangement is applied. Means of the appropriate isolation are as follows: (A) Two(2) screw down check valves in series with a spool piece (refer **Fig 9.10.2**(a)), or (B) Two(2) screw down check valves in series with a liquid seal at least 1.5 m in depth (refer **Fig 9.10.2**(b)), or (C) Automatic double block and bleed valves and a non-return valve (refer **Fig 9.10.2**(c)) *(2017)*  **Fig 9.10.2(a)**  **Fig 9.10.2(b)**  **Fig 9.10.2(c)** ***(2017)*** <hereafter, same as the present Rules>

Amended Guidance for Approval of Manufacturing Process and Type Approval, Etc.

- Main Amendments -

(1) Effective date : 1 January 2017 (based on contract date for ship construction or application date for certification of product)

◉ To reflect IACS UR M68 (Rev.2 Apr 2015)

◉ To reflect IACS UI SC253 (Rev.1 May 2016)

Present	Amendment
CHAPTER 1 <Omitted> **CHAPTER 2 APPROVAL OF MANUFACTURING PROCESS** **Section 1 ~ Section 3 <Omitted>** **Section 4 Castings and Steel Forgings** **401. ~ 404. <Omitted>** **405. Approval tests** **1. ~ 3.** <Omitted> **4.** <New>	**CHAPTER 1 <Same as the present Guidance>** **CHAPTER 2 APPROVAL OF MANUFACTURING PROCESS** **Section 1 ~ Section 3 <Same as the present Guidance>** **Section 4 Castings and Steel Forgings** **401. ~ 404. <Same as the present Guidance>** **405. Approval tests** **1. ~ 3.** <Same as the present Guidance> **4. Approval tests for intermediated shaft material under special requirements (2017)** For alloy steel forgings which has a minimum specified tensile strength greater than 800 N/mm2 but less than 950 N/mm2 for use as intermediate shaft material in **Pt 5, Ch 3, 203.** and **Ch 4, 202.** and **Pt2, Ch 1, 601.** of the Rules, where special manufacturing processes are adopted to reduce shaft dimensions or higher permissible vibration stresses is to be required as following additional tests. (1) Torsional fatigue test A torsional fatigue test is to be performed to verify that the material exhibits similar fatigue life as conventional steels. The torsional fatigue strength of said material is to be equal to or greater than the permissible torsional vibration stress(τ_1 and τ_2) given by the formulae in **Pt 5, Ch 4, 202. 1.** of the Rules. The test is to be carried out with notched and unnotched specimens respectively. For calculation of the stress concentration factor of the notched specimen, fatigue strength reduction factor(β) is to be evaluated in consideration of the severest torsional stress concentration in the design criteria. (A) Surface condition Mean surface roughness is to be <0.2μm Ra with the absence of localised machining marks verified by visual examination at low magnification(x20) as required by **Section 8.4** of **ISO 1352**.

Present	Amendment
	(B) Test procedures are to be in accordance with **Section 10** of **ISO 1352**. Test conditions are to be in accordance with **Table 2.4.2**.

Table 2.4.2 Test condition

Loading type	Torsion
Stress ratio	R = -1
Load waveform	Constant-amplitude sinusoidal
Evaluation	S-N curve
Number of cycles for test termination	1 x 10^7 cycles

(C) Acceptance criteria

Measured high-cycle torsional fatigue strength τ_{C1} and low-cycle torsional fatigue strength τ_{C2} are to be equal to or greater than the values given by the following formulae:

$$\tau_{C1} \geq \tau_{1,\lambda=0} = \frac{T_s + 160}{6} C_k C_d$$

$$\tau_{C2} \geq \frac{1.7\tau_{C1}}{\sqrt{C_k}}$$

C_k : factor for the particular shaft design features

$C_k = 1.45/scf$

scf : stress concentration factor, see **Pt5, Ch4, 202. 3.** of Guidance(For unnotched specimen, 1.0)

C_d : size factor, see **Pt5, Ch4, 202. 1.** of the Rules

T_s : specified minimum tensile strength in $\mathrm{N/mm^2}$ of the shaft material

Present	Amendment
	(2) Cleanliness requirements Cleanliness requirements are to be in accordance with the requirements in **Pt 2, Ch 1, 601. 18.** of the Rules. (3) Non-destructive inspection No-destructive inspection is to be in accordance with the requirements in **Pt 2, Ch 1, 601. 10.** of the Rules.
406. ~ 407. <Omitted>	**406. ~ 407. <Same as the present Guidance>**
Section 5 ~ Section 14 <Omitted>	**Section 5 ~ Section 14 <Same as the present Guidance>**

Present	Amendment
CHAPTER 3 TYPE APPROVAL **Section 1 ~ Section 33 <Omitted>** **Section 34 Fiber Reinforced Plastic Gratings** **3401. ~ 3402. <Omitted>** **3403. Type tests** **1.** <Omitted> **2. Fire integrity test** The service and locations for fire integrity test are to comply with the requirements specified in **Table 3.34.1**. The definitions and test procedures for L1, L2, L3 are also to be as follows.	**CHAPTER 3 TYPE APPROVAL** **Section 1 ~ Section 33 <Same as the present Guidance>** **Section 34 Fiber Reinforced Plastic Gratings** **3401. ~ 3402. <Same as the present Guidance>** **3403. Type tests** **1.** <Same as the present Guidance> **2. Fire integrity test** The service and locations for fire integrity test are to comply with the requirements specified in **Table 3.34.1**. The definitions and test procedures for L1, L2, L3 and L0 are also to be as follows. Details of test for fire integrity not specially mentioned in **3403. 2** are to comply with **ASTM F3059-14**.

<Present>

Tabel 3.34.1 Level for fire integrity

Location	Service	Fire Integrity
Machinery Spaces	Walkways or areas which may be used for escape, or access for firefighting, emergency operation or rescue	L1 (1)
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	L3
Cargo Pump Rooms	All personnel walkways, catwalks, ladders, platforms or access areas	L1
Cargo Holds	Walksways or areas which may be used for escape, or access for firefighting, emergency operation or rescue	L1
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	-
Cargo Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	- (2)
Fuel Oil Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	- (2)
Ballast Water Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	- (3)
Cofferdams, void spaces, double bottoms, pipe tunnels, etc.	All personnel walkways, catwalks, ladders, platforms or access areas	- (3)
Accommodation, service, and control spaces	All personnel walkways, catwalks, ladders, platforms or access areas	L1
Lifeboat embarkation or temporary safe refuge stations in open deck areas	All personnel walkways, catwalks, ladders, platforms or access areas	L2
Open Deck or semi-enclosed areas	Walkways or areas which may be used for escape, or access for firefighting, emergency operation or rescue The areas to comply with the requirements of **3401. 1**	L3 (4)
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	-

Notes;
(1) If the machinery space does not contain any internal combustion machinery, other oil burning, oil heating, or oil pumping units, fuel oil filling stations, or other potential hydrocarbon fire sources and has not more than 2.5 kg/m2 of combustible storage, grating of L3 integrity may be used in lieu of L1.
(2) If these spaces are normally entered when underway, gratings of L1 integrity shall be required.
(3) If these spaces are normally entered when underway, gratings of L3 integrity shall be required.
(4) Vessels fitted with deck foam firefighting systems require gratings of L1 integrity for foam system operational areas and access routes.

<Amendment>

Tabel 3.34.1 Level for fire integrity

Location	Service	Fire Integrity
Machinery Spaces	Walkways or areas which may be used for escape, or access for firefighting, emergency operation or rescue	L1 (1)
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	L3
Cargo Pump Rooms	All personnel walkways, catwalks, ladders, platforms or access areas	L1
Cargo Holds	Walksways or areas which may be used for escape, or access for firefighting, emergency operation or rescue	L1
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	L0
Cargo Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	L0
Fuel Oil Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	L0
Ballast Water Tanks	All personnel walkways, catwalks, ladders, platforms or access areas	L0
Cofferdams, void spaces, double bottoms, pipe tunnels, etc.	All personnel walkways, catwalks, ladders, platforms or access areas	L0
Accommodation, service, and control spaces	All personnel walkways, catwalks, ladders, platforms or access areas	- (2)
Lifeboat embarkation or temporary safe refuge stations in open deck areas	All personnel walkways, catwalks, ladders, platforms or access areas	L2
Open Deck or semi-enclosed areas	Operational areas and access routes for deck foam firefighting systems on tank vessels	L2
	Walkways or areas that may be used for escape, or access for firefighting systems and AFFF hose reels, emergency operation, or rescue on MODUs and production platforms including safe access to tanker bows(the areas to comply with the requirements of **3401. 1**)	L2
	Walkways or areas which may be used for escape, or access for firefighting systems, emergency operation or rescue other than those described above	L2
	Personnel walkways, catwalks, ladders, platforms or access areas other than those described above	L2

Notes;
(1) If the machinery space does not contain any internal combustion machinery, other oil burning, oil heating, or oil pumping units, fuel oil filling stations, or other potential hydrocarbon fire sources and has not more than 2.5 kg/m2 of combustible storage, grating of L3 integrity may be used in lieu of L1.
(2) FRP grating is not permitted.

Present	Amendment
(1) **Definitions** (A) **Level 1 (L1)**: FRP gratings meeting the L1 performance criteria are intended to be satisfactory for use in escape routes or access for firefighting, emergency operation or rescue, after having been exposed to a significant hydrocarbon or cellulosic fire incident. In addition they are also acceptable for the services and functions described for levels L2 and L3. (B) **Level 2 (L2)**: FRP gratings meeting the L2 performance criteria are intended to be satisfactory for use in open deck areas where groups of people are likely to assemble such as temporary safe refuge or lifeboat embarkation areas. In addition they are also acceptable for the services and functions described for level L3. (C) **Level 3 (L3)**: FRP gratings meeting the L3 performance criteria are intended to be satisfactory for use in egress routes and any areas that may require access for firefighting, rescue or emergency operations during exposure to or shortly after exposure to a transitory hydrocarbon or cellulosic fire. (D) <New>	(1) **Definitions** (A) **Level 1(L1)**: FRP gratings meeting the L1 performance criteria provide the highest degree of safety and are intended for use in escape routes or areas in which access for firefighting, emergency operation, or rescue is needed after a significant fire exposure that may weaken the gratings. Level 1 gratings may also be used in any areas requiring Levels 2 or 3 gratings. (B) **Level 2(L2)**: FRP gratings meeting the L2 performance criteria are intended for use in areas in which personnel may need to assemble after the grating has been exposed to a fire and are tested to ensure that they will be able to sustain a post-fire structural loading. Areas in which L2 gratings are specified include temporary safe refuge or lifeboat embarkation stations. Level 2 gratings may also be used in any areas requiring Level 3 gratings. (C) **Level 3(L3)**: FRP gratings meeting the L3 performance criteria are intended for use in areas used as egress routes or that may require access for firefighting, rescue or emergency operations during or shortly after exposure to a very limited fire not likely involving flammable liquids. (D) **Level 0(L0)**: FRP gratings have no level of fire integrity. L0 gratings are used for personnel walkways, catwalks, ladders, platforms, or access areas in cargo holds and tanks.

Present	Amendment
(2) **Level 1** - To be qualified as L1, the FRP gratings shall meet the requirements for qualification as level 3 and level 2, and in addition shall be subjected to the following test procedures: (A) Three FRP grating specimens, after being subjected to the level 2 testing, shall be unloaded and prepared for impact testing in the manner specified for horizontal specimens in **ASTM E 695**(Standard Method of Measuring Resistance of Wall, Floor, and Roof Construction to Impact Loading). The test specimens shall be secured as required in section 8.3 of **ASTM E 695** except that the span shall be 200 mm less than the specimen length. A lead shot bag of 40 kg mass shall be dropped once from a height of 2 m such that the point of impact is in the center of the span. The specimens shall then be uniformly loaded as required by the level 2 test procedures. (B) The test will be considered successful if all three specimens remain intact after being subjected to the impact test and the level 2 loading test. Failure will be indicated by collapse of one or more of the gratings. (3) **Level 2** - To be qualified as L2, the FRP gratings shall meet the requirements for qualification as level 3, and in addition shall be subjected to the following test procedures: (A) On the FRP grating specimen and the steel grating specimen subjected to the level 3 post-loaded testing, the specimen shall be gradually loaded in increments not to exceed 20 kg, placed in such a manner as to represent a uniformly distributed loaded across the span. (B) The test will be considered successful if the FRP grating remains intact at a load greater than or equal to a uniform 4.5 kN/m^2 or greater than or equal to the steel grating failure loading, whichever is less. Failure will be indicated by collapse of the grate.	(2) **Test specimens** (A) A set of two test specimens(one preload and one postload are required for Levels 2 and 3 testing; a set of four test specimens(one preload and three postload) are required for Level 1 testing. (B) The test specimens are to be tested without any coatings(for example, UV coating, skid-resistant coating, and so forth). (C) Each test specimen is to be 302 to 352 mm in width to allow for the differences in the spacing of longitudinal load-bearing members. The width is to be measured at the top surface from outside load-bearing member to outside load-bearing member. The length of each test specimen is to be the maximum length to be qualified for service plus 203 mm but a minimum of 1321 mm long. Test specimens are to be cut when required using representative methods and equipment as recommended by the manufacturer. (D) Test specimens are to be conditioned for a minimum of 24 hours at a temperature of 23±2.8 ℃ and at a relative humidity of 50±5 %. (3) **Approval test** (A) The specification of fire conditions based on **ASTM E 119**. The time-temperature curve is to be the standard for **ASTM E 119**. (B) **Placement of test specimens** (a) A complete set of test specimens is to be placed in the furnace. More than one set may be placed in the furnace if each whole additional set can be accommodated. Individual specimens of a set are not to be tested in separate runs of the furnace. (b) The specimens are to be had a minimum 305 mm clearance to the furnace walls and a minimum 610 mm clearance to the furnace floor or more as required ensuring maximum deflection limits can be properly evaluated. (c) Each specimen is to be simply supported on minimum 102 mm wide steel or concrete supports without any other restraint to simulate the maximum unsupported

Present	Amendment
(4) **Level 3** - To be qualified as L3, the FRP gratings should be subjected to the following fire test procedures for both the post-loaded and pre-loaded tests and conditions: (A) A fire test will be conducted in accordance with **ASTM E 119**(Standard Test Method for Tests of Building Construction and Materials). Two tests shall be conducted in the **ASTM E 119** furnace for each FRP grating design. The first fire test shall be conducted with the specimens under the specified load (pre-loaded) and the second fire test will be conducted on unloaded specimens (post-loaded). The time-temperature curve shall be the standard for **ASTM E 119** or the **ISO** equivalent. (B) Each test specimen shall be 300~350 mm wide to allow for the differences in the spacing of longitudinal supporting members. The length of each test specimen shall be the length of the maximum span to be seen in service plus 200 mm. Four test specimens shall be prepared as described above; two of the proposed FRP gratings and two of a similar steel gratings that would be used in the same location constructed to the applicable regulations and standards. And steel gratings rated at a minimum of 4.5 kN/m^2 uniform loading with a 1.67 factor of safety are acceptable. (C) The pre-loaded test shall consist of the following. (a) One steel grating specimen and one FRP grating specimen shall be placed adjacent to one another in the furnace simply supported on two I-beams with a minimum flange width of 100 mm at an elevation of at least one half of the furnace height or a minimum of 300 mm above the burners; (b) The specimens shall be placed on the I-beams such that 100mm of each side of the specimen rests on each of the two I-beams; (c) A static load represented by a 40 kg mass shall be placed in the center span of the test specimens; (d) The 40 kg mass load shall consist of a steel container filled with sand, the base of which shall be square with an area of 0.09 m^2.	span. The test specimen is to be placed with 100 mm of each end resting on the supports. (C) The test for a furnace to be conducted with exposure duration of 60 minutes. (D) **Data recording** (a) The furnace temperature measurements are to be recorded at a maximum of 1 minute intervals. (b) The time at which the vertical deflection of the preload test specimen exceeds a distance equal to the length of the unsupported span divided by 10 is to be recorded. The recorded time is to be within 6 seconds of the occurrence. (c) The time when each of the unloaded test specimens collapse is to be recorded. (E) **Preload test** For the preload test specimen of each set, the 392 N static load is to be applied at the center of the unsupported span of the test specimen. The load is to be applied over 102 mm of the longitudinal span and distributed evenly across the load-bearing members. (F) **Postload test** (a) The specimens are to be allowed to cool to ambient conditions before the postload test. (b) For Level 3, the center load test of (c) is to be conducted. For Level 2, the center load test of (c) and the uniform load test of (d) are to be consecutively conducted. For Level1, the center load test of (c) and the uniform load test of (d) and the impact test of (e) are to be consecutively conducted for each test specimen and the uniform load test of (d) is to be conducted again. (c) **Center load test** (i) Each postload test specimen is to be supported as (B) (c) and is to be ubject to the 392 N static load at center of the unsupported span as required in the preload test of (E). The static load is to be applied for 15 minutes after the specimen appears motionless.

Present	Amendment
(e) Arrangements shall be made to measure the deflection at the center of the span of each of the loaded specimens during the test with a degree of accuracy of ±5 mm.	(ii) Whether each test specimen sustained the load without collapse is to be recorded. The specimen touching the ground or falling off the supports is to be considered as a collapse.
(f) The two specimens shall be subjected to the time-temperature curve specified in the **ASTM E 119**;	(d) **Uniform load test**
(g) Deflection of the two loaded test specimens shall be measured throughout the duration of the fire test and the average furnace temperature shall be recorded when each of the two specimens has deflected a distance of L/10(failure point) from the horizontal where L is equal to the maximum unsupported span of the specimens; and	(i) Each postload test specimen is to be supported as (B) (c).
(h) The test will be considered successful if the difference between the average furnace temperature at the time of failure of the steel grating and the average furnace temperature at the time of failure of the FRP grating is less than 100 °C (180 °F).	(ii) To each, a uniform distributed load in increments not exceeding 196 N until a load of 4.5 kN/m^2 is reached or until collapse, whichever occurs first, is to be applied. Each incremental load is to be applied for at least 5 minutes. The final load is to be applied for 15 minutes after the specimen appears motionless.
(D) The post-loaded test shall consist of the following.	(iii) The load resulting in collapse for each specimen is to be recorded. Whether each test specimen sustained the final load without collapse is to be recorded. The specimen touching the ground or falling off the supports is to be considered as a collapse.
(a) One steel grating specimen and one FRP grating specimen shall be placed adjacent to one another in the furnace simply supported on two I-beams with a minimum flange width of 100 mm at an elevation of at least one half of the furnace height;	(e) **Impact test**
(b) The specimens shall be placed on the I-beams such that 100 mm of each side of the specimen rests on each of the two I-beams;	(i) Subject the test specimens to impact testing in accordance with **ASTM E 695**(Standard Method of Measuring Resistance of Wall, Floor, and Roof Construction to Impact Loading).
(c) The two specimens shall be subjected to the time-temperature curve specified in the **ASTM E 119** for a duration of 60 minutes;	(ii) The test specimens are to be secured as required in **ASTM E 695** except that the span between supports should be 203 mm less than the pretest specimen length.
(d) At the end of the 60 minutes the specimens will be allowed to cool and shall then be subjected to a static load represented by the 40 kg mass specified in the pre-loaded test above, placed in the center span of the test specimens; and	(iii) A lead shot bag with a minimum mass of 40 kg is to be dropped one time on each test specimen from a minimum height of 2 m, such that the point of impact is the midpoint of the span.
(e) The test will be considered successful if the FRP grating specimen is intact at the end of the test and does not collapse under the 40 kg mass load.	(4) **Acceptance criteria**
	(A) **Level 3(L 3)**
	(a) The time for the heat exposure for the preload test specimen exceeds 18 minutes.

Present	Amendment
	(b) The unloaded test specimens are not to be collapsed during the furnace test. (c) The test specimen after center load test is to be supported the load for the specified duration without collapse. (B) **Level 2(L 2)** The FRP gratings are considered to comply with Level 2 structural fire integrity requirements if they meet the requirements of Level 3 structural fire integrity and the test specimen of uniform load test is to be supported the load for the specified duration without collapse. (C) **Level 1(L 1)** The FRP gratings are considered to comply with Level 1 structural fire integrity requirements if all three postload specimens meet the requirements of Level 2 structural fire integrity and withstand the impact test in accordance with (3) (e) and subsequent uniform load test in accordance with (3) (d) without collapse. (D) **Level 0(L 0)** There are no structural fire integrity requirements.
<hereafter, omitted>	<hereafter, same as the present Guidance>

- Main Amendments -

(1) Effective date : 1 Jan 2017 (Date of which application for approval is submitted)

◉ To reflect IACS UR P2.11(Rev.4 Mar. 2016)

◉ To reflect IACS UR P3(Rev.4 Jan. 2016)

Present

Section 18 Mechanical Joints

<1801~1803.3 omitted>

4. Selection of test specimen

(1) Test specimens are to be selected from production line or at random from stock.
(2) Where there are various sizes from type of joints requiring approval, minimum of three separate sizes representative of the range, from each type of joints are to be subject to the tests listed in **Table 3.18.1**

<1803.4~1804 omitted>

Table 3.18.2 The outlines of testing methods of mechanical joints

Test item	Kinds	Type test method
1. Tightness test	all mechanical joints	In order to ensure correct assembly and tightness of the joints, all mechanical joints are to be subjected to a tightness test, as follows. (1) Mechanical joint assembly test specimen is to be connected to the pipe or tubing in accordance with the requirements of **1803. 5** (3) and the manufacturers instructions, filled with test fluid and de-aerated. Mechanical joints assemblies intended for use in rigid connections of pipe lengths, are not to be longitudinally restrained. Rigid connections are joints, connecting pipe length without free angular or axial movement. Pressure inside the joint assembly is to be slowly increased to 1.5 times of design pressure. This test pressure is to be retained for a minimum period of 5 minutes. In the event where there is a drop in pressure and there is visual indication of leakage, the test (including fire test) shall be repeated for two test pieces. If during the repeat test one test piece fails, the testing is regarded as having failed. Other alternative tightness test procedure, such as pneumatic test, may be accepted. <(2)~(3) omitted>

Amendment

Section 18 Mechanical Joints

<1801~1803.3 same as present>

4. Selection of test specimen

(1) Test specimens are to be selected from production line or at random from stock.
(2) Where there is a variety of size of joints requiring approval, a minimum of three separate sizes, representative of the range, from each type of joint to be tested in accordance with **Table 3.18.1** are to be selected.

<1803.4~1804 same as present>

Table 3.18.2 The outlines of testing methods of mechanical joints

Test item	Kinds	Type test method
1. Tightness test	all mechanical joints	In order to ensure correct assembly and tightness of the joints, all mechanical joints are to be subjected to a tightness test, as follows. (1) The mechanical joint assembly test specimen is to be connected to the pipe or tubing in accordance with the requirements of **1803. 5** (3) and the manufacturers instructions, filled with test fluid and de-aerated. Mechanical joints assemblies intended for use in rigid connections of pipe lengths, are not to be longitudinally restrained. Rigid connections are joints, connecting pipe length without free angular or axial movement. The pressure inside the joint assembly is to be slowly increased to 1.5 times ~~of~~ the design pressure. This test pressure is to be retained for a minimum period of 5 minutes. In the event ~~where there is~~ of a drop in pressure or visible ~~there is visual indication of~~ leakage, the test (including fire test) ~~shall~~ is to be repeated for two ~~test pieces~~ further specimens. If during the repeat test one test piece fails, the ~~testing~~ coupling is regarded as having failed. ~~Other~~ An alternative tightness test procedure, such as a pneumatic test, may be accepted. <(2)~(3) same as present>

Present

Table 3.18.2 The outlines of testing methods of mechanical joints (continued)

Test item	Kinds	Type test method
2. Vibration (fatigue) test	General	(1) In order to establish the capability of the mechanical joint assembly to withstand fatigue, which is likely to occur due to vibrations under service conditions, mechanical joints assembly is to be subject to the following vibration test. (2) Conclusions of the vibration tests should show no leakage or damage, which could subsequently lead to a failure.
	compression couplings, pipe unions, expansion & flexible joints	Compression couplings, pipe unions or other similar joints intended for use in rigid connections of pipe are to be tested in accordance with this method described as follows. <(A)~ (E) omitted> (F) In the event of drop in the pressure and visual signs of leakage the test is to be repeated as described in **1803. 6.** (G) Visual examination of the joint assembly is to be carried out for signs of damage which may eventually lead to joint leakage. <(H)~(J) omitted>
	<Grip type and Machine grooved type joints omitted>	
<3. Pressure pulsation test 생략>		
4. Burst pressure test	mechanical joint assembly	<above omitted > (4) This pressure value will be annotated. (5) Where consider convenient, the mechanical joint test specimen used in tightness test in **1.** of this **Table**, same specimen may be used for the burst test provided it passed the tightness test. (6) The specimen may have small deformation whilst under test pressure, but no leakage or visible cracks are permitted.

Amendment

Table 3.18.2 The outlines of testing methods of mechanical joints (continued)

Test item	Kinds	Type test method
2. Vibration (fatigue) test	General	(1) In order to establish the capability of the mechanical joint assembly to withstand fatigue, which is likely to occur due to vibrations under service conditions, mechanical ~~joints assembly is~~ joint assemblies are to be subject to the following vibration test. (2) Conclusions of the vibration tests should show no leakage or damage. ~~which could subsequently lead to a failure.~~
	compression couplings, pipe unions, expansion & flexible joints	Compression couplings and, pipe unions ~~or other similar joints~~ intended for use in rigid pipe connections ~~of pipe~~ are to be tested ~~in accordance with this method described~~ as follows. <(A)~ (E) same as present> (F) In the event of a drop in the pressure and ~~visual signs of~~ visible leakage the test is to be repeated as described in **1803. 6.** (G) Visual examination of the joint assembly is to be carried out. ~~for signs of damage which may eventually lead to joint leakage.~~ <(H)~(J) same as present>
	<Grip type and Machine grooved type joints same as present>	
<3. Pressure pulsation test **same as present**>		
4. Burst pressure test	mechanical joint assembly	<above same as present> ~~(4) This pressure value will be annotated.~~ (4) Where considered convenient, the mechanical joint test specimen used in the tightness test in **1.** of this **Table**, ~~same specimen~~ may be used for the burst test provided it passed the tightness test. (5) The specimen may ~~have~~ exhibit a small deformation whilst under test pressure, but no leakage or visible cracks are permitted.

Present

Table 3.18.2 The outlines of testing methods of mechanical joints

Test item	Kinds	Type test method
5. Pull-out test	mechanical joint assembly	In order to determine ability of a mechanical joint assembly to withstand axial load likely to be encountered in service without the connecting pipe from becoming detached, following pull-out test is to be carried out. (1) Pipe length of suitable size is to be fitted to each end of the mechanical joints assembly test specimen. (2) The test specimen is to be pressurized to design pressure. When pressure is attained, an external axial load is to be imposed with a value calculated by the following formula: The pressure and axial load are to be maintained for a period of 5 minutes $L = \frac{\pi}{4} \cdot D^2 \cdot p$ where: D =pipe outside diameter (mm) p =design pressure ($\mathrm{N/mm^2}$) L =applied axial load (N) (3) During the test, pressure is to be monitored and relative movement between the joint assembly and the pipe measured. (4) The mechanical joint assembly is to be visually examined for drop in pressure and signs of leakage or damage. (5) There are to be no movement between mechanical joint assembly and the connecting pipes.
6. Fire endurance test	mechanical joint assembly	<(1)~(3) omitted> (4)~(5) New

Amendment

Table 3.18.2 The outlines of testing methods of mechanical joints

Test item	Kinds	Type test method
5. Pull-out test	mechanical joint assembly	In order to determine the ability of a mechanical joint assembly to withstand the axial loading likely to be encountered in service without the connecting pipe ~~from~~ becoming detached, following pull-out test is to be carried out. (1) Pipes ~~length~~ of suitable ~~size~~ length are ~~is~~ to be fitted to each end of the mechanical joints assembly test specimen. (2) The test specimen is to be pressurized to design pressure. When pressure is attained, an external axial load is to be imposed with a value calculated ~~by~~ using the following formula: The pressure and axial load are to be maintained for a period of 5 minutes $L = \frac{\pi}{4} \cdot D^2 \cdot p$ where: D =pipe outside diameter (mm) p =design pressure ($\mathrm{N/mm^2}$) L =applied axial load (N) (3) During the test, pressure is to be monitored and relative movement between the joint assembly and the pipe measured. (4) The mechanical joint assembly is to be visually examined for drop in pressure and signs of leakage or damage. (5) There ~~are~~ is to be no movement between the mechanical joint assembly and the connecting pipes.
6. Fire endurance test	mechanical joint assembly	<(1)~(3) same as present> (4) Alternative test methods and/or test procedures onsidered to be at least equivalent may be accepted at the discretion of the Society in cases where the test pieces are too large for the test bench and cannot be completely enclosed by the flames. (5) Thermal insulation materials applied on couplings are to be non-combustible in dry condition and when subjected to oil spray. A non-combustibility test according to ISO 1182 is to be carried out.

Present

Table 3.18.2 The outlines of testing methods of mechanical joints

Test item	Kinds	Type test method
7. Vacuum test	mechanical joint assembly	In order to establish capability of mechanical joint assembly to withstand internal pressures below atmosphere, similar to the conditions likely to be encountered under service conditions, following vacuum test is to be carried out. (1) Mechanical joint assembly is to be connected to a vacuum pump and subjected to a pressure 170 hPa absolute. (2) Once this pressure is stabilized the mechanical joint assembly test specimen under test are to be isolated from the vacuum pump and this pressure is to be retained for a period of 5 minutes. (3) Pressure is to be monitored during the test. (4) No internal pressure rise is permitted.
<8. Low temperature test omitted>		
9. Repeated assembly test	mechanical joint assembly	Mechanical joint test specimen are to be dismantled and reassembled 10 times in accordance with manufacturers instructions and then subjected to a tightness test as defined in **1 of this Table.**

Amendment

Table 3.18.2 The outlines of testing methods of mechanical joints

Test item	Kinds	Type test method
7. Vacuum test	mechanical joint assembly	In order to establish the capability of the mechanical joint assembly to withstand internal pressures below atmospheric ~~atmosphere~~, similar to the conditions likely to be encountered under service conditions, the following vacuum test is to be carried out. (1) The mechanical joint assembly is to be connected to a vacuum pump and subjected to a pressure of 170 hPa absolute. (2) Once this pressure is stabilized, the ~~mechanical joint assembly test~~ specimen under test ~~are~~ is to be isolated from the vacuum pump and ~~this~~ the pressure is to be maintained ~~retained~~ for a period of 5 minutes. ~~(3) Pressure is to be monitored during the test.~~ (3) No internal pressure rise is permitted.
<8. Low temperature test same as below>		
9. Repeated assembly test	mechanical joint assembly	The mechanical joint test specimen ~~are~~ is to be dismantled and reassembled 10 times in accordance with manufacturers instructions and then subjected to a tightness test as defined in **1 of this Table.**

Amended Guidance Relating to the Rules for the Classification of Mobile Offshore Drilling Units

(Chapter 1 General)

- Main Amendments -

(1) Effective date : 1 Jan 2017 (Date of which ship contracted for construction)

◉ To reflect IACS UI MODU2 (New Aug 2016)

Present	Amendment
CHAPTER 1 GENERAL	**CHAPTER 1 GENERAL**
Section 1 General	**Section 1 General**
<omitted>	**<omitted>**
	Section 2 Definitions
<newly added>	**206. Light ship weight** **1.** In application to **206.** of the Rules, the weight of mediums on board for the fixed fire-fighting systems (e.g. freshwater, CO_2, dry chemical powder, foam concentrate, etc.) shall be included in the lightweight and lightship condition. *(2017)*
<omitted>	<same as the present>