RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part B Class Surveys

2015 AMENDMENT NO.3

Rule No.63 25th December 2015

Resolved by Technical Committee on 28th July 2015

Approved by Board of Directors on 14th September 2015

Rule No.63 25th December 2015
AMENDMENT TO THE RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

"Rules for the survey and construction of steel ships" has been partly amended as follows:

Part B CLASS SURVEYS

Amendment 3-1

Chapter 1 GENERAL

1.3 Definitions

1.3.1 Terms

Sub-paragraphs (17) to (20) have been renumbered to Sub-paragraphs (19) to (22), and Sub-paragraphs (17) and (18) have been added as follows.

((1) to (10) are omitted.)

(11) "Oil tankers" are ships constructed or adapted for the carriage of oil in bulk and include chemical carriers intended to carry oil in bulk and combination carriers which are designed to carry either oil or solid cargoes in bulk, such as ore/oil carriers and ore/bulk/oil carriers.

(12) "Double hull oil tankers" are ships which belong to oil tankers specified in **(11)** above, which have the cargo tanks protected by a double hull which extends for the entire length of the cargo area, consisting of double sides and double bottom spaces for the carriage of water ballast or void spaces, and includes existing double hull tankers not complying with **3.2.4**, **Part 3 of the Rules for Marine Pollution Prevention Systems** but having double hull structure.

(13) "Bulk carriers" are ships defined as the following:

(a) Ships constructed or converted with a single deck, topside tanks and hopper side tanks in cargo spaces, and intended primarily to carry dry cargoes in bulk

(b) Ships constructed or converted with a single deck, two longitudinal bulkheads and a double bottom throughout the cargo spaces, and intended primarily to carry ore cargoes in the centre holds only

(c) Combination carriers which are designed to carry either oil or solid cargoes in bulk, such as ore/oil carriers and ore/bulk/oil carriers, and have the same construction as the ships defined in **(a)** or **(b)** above

(14) "Double Skin Bulk carriers" are ships, which belong to bulk carriers specified in **(13)** above, in which all cargo holds are bounded by a double-side skin (regardless of the width of the wing space).

(15) "General dry cargo ships" are ships constructed or converted to carry solid cargoes other than:

- bulk carriers;
- container carriers;
- ro-ro cargo ships;
- car carriers;
- refrigerated cargo ships;

- dedicated wood chip carriers; and
- dedicated cement carriers
- ships of double side-skin construction, with double side-skin extending for the entire length of the cargo area, and for the entire height of the cargo hold to the upper deck

(16) "Ships carrying timber cargoes" are cargo ships which belong to general dry cargo ships specified in **(15)** above and which have marked timber load lines in accordance with the requirements in **Part V** or primarily carry log cargoes.

(17) "Ships carrying liquefied gases in bulk" refers to the definition in **2.1.42, Part A**.

(18) "Ships carrying dangerous chemicals in bulk" refers to the definition in **2.1.43, Part A**.

(~~17~~19) "Anniversary Date" is the day corresponding to the expiry date of the Classification Certificate, excluding the expiry date of the Classification Certificate.

(~~18~~20) "Pitting corrosion" is defined as scattered corrosion spots/areas with local material reductions which are greater than the general corrosion in the surrounding area. Pitting intensity is defined in **Fig. B1.1**.

(~~19~~21) "Edge corrosion" is defined as local corrosion at the free edges of plates, stiffeners, primary support members as well as around openings. An example of edge corrosion is shown in **Fig. B1.2**.

(~~20~~22) "Grooving corrosion" is defined as local corrosion adjacent to weld joints along abutting stiffeners or at stiffener or plate butts or seams. An example of grooving corrosion is shown in **Fig. B1.3**.

Chapter 11 SURVEYS OF SUBMERSIBLES

11.1 General

11.1.2 General Requirements on Surveys

Sub-paragraph -3(1) has been amended as follows.

3 Due date of Periodical Surveys

(1) Intermediate Surveys

Intermediate surveys are to be carried out within three *months* of the anniversary date defined in **1.3.1(~~17~~19)**.

(2) Special Surveys

Special Surveys are to be carried out on the due date required by **1.1.3-1(3)**.

EFFECTIVE DATE AND APPLICATION (Amendment 3-1)

1. The effective date of the amendments is 25 December 2015.

Amendment 3-2

Chapter 1 GENERAL

1.4 Preparation for Surveys and Miscellaneous

Paragraph 1.4.6 has been added as follows.

1.4.6 Firms Engaged in Surveys, Measurements and Maintenance

1 Unless otherwise specified, where third parties engaged in thickness measurements, in-water surveys by divers or remote operated vehicles, or tightness testing of closing appliances such as hatches, doors, etc., with ultrasonic equipment are to be firms deemed appropriate by the Society.

2 Unless otherwise specified, third parties engaged in surveys and maintenance of fixed fire extinguishing systems, portable fire extinguishers, self contained breathing apparatuses, emergency escape breathing devices or fire detection and alarm systems are to be firms deemed appropriate by the Society.

3 Unless otherwise specified, third parties engaged in tightness testing of primary and secondary barriers of gas carriers with membrane cargo containment systems are to be firms deemed appropriate by the Society.

Chapter 5 SPECIAL SURVEYS

5.2 Special Surveys for Hull, Equipment, Fire Extinction and Fittings

5.2.6 Thickness Measurements

Sub-paragraph -1 has been amended as follows.

1 At Special Surveys, thickness measurements are to be carried out in accordance with **(1)** ~~through~~to **(5)** below.

(1) Thickness measurements are to be carried out using appropriate ultra-sonic gauging machines or other approved means. The Surveyor may request that the accuracy of the equipment be demonstrated.

(2) Thickness measurements are to be carried out at or after the time of the 4th Annual Survey under the attendance of the Surveyor by the firm approved by the Society under the "**Rules for Approval of Manufactures and Service Suppliers**" ~~or equivalent firm~~. The surveyor may request to have the measurements taken again to ensure acceptable accuracy.

(3) Additional thickness measurements are to be carried out before the completion of the survey.

(4) A thickness measurement record is to be prepared and submitted to the Society.

(5) Thickness measurements of structures in areas where close-up surveys are required are to be carried out simultaneously with close-up surveys.

Chapter 11 SURVEYS OF SUBMERSIBLES

11.1 General

11.1.2 General Requirements on Surveys

Sub-paragraphs -5 and -6 have been added as follows.

5 Unless otherwise specified, third parties engaged in thickness measurements, in-water surveys by divers or remote operated vehicles, or the tightness testing of closing appliances, such as hatches, doors, etc., with ultrasonic equipment are to be firms deemed appropriate by the Society.
6 Unless otherwise specified, where a third parties engaged in surveys and maintenance of portable fire extinguishers are to be firms deemed appropriate by the Society.

Chapter 13 SPECIAL REQUIREMENTS OF PERIODICAL SURVEYS FOR OFFSHORE STRUCTURES

13.2 Preparation of Surveys and Inspections

Paragraph 13.2.2 has been amended as follows.

13.2.2 ~~Approval of~~ Inspection Compan~~y~~ies Carrying Out Surveys, Measurements and Maintenance

~~Where an inspection company carries out the inspection specified in **13.4**, the inspection company is required to be approved by the Society.~~
1 Unless otherwise specified, third parties engaged in thickness measurements, in-water surveys by divers or remote operated vehicles, or tightness testing of closing appliances such as hatches, doors, etc. with ultrasonic equipment are to be firms deemed appropriate by the Society.
2 Unless otherwise specified, third parties engaged in surveys and maintenance of fixed fire extinguishing systems, portable fire extinguishers, self contained breathing apparatuses, emergency escape breathing devices or fire detection and alarm systems are to be firms deemed appropriate by the Society.

EFFECTIVE DATE AND APPLICATION (Amendment 3-2)

1. The effective date of the amendments is 1 January 2016.
2. Notwithstanding the amendments to the Rules, the current requirements may apply to manufacturing works and service suppliers approved by the Society before 1 January 2016 until 31 December 2018 or the expiry date of their certificate, whichever comes first.

Amendment 3-3

Chapter 1 GENERAL

1.1 Surveys

1.1.3 Intervals of Class Maintenance Surveys

Sub-paragraph (6) has been amended as follows.

1 Periodical Surveys are to be carried out in accordance with the requirements specified in **(1)** through **(6)** below.
(-1 to -5 are omitted.)

(6) Propeller Shaft and Stern Tube Shaft Surveys

Ordinary Surveys of propeller shafts and stern tube shafts are to be carried out as specified in the following **(a)** ~~through~~to **(~~d~~h)**:

(a) Ordinary Surveys of Propeller shafts Kind 1 or stern tube shafts Kind 1 (hereinafter referred to as "shafts Kind 1" in this chapter) are to be carried out within 5 *years* from the date of completion of the Classification Survey or the previous Ordinary Survey (survey due date).

(b) Regardless of **(a)** above, Ordinary Surveys of propeller shaft with oil~~-~~ lubricated stern tube bearings are to be as specified in the following **i)** and **ii)**:

i) Ordinary Surveys of propeller shafts Kind 1B may be postponed for no longer than 3 *years* from the date of completion of Partial Surveys provided that the Partial Survey specified in **8.1.2-1** is carried out at the time prescribed in **(a)** above. Moreover, in cases where it is confirmed within 3 *years* from the date of completion of said Partial Survey that proper maintenance has been conducted since said Survey, Ordinary Surveys may be postponed for not more than 2 *years* from the date of the Confirmatory Survey above.

ii) Ordinary Surveys of propeller shafts Kind 1C may be postponed for no longer than 5 *years* from the date of completion of Partial Surveys provided that the Partial Survey specified in **8.1.2-2** is carried out at the time prescribed in **(a)** above.

(c) Regardless of **(a)** above, propeller shafts Kind 1 adopting the preventive maintenance system in accordance with the requirements of **8.1.3**, need not be withdrawn at the Ordinary Surveys. The shafts are to be withdrawn for examination at the times required on the basis of the results of the preventive maintenance.

(d) Ordinary Surveys of Propeller shafts Kind 2 and stern tube shafts Kind 2 (hereinafter referred to as "shafts Kind 2" in this chapter) are to be carried out as prescribed in **i)** and **ii)**.

i) Concurrently with Special Surveys

ii) Within 36 months from the date of completion of the Classification Survey or the previous Ordinary Surveys (survey due date)

However, where the construction of the shaft in the stern tube bearing and shaft bracket corresponds to shafts Kind 1 but the construction of the shaft between the stern tube and the shaft bracket corresponds to shafts Kind 2, the shaft may be surveyed at the intervals prescribed in **(a)**, provided that examination required for the part corresponding to shafts Kind 2 is carried out at the times prescribed in **i)** and **ii)**.

(e) In applying **(a)** and **(d)** above, for Ordinary Surveys completed within 3 *months* before the survey due date, the survey due date will be regarded as the date of completion of this survey.
(f) In applying **(b)** above, for Partial Surveys or Confirmatory Surveys completed within 1 month before the survey due date, the survey due date will be regarded as the date of completion of this survey.
(g) For keyless connection shafts lubricated with water lubricated bearings, two consecutive dismantling and verifications of the shaft cone by means of non-destructive examination (*NDE*) is not to exceed 15 *years*. *NDE* generally refers to the magnetic particle method.
(h) Regardless of **(a)** to **(g)** above, Ordinary Surveys of the propeller shafts and stern tube shafts of ships affixed with the notation "*APSS・O*" or "*APSS・W*" are to be carried out as specified separately by the Society.

1.2 Specialized Ships, Installations, and Apparatus

Paragraph 1.2.4 has been added as follows.

1.2.4 Surveys of Water Jet Propulsion Systems, etc.

Surveys of water jet propulsion systems and azimuth thrusters are to be carried out as specified separately by the Society.

1.3 Definitions

1.3.1 Terms

Sub-paragraph (21) has been added as follows.

The definitions of terms which appear in this Part are as specified in the following. Terms not define here are as defined in other parts of the Rules.
((1) to (20) are omitted.)
(21) The terminology used in the application of propeller shaft and stern tube shaft surveys is as specified in the following **(a)** to **(h)**:
(a) "Shafts" mean propeller shafts as specified in the following **(b)** and stern tube shafts as specified in the following **(c)**.
(b) "Propeller shaft" is the part of the propulsion shaft to which the propeller is fitted.
(c) "Stern tube shaft" is a shaft placed between the intermediate shaft and propeller shaft, normally arranged within a stern tube or running in open water.
(d) "Stern tube" is a tube or pipe fitted in the shell of a ship at the stern (or rear part of the ship), through which passes the stern tube shaft or aftermost section of the propeller shaft. "Stern tube" is the housing of the shaft bearings that sustain the shaft and also accommodates the shaft sealing arrangement.
(e) "Stern tube sealing system" means the equipment installed on the inboard extremity and, for oil or freshwater lubricated bearings, at outboard extremity of the stern tube. An "inboard seal" is the device fitted on the fore part of the stern tube that achieves the sealing against the possible leakage of the lubricant media into the ship internal. An "outboard seal" is the device fitted on the aft part of the stern tube that achieves the sealing against the possible sea water ingress and the leakage of the lubricant media.

(f) “Oil lubricated” means closed loop oil lubricating systems which use oil to lubricate the bearings and are sealed against the environment by adequate sealing or gland devices.

(g) “Freshwater lubricated” means closed loop water lubricating systems which use fresh water to lubricate the bearings and are sealed against the environment by adequate sealing or gland devices.

(h) “Water lubricated” means open water lubricating systems where bearings are cooled and lubricated by water (salt or fresh) which are exposed to the environment.

Chapter 6 DOCKING SURVEYS

6.1 Docking Surveys

Paragraph 6.1.2 has been amended as follows.

6.1.2 In-water Surveys

(-1 is omitted.)

2 The following plans and documents are to be included as part of a submission to the Society for approval for conducting In-water Surveys, which is to be obtained prior to commencement.

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

(3) Documents showing the procedure which enables the Surveyor to confirm the clearance of the rudder bearing or the condition of the stern tube bearing based on a review of the operating history, the on-board testing or analysis of sampled stern lubricating oil or lubricating freshwater ~~sample~~.

Where the bearing is found to be satisfactory, special consideration may be given to the requirements in **-3(1)** or **-3(4)** below.

((4) is omitted.)

3 Ships intended to be subjected to the In-water Survey are to comply with the following. Where the documents specified in **-2(3)** above are submitted, special consideration may be given to **(1)** or **(4)** below.

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

(3) For water lubricated~~ing type~~ stern tube bearings, a means of measuring the clearance between the propeller shafts and their bearings is provided

(4) For oil or freshwater lubricated~~ing type~~ stern tube bearings, a suitable means of ascertaining the performance of the stern tube bearings including oil sealing devices is provided

(5) A suitable means of ascertaining the position and identity of each blade of the propellers is provided

((6) and (7) are omitted.)

(-4 is omitted.)

Table B6.1 has been amended as follows.

Table B6.1 Requirements for Docking Surveys

Items	Examinations
(1 to 3 are omitted.)	
4 After end of stern bush	・The wear down of the bearing is to be measured; or the clearance between the propeller shaft or stern tube shaft and the after bearing of the stern tube or the shaft bracket bearing.
5 Sealing devices for stern tube and shaft bracket bearing	・In the case of oil or freshwater lubricated stern tube bearings, ~~T~~the efficiency of the oil or freshwater gland is to be checked.
6 Propeller	・Propellers are to be examined. Where a controllable pitch propeller is fitted, the pitch control device is to be examined without dismantling.
(7 to 9 are omitted.)	

Chapter 8 PROPELLER SHAFT AND STERN TUBE SHAFT SURVEYS

8.1 Propeller Shaft and Stern Tube Shaft Surveys

Paragraphs 8.1.1 to 8.1.3 have been amended as follows.

8.1.1 Ordinary Surveys

~~At~~ Ordinary Surveys of ~~a~~ propeller and stern tube shafts~~, the shaft is to be withdrawn for examinations specified in~~ are to be carried out in accordance with **Table B8.1**.

8.1.2 Partial Surveys

1 At Partial Surveys for propeller shafts Kind 1 of oil lubricated stern tube bearings, the examinations specified in the following **(1)** ~~through~~to **(3)** are to be carried out.

(1) ~~A visual examination of the parts of the propeller shafts exposed in the engine room~~Visual inspection of all accessible parts of the shafting system

(2) ~~Confirmation that the shaft is not operated in the barred speed range for torsional vibration~~Verification that the main engines have not been operated within the barred speed range for torsional vibration.

(3) Examinations specified in ~~1~~2, ~~4,~~ 6, ~~5, 6~~9, ~~9~~12 and ~~10~~13 in **Table B8.1** as well as the following **(a)** to **(d)**. However, the requirements of ~~1~~2~~, 5~~ and ~~6~~9 in **Table B8.1** may be omitted for shafts having keyless propeller attachments or coupling flanges at their aft end, if general examinations are proved satisfactory.

(a) Checking and recording measurements of the bearing weardown of the propeller shaft or the stern tube shaft at the after bearing of the stern tube

(b) Verification that the propeller is free of damages which may cause the propeller to be out of balance

(c) Seal liner found to be or placed in a satisfactory condition

(d) Verification of the satisfactory conditions of inboard and outboard seals

2 At Partial Surveys for propeller shafts Kind 1*C*, the "Record for Monitoring System of Stern Tube Bearing and Oil Sealing Devices" is to be examined in addition to the examinations specified in **-1**.

8.1.3 Preventive Maintenance System

Notwithstanding the requirements in **8.1.1** above, where the ship is equipped with oil lubricated stern tube bearings and appropriate stern tube oil sealing devices as approved by the Society, the survey items of -1, -~~2~~3, -~~3~~4, -5, ~~and~~ -~~5~~7 and -8 in **Table B8.1** ~~need not be complied~~may be replaced with a general examination of the shafting system provided that all condition monitoring data taken according to the approved preventive maintenance system is found to be within permissible limits ~~and a general examination of the shafting system is carried out~~. The propeller shaft may be examined as a propeller shaft Kind 1*C* for the remaining requirements except -1, -~~2~~3, -~~3~~4, -5, ~~and~~ -~~5~~7 and -8 in **Table B8.1**. The examination ~~of the propeller boss bore in way of the propeller shaft taper section~~ required by survey item -~~6~~9 in **Table B8.1** may be partly dispensed with where deemed appropriate by the Society.

(1) Based upon Society approved preventive maintenance systems, at least the following **(a)** ~~through~~to **(d)** are to be properly monitored and recorded for diagnosing lubricating conditions of shafting systems and performing preventive system maintenance. Moreover, the notation "*Propeller Shaft Condition Monitoring System*" (abbreviated as "*PSCM*") is to be affixed to the classification characters of ships whose preventive maintenance systems ~~have been~~are approved by the Society.

(a) Lubricating oil sampling and analysis is to be carried out regularly at intervals not exceeding 6 *months*, with at least the following **i)** ~~through~~to **iv)** being analyzed each time:
   i) Water content
   ii) Chloride~~s~~ content
   iii) Content of shaft metal and bearing metal particles
   iv) Oxidation of oil
(b) Lubricating oil consumption rate
(c) Bearing temperature
(d) The value<u>s</u> specified in <u>item</u> ~~4~~<u>8</u> of **Table B8.1**

(2) Based upon Society approved preventive maintenance systems, at least the following **(a)** ~~through~~<u>to</u> **(e)** are to be properly monitored and recorded for diagnosing lubricating conditions of shafting systems and performing preventive system maintenance. Moreover, the notation "*Propeller Shaft Condition Monitoring System・A*" (abbreviated as "*PSCM・A*") is to be affixed to the classification characters of ships whose preventive maintenance systems are approved by the Society.
   (a) Lubricating oil sampling and analysis is to be carried out regularly at intervals not exceeding 6 *months*,with at least the following **i)** ~~through~~<u>to</u> **iv)** being analyzed each time:
      i) Water content
      ii) Chloride content
      iii) Content of shaft metal and bearing metal particles
      iv) Oxidation of oil
   (b) The monthly onboard checking of lubricating oil water content. Such checking, however, may be omitted when the oil sampling and analysis specified in **(a)** above is carried out regularly at intervals not exceeding 3 *months*.
   (c) Lubricating oil consumption rate
   (d) Bearing temperature
   (e) The values specified in <u>item</u> ~~4~~<u>8</u> of **Table B8.1**

Paragraph 8.1.4 has been added as follows.

<u>8.1.4 Propeller Shaft and Stern Tube Shaft Surveys of Ships Affixed with Notation "*APSS・O*" or "*APSS・W*"</u>

<u>Notwithstanding the requirements in **8.1.1** to **8.1.3** above, propeller shaft and stern tube shaft surveys of ships affixed with the notation "*APSS・O*" or "*APSS・W*" are to be carried out as specified separately by the Society.</u>

Table B8.1 has been amended as follows.

Table B8.1 Ordinary Surveys of Propeller Shaft and Stern Tube Shaft

Items	Examinations
1 Drawing out of the propeller shaft and the stern tube shaft -1) for oil or freshwater lubricated bearings	Drawing the propeller shaft and the stern tube shaft and examining the entire shafts, seals system and bearings
-2) for water lubricated bearings	Drawing the propeller shaft and the stern tube shaft and examining the entire shaft (including liners, corrosion protection system and stress reducing features, where provided), inboard seal system and bearings
~~1~~2 Propeller connections ~~(~~-1~~)~~ Shafts having keyed propeller connections~~attachments~~	~~The aft shaft taper is to be examined from the end of the cylindrical part of the shaft (or from the aft edge of the liner, if any) for one-third of the length of the shaft taper by an efficient crack detection method.~~Removing the propeller to expose the forward end of the taper; and performing a non-destructive examination (*NDE*)[1] by an approved surface crack-detection method all around the shaft in way of the forward portion of the taper section, including the keyway. For shaft provided with liners the *NDE* is to be extended to the after edge of the liner.
~~(~~-2~~)~~ Shafts having keyless propeller connections~~attachments~~	~~The forward portion of the aft shaft taper is to be examined by an efficient crack detection method.~~Removing the propeller to expose the forward end of the taper; and performing a non-destructive examination (*NDE*)[1] by an approved surface crack-detection method all around the shaft in way of the forward portion of the taper section. For shafts provided with liners the *NDE* is to be extended to the after edge of the liner. [2] When the propeller is force fitted to the shaft, it is to be ascertained that the pull-up length is within the upper and lower limits given in **7.3.1-1, Part D**.
~~(~~-3~~)~~ Shafts having ~~coupling~~ flange connections~~at the after end~~	~~The flange fillet and coupling bolts are to be examined by an efficient crack detection method. However, the crack detection examination may be dispensed with, provided that the Surveyor is satisfied with the condition after an external examination.~~Whenever the coupling bolts of any type of flange-connected shaft are removed or the flange radius is made accessible in connection with overhaul, repairs or when deemed necessary by the surveyor, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method[1].
~~2~~3 Propeller shaft, stern tube shaft, and coupling bolts	Examination of ~~T~~the sleeves, the fillet of the coupling flange to the intermediate shaft or to the stern tube shaft and the coupling bolts ~~are to be examined~~ with the shaft drawn from the stern tube bearings. However, coupling bolts are to be examined by an efficient crack detection method, in cases where Surveyors, based on the results of external examinations, deem such addition testing to be necessary. In addition, anti-corrosion covers are to be removed for shafts of Kind 2.
~~3~~4 Stern tube bearing	Examination of ~~T~~the stern tube bearings~~ are to be examined.~~
~~4~~5 ~~After end of stern bush~~Clearances between the propeller shaft or the stern tube shaft and the after bearing of the stern tube	~~The clearance between the propeller shaft or the stern tube shaft and the after bearing of the stern tube or the shaft bracket bearing or wear down of the bearing is to be measured.~~Checking and recording the bearing clearances
6 Propellers	Verification that the propeller is free of damages which may cause the propeller to be out of balance
~~5~~7 ~~Sealing device~~Stern tube sealing systems	~~Major parts of the stern tube sealing devices (including shaft bracket sealing devices, if any, hereinafter referred to as the same in this Chapter.) are to be opened and examined.~~Verification of the satisfactory conditions of inboard and outboard seals during the re-installation of the shaft and propeller

Table B8.1 Ordinary Surveys of Propeller Shaft and Stern Tube Shaft (continued)

Items	Examinations
8 For oil lubricated or freshwater lubricated bearings, weardown of the propeller shaft or the stern tube shaft at the after bearing of the stern tube	Recording the bearing weardown measurements (after re-installation)
~~6~~9 Propeller boss surfaces in contact with the propeller shaft taper	~~The propeller boss bore in way of the propeller shaft taper section is to be examined.~~Examination of the propeller boss surfaces
~~7~~10 Controllable pitch propeller connections	Examination of ~~T~~the pitch control gear and working parts ~~are to be examined and~~as well as, by an efficient crack detection method, the propeller blade fixing bolts~~ are to be examined by an efficient crack detection method.~~
~~8~~11 Water lubrication lines	Where water~~-~~ lubricated stern tube bearings are adopted, the ~~sea~~ water piping for lubrication is to be examined.
~~9~~12 Low oil level alarms of the lubricating oil or lubricating freshwater tanks, lubricating oil or lubricating freshwater temperature measuring devices, ~~O~~oil or freshwater lubrication lines as well as lubricating oil or lubricating freshwater circulation pumps, etc.	Where oil~~-~~ or freshwater lubricated stern tube bearings are adopted, examination of the systems for verifying whether of stern tube bearings are being maintained in good working condition~~the low oil level alarms of the lubricating oil tanks, oil temperature measuring devices and oil circulation pumps are to be examined.~~
13~~0~~ Lubricating~~ion~~ oil or lubricating freshwater	Where oil~~-~~ or freshwater lubricated stern tube bearings are adopted, examination of the lubricating oil or lubricating freshwater record book~~ is to be examined.~~

(Notes)

1 *NDE* or approved surface crack detection method generally refers to the magnetic particle method.

2 For shafts with water lubricated bearings, it is recommended that the survey specified in **1.1.3-1(6)(g)** also be carried out in cases where the next survey due date is less than 15 *years* after the date of completion of the previous survey specified in **1.1.3-1(6)(g)**.

Chapter 12 SURVEYS FOR MOBILE OFFSHORE DRILLING UNITS AND SPECIAL PURPOSE BARGES

12.1 General

Paragraph 12.1.3 has been amended as follows.

12.1.3 Postponement of Periodical Surveys

For propeller shafts of mobile offshore drilling units (excluding those affixed with the notation "*APSS・O*" or "*APSS・W*") fitted with oil lubricated stern tube bearings that have low running hours, the following examinations may be conducted as an alternative survey to the Ordinary Survey (specified in **1.1.3-1(6)(a)** to **(d)**). If the units are found in good condition, the Ordinary Survey may be postponed for not more than a *year* from the date of completion of the alternative survey. However, this postponement is not to be granted to shafts which operated over 7,000 *hours* from the date of completion of the Classification Survey or the previous Ordinary Survey.

(1) External examination of stern bearing and outboard seal area including weardown check as far as is possible.
(2) Internal examination of the shaft area (inboard seals) in propulsion machinery rooms.
(3) Confirmation of lubricating oil records (oil loss rate, contamination).
(4) Examination/Replacement of shaft seal elements in accordance with seal manufacturer's recommendations.

EFFECTIVE DATE AND APPLICATION (Amendment 3-3)

1. The effective date of the amendments is 1 January 2016.
2. Notwithstanding the amendments to the Rules, the current requirements apply to ships other than ships the delivery of which is on or after 1 January 2016 (hereinafter, referred to as "existing ships") until the first propeller shaft and stern tube shaft survey scheduled on or after 1 January 2016.
3. Notwithstanding the provision of preceding **2.**, the amendments to the Rules may apply to existing ships upon request by the owner.

Amendment 3-4

Chapter 2 CLASSIFICATION SURVEYS

2.1 Classification Survey during Construction

Paragraph 2.1.5 has been amended as follows.

2.1.5 Hydrostatic Tests, Watertight Tests, and Relevant Tests

In the Classification Survey during construction, hydrostatic tests, watertight tests, and other relevant tests are to be carried out in accordance with the following:

(1) Hull and equipment

The watertightness and the structural adequacy of tanks and watertight boundaries as well as the weathertightness of other structures and shipboard outfittings are to be verified by tests deemed appropriate by the Society.

~~(a) Hydrostatic tests or watertight tests are to be carried out after all work in connection with watertightness are completed but before painting, in accordance with the requirements specified in **Table B 2.2**.~~

~~(b) A part or all of the hose tests may be dispensed with at the discretion of the Society.~~

~~(c) Watertight tests may be replaced by airtight tests at the discretion of the Society, provided that certain tanks designated by the Society are to be subjected to hydrostatic tests specified in **Table B 2.2**, while afloat.~~

(2) Machinery

Hydrostatic, leakage or airtight tests are to be carried out as specified in each chapter of **Part D** in relation to the kind of machinery.

~~(3) Ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk~~

~~For ships carrying liquefied gases in bulk, hydrostatic tests, leakage tests, or airtight tests as stipulated in **Part N** are to be carried out in addition to the tests stipulated in **(1)** and **(2)**. For ships carrying dangerous chemicals in bulk, hydrostatic tests, leakage tests, or airtight tests are to be carried out in accordance with the requirements stipulated otherwise by the Society in addition to the tests stipulated in **(1)** and **(2)**.~~

2.2 Classification Survey of Ships not Built Under Survey

Paragraph 2.2.2 has been amended as follows.

2.2.2 Hydrostatic Tests, Watertight Tests, and Relevant Tests

In the Classification Survey prescribed in **2.2.1**, sea trials are to be carried out after the following items have been completed: hydrostatic tests and watertight tests in accordance with the requirements shown below in **(1)** ~~through~~ and **(~~3~~2)**; maintenance of machinery and determination of the working pressure of the boilers; and adjustment of safety valves and accumulation tests of the boilers. Tests and trials may be dispensed with at the discretion of the Society with the exception of hydrostatic tests of boilers and pressure vessels of which important parts have been newly repaired, main steam pipes, and air tanks of which the interior can not be inspected; and tests for gas leakage of refrigerating machinery on board.

(1) Double bottoms, both peaks, tanks, cofferdams and chain lockers, watertight bulkheads and shaft tunnels are to be tested as specified in ~~**Table B 2.2**~~**2.1.5(1)**.

(2) Hydrostatic, leakage or airtight tests are to be carried out on machinery and its parts at the

pressures specified in the relevant chapters of **Part D**.

~~(3) For ships carrying liquefied gases in bulk, hydrostatic, leakage or airtight tests required in **Part N** are to be carried out in addition to the test specified in **(1)** and **(2)**. For ships carrying dangerous chemicals in bulk, hydrostatic, leakage or airtight tests stipulated otherwise by the Society are to be carried out.~~

Table B2.2 has been deleted.

Table B2.2 Hydrostatic Tests

No.	Applicable areas	Type of tests and their pressure/head	Notes
1	Double bottom	Hydrostatic test with a head of water up to the top of the air pipe or the bulkhead deck, whichever is the greater	The centre girder between tanks that carry the same liquid need not be tested.
2	Deep tanks	Hydrostatic test with a head of water up to the load waterline, or top of overflow pipe, or 2.45 *m* above the tank top, or 2/3 *H* from the tank top, whichever is the greatest, where *H* is the height from the tank top to the upper end of *D*.	Where it is impracticable to carry out hydrostatic tests for each tank and cofferdam on the drydock with the specified test head levels, the tests may be carried out with the water up to the ballast water line.
3	Cargo tanks and cofferdams of oil tankers	Hydrostatic test with a head of water up to the level of 2.45 *m* above the deck at side forming the crown of the tank or 0.6 *m* above the top of hatch, whichever is the greater.	After the ship is launched, the tests can be carried out with the water up to the levels required in this table.
4	After peaks and stern tube compartments	Hydrostatic test with a head of water up to the load waterline. For portions above load waterline, hose test with a pressure of water not less than 0.2 *MPa* in the hose.	Where they are used as tanks, tests are as specified in column No.2.
5	Forepeaks	Hydrostatic test with a head of water up to the load waterline or to the waterline corresponding to the draught of 2/3 *D*, whichever is the greater. For portions above this waterline, hose test with a pressure of water not less than 0.2 *MPa* in the hose.	Where they are used as tanks, tests are as specified in column No.2.
6	Chain lockers	Hydrostatic test with a head of water up to the top of chain lockers.	—
7	Shell Plating	Hose test with a pressure of water not less than 0.2 *MPa* in the hose.	For shell plating of the areas listed in rows No.1 through No.6, refer to the corresponding row.
8	Watertight decks		For decks of the areas listed in rows No.2 through No.6, refer to the corresponding row.
9	Watertight bulkheads and recesses		When part of deep tanks or peak tanks, refer to the corresponding row.
10	Shaft tunnels and other watertight tunnels		
11	Hatchways with weathertight steel covers		To be tested in closed position.
12	Double plate rudders	Hydrostatic test with a head of 1.5*D* or 2*d*, whichever is the smaller, or airtight test with a pressure of 0.05 *MPa*	

Note:

Tests of piping systems in each part of the ship are to be carried out as specified in **12.6**, **13.17**, and **14.6**, **Part D**.

EFFECTIVE DATE AND APPLICATION (Amendment 3-4)

1. The effective date of the amendments is 1 January 2016.

2. Notwithstanding the amendments to the Rules, the current requirements may apply to ships for which the date of contract for construction* is before the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.

Amendment 3-5

Chapter 2 CLASSIFICATION SURVEYS

2.1 Classification Survey During Construction

2.1.6 Documents to be Maintained on Board

Sub-paragraph -1(2) has been amended as follows.

1 At the completion of a classification survey, the Surveyor confirms that the finished versions of the following applicable drawings, plans, manuals, lists, etc., are on board.
((1) is omitted.)
(2) Other documents
- (a) Towing and mooring fitting arrangement plans (**27.2.4, Part C** or **23.2.4, Part CS**)
- (b) Operation manuals for the emergency towing arrangement (**27.3, Part C**)
- (c) Booklets for damage control and Damage Stability Information (**33.3.2, Part C** and **33.3.3, Part C**)
- (d) Operation manuals for the loading computer (**34.1.3-3, Part C**)
- (e) Plans for means of access (**35.1.5, Part C** or **26.1.5, Part CS**)
- (f) Operation manuals for the stability instrument (**2.3.2-5**) and/or the stability computer (**1.2.2, Part U**)
- (g) Operating and maintenance instructions for ship machinery and equipment (**1.3.9, Part D**)
- (h) Manuals for the water level detection and alarm systems (**13.8.5-4** or **13.8.6-3, Part D**)
- (i) Maintenance records of batteries (**1.1.8, Part H**)
- (j) Instruction manuals for the cargo tank venting systems (**4.5.3, Part R**)
- (k) Fire Control Plans, Fire Safety Operational Booklets, Training manuals and Maintenance plans (**Chapters 14**, **15** and **16, Part R**)
- (l) Operation manuals for the helicopter facilities (**18.8, Part R**)
- (m) Instruction manuals for the inert gas systems (**35.2.2-5~~11~~, Part R**)
- (n) A copy of the *IGC* Code or national regulations incorporating the provisions of the *IGC* Code (**18.2.2-3, Part N**)
- (o) A copy of the *IBC* Code or national regulations incorporating the provisions of the *IBC* Code (**16.2.3-1, Part S**)
- (p) Emergency Towing Procedures (**27.4, Part C** or **23.3, Part CS**)
- (q) Noise survey report.

((3) is omitted.)

Chapter 3 ANNUAL SURVEYS

Table B3.8 has been amended as follows.

Table B3.8 Additional Requirements for Tankers and Ships Carrying Dangerous Chemicals in Bulk

Items	Examinations
1 Cargo pumps, bilge pumps, ballast pumps, stripping pumps and ventilators	Operation tests for the remote control systems and shut-off devices of the pumps installed in cargo pump rooms are to be carried out.
2 Bilge systems	Operation tests of the bilge systems installed in cargo pump rooms are to be carried out.
3 Level indicators	Operation tests of level indicators used in cargo tanks are to be carried out.
4 Pressure indicators	Operation tests of pressure indicators installed in cargo discharge lines are to be carried out.
5 Inert gas systems	Inert gas systems installed in accordance with **4.5.5, Part R**, are subjected to the following tests. Other inert gas systems are to be examined as deemed appropriate by the Society. (a) Operation tests of the inert gas blowers and scrubber room ventilation systems (b) Function tests of the water seals or general examinations of double-block and bleed valves and ~~general examinations of~~ the non-return valves (c) Operation tests of the remotely operated or automatically controlled valves (d) Operation tests of the interlocking system between the soot blowers and the shut-off valves on gas supply line (e) Operation tests of the measuring devices, alarm devices and safety devices specified in **35.2.62** ~~**and 35.2.8**~~ through **35.2.104**~~**,**~~ **Part R**.
6 Gauging, detecting and alarming devices	Operation tests for the following are to be carried out. Where tests under actual conditions are difficult, simulation tests or other suitable means may be used to confirm functionality. (a) Fixed and portable gas detecting instruments and associated alarms (b) Gauging devices for oxygen density

EFFECTIVE DATE AND APPLICATION (Amendment 3-5)

1. The effective date of the amendments is 1 January 2016.

2. Notwithstanding the amendments to the Rules, the current requirements may apply to ships the keels of which were laid or which were at *a similar stage of construction* before the effective date.
(Note) The term "*a similar stage of construction*" means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 *tonnes* or 1% of the estimated mass of all structural material, whichever is the less.

Amendment 3-6

Chapter 4 INTERMEDIATE SURVEYS

4.1 General

4.1.1 Surveys Equivalent to Special Surveys

Sub-paragraph -2 has been amended as follows.

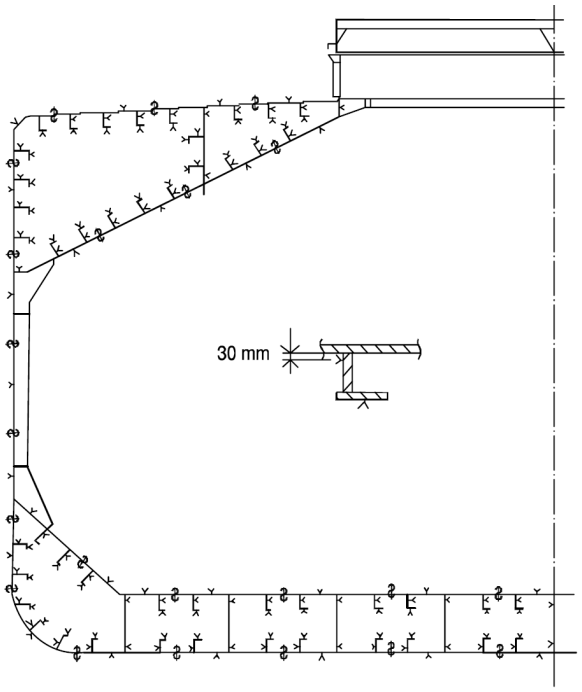
2 Intermediate Surveys for bulk carriers, oil tankers, and ships carrying dangerous chemicals in bulk over 10 *years* of age and general dry cargo ships of not less than 500 *gross tonnage* over 15 *years* of age are to be carried out to the extent of the previous Special Survey. That is, the surveys specified in **4.2.2**, **4.2.4**, **4.2.5** and **4.2.6** are replaced by **5.2.2**, **5.2.4**, **5.2.5** and **5.2.6** (except ~~7~~**8**) respectively; and the surveys specified in **5.2.3-2(3), (5)** and Docking Surveys (except item 7 specified in **Table B6.1**) are to be carried out. However, the following **(1)** to **(3)** do not need to be carried out:

(1) Internal examinations of fuel oil, lube oil and fresh water tanks;
(2) Examinations (both external and internal) of automatic air pipe heads installed on the exposed deck and the ventilators and closing appliances for machinery and cargo spaces; and
(3) Thickness measurements of each bottom plate within the cargo length area including lower turn of bilge for general dry cargo ships of not less than 500 *gross tonnage* over 15 *years* of age.

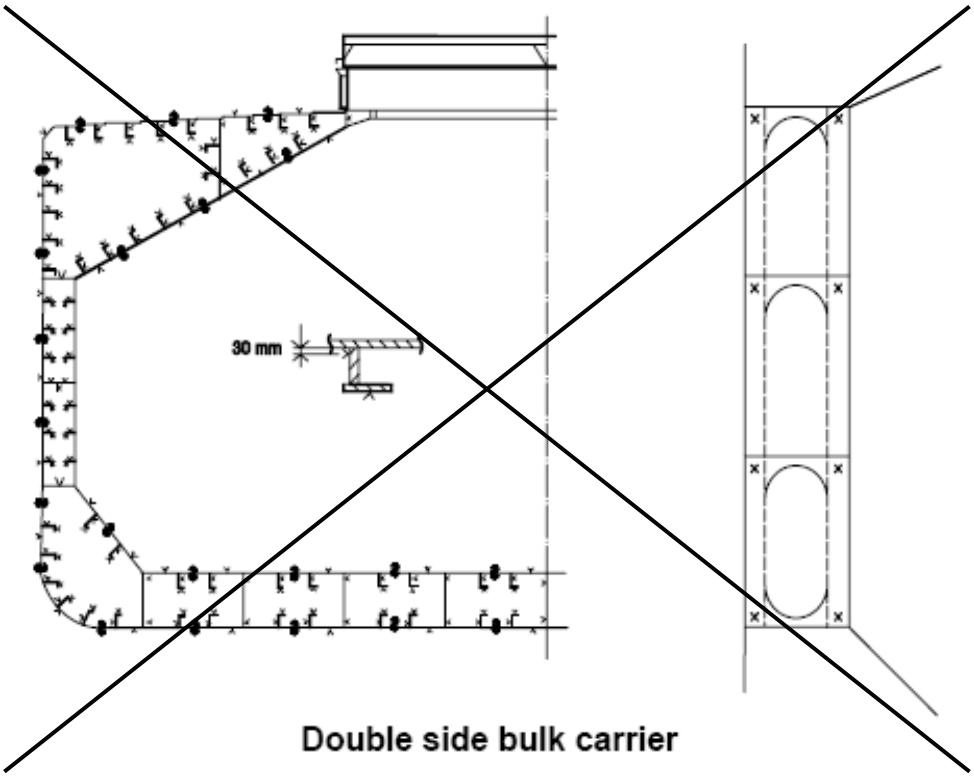
Chapter 5 SPECIAL SURVEYS

Fig. B5.1 has been amended as follows.

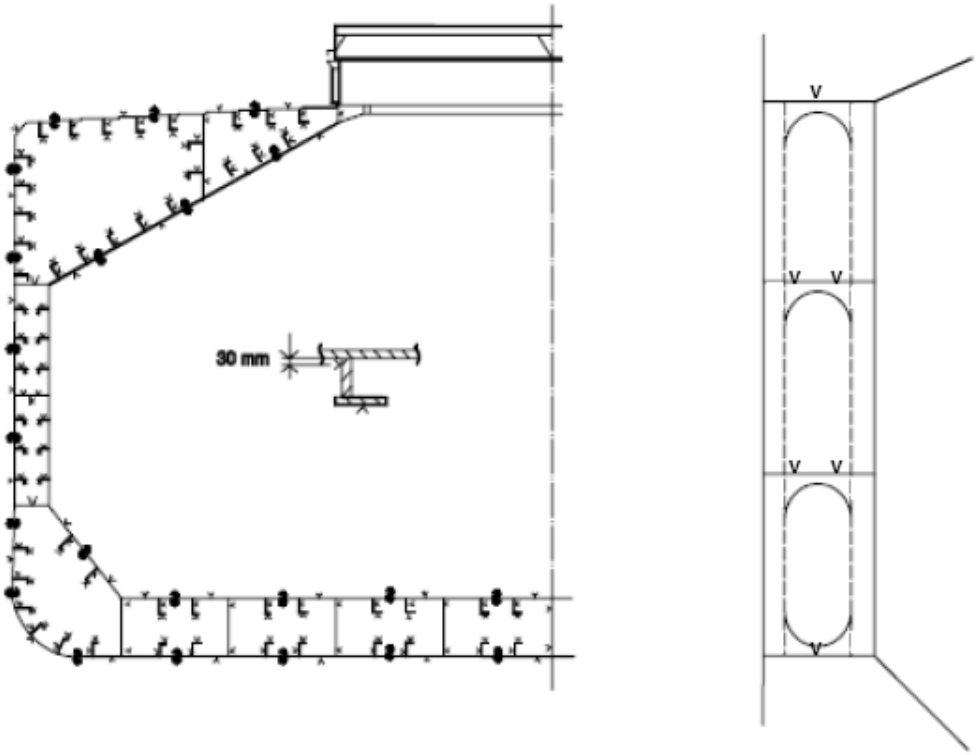
Fig. B5.1 Example of locations subject to thickness measurements in transverse sections (bulk carriers)



Single side bulk carriers



Double side bulk carrier

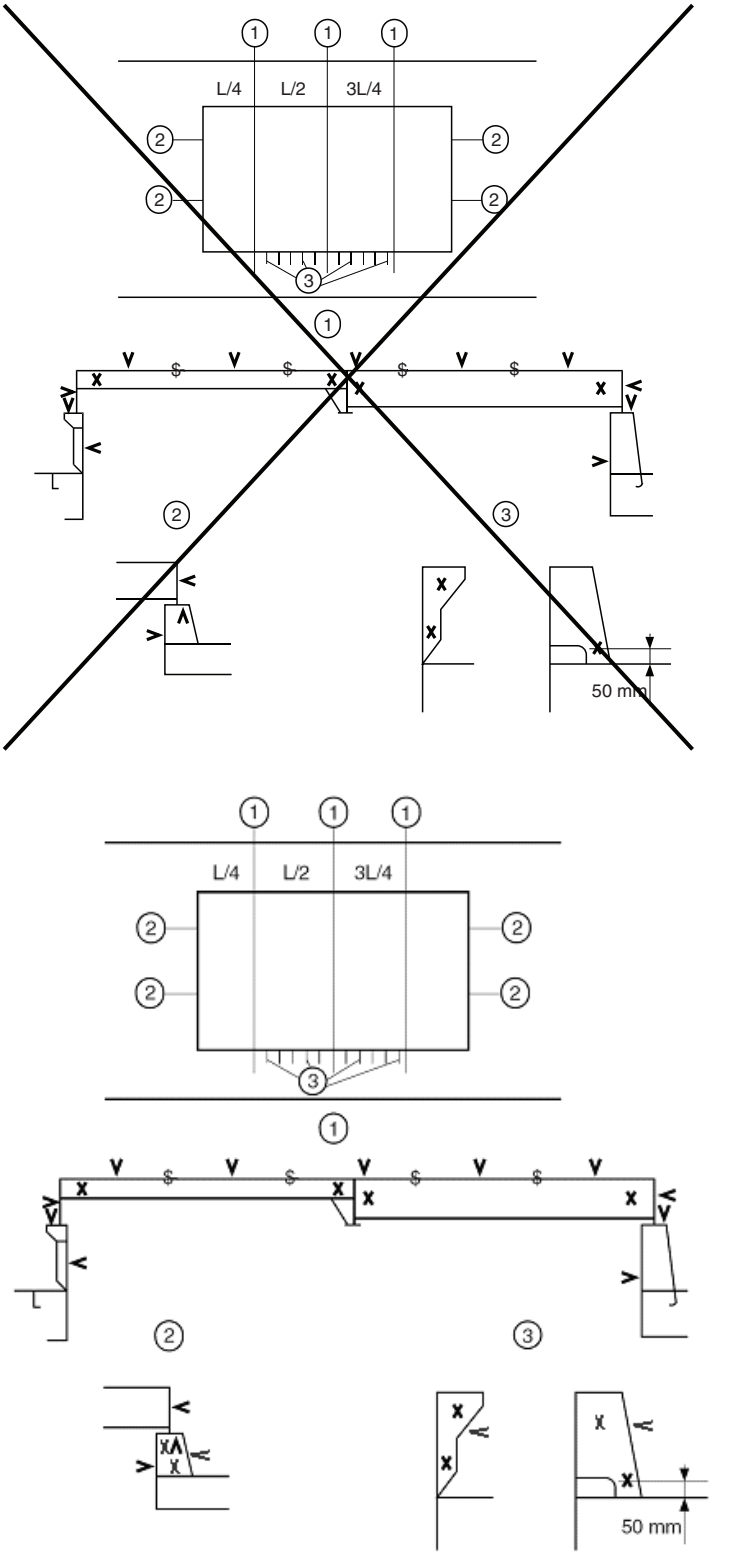


Double skin bulk carriers

Note: (omitted)

Fig. B5.2 has been amended as follows.

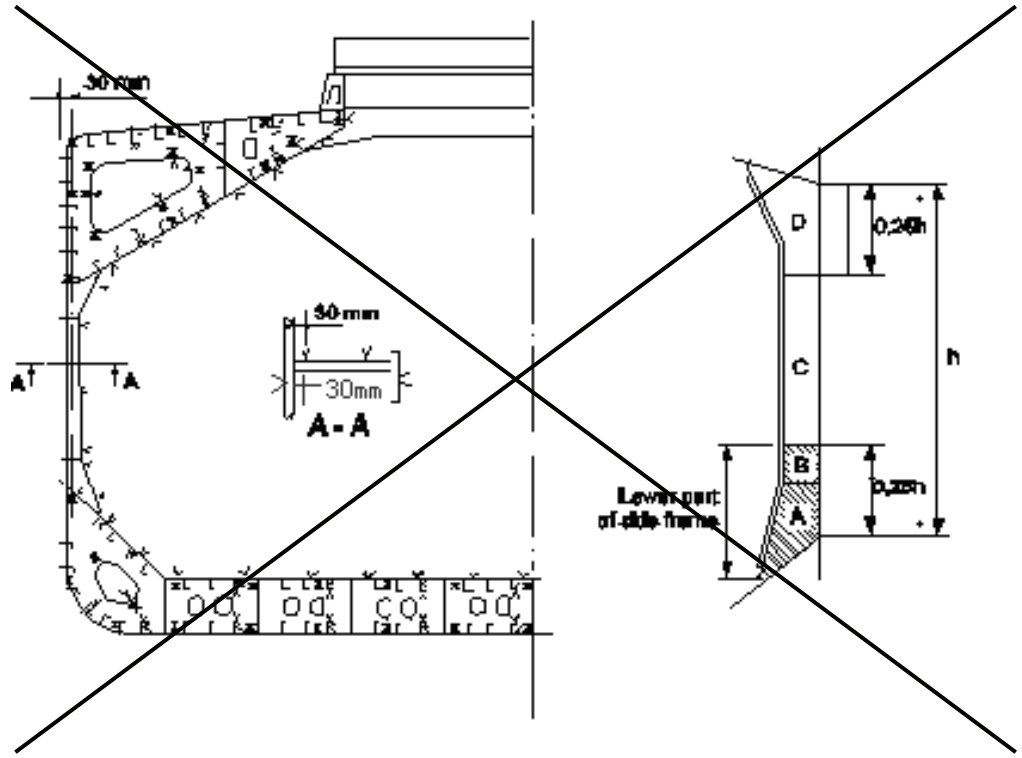
Fig. B5.2 Example of locations subject to thickness measurements on hatch covers and hatch coamings (bulk carriers)

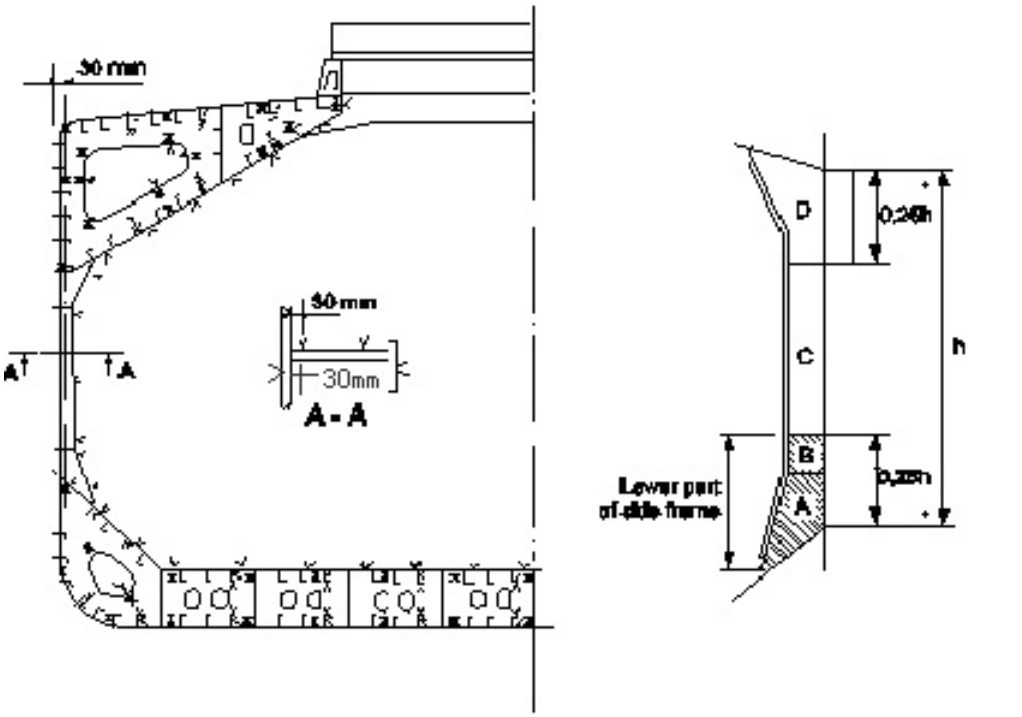


Notes: (omitted)

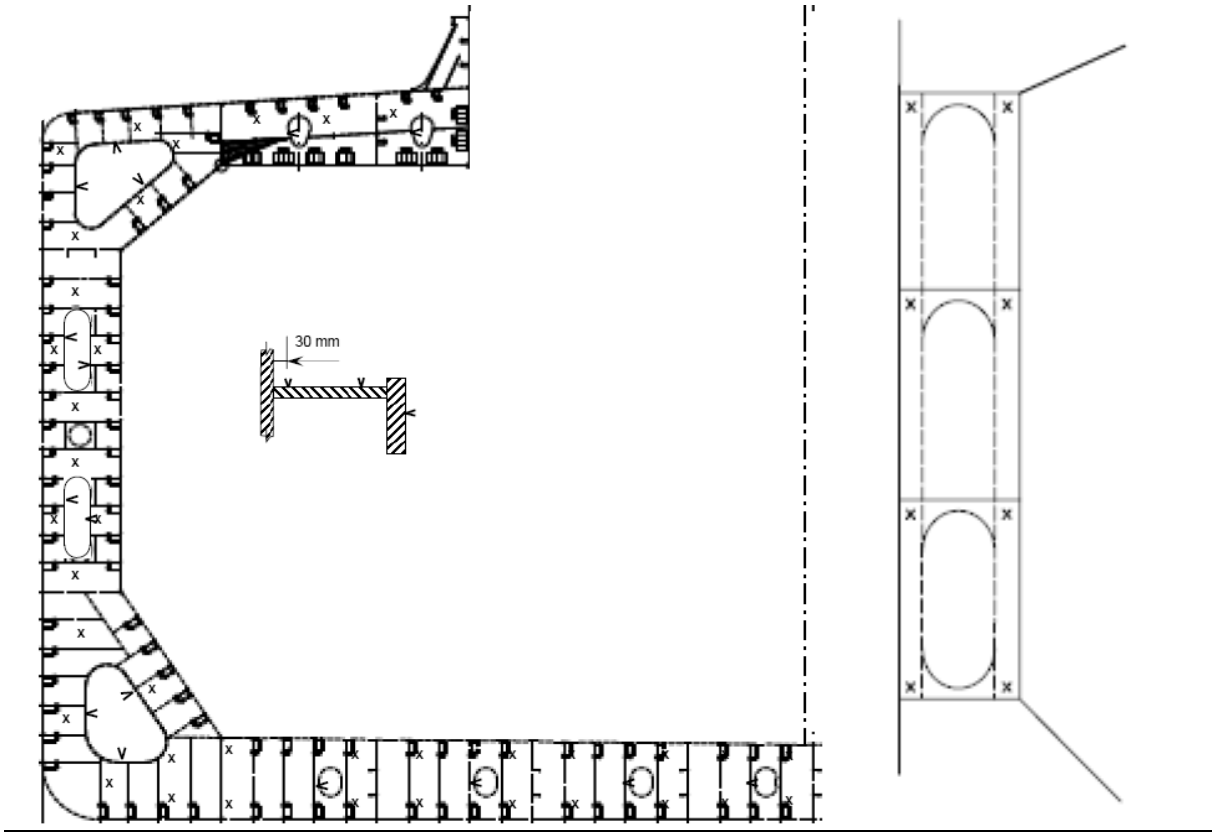
Fig. B5.3 has been amended as follows.

Fig. B5.3 Example of locations subject to thickness measurements in cargo holds and water ballast tanks ~~(single side skin bulk carriers)~~





Single side bulk carriers

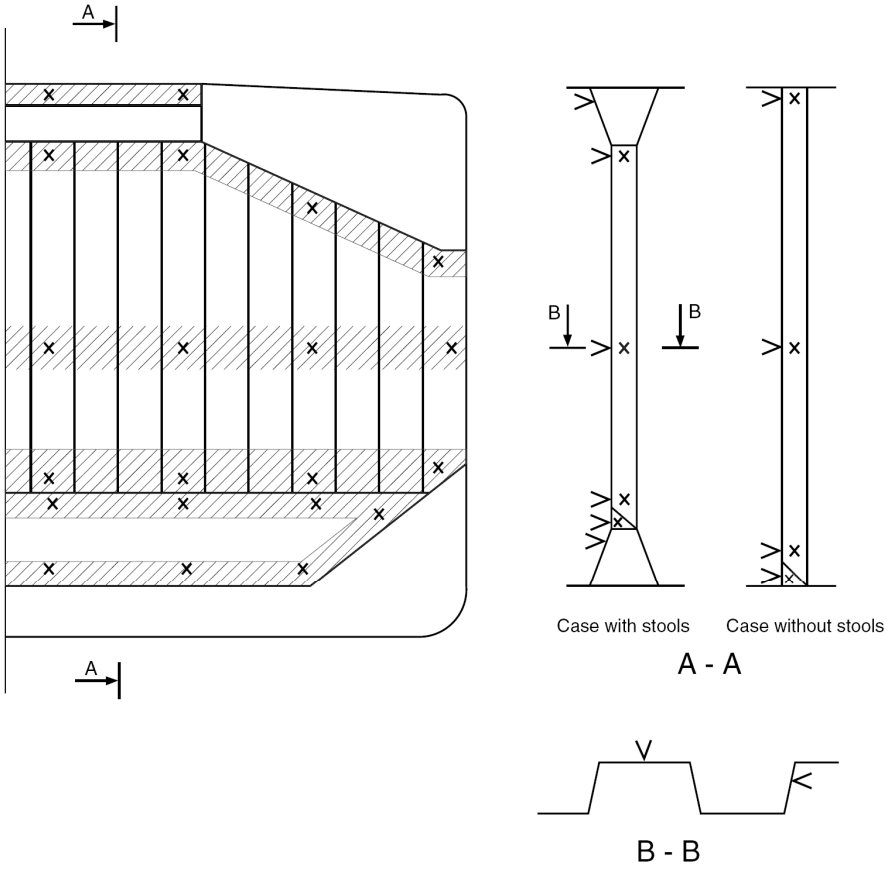


Double side bulk carriers

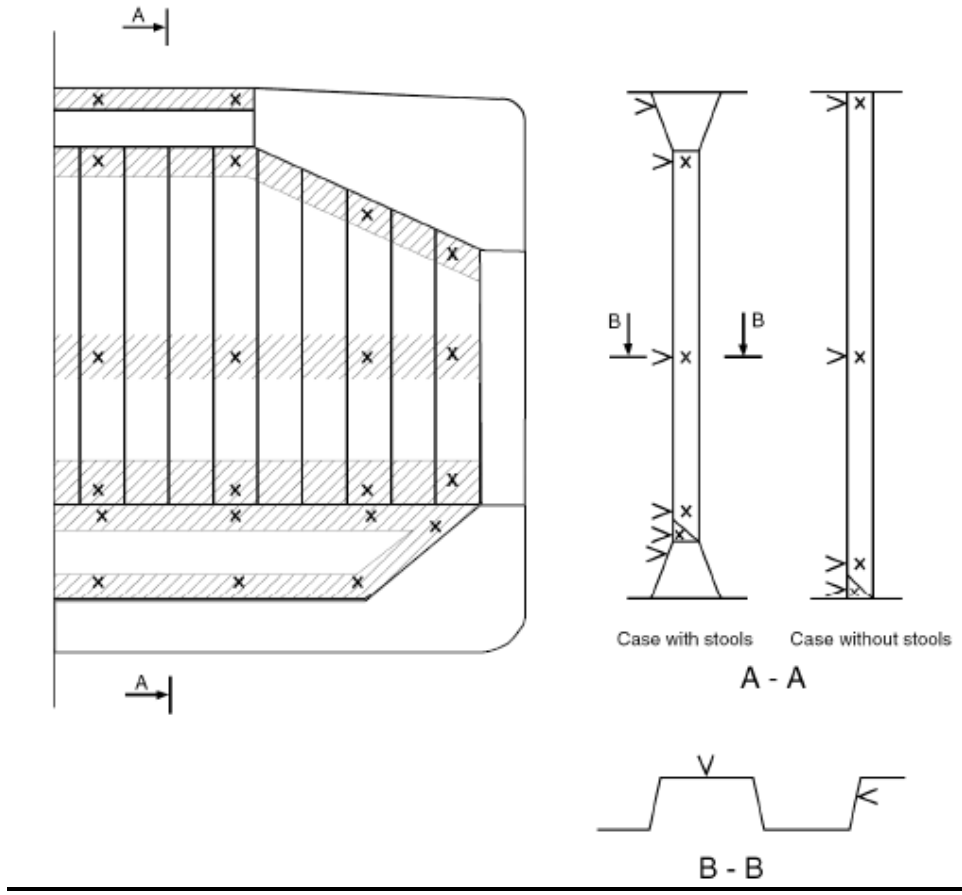
Notes: (omitted)

Fig. B5.4 has been amended as follows.

Fig. B5.4 Example of locations subject to thickness measurements on cargo hold transverse bulkheads ~~(bulk carriers)~~



Single side bulk carriers

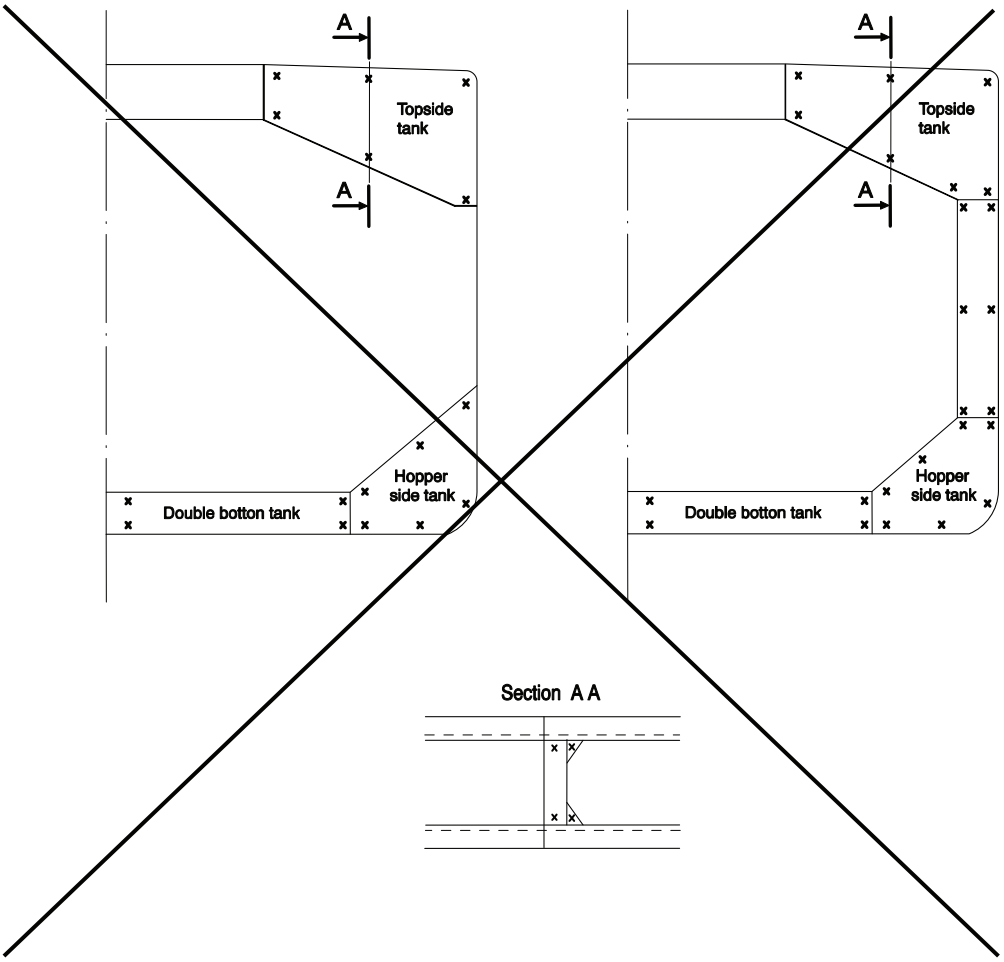


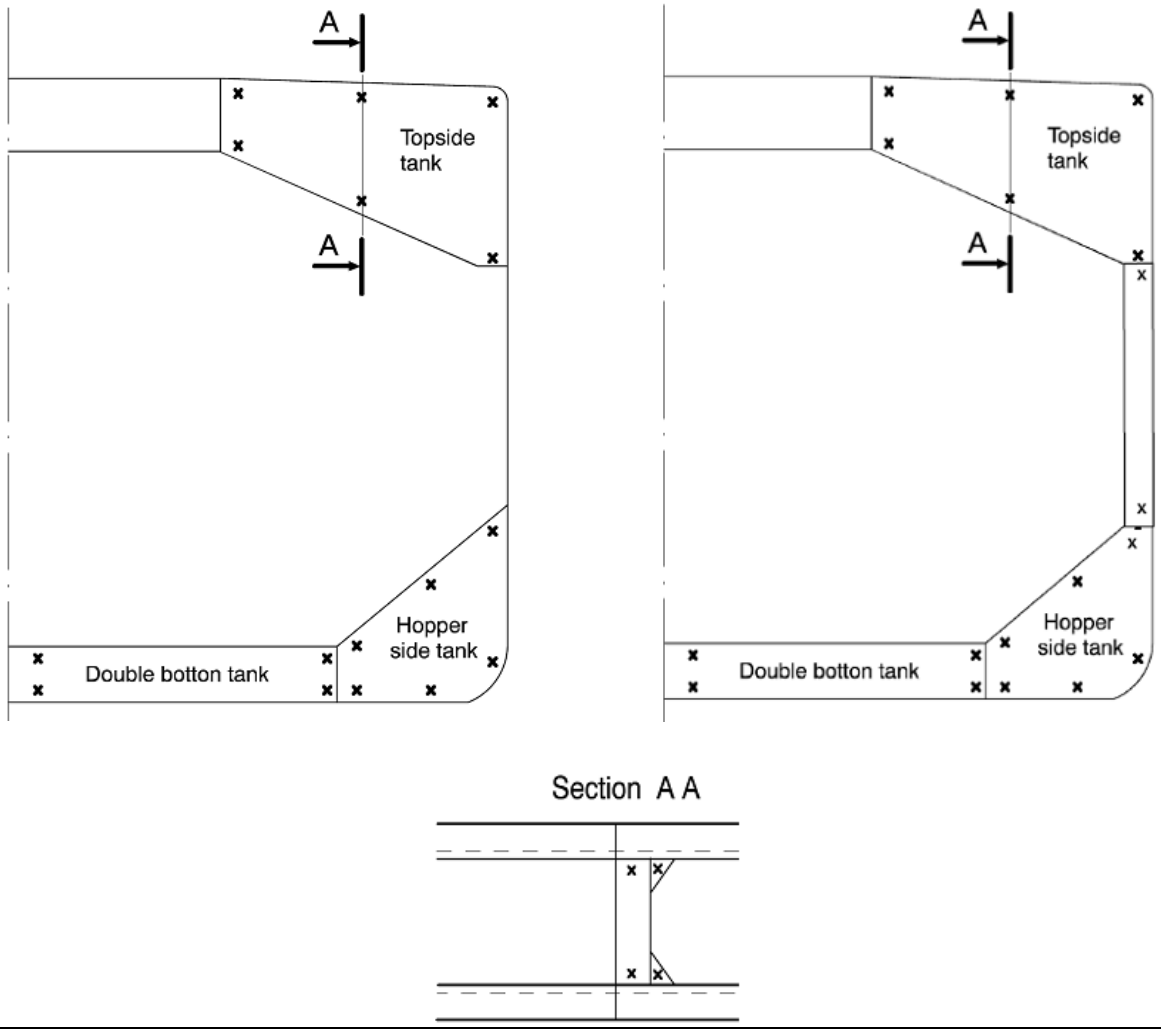
Double side bulk carriers

Notes: (omitted)

Fig. B5.5 has been amended as follows.

Fig. B5.5 Example of locations subject to thickness measurements on transverse bulkheads of topside, hopper, double hull and double bottom tanks (bulk carriers)





Notes: (omitted)

Chapter 12 SURVEYS FOR MOBILE OFFSHORE DRILLING UNITS AND SPECIAL PURPOSE BARGES

12.1 General

Paragraph 12.1.2 has been amended as follows.

12.1.2 General Requirements on Surveys

1 General requirements of the Classification Survey, Class Maintenance Survey, and other relevant surveys not specified in this Chapter are to follow the requirements specified in **Chapter 1**. At Classification Surveys and Class Maintenance Surveys, it is to be verified that the units are in good conditions through examinations, tests and investigations carried out to the satisfaction of the Surveyor.

2 Notwithstanding the requirements specified in **-1**, units complying with **12.1.1-3** above and units to which it is considered impracticable to apply the survey items required by this Chapter due to the their configuration or purpose may be subject to the requirements specified in **Chapter 13**.

3 An applicant is to submit a Survey Programme that details survey items as part of the preparation for the Special Survey and Continuous Survey stipulated in **12.5.1-2** for mobile offshore drilling units.

4 The interval between Special Surveys may be reduced in cases where deemed necessary by the Society.

12.3 Annual Surveys

12.3.2 Annual Surveys for Hull, Equipment, Fire Extinguishing Systems, and Fittings

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

2 Annual Surveys for hulls, equipment, fire extinguishing systems and fittings

At Annual Surveys, the ~~general condition of the~~ following surveys are to be ~~examined~~ carried out as far as practicable, in addition to the relevant survey items specified in **3.2.2** through **3.2.7** corresponding to hull structure, equipment, purpose, etc.

(1) It is to be confirmed that no material alterations have been made to the unit, its structural arrangements, subdivisions, superstructure, fittings and closing appliances.

(2) Suspect areas identified at previous surveys are to be examined. Thickness measurements are to be taken at areas of substantial corrosion in accordance with **Table B5.9**.

(3) The following items are to be examined:

(a) Exposed parts of hulls, decks, deck houses, structures attached to decks, derrick substructures (including supporting structures and accessible internal spaces);

(b) Accessible hatchways, manholes and other openings;

(c) Machinery casings and covers, companionways, and deck houses protecting openings;

(d) Portlights together with deadcovers, cargo ports and similar openings in hull sides, ends or in enclosed superstructures;

(e) Ventilators, tank vent pipes together with flame screens, and overboard discharges from enclosed spaces;

(f) Watertight bulkheads and end bulkheads of enclosed superstructures;

(g) Closing appliances, hatch covers and doors for the items specified in **(b)** to **(f)** above, together with their respective securing devices (including dogs), sills, coamings and supports;
(h) Freeing ports together with bars, shutters and hinges;
(i) Protective equipment for the crew, guard rails, lifelines, and deck houses;
(~~1~~j) The ~~M~~mooring systems specified in **Chapter 10, Part P**, their fittings (including windlasses and attachments for anchor racks and anchor cables) as well as ~~and~~ adjacent hull constructions; and
(~~2~~k) ~~For mobile offshore drilling units, the exposed parts of d~~Drilling derricks. ~~and substructures including the supporting structures of drilling derricks~~

3 For self-elevating units, general examinations of the following items are to be carried out in addition to **-1** and **-2**, as far as practicable, down to the waterline~~:~~.
(1) Leg structures;
(2) Jack ~~frame~~-house structures~~, leg supporting structure~~ and attachments to upper hulls or ~~adjacent~~ platforms; and ~~structure~~
(3) Plating and supporting structures in way of leg wells.

4 For column-stabilized units, general examinations of the upper hull, ~~and its supporting structure and exposed parts of~~ columns and bracing together with their connections are to be carried out in addition to **-1** and **-2** as far as practicable down to the waterline.

5 For ship-type units and barge-type units, general examinations of the ~~surrounding construction of openings such as~~ hull and deck structure around the moon pool~~s~~ and in the vicinity of any other structural changes in sections, slots, steps, or openings in the deck or hull as well as ~~and~~ the back-up structure in way of structural members or sponsons connecting to the hull are to be carried out in addition to **-1** and **-2** as far as practicable down to the waterline.

12.4 Intermediate Surveys

12.4.2 Intermediate Surveys for Hull, Equipment, Fire Extinguishing Systems and Fittings

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

(-1 is omitted.)

2 Surveys for hull, equipment, fire extinguishing systems and fittings
At Intermediate surveys, the following surveys ~~items~~ are to be ~~examined~~ carried out as far as practicable, in addition to the relevant survey items specified in **4.2.2** through **4.2.7** corresponding to the unit's structure, equipment, etc. and a general examination of hull, equipment, fire extinguishing systems and fittings specified in **12.3.2-2** through **-6** is to be carried out.
(1) General examination of ~~E~~external sides of hull structure and platform, especially machinery room and representative cofferdam, water tanks such as ballast water tanks, and oil tanks such as fuel oil tanks
(2) General examination of openings such as side scuttles, doors, etc. that are required to have water-tightness ~~and~~ or weather-tightness, ~~; inspection of~~ their closing appliances, and inspection of fittings~~; and~~. In addition, a performance test of the closing appliances is to be carried out.

3 For self-elevating units, the following surveys ~~items~~ are to be ~~examined~~ carried out in addition to the survey items specified in **-1** and **-2**.

(1) For units over 5 *years* of age, an internal examination and thickness measurements of representative ballast tanks and at least two pre-load tanks are to be conducted.
(2) Where the effectiveness of the corrosion protection of those tanks is verified as a result of the internal examination specified in **(1)**, thickness measurements may be dispensed with.

4 For column-stabilized units, the following surveys ~~items~~ are to be examined in addition to the survey items specified in **-1** and **-2**.
(1) For units over 5 *years* of age, an internal examination and thickness measurements of representative ballast tanks in footings and lower hulls and at least two ballast tanks in columns, if accessible, are to be conducted.
(2) Where the effectiveness of the corrosion protection of those tanks is verified as a result of the internal examination specified in **(1)**, thickness measurements may be dispensed with.

5 For ship-type units and barge-type units, the following survey items are to be examined in addition to the survey items specified in **-1** and **-2**.
(1) For units over 5 *years* of age, an internal examination and thickness measurements of one aft or fore peak tank and at least two ballast tanks except for aft and fore peak tanks are to be conducted.
(2) Where the effectiveness of the corrosion protection of those tanks is verified as a result of the internal examination specified in **(1)**, thickness measurements may be dispensed with.

6 Examination of tanks mentioned in **-3** through **-5** that were examined during the Docking Survey specified in **12.6**, may be dispensed with.

12.5 Special Surveys

Paragraph 12.5.1 has been amended as follows.

12.5.1 General

1 Commencement and completion of the Special Survey is to follow the requirements specified in this **12.5.1** in addition to the requirements specified in **5.1.1**.

2 At the request of the owner, and upon receiving Society approval of the proposed arrangements, a system of Continuous Survey may be undertaken whereby Special Survey requirements are carried out in a regular rotation to complete all the requirements of the particular Special Survey within a five year period.

Paragraph 12.5.2 has been amended as follows.

12.5.2 Special Surveys for Hull, Equipment, Fire Extinguishing Systems and Fittings

(-1 is omitted.)

2 Surveys for hull, equipment, fire extinguishing systems and fittings

At Special surveys, the following surveys ~~items~~ are to be ~~examined~~ carried out, in addition to the relevant survey items specified in **5.2.2** through **5.2.7** corresponding to the unit's structure, equipment, etc. The hull, equipment, fire fighting systems and fittings specified in **12.4.2-2** are to be examined thoroughly.

~~(1) Internal and external parts of hull structure and platform, machinery room and cofferdam, water tanks such as ballast water tanks and oil tanks such as fuel oil tanks~~

The following items are to be examined:

(a) The interiors and exteriors of hull or platform structures including tanks, watertight bulkheads and decks, cofferdams, void spaces, sponsons, chain lockers, duct keels, helicopter decks and their supporting structures, machinery spaces, peak spaces, steering

gear spaces, and all other internal spaces. In addition, thickness measurements of plating and framing may be required where wastage is evident or suspected;

(b) The interiors and exteriors of all tanks, compartments and free-flooding spaces throughout the drilling unit. In addition, internal examinations of spud cans and mats may be dispensed with when deemed appropriate by the Society;

(c) The watertight integrity of tanks, bulkheads, hulls, decks and other compartment boundaries (it is to be verified by visual inspection);

(d) Suspect areas and critical structural areas. In addition, tests for tightness, non-destructive tests or thickness measurements may be requested as deemed necessary by the Surveyor;

(e) Structures such as derrick substructures and their supporting structures, jack-houses, deck houses, superstructures, helicopter landing areas, raw water towers (sea water intakes) and their respective attachments to decks or hulls;

(f) Foundations and supporting headers, brackets, and stiffeners for drilling related apparatuses where attached to hulls, decks, superstructures or deck houses; and

(g) Drilling derricks.

(2) All special portions of structural members and primary structural members defined in **6.2.1, Part P** and identified critical structural areas are to be subjected to close up surveys.

(3) Thickness measurements are to be carried out where wastage is evident or suspected.

(4) The conditions of corrosion prevention systems of ballast tanks, where provided, are to be examined. Tanks with the conditions indicated in **(a)** to **(c)** require internal examinations be carried out at frequencies determined by the Society.

(a) A hard protective coating is found to be in poor condition and has not been renewed.

(b) A soft or semi-hard coating has been applied.

(c) A hard protective coating has not been applied since time of construction

(~~2~~5) Tanks are to be tested at the highest conceivable pressure or the highest design pressure; however, these tests may be omitted, provided that the Surveyor is satisfied with the condition of the tanks as a result of an external and internal examination.

~~(3) Thickness measurements of the structural members listed in **(a)** to **(c)** for all units~~

~~Appropriate ultrasonic equipment or other approved means are to be used to obtain accurate readings and the results are to be reported to the Society. For units under *5 years* of age, however, the thickness measurement specified in **(c)** may be dispensed with.~~

~~(a) Structural members in locations considered by the Surveyor to be prone to rapid wastage or showing excessive corrosion~~

~~(b) Representative parts of splash zones or related structures near the draught of operational condition.~~

~~(c) Sufficient number of structural members to allow general assessment and recording of corrosion pattern.~~

(~~4~~6) For mooring systems (including windlasses and attachments for anchor racks and anchor cables) specified in **Chapter 10, Part P**, the following examinations are to be carried out.

(a) For anchor mooring systems or tension mooring systems, thorough examinations of anchor chains or tension mooring lines and measurements of dimensions of chains or lines.

(b) General examination and operating test of equipment used for mooring systems.

(c) For tension mooring systems, a thorough examination and thickness measurements of pipes, where steel pipes are used for mooring lines.

(d) For dolphin mooring systems, general examinations of fenders, hull structures around fenders and their fittings are to be examined.

(~~5~~7) For units with a dynamic positioning system, a general examination of its components and fittings and an operating test is to be carried out in accordance with the test procedure for dynamic positioning systems.

~~**3** For mobile offshore drilling units, a thorough examination is to be conducted on drilling derricks, substructures (including the supporting structures of drilling derricks) as well as the connections of drilling derricks to the hull, and the supports and reinforcements on the hull where the drill is attached.~~

43 For self-elevating units, ~~thorough examinations described below~~ following surveys are to be carried out, in addition to the survey items specified in **-1** ~~through~~ and ~~-3~~**2**. However, where the unit is examined while floating, examinations deemed appropriate by the Society are to be conducted.

(1) The following items are to be examined;

(a) All legs including chords, bracing, gussets, racks, joints~~, and~~ together with leg guides. Tubular or similar type legs are to be examined externally and internally together with internal stiffeners;~~.~~

(~~2~~b) ~~Externals of~~ The structure in, around and under jack-houses and ~~structure and attachment to upper hull or platform and plating and supporting structure in way of~~ leg wells. Parts designated by the Society as being concentrations of stress may require non-destructive tests.

(~~3~~c) Leg ~~C~~connections ~~between legs and~~ to bottom mats or ~~footings~~ spud cans. Non-destructive tests of leg connections to mats or spud cans are to be carried out.

(d) Jetting piping systems or other external piping, particularly where penetrating mats or spud cans

(~~4~~e) ~~Interior and exterior of bottom mats or footings~~ Spud cans or mats. Where ~~bottom mats~~ the spud cans or ~~footings~~ mat are partly or entirely obscured below the mud line, the Society may allow the examination to be postponed until the unit is moved.

~~(5) Parts specified in **(1)** through **(3)** designated by the Society as having a concentration of stress may require non-destructive tests~~

(~~6~~2) ~~For units over 5 *years* of age, thickness measurement of members in representative ballast tanks and at least two pre-load tanks, in addition to the examinations specified in **(1)** through **(5)***~~

~~Where the effectiveness of the corrosion protection of those tanks is verified as a result of the internal examinations, thickness measurements of these structural members may be omitted as deemed appropriate by the Society.~~

At Special Surveys, thickness measurements are to be carried out for the structural members listed in **Table B12.1**. Where substantial corrosion is found as a result of such thickness measurements, additional thickness measurements are to be taken in accordance with **Table B5.9**.

54 For column-stabilized units, ~~thorough examinations described below~~ following surveys are to be carried out, in addition to the survey items specified in **-1** ~~through~~ and ~~-3~~**2**. However, where the unit is examined while floating, examinations deemed appropriate by the Society are to be conducted.

(1) ~~Connections of columns and bracing to upper hull or platform and lower hull or pontoons~~ Connections of columns and bracings to upper hulls, structures or platforms and lower hulls, structures or pontoons as well as the joints of supporting structures are to be examined. However, parts designated by the Society as having a concentration of stress may require non-destructive tests.

(2) ~~Internal and external parts of columns, lower hulls or footings and bracing~~
At Special Surveys, thickness measurements are to be carried out for the structural members listed in **Table B12.3**. Where substantial corrosion is found as a result of such thickness measurements, additional thickness measurements are to be taken in accordance with **Table B5.9**.

(3) A lightweight survey is to be carried out in accordance with the following **(a)** and **(b)**.

(a) At the first special survey

A lightweight survey or inclining test is to be conducted at the first special survey and the results are to be indicated in the operating manual. If a lightweight survey is conducted and it indicates a change from the calculated light ship displacement in excess of 1% of the operating displacement, the following **i)** or **ii)** is to be conducted.

i) An inclining test

ii) The difference in weight is to be placed in an indisputably conservative vertical centre of gravity and approved by the Society.

(b) At succeeding special surveys

Where the following **i)** and **ii)** are complied with, light ship displacement may be verified in operation by comparison of the calculated and observed draught. Where the difference between the expected displacement and the actual displacement based upon draught readings exceed 1% of the operating displacement, a lightweight survey is to be completed in accordance with **(a)** above.

i) The survey or test at the first special surveys demonstrated that the unit was maintaining an effective weight control program.

ii) At succeeding special surveys this is confirmed by the records of all changes to machinery, structure, outfitting and equipment that affect the light ship data maintained in light ship data alterations log.

~~(4) For units over 5 *years* of age, thickness measurements of members in representative ballast tanks in footings and lower hulls, if accessible and at least two pre-load tanks is to be carried out, in addition to the examinations specified in **(1)** through **(3)**~~

~~Where the effectiveness of the corrosion protection of those tanks is verified as a result of the internal examination, thickness measurements of these structural members may be omitted as deemed appropriate by the Society.~~

~~6~~5 For ship-type units and barge-type units, ~~thorough examinations described below~~ the following surveys are to be carried out, in addition to the survey items specified in **-1** through **-3**. However, where the unit is examined while floating, examinations deemed appropriate by the Society are to be conducted.

(1) The following items are to be examined:

(a) Structural appendages and ducts for positioning systems;

(~~2~~b) The ~~H~~hull structure around openings such as moon pools; and

(~~3~~c) The ~~P~~parts specified in **(~~1~~a)** and **(~~2~~b)** above designated by the Society as being~~having a~~ concentrations of stress may require non-destructive tests

(~~4~~2) ~~For units over 5 *years* of age, thickness measurements of members in the fore peak tank, aft peak tank and two representative ballast tanks except the fore peak tank and aft peak tank is to be carried out, in addition to the examinations specified in **(1)** through **(3)**~~

~~Where the effectiveness of the corrosion protection of those tanks is verified as a result of the internal examinations, thickness measurements of these structural members may be omitted as deemed appropriate by the Society.~~

At Special Surveys, thickness measurements are to be carried out for the structural members listed in **Table B12.1**. Where substantial corrosion is found as a result of such thickness measurements, additional thickness measurements are to be taken in accordance with **Table B5.9**.

12.6 Docking Surveys

12.6.2 Docking Surveys

Sub-paragraphs -2 to -4 have been amended as follows.

2 Self-elevating units
The following parts are to be cleaned and examined:
(1) External surface of upper structure or platform
(2) External surface of spud cans, mats, under water areas of legs and their connections
(3) The ~~s~~Surveyor may request non-destructive tests of important parts or suspect areas of substantial corrosion as a result of the examinations.
(4) For units over 10 *years* of age, the condition of the internal structure of the mat or spud cans is to be examined.

3 Column-stabilized units
The following parts are to be cleaned and examined:
(1) External surface of upper hull or platform
(2) Footings, pontoons or lower hulls, underwater areas of columns, bracing and their connections
(3) Sea chests, ~~P~~propulsion system
(4) The ~~s~~Surveyor may request non-destructive tests of important parts or suspect areas of substantial corrosion as a result of the examinations.

4 For units over 5 *years* of age, internal examinations and ~~non-destructive tests~~ thickness measurements of the following ballast spaces are to be carried out. However, where corrosion control arrangements of these ballast spaces are considered satisfactory, ~~non-destructive tests~~ thickness measurements may be dispensed with.
(1) For self-elevating units
Representative ballast tanks or free-flooding compartments in bottom mats or spud cans, if accessible, and at least two representative pre-load tanks
(2) For column-stabilized units
Representative ballast tanks in footings, lower hulls or free-flooding compartments as accessible, and at least two ballast tanks in columns or upper hull, if accessible
(3) For ship-type and barge-type units
One peak tank and at least two other representative ballast tanks between the peak bulkheads used primary for water ballast

Table B12.1 has been added as follows.

Table B12.1 Requirements for Thickness Measurements for Self-elevating Units

Special Survey	Structural members subject to thickness measurements
Special Survey for units up to 5 *years* of age (Special Survey No.1)	1. Suspect areas throughout the unit (particular attention is to be paid to the legs in way of the splash zone.)
Special Survey for units over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas throughout the unit. 2. Legs in way of the splash zone. 3. Special portions of structural members and primary structural members where wastage is evident. 4. Representative locations of the upper hull deck and bottom plating. 5. Representative locations of the interior of one preload (ballast) tank.
Special Survey for units over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas throughout the unit. 2. Legs in way of the splash zone. 3. Representative locations, throughout, of special portions of structural members and primary structural members. 4. Leg well structure 5. Representative locations of deck, bottom and side shell plating of hull and mat. 6. Interiors of at least two preload (ballast) tanks.
Special Survey for units over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas throughout the unit. 2. Legs in way of the splash zone. 3. Special portions of structural members and primary structural members. 4. Leg well structure. 5. Representative locations of deck, bottom and side shell plating of hull and mat. 6. Substructure of derrick (as deemed necessary by the Surveyor). 7. Representative locations of interior of all preload (ballast) tanks

Note:
The definitions of special portions of structural members and primary structural members are according to **6.2.1, Part P**.

Table B12.2 has been added as follows.

Table B12.2 Requirements for Thickness Measurements for Column-Stabilized Units

Special Survey	Structural members subject to thickness measurements
Special Survey for units up to 5 *years* of age (Special Survey No.1)	1. Suspect areas throughout the unit. 2. Columns and bracings where wastage is evident in the splash zone.
Special Survey for units over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas throughout the unit. 2. The following locations: (1) Representative locations of columns and bracings in the splash zone; (2) Representative locations of interiors of the columns and bracings specified in **(1)** above; and 3. Special portions of structural members and primary structural members where wastage is evident.
Special Survey for units over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas throughout the unit. 2. Representative locations, throughout, of special portions of structural members and primary structural members. 3. The following locations: (1) One transverse section (girth belt) of each of 2 columns and 2 bracings in the splash zone (2) The interiors of the columns and bracings specified in **(1)**; 4. Lower hulls in way of mooring lines where wastage is evident; and 5. One transverse section (girth belt) of each lower hull between one set of columns.
Special Survey for units over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas throughout the unit. 2. Special portions of structural members and primary structural members. 3. The following locations: (1) One transverse section (girth belt) of each of one-half of the columns and bracings in the splash zone; (2) Interiors of the columns and bracings specified in **(1)** (as deemed necessary by the Surveyor); 4. Lower hulls in way of mooring lines where wastage is evident; 5. One transverse section (girth belt) of each lower hull between one set of columns; 6. Representative locations of the substructures of drilling derricks.

Notes:

(1) The definitions of special portions of structural members and primary structural members are according to **6.2.1, Part P**.

(2) A transverse section (girth belt) includes all continuous longitudinal members such as plating, longitudinals and girders at a given section of the unit.

Table B12.3 has been added as follows.

Table B12.3 Requirements for Thickness Measurements for Ship-type and Barge-type Units

Special Survey	Structural members subject to thickness measurements
Special Survey for units up to 5 *years* of age (Special Survey No.1)	1. Suspect areas throughout the unit.
Special Survey for units over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas throughout the unit. 2. The following locations: (1) One transverse section of deck plating abreast the moon pool opening within amidships 0.6*L*; (2) Interiors of the deck plating specified in **(1)** (as deemed necessary by the Surveyor); and (3) In addition to **(1)** and **(2)** above, where the unit is configured with side ballast tanks, the plating and internals of the tanks are also to be gauged in way of the section chosen. 3. Moon pool boundary bulkhead plating.
Special Survey for units over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas throughout the unit. 2. The following locations: (1) Two transverse sections (girth belts) of deck, bottom and side plating abreast the moon pool and one hatch opening within amidships 0.6 *L*; (2) Interiors of the transverse sections specified in **(1)** (as deemed necessary by the Surveyor); and (3) In addition to **(1)** and **(2)** above, where the unit is configured with side ballast tanks, the plating and interiors of the tanks to be gauged in way of the required belts. Remaining internals are to be gauged as necessary by the Surveyor. 3. Moon pool boundary bulkhead plating. 4. Interiors of forepeak and after peak tanks as deemed necessary by the Surveyor.
Special Survey for units over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas throughout the unit. 2. A minimum of three transverse sections (girth belts) of deck, bottom, side and longitudinal bulkhead plating in way of the moon pool and other areas within amidships 0.6*L* together with the interiors in way (including within perimeter ballast tanks, where fitted in way of belts). 3. Moon pool boundary bulkhead plating. 4. Interiors of forepeak and after peak tanks as deemed necessary by the Surveyor. 5. Lowest strake of all transverse bulkheads in hold spaces. Remaining bulkhead plating to be gauged as deemed necessary by the Surveyor. 6. All plates in two wind and water strakes, port and starboard, full length. 7. All exposed main deck plating (full length) and all exposed first tier superstructure deck plating (poop, bridge and forecastle decks). 8. All keel plating (full length) plus additional bottom plating as deemed necessary by the Surveyor, particularly in way of cofferdams and machinery spaces. 9. Duct keel or pipe tunnel plating and interiors (as deemed by the Surveyor) 10. Plating of sea chests. Shell plating in way of overboard discharges as deemed necessary by the Surveyor.

Notes:

(1) For units less than 100 *m* in length, the number of transverse sections required at Special Survey No. 3 may be reduced to one, and the number of transverse sections required at subsequent Special Surveys may be reduced to two.

(2) For units more than 100 *m* in length, thickness measurements of exposed deck plating within amidship 0.5 *L* may be required at Special Survey No.3.

Chapter 15 SURVEYS FOR WORK-SHIPS

15.6 Docking Surveys

15.6.1 General

Sub-paragraph -4 has been amended as follows.

4 For ships over 5 *years of age*, internal examinations and ~~non-destructive tests~~ thickness measurements of the representative ballast tanks or free-flooding compartments in bottom mats or spud cans, if accessible, and at least two representative pre-load tanks are to be carried out. However, where corrosion control arrangements of these ballast spaces are considered satisfactory, ~~non-destructive tests~~ thickness measurements may be dispensed with.

EFFECTIVE DATE AND APPLICATION (Amendment 3-6)

1. The effective date of the amendments is 1 January 2016.

2. Notwithstanding the amendments to the Rules, the current requirements may apply to the surveys for which the application is submitted to the Society before the effective date.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part B Class Surveys

GUIDANCE

2015 AMENDMENT NO.3

Notice No.82 25th December 2015

Resolved by Technical Committee on 28th July 2015

Notice No.82 25th December 2015
AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

"Guidance for the survey and construction of steel ships" has been partly amended as follows:

Part B CLASS SURVEYS

Amendment 3-1

Annex B2.3.1-1(11) PROCEDURES FOR ON BOARD NOISE MEASUREMENTS

1.1 General

1.1.2 Scope

Sub-paragraph -4 has been amended as follows.

4 This Annex does not apply to passenger cabins and other passenger spaces, except in so far as they are work spaces and are covered by the provisions of this Annex. Passenger spaces where they are also occupied by crew such as recreation rooms and open recreation areas are to be considered as "other passenger spaces", and therefore are not subject to this **Annex**. However, bulkhead and decks of crew cabins and hospitals adjacent to such rooms/areas are to have the weighted sound reduction index (*Rw*) in compliance with **5.1.1-1**.

Chapter 3 MEASUREMENT

3.3 Measurement Conditions

3.3.1 Operating Conditions at Sea Trials

Sub-paragraphs -6 and -7 have been amended as follows.

Measurements are to be carried out under the following conditions specified in the following **-1** to **-8**. The actual conditions during measurement are to be recorded on the noise survey report.
(-1 to -5 are omitted.)
6 Mechanical ventilation, heating and air-conditioning equipment are to be in normal operation, taking into account that the capacity is to be in accordance with the design conditions. With respect to the requirement, air conditioning vents are to be kept open during the taking of noise measurements on board, unless they are designed to be kept closed in the normal operating condition.
7 In general, doors and windows are to be closed. With respect to the requirement, closing devices of ventilation grilles/louvres of cabin doors are to be kept open during the taking of noise measurements on board, unless they are designed to be kept closed in the normal operating condition.
(-8 is omitted.)

3.3.2 Equipment for Long Periods of Use

Sub-paragraph -2 has been amended as follows.

2 In the case of ships with Dynamical Positioning (DP), which is intended for use under normal working conditions, additional noise measurements at the DP mode, which would approximate station-holding at or above 40% of maximum thruster power for design environmental conditions that the ship operates in, are to be made at control stations, duty stations, and accommodation spaces to ensure that the maximum noise level limits in these spaces are not exceeded. With respect to the requirement, the wording “40% of maximum thruster power” means exactly “40% of maximum” and does not mean “40% of 80% as required by **3.3.1-3**”.

Chapter 4 MAXIMUM ACCEPTABLE SOUND PRESSURE LEVELS

4.1 General

Measurement results are to be lower than the noise level limits specified in **Table 4.1**. In large rooms with many measurement positions the individual positions are to be compared to the limits.

Table 4.1 has been amended as follows.

Table 4.1 Noise level limits (unit: *dB*(*A*))

Designation of rooms and spaces	Ship size	
	1,600 up to 10,000 GT	≥10,000 GT
Work spaces		
Machinery spaces [1]	110	110
Machinery control rooms	75	75
Workshops other than those forming part of machinery spaces	85	85
Non–specified work spaces (other work areas)	85	85
Navigation spaces		
Navigating bridge and chartrooms [2]	65	65
Look-out posts, incl. navigating bridge wings and windows [3]	70	70
Radio rooms [4] (with radio equipment operating but not producing audio signals)	60	60
Radar rooms	65	65
Accommodation spaces		
Cabin and hospitals [5]	60	55
Messrooms	65	60
Recreation rooms	65	60
Open recreation areas (external recreation areas)	75	75
Offices	65	60
Service spaces		
Galleys, without food processing equipment operating	75	75
Serveries and pantries	75	75
Normally unoccupied spaces		
Spaces referred to in section **3.8**	90	90

Notes:

1. If the maximum noise levels in **Table 4.1** are exceeded when machinery is operating, stay is to be limited to very short periods if dispensation is granted by the Administration.

2. A navigating bridge provided with radio equipment is to be regarded as a “navigating bridge”.

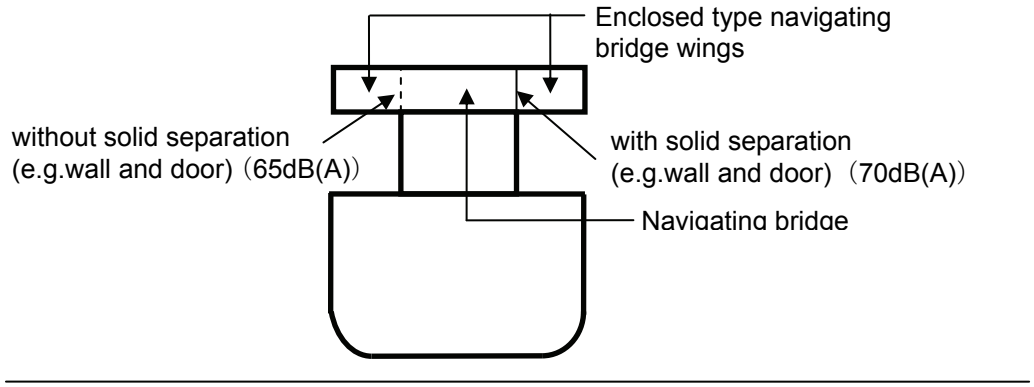
3. With respect to the enclosed type navigating bridge wings, navigating bridge wings without solid separation (e.g. wall and door), and those with solid separation (e.g. wall and door) are to be regarded as “navigating bridge” and “navigating bridge wings” respectively. (See **Fig. 4.1**)

4. “Radio rooms” mean separate rooms dedicated for sending/receiving radio messages.

5. A room consisting of day-room and bedroom is to be regarded as a single “cabin” in cases where the room is for single occupancy.

Fig. 4.1 has been added as follows.

Fig. 4.1 Noise Levels in Enclosed Type Navigating Bridge



Chapter 5 ACOUSTIC INSULATION BETWEEN ACCOMMODATION SPACES

Section 5.1 has been amended as follows.

5.1 Sound Insulation Index

5.1.1 Bulkheads and Decks

1 The airborne sound insulation properties for bulkheads and decks within accommodation spaces are to comply at least with the following ~~-1~~**(1)** to ~~-4~~**(4)** weighted sound reduction index (R_w) according to *ISO* Standard 717-1:1996 as amended (1:2006), part 1.

(1) Cabin to cabin: R_w=35

(2) Messrooms, recreation rooms, public spaces and entertainment areas to cabins and hospitals: R_w=45

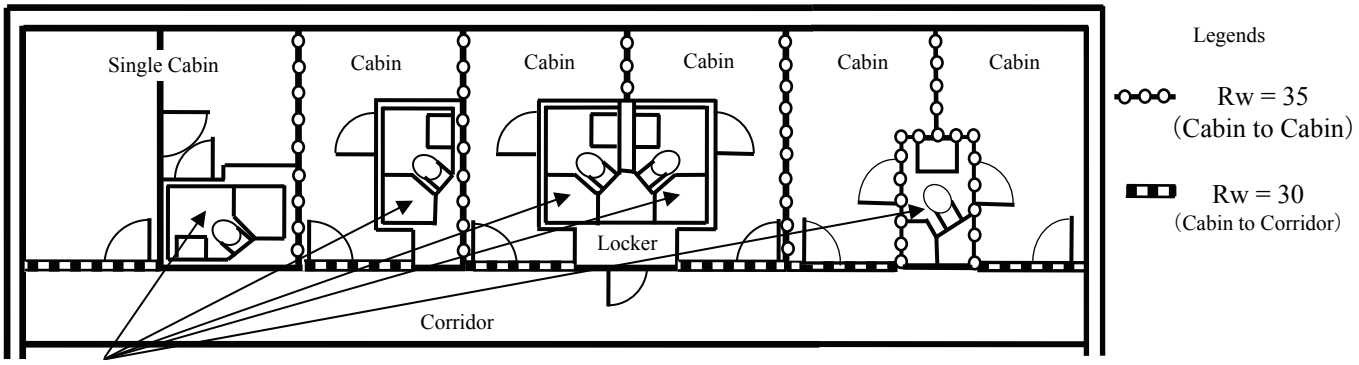
(3) Corridor to cabin: R_w=30

(4) Cabin to cabin with communicating door: R_w=30

2 If a cabin is completely separated by more than one bulkhead from the airborne sound source, the bulkheads are not required to have the airborne sound insulation properties as required in **-1** above. For this purpose, bathrooms, toilets or lavatories are not regarded as cabins, but are regarded as origins of airborne sounds to other cabins. (See **Fig.5.1.1-2**)

3 For a room consisting of a day-room and bedroom for single occupancy, partitions (panels and doors) between the day-room and bedroom need not have the airborne sound insulation properties required in **-1** above.

Fig. 5.1.1-2 Arrangement of Cabins



5.1.2 Airborne Sound Insulation Properties of Bulkheads and Decks

With respect to the requirement, the airborne sound insulation properties of bulkheads and decks are to comply with the following **(1)** to **(4)**:

(1) The requirements regarding airborne sound insulation properties for bulkheads are to apply to components installed in bulkheads (e.g., cabin doors).

(2) In cases of bulkheads consisting of acoustic insulation panels and doors, each component forming the surface of the bulkhead (acoustic insulation panels and doors, etc.) is to have at

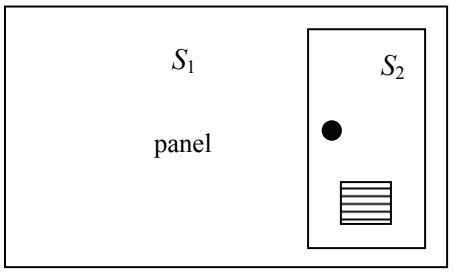
least the required R_w in **5.1.1-1**.

(3) Notwithstanding **(2)** above, in cases where either acoustic insulation panels or doors forming parts of bulkheads have a weighted sound reduction index inferior to that required by **5.1.1-1**, this requirement is considered satisfied provided that the R_w of the bulkheads is not inferior to their required values, i.e. the R_w of the bulkhead calculated using both the airborne sound insulation properties of the doors and those of the panels is not inferior to the required value. As guidance on evaluation of the R_w of bulkheads, the following formulae can be used:

$$\overline{R} = 10\log_{10}\left[S / \sum_{i=1}^{n} \left(S_i \cdot 10^{-R_i/10} \right) \right]$$

S: Area of the concerned bulkhead
n: Number of components forming the concerned bulkhead
R_i: Sound reduction index of the i-th component (Note: R_i has frequency elements in the frequency range from 100 to 5,000 *Hz*)
S_i: Area of the i-th component

Fig. 5.1.2 Acoustic insulation panels and doors forming parts of bulkheads



n= 2
S_1: Area of the panel
S_2: Area of the door
S: Area of concerned bulkhead ($S = S_1 + S_2$)
R_1: Sound reduction index of the panel
R_2: Sound reduction index of the door

(4) The requirements regarding airborne sound insulation properties for decks are to apply to decks together with their coverings. However, they need not apply to ceiling panels.

Section 5.2 has been amended as follows.

5.2 Measurements of Airborne Sound Insulation Properties

1 Materials used to comply with the requirements of **5.1** are to be one of the following **(1)** to **(3)**:

(1) Materials whose airborne sound insulation properties are determined by laboratory tests in accordance with *ISO* 10140-2:2010 and approved by the Administration;

(2) Materials which are approved by the Society in accordance with **Chapter 6, Part 4 of the GUIDANCE FOR THE APPROVAL AND TYPE APPROVAL OF MATERIALS AND EQUIPMENT FOR MARINE USE**; or

(3) Materials whose airborne sound insulation properties are determined by laboratory tests in accordance with *ISO* 10140-2:2010 and deemed equivalent to those listed in **(1)** or **(2)** above.

2 With respect to the tests in accordance with *ISO* 10140-2:2010, the following **(1)** to **(3)** apply:

(1) Coverings are to be tested in laboratory as in the onboard arrangement;

(2) Closing devices of ventilation grilles/louvres of cabin doors are to be kept open during laboratory tests; and

(3) Doors are to be tested together with the associated door frame. In cases where there is no sill being part of the door frame, the doors are to be tested with the gap specified by manufacturers and with sealing materials, if fitted.

EFFECTIVE DATE AND APPLICATION (Amendment 3-1)

1. The effective date of the amendments is 25 December 2015.

Amendment 3-2

B1 GENERAL

B1.1 Surveys

B1.1.3 Intervals of Class Maintenance Surveys

Sub-paragraph -7(19) has been added as follows.

7 Occasional Surveys specified in **1.1.3-3(5), Part B of the Rules** are as specified below:
((1) to (18) are omitted.)
(19) Portable Gas Detector
For vehicle carriers defined in **3.2.54**, **Part R** for the carriage of motor vehicles with compressed natural gas in their tanks for their own propulsion and/or motor vehicles with compressed hydrogen in their tanks for their own propulsion which had been at the beginning stage of construction before 1 January 2016, a survey is to be carried out to verify compliance with the requirements of **20A.5, Part R of the Rules** by the first scheduled special survey on or after 1 January 2016.

EFFECTIVE DATE AND APPLICATION (Amendment 3-2)

1. The effective date of the amendments is 1 January 2016.

Amendment 3-3

B1 GENERAL

B1.1 Surveys

Paragraph B1.1.3 has been amended as follows.

B1.1.3 Intervals of Class Maintenance Surveys

(-1 and -2 are omitted.)

3 The timing (survey due date) of Ordinary Surveys of propeller shafts Kind 1 and stern tube shafts Kind 1 specified in **1.1.3-1(6)(a), Part B of the Rules** may be extended subject to the carrying out of Occasional Surveys in accordance with the following **(1)** to **(4)**:~~postponed until the date of the next Docking Survey only for the purpose of merging the two dates. However, an Occasional Survey is to be carried out on the following requirements, and the examined parts are to be in good condition. Also, this postponement is not to exceed 6 *months* for shafts Kind 1*A*, and 12 *months* for shafts Kind 1*B* and 1*C*.~~

(1) For oil lubricated bearings, the following **(a)** to **(c)** are to apply:

(a) The survey due date may be extended for up to 1 *year* in cases where, after the execution of a survey consisting of the following **i)** to **viii)**, examined parts are proven to be in good condition. In this case, only one more "one-year extension" may be granted.

i) Verification of no reported repairs by grinding or welding of shaft and/or propeller;

ii) Confirmation from the chief engineer that the shafting arrangement is in good working condition;

~~(1~~iii)~~Propeller shafts exposed in the engine room are to be visually examined~~Visual inspection of all accessible parts of the shafting system;

~~(2~~iv)~~The records of the weardown/clearance at the after end of the stern tube bearing (or the after end of the shaft bracket bearing, if any) are to be examined.~~Review of the previous recordings of the weardown and/or clearance between the shaft and the bearing;

~~(3~~v) Verification of ~~M~~maintenance records of the stern tube sealing devices ~~are to be examined.~~;

~~(4~~vi) Verification~~Confirmation is to be made~~ that ~~the~~ main engines have not been operated within~~outside~~ the barred speed range for torsional vibration~~.~~;

vii) Verification that the propeller is free of damages which may cause the propeller to be out of balance; and

~~(5~~viii) Carrying out the ~~E~~examinations specified in items ~~8, 9~~12 and ~~10~~13 in **Table B8.1**, **Part B of the Rules** ~~are to be carried out~~.

(b) The survey due date may be extended for up to 3 *months* in cases where, after the execution of a survey consisting of the following **i)** and **ii)**, examined parts are proven to be in good condition.

i) The verifications and examinations, etc. specified in the preceding **(a)i)** to **iv)** as well as **vi)** and **viii)**; and

ii) Verification of the effectiveness of the inboard seal.

(c) The surveys specified in the preceding **(a)** and **(b)** may be carried out sequentially; the survey due date, however, may be extended for only 1 *year*.

(2) For freshwater lubricated bearings, the following **(a)** to **(c)** are to apply:

(a) The survey due date may be extended for up to 1 *year* in cases where, after the execution

of a survey consisting of the following **i)** to **v)**, examined parts are proven to be in good condition. In this case, only one more "one-year extension" may be granted.

i) The review specified in the preceding **(1)(a)iv)**;

ii) Review of service records, regularly recorded data showing in-service conditions of the shaft(s), which may include water flow, water temperature, salinity, pH, make-up water and water pressure;

iii) Review of test records of freshwater sample tests carried out in accordance with the following **1)** to **4)**. After the review, freshwater sample tests are to be carried out in accordance with the following **(b)** to **(d)** in the presence of a surveyor.

1) Freshwater sample tests are to be carried out at regular intervals, in principle, not exceeding six months.

2) Freshwater sample tests are to include, as parameter, chlorides content, pH value, and presence of bearing particles or other particles (only for laboratory analysis, not required for tests carried out in presence of the surveyor).

3) Samples are to be taken under service conditions and are to be representative of the water circulating within the stern tube.

4) Analysis results are to be retained on board and made available to the surveyor.

iv) The verifications and examinations, etc. specified in the preceding **(1)(a)i)** to **iii)**, **vii)** as well as **viii)**; and

v) Verification of the effectiveness of the inboard seal and outboard seals

(b) The survey due date may be extended for up to 3 *month* in cases where, after the execution of a survey consisting of the following **i)** and **ii)**, examined parts are proven to be in good condition.

i) The verifications and examinations, etc. specified in the preceding **(a)i)** to **iv)**; and

ii) Verification of the effectiveness of the inboard seal.

(c) The surveys specified in the preceding **(a)** and **(b)** may be carried out sequentially; the survey due date, however, may only be extended for a maximum of 1 *year*.

(3) For water lubricated bearings, the following **(a)** to **(c)** are to apply:

(a) The survey due date may be extended for up to 1 *year* in cases where, after the execution of a survey consisting of the following **i)** to **viii)**, examined parts are proven to be in good condition.

i) Review of the previous recording of clearances between the shaft and its bearings;

ii) Confirmation from the chief engineer that the shafting arrangement is in good working condition after the execution of a survey consisting of the following **1)** and **2)**:

1) Review of service records, regularly recorded data showing in-service conditions of the shaft(s); and

2) Verification of no reported repairs by grinding or welding of shaft and/or propeller.

iii) Visual inspection of all accessible parts of the shafting system;

iv) Verification that the propeller is free of damages which may cause the propeller to be out of balance;

v) Checking and recording the clearances of bearing between the shaft and its bearings;

vi) Verification of the effectiveness of the inboard seal;

vii) Examination of the lubrication water piping in the case of shafts with seawater lubricated stern tube bearings or stern tube bearings utilising outboard fresh water; and;

viii) Verification that the main engines have not been operated within the barred speed range for torsional vibration;

(b) The survey due date may be extended for up to 3 *month* in cases where, after the execution of the verfications and examinations, etc. specified in the preceding **(a)i)** to **iv)** as well as **vi)** to **viii)**, examined parts are proven to be in good condition.

(c) The surveys specified in the preceding **(a)** and **(b)** may be carried out sequentially; the survey due date, however, may only be extended for a maximum of 1 *year*.

(4) Occasional Surveys are, in principle, to be carried out within 1 *month* of the survey due date (including extended due dates). If the Occasional Survey is carried out more than 1 *month* prior to the survey due date, then the period of extension counts from the date on which the Occasional Survey was completed.

(-4 and -5 are omitted.)

6 The postponement of the Ordinary Surveys of propeller shafts Kind 1 and stern tube shafts Kind 1 facilitated by the Occasional Survey specified in **-3** above or the Partial Survey specified in **1.1.3-1(6)(b), Part B of the Rules**, are not to exceed~~be beyond~~ the following ~~longest terms~~:

(1) ~~5~~6 *years* ~~and 6 *months*~~ for shafts Kind 1*A*

(2) 8 *years* for shafts Kind 1*B* (10 *years* in cases where **-4** and **-5** above are complied with.)

(3) 10 *years* for shafts Kind 1*C*

(4) 7 *years* for shafts Kind 1*W*

7 With respect to the "non-destructive examination (*NDE*)" specified in **1.1.3-1(6)(g), Part B of the Rules,** the survey due date may be extended for up to 3 *months* in cases where, after the execution of an Occasional Survey consisting of the following **(1)** to **(7)**, examined parts are proven to be in good condition.

(1) Review of the previous recording of clearance between the shaft and its bearings;

(2) Confirmation from the chief engineer that the shafting arrangement is in good working condition after the execution of the review and verification specified in the following **(a)** and **(b)**:

(a) Review of service records, regularly recorded data showing in-service conditions of the shaft(s); and

(b) Verification of no reported repairs by grinding or welding of shaft and/or propeller.

(3) Visual inspection of all accessible parts of the shafting system;

(4) Verification that the propeller is free of damages which may cause the propeller to be out of balance;

(5) Verification of the effectiveness of the inboard seal;

(6) Examination of the lubrication water piping in the case of shafts with seawater lubricated stern tube bearings or stern tube bearings utilising outboard fresh water; and

(7) Verification that the main engines have not been operated within the barred speed range for torsional vibration.

8 The wording "as specified separately by the Society" in **1.1.3-1(6)(h), Part B of the Rules** means that surveys are to be carried out in accordance with **Annex B1.1.3-7 "Alternative Propeller Shaft Survey Methods"**.

~~7~~**9** The Occasional Surveys specified in **1.1.3-3(5), Part B of the Rules** are as specified below:

((1) to (19) are omitted.)

~~8~~**10** With respect to the provisions of ~~-5~~**9** above, for ships at beginning stage of construction, such construction began before the effective date of each Occasional Survey requirements and such ships are delivered after these effective date, the Classification Survey of such ships is regarded as either their "first survey" or their "first scheduled dry docking"; therefore, these ships need to comply with each of the requirements of Occasional Surveys by the completion date of their Classification Survey.

B1.2 Specialized Ships, Installations, and Apparatus

Paragraph B1.2.4 has been added as follows.

B1.2.4 Surveys of Water Jet Propulsion Systems, etc.

With respect to the wording "specified separately by the Society" in **1.2.4, Part B of the Rules**, reference is to be made to **Annex D1.1.3-1 "Guidance for the Survey and Construction of Waterjet Propulsion Systems", Part D of the Guidance** for water jet propulsion systems and **Annex D1.1.3-3 "Guidance for the Survey and Construction of Azimuth Thrusters", Part D of the Guidance** for azimuth thrusters.

B3 ANNUAL SURVEYS

B3.2 Annual Surveys for Hull, Equipment, Fire extinction and Fittings

B3.2.3 Performance Tests

Sub-paragraph -5 has been amended as follows.

5 Inspection of Water Level Detection and Alarm Systems (refer to **13.8.5, Part D of the Rules, 13.8.6, Part D of the Rules** and **B1.1.3-~~7~~9(5)**) specified in item 9 of **Table B3.3, Part B of the Rules,** is to be carried out on the items installed on the following ships.

B8 PROPELLER SHAFT AND STERN TUBE SHAFT SURVEYS

B8.1 Propeller Shaft and Stern Tube Shaft Surveys

B8.1.1 Ordinary Surveys

Sub-paragraph -2 has been amended as follows.

2 When the clearance and/or wear down at the aft end of the stern tube or the shaft bracket bearing exceed the value given below, the bearing is to be replaced or repaired.

(1) Clearance for water lubricated bearings:
Propeller shaft diameter, *d* (*mm*): Clearance (*mm*)
$d \leq$ 230: 6.0
230 $< d \leq$ 305: 8.0
305 $< d$: 9.5

(2) Wear down for oil lubricated bearings:
As a rule, 0.3 *mm*, but factors such as the characteristics of the lubricating oil, the temperature fluctuation history of the lubricating oil or bearing material are to be taken into account.

(3) Weardown for freshwater lubricated bearings:
Weardown value used as reference for repairs specified by the manufacturer.

B8.1.3 Preventive Maintenance System

Sub-paragraphs -4 and -5 have been amended as follows.

4 The "properly monitored" in **8.1.3(1), Part B of the Rules** as it pertains to "bearing temperature" ~~means~~is to be achieved by either of the following monitoring and recording devices ~~is to be~~ provided for measuring the temperature of the metal at the aft end bottoms of stern tubes:

(1) Two or more temperature sensors embedded into the metal

(2) An embedded temperature sensor which can be replaced from inside the ship and a spare temperature sensor.
In such cases, replacement by the spare sensor is to be demonstrated according to the procedures submitted beforehand.

5 The "properly monitored" in **8.1.3(2), Part B of the Rules** as it pertains to "bearing temperature" ~~means that~~is to be achieved by at least one device ~~is to be~~ provided for measuring the temperature of the metal at the aft end bottoms of stern tubes.

Paragraph B8.1.4 has been added as follows.

B8.1.4 Propeller Shaft and Stern Tube Shaft Surveys of Ships Affixed with Notation "*APSS・O*" or "*APSS・W*"

The wording "specified separately by the Society" specified in **8.1.4, Part B of the Rules** means that the surveys are to be carried out in accordance with **Annex B1.1.3-7 "Alternative Propeller Shaft Survey Methods"**.

Table B8.1.3-1 has been amended as follows.

Table B8.1.3-1 Approval procedure of preventive maintenance system for oil lubricated propeller shafts

Item	Procedures
(Omitted)	
5. After Approval	(-1 to -3 are omitted.) -4 The ship is to ~~undergo~~be subject to the ~~examinations~~applicable survey items specified in **Table B8.1**, **Part B of the Rules** (excluding survey items 1, ~~2~~3, ~~3~~4, 5, 7 and ~~5~~8 for parts covered by the preventive maintenance system) as well as checking and recording the measurements of bearing weardown of the propeller shaft or the stern tube shaft at the after bearing of the stern tube, visual inspection of all accessible parts of the shafting system, seal liner found to be or placed in a satisfactory condition and verification of the satisfactory condition of inboard and outboard seals at the propeller shaft surveys in accordance with **1.1.3-1(6)(a), Part B of the Rules**. However, for propeller shafts with keyless propeller attachments or having coupling flanges at the aft end, survey items ~~1~~2, ~~6~~9 and ~~7~~10 in **Table B8.1, Part B of the Rules** may be extended[1] until the earlier date of the following **(1)** or **(2)**~~;~~ In cases where survey items 2, 9 and 10 specified in **Table B8.1**, **Part B of the Rules** are carried out, verification of the satisfactory re-installation of the propeller including verification of the satisfactory condition of inboard and outboard seals is to be carried out. (1) The date when the propeller shaft is withdrawn for an examination due to some reason such as an abnormality being found by the analysis of monitoring parameters (2) The date ~~five~~15 *years* after the propeller shaft survey (~~excluding~~including survey items ~~1~~2, ~~6~~9 and ~~7~~10 in **Table B8.1, Part B of the Rules**) was completed
(Omitted)	

(Note)

1 The carrying out of survey items 2, 9 and 10 specified in **Table B8.1**, **Part B of the Rules** is recommended in cases where the next survey due date will be earlier than 15 *years* after the date of completion of the previous survey which included the survey items 2, 9 and 10 specified in **Table B8.1**, **Part B of the Rules**.

Annex B1.1.3-7 has been added as follows.

Annex B1.1.3-7 Alternative Propeller Shaft Survey Methods

Chapter 1 General

1.1 General

1.1.1 Application

This annex applies to propeller shaft and stern tube shaft surveys of ships affixed with the notation "*APSS・O*" or "*APSS・W*".

Chapter 2 Shaft Surveys

2.1 General

2.1.1 Ordinary Survey Intervals

1 Ordinary Surveys of oil lubricated shafts are to be carried out within 5 years from the date of completion of the Classification Survey or the previous Ordinary Survey in accordance with **2.2**.

2 Ordinary Surveys of freshwater lubricated shafts are to be carried out within 5 years from the date of completion of the Classification Survey or the previous Ordinary Survey in accordance with **2.3**.

3 In applying **-1** and **-2** above, for surveys completed within 3 months before the survey due date, the survey due date will be regarded as the date of completion of this survey.

2.1.2 Extensions of Survey Due Date

The survey due dates specified in **2.1.1** may be extended in accordance with the following **(1)** and **(2)**:

(1) For shafts with oil lubricated or freshwater lubricated bearings, survey due dates may be extended in accordance with the following **(a)** to **(c)**. When the results of verification, recording and examination are not satisfactory, however, survey due dates for shafts with oil lubricated bearings are to be according to **2.2** and survey due dates for shafts with freshwater lubricated bearings are to be according to **2.3.**

(a) Extension up to 30 *months*

When the results of a review, verification and examination or inspection, etc. specified in the following **i)** to **vii)** are satisfactory, the survey due date may be extended up to 30 months. In cases where the survey due date is extended in accordance with this provision, no more than one extension may be granted and no further extension, of other type, can be granted until an Ordinary Survey is carried out.

i) verification in accordance with **2.2.1-2(1)** to **(3)**, as applicable, for oil lubricated bearings or for **2.3.1-2(1)** to **(3)**, as applicable, for freshwater lubricated bearings; and confirmation from the chief engineer that the shafting arrangement is in good working condition;

ii) checking and recording the bearing weardown measurements, as far as practicable;

iii) visual inspection of all accessible parts of the shafting system;

iv) verification that the propeller is free of damages which may cause the propeller to be out of balance;

v) verification of the effectiveness of the inboard seal and outboard seals;

vi) examination of the low oil level alarms of the lubricating oil or lubricating freshwater tanks, lubricating oil or lubricating freshwater temperature measuring devices and lubricating oil or lubricating freshwater circulation piping and pumps for maintaining stern tube bearing conditions; and

vii) examination of the lubricating oil or lubricating freshwater record book.

(b) Extension up to 1 *year*

When the results of a review, verification and examination, etc. carried out in accordance with the following **i)** and **ii)** are satisfactory, the survey due date may be extended up to 1 *year*. In cases where the survey due date is extended in accordance with this provision, no more than two consecutive "one-year extensions" may be granted and no further extension of other type, can be granted until an Ordinary Survey is carried out.

i) review of the previous weardown and/or clearance recordings, and

ii) verification and examination or inspection, etc. as specified in **(a)i)**, **iii)**, **iv)**, **v)**, **vi)** and **vii)** above.

(c) Extension up to 3 *months*

When the results of a review, verification and examination, etc. carried out in accordance with the following **i)** to **ii)** are satisfactory, the survey due date may be extended up to 3 months. In cases where the survey due date is extended in accordance with this provision, no more than one "three-month extension" in accordance with this provision can be granted until an Ordinary Survey is carried out. In the event an additional extension is requested, the provision of **(b)** above is to be applied and the survey due date, prior to the previous extension, is extended for a maximum of one *year*.

i) review, verification and examination, etc. as specified in **(b)i)** above as well as in **(a)i)**, **iii)**, **vi)**, and **vii)** above; and

ii) verification of the effectiveness of the inboard seal.

(2) The review, verification and examination, etc. specified in **(1)(a)** to **(c)** above are normally to be carried out within 1 *month* of the survey due date. If the extension survey is carried out more than 1 *month* prior to the survey due date, then the period of extension counts from the date of such review, verification, recording and examination, etc.

2.1.3 15-year Interval Ordinary Surveys

In addition to those specified in **2.1.1**, Ordinary Surveys are to be carried out in accordance with the following **(1)** and **(2)**:

(1) For keyless or flange connection shafts with oil lubricated bearings, the maximum interval between the two surveys carried out according to **Tables 2.1** or **2.2** is not to exceed 15 years, except in the case when one extension for no more than three months is granted in accordance with **2.1.2(1)(c)**. In this context, in cases where an application is submitted in order to newly affix the notation "*APSS・O*" or "*APSS・W*" to ships without said notations, the following **(a)** and **(b)** are to be applied:

(a) In cases of ships without the notation "*PSCM*" or "*PSCM・A*", the date of completion of the previous Ordinary Survey for keyless connection shafts or the date of completion of the previous Ordinary Survey or Partial Survey for flange connection shafts is regarded as the date of completion of the previous Ordinary Survey carried out according to **Table 2.1** or **2.2**.

(b) In the case of ships affixed with the notation "*PSCM*" or "*PSCM・A*", the date of completion of the examinations specified in 5.-4 of **Table B8.1.3-1**, **Part B of the Guidance** (including items 2, 9 and 10 of **Table B8.1, Part B of the Rules**) is regarded as the date of completion of the previous Ordinary Survey carried out according to **Table 2.1** or **2.2**.

(2) For freshwater lubricated bearings, the maximum interval between two surveys carried out according to **Table 2.1** is not to exceed 15 *years*, except in the case when one extension for no more than three months is granted in accordance with **2.1.2(1)(c)**. In this context, in cases where an application is submitted in order to newly affix the notation "*APSS・W*" to ships without said notation, the date of completion of the previous Ordinary Survey is regarded as the previous Ordinary Survey carried out according to **Table 2.1**.

2.2 Ordinary Surveys of Oil Lubricated Shafts

2.2.1 Ordinary Surveys

1 Ordinary Surveys of shafts with oil lubricated bearings are to be carried out in accordance with

Table 2.1, **2.2** or **2.3**. In the case of keyed connections, Ordinary Surveys are to be carried out in accordance with **Table 2.1** or **2.2**.

2 Before carrying out surveys in accordance with **Table 2.2** or **2.3**, the items specified in the following **(1)** to **(3)** are to be carried out. When the results of the verification specified in the following **(1)** to **(3)** or the results of surveys in accordance with the following **Table 2.2** or **2.3** are not satisfactory, an Ordinary Survey in accordance with **Table 2.1** is to be carried out.

(1) Review of service records, regularly recorded data showing in-service conditions of the shaft(s), which may include lubricating oil temperature, bearing temperature and oil consumption records;

(2) Review of test records of lubricating oil analysis for verification that the record of the analysis carried out in accordance with the following **(a)** to **(d)** satisfies the criteria determined by the executive management of the ship, based upon experience and knowledge, in accordance with the reference standards specified in **Table B8.1.3-1, Part B of the Guidance**. After the review, oil sample examinations (i.e., visual examination of stern tube lubricating oil taken in presence of the surveyor with a focus on water contamination) are to be carried out.

(a) Lubricating oil analysis is to be carried out at regular intervals not exceeding six months.

(b) Lubricating oil analysis is to include at least the items specified in the following **i)** to **iv)**:

i) water content

ii) chloride content

iii) content of shaft metals and bearing metal particles; and

iv) oxidation of oil.

(c) Oil samples, to be submitted for the analysis, are to be taken under service conditions.

(d) The documentation on lubricating oil analysis is to be available on board.

(3) Verification of no reported repairs by grinding or welding of shaft and propeller.

2.3 Ordinary Surveys of Freshwater Lubricated Shafts

2.3.1 Ordinary Surveys

1 Ordinary Surveys of shafts with freshwater lubricated bearings are to be carried out in accordance with **Table 2.1**, **2.2** or **2.3**. In the case of keyed connections, Ordinary Surveys are to be carried out in accordance with **Table 2.1** or **2.2**.

2 Before carrying out surveys in accordance with **Table 2.2** or **2.3**, the items specified in the following **(1)** to **(3)** are carried out. When the results of the verification specified in the following **(1)** to **(3)** or the results of surveys in accordance with the following **Table 2.2** or **2.3** are not satisfactory, an Ordinary Survey in accordance with **Table 2.1** is to be carried out.

(1) Review of service records, regularly recorded data showing in-service conditions of the shaft(s), which may include water flow, water temperature, salinity, pH, make-up water and water pressure (for closed loop freshwater lubricated bearings;

(2) Review of test records of freshwater sample tests carried out in accordance with the following **(a)** to **(d)**. After the review, freshwater sample tests are to be carried out in accordance with the following **(b)** to **(d)** in the presence of a surveyor.

(a) Freshwater sample tests are, in principle, to be carried out at regular intervals not exceeding six months.

(b) Freshwater sample tests are to include the parameters specified in the following **i)** to **iii)**:

i) chloride content;

ii) pH value; and

iii) presence of bearing particles or other particles (only for laboratory analysis, not required for tests carried out in the presence of a surveyor).

(c) Samples are to be taken under service conditions and are to be representative of the water

circulating within the stern tube.

(d) Analysis results are to be retained on board and made available to the surveyor.

(3) Verification of no reported repairs by grinding or welding of shaft and propeller.

Table 2.1 Ordinary Survey of Propeller Shafts and Stern Tube Shafts (Method 1)

Items	Examinations
1 Drawing out of the shafts	Drawing the propeller shaft and the stern tube shaft and examining the entire shafts, seals system and bearings
2 Propeller connections -1 for keyed connections or keyless connections	Removing the propeller to expose the forward end of the taper; and performing a non-destructive examination (*NDE*)[1] by an approved surface crack-detection method all around the shaft in way of the forward portion of the taper section, including the keyway (if fitted). For shaft provided with liners the *NDE* is to be extended to the after edge of the liner.[2]
-2 for flanged connections	Whenever the coupling bolts of any type of flange-connected shaft are removed or the flange radius is made accessible in connection with overhaul, repairs or when deemed necessary by the surveyor, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method[1].
3 Clearances between the propeller shaft or the stern tube shaft and the after bearing of the stern tube	Checking and recording the bearing clearances
4 Propellers	Verification that the propeller is free of damages which may cause the propeller to be out of balance
5 Stern tube sealing systems	Verification of the satisfactory conditions of inboard and outboard seals during the re-installation of the shaft and propeller
6 Weardown of the propeller shaft or the stern tube shaft at the after bearing of the stern tube	Recording the bearing weardown measurements (after re-installation)
7 Propeller boss surfaces in contact with the propeller shaft taper	Examination of the propeller boss surfaces
8 Controllable pitch propeller connections (flanged connections only)	Examination of the pitch control gear and working parts as well as, by an efficient crack detection method, the propeller blade fixing bolts
9 Low oil level alarms of the lubricating oil or lubricating freshwater tanks, lubricating oil or lubricating freshwater temperature measuring devices, oil or freshwater lubrication lines, lubricating oil or lubricating freshwater circulation pumps, etc.	Where oil or freshwater lubricated stern tube bearings are adopted, examination of the systems for verifying whether stern tube bearings are being maintained in good working condition
10 Lubricating oil or lubricating freshwater	Where oil or freshwater lubricated stern tube bearings are adopted, the lubricating oil or lubricating freshwater record book is to be examined.

(Notes)

1 *NDE* or approved surface crack detection method generally refers to the magnetic particle method.

2 When the shaft is of keyless connection, it is to be ascertained that the pull-up length is within the upper and lower limits given in **7.3.1-1, Part D of the Rules for the Survey and Construction of Steel Ships**.

Table 2.2 Ordinary Survey of Propeller Shafts and Stern Tube Shafts (Method 2)

Items[1]	Examinations
1 Propeller connections -1 for keyed connections or keyless connections	Removing the propeller to expose the forward end of the taper; and performing a non-destructive examination (*NDE*)[2] by an approved surface crack-detection method all around the shaft in way of the forward portion of the taper section, including the keyway (if fitted).[3]
-2 for flanged connections	Whenever the coupling bolts of any type of flange-connected shaft are removed or the flange radius is made accessible in connection with overhaul, repairs or when deemed necessary by the surveyor, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method[2].
2 Weardown of the propeller shaft or the stern tube shaft at the after bearing of the stern tube	Checking and recording the bearing weardown measurements
3 Shafting systems	Visual Inspection of all accessible parts of the shafting system
4 Propellers	Verification that the propeller is free of damages which may cause the propeller to be out of balance
5 Seal liners	Seal liner found to be or placed in a satisfactory condition
6 Stern tube sealing systems	Verification of the satisfactory re-installation of the propeller including verification of satisfactory conditions of inboard and outboard seals.
7 Propeller boss surfaces in contact with the propeller shaft taper	Examination of the propeller boss surfaces
8 Controllable pitch propeller connections (flanged connections only)	Examination of the pitch control gear and working parts as well as, by an efficient crack detection method, the propeller blade fixing bolts
9 Low oil level alarms of the lubricating oil or lubricating freshwater tanks, lubricating oil or lubricating freshwater temperature measuring devices, oil or freshwater lubrication lines, lubricating oil or lubricating freshwater circulation pumps, etc.	Where oil or freshwater lubricated stern tube bearings are adopted, examination the systems for verifying whether stern tube bearings are being maintained in good working condition
10 Lubricating oil or lubrication freshwater	Where oil or freshwater lubricated stern tube bearings are adopted, the lubricating oil or lubricating freshwater record book is to be examined.

(Notes)

1 For shafts with freshwater lubricated bearings, it is recommended that an Ordinary Survey be carried out in accordance with **Table 2.1** in cases where the next survey due date will be less than 15 *years* after the date of completion of the previous Ordinary Survey carried out in accordance with **Table 2.1**.

2 *NDE* or approved surface crack detection method generally refers to the magnetic particle method.

3 When the shaft is of keyless connection, it is to be ascertained that the pull-up length is within the upper and lower limits given in **7.3.1-1, Part D of the Rules for the Survey and Construction of Steel Ships**.

Table 2.3 Ordinary Survey of Propeller Shafts and Stern Tube Shafts (Method 3)

Items [1, 2]	Examinations
1 Weardown of the propeller shaft or the stern tube shaft at the after bearing of the stern tube	Checking and recording the bearing weardown measurements
2 Shafting systems	Visual Inspection of all accessible parts of the shafting system
4 Propellers	Verification that the propeller is free of damages which may cause the propeller to be out of balance
4 Seal liners	Seal liner found to be or placed in a satisfactory condition
5 Stern tube sealing systems	Verification of the satisfactory conditions of inboard and outboard seals
6 Low oil level alarms of the lubricating oil or lubricating freshwater tanks, lubricating oil or lubricating freshwater temperature measuring devices, oil or freshwater lubrication lines, lubricating oil or lubricating freshwater circulation pumps, etc.	Where oil or freshwater lubricated stern tube bearings are adopted, examination of the systems for verifying that stern tube bearings are being maintained in good working condition
7 Lubricating oil or lubrication freshwater	Where oil or freshwater lubricated stern tube bearings are adopted, the lubricating oil or lubricating freshwater record book is to be examined.

(Notes)

1 For shafts with oil lubricated bearings having keyless or flanged connections, it is recommended that an Ordinary Survey be carried out in accordance with **Table 2.1** or **2.2** in cases where the next survey due date will be less than 15 *years* after the date of completion of the previous Ordinary Survey carried out in accordance with **Table 2.1** or **2.2**.

2 For shafts with freshwater lubricated bearings, it is recommended that an Ordinary Survey be carried out in accordance with **Table 2.1** in cases where the next survey due date will be less than 15 *years* after the date of completion of the previous Ordinary Survey carried out in accordance with **Table 2.1**.

2.4 Repairs, etc. of Stern Tube Bearings

2.4.1 Repairs, etc. due to Stern Tube After End Weardown

When the weardown at the aft end of the stern tube measured in accordance with **Table 2.1** or **2.2** exceeds the values given below, the stern tube bearing, including shaft bracket bearing, is to be replaced or repaired:

(1) Weardown for oil lubricated bearings:
0.3 *mm* as a rule, but factors such as the characteristics of the lubricating oil, the temperature fluctuation history of the lubricating oil or bearing material are to be taken into account.

(2) Weardown for freshwater lubricated bearings:
Weardown values used as references for repairs specified by the manufacturer.

EFFECTIVE DATE AND APPLICATION (Amendment 3-3)

1. The effective date of the amendments is 1 January 2016.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships other than ships the delivery of which is on or after 1 January 2016 (hereinafter, referred to as "existing ships") until the first propeller shaft and stern tube shaft survey scheduled on or after 1 January 2016.

3. Notwithstanding the provision of preceding **2.**, the amendments to the Guidance may apply to existing ships upon request by the owner.

Amendment 3-4

B1 GENERAL

B1.4 Preparation for Survey and Other Items

Paragraph B1.4.6 has been added as follows.

B1.4.6 Firms Engaged in Surveys, Measurements and Maintenance

1 The wording "firm deemed appropriate by the Society" in **1.4.6-1, Part B of the Rules** refers to firms complying with the requirements of **Chapter 2**, **3** or **8, Part 3 of the Rules for Approval of Manufacturers and Service Suppliers** and approved by the Society.

2 The wording "firm deemed appropriate by the Society" in **1.4.6-2** and **-3, Part B of the Rules** refers to any of the following: firms complying with the requirements of **Chapter 6** or **15, Part 3 of the Rules for Approval of Manufacturers and Service Suppliers** respectively and approved by the Society; firms approved by the Administration; firms approved by duly authorized organizations acting on behalf of the Administration; or firms approved by other organizations which are acceptable to the Administration.

B11 SURVEYS OF SUBMERSIBLES

B11.1 General

Paragraph B11.1.2 has been amended as follows.

B11.1.2 General Requirements on Surveys

1 Where an Intermediate Survey was carried out in advance in accordance with **11.1.2-4, Part B of the Rules**, the anniversary date is to be amended to a new date 3 *months* after the date on which the Intermediate Survey was completed. Subsequent Intermediate Surveys specified in **11.1.2-2(1)(a), Part B of the Rules** are to be carried out at intervals using the new anniversary date.

2 The wording "firm deemed appropriate by the Society" in **11.1.2-5, Part B of the Rules** refers to firms complying with the requirements of **Chapter 2**, **3** or **8, Part 3 of the Rules for Approval of Manufacturers and Service Suppliers** and approved by the Society.

3 The wording "firm deemed appropriate by the Society" in **11.1.2-6, Part B of the Rules** refers to any of the following: firms complying with the requirements of **Chapter 6, Part 3 of the Rules for Approval of Manufacturers and Service Suppliers** and approved by the Society; firms approved by the Administration; firms approved by duly authorized organizations acting on behalf of the Administration; or firms approved by other organizations which are acceptable to the Administration.

B13 SPECIAL REQUIREMENTS OF PERIODICAL SURVEYS FOR OFFSHORE STRUCTURES

B13.2 Preparation for Surveys by Inspection Company

Paragraph B13.2.2 has been amended as follows.

B13.2.2 ~~Approval of~~ Inspection Compan~~y~~ies Carrying Out Surveys, Measurements and Maintenance

1 The wording "firm deemed appropriate by the Society" in **13.2.2-1, Part B of the Rules** refers to firms complying with the requirements of **Chapter 2**, **3** or **8, Part 3 of the Rules for Approval of Manufacturers and Service Suppliers** and approved by the Society.

2 The wording "firm deemed appropriate by the Society" in **13.2.2-2, Part B of the Rules** refers to any of the following: firms complying with the requirements of **Chapter 6, Part 3 of the Rules for Approval of Manufacturers and Service Suppliers** and approved by the Society; firms approved by the Administration; firms approved by duly authorized organizations acting on behalf of the Administration; or firms approved by other organizations which are acceptable to the Administration.

~~**1 Application Procedure**~~

~~(1)~~**3** Where the inspection company wishes to use survey equipment or survey robots for the survey of offshore structures, it is to submit an application together with the documents specified in the following **(a)** to **(i)** to the Society before inspections are carried out. Inspection companies approved by the Society as a provider of in-water inspection services or thickness gauging services are to submit a copy of the relevant approval certificate.

(~~a~~1) Specifications of equipment

(~~b~~2) Structural assembly drawings of equipment

(~~c~~3) Operating instruction manuals (including the correlation between equipment and inspection areas), maintenance manuals and calibration manuals of equipment

(~~d~~4) Outline of the company

(~~e~~5) Organisation and management system of the group implementing the inspection

(~~f~~6) Guidance for inspection services (including work system, work procedures, measures for safety and security, operating and inspection procedures for equipment)

(~~g~~7) Qualifications of divers, thickness gauging engineers, non-destructive testing engineers, and skilled operators such as welding operators

(~~h~~8) Education programs for skilled operators

(~~i~~9) Formats of inspection records

~~(2) For inspection equipment and inspection companies which have been already approved by other classification societies, one copy of the certification issued by that society is to be submitted to the Society.~~

~~**2 Approval tests**~~

~~(1) Demonstration tests using actual offshore structures are to be carried out in the presence of the Surveyor in order to verify the functions described in the data attached to the application.~~

~~(2) Inspection companies already approved by the Society or other classification societies to conduct in-water surveys and thickness measurements may not be required to take all the approval tests.~~

~~**3 Approval**~~

~~If after document screening, workplace examination, and approval test, the application is successful, the Society will issue a notice and certificate stipulating that the equipment~~

~~specified in the application is approved for use and the inspection company is approved to conduct inspections.~~

~~**4 Validity of the certificate and its renewal**~~

~~(1) The validity of the certificate is three *years* from the date approved.~~

~~(2) To renew the certificate, the applicant is to submit to the Society one copy of the application, the current certificate, records representative of the inspections conducted while the approval was valid, and media such as video tapes showing the inspection procedures. If by inspecting the record books and video tapes, and conducting simple tests on board the offshore structures, the Society is satisfied that there have been no changes made to the content described in the approved documents, the approval certificates are renewed.~~

~~**5 Withdrawal of approval**~~

~~Under any of the following conditions, the Society may withdraw the approval of the company depending on the situation.~~

~~(1) When significant changes are made to the contents of approval~~

~~(2) When application for renewal is neglected~~

~~(3) When application for withdraw is received~~

~~(4) When anything considered by the Society to indicate that continuation of approval is deemed inadequate occurs~~

~~**6 Post-approval procedures**~~

~~(1) Any changes to the content described in the approved documents (e.g. the implementing organisation, management system, equipment used, or skilled operators of the inspection company) are to be reported to the Society.~~

~~(2) Upon inspection of the content of the changes, re-examinations or re-tests may be required when deemed necessary by the Society.~~

EFFECTIVE DATE AND APPLICATION (Amendment 3-4)

1. The effective date of the amendments is 1 January 2016.

2. Notwithstanding the amendments to the Guidance, the current requirements may apply to manufacturing works and service suppliers approved by the Society before 1 January 2016 until 31 December 2018 or the expiry date of their certificate, whichever comes first.

Amendment 3-5

B2 CLASSIFICATION SURVEYS

B2.1 Classification Survey during Construction

Paragraph B2.1.5 has been amended as follows.

B2.1.5 Hydrostatic Tests, Watertight Tests, and Relevant Tests

1 The tests referred to as "tests deemed appropriate by the Society" in **2.1.5(1), Part B of the Rules** of the Rules are as follows:

(1) The tests stipulated in *SOLAS Chapter II-1 Regulation 11*, except where specially approved by the Administration; and

(2) The tests stipulated in **Annex B2.1.5-1 "Testing Procedures of Watertight Compartments"**.

~~**1** The requirements referred to as "the requirements stipulated otherwise by the Society" in **2.1.5(3), Part B of the Rules** of the Rules are as follows.~~

~~Hydrostatic and watertight tests of cargo tanks for ships carrying dangerous chemicals in bulk are to be carried out according to the requirements specified by **(1)** to **(3)** below, depending on tank types defined in **4.1, Part S of the Rules** and the characteristics of the cargoes.~~

~~(1) For gravity tanks that are to be loaded with cargoes having a cargo density not exceeding 1.0, tests are to be carried out in accordance with **2.1.5, Part B of the Rules**.~~

~~(2) For gravity tanks that are to be loaded with cargoes having a cargo density exceeding 1.0, a hydrostatic test is to be carried out with a head of water to the height obtained from the following formula above the top of the tank (For integral tanks: above the deck at side forming the crown of the tank.).~~

~~$\frac{H}{2}(\gamma - 1) + 2.45$ (*m*)~~

~~*H*: Vertical distance measured from the lower edge of the bulkhead plate of the tank to the top of the tank (*m*). For integral tanks, the vertical distance measured from the lower edge of the bulkhead plate of the tank to above the deck at side forming the crown of the tank, may be used.~~

~~γ: Density of cargoes loaded in the tank.~~

~~Where *L* exceeds 150 *m*, or *H* is exceptionally large in comparison with *L*, the manner of the hydrostatic test is to be considered by the Society.~~

~~(3) For pressure tanks, these tests are to be carried out in accordance with **4.10, Part N of the Rules**. In applying **4.10, Part N of the Rules**, "design vapour pressure" is to be read as "design pressure."~~

~~**2** The standard procedures of hydrostatic tests, watertight tests, and other relevant tests required in **2.1.5(1), Part B of the Rules** are as specified in **(1)** through **(3)** below.~~

~~(1) Hydrostatic tests may be carried out after application of the shop primer. However, the tests may be carried out after the protective coating has been applied, provided that the following two conditions are satisfied:~~

~~(a) All welds are completed and carefully examined visually to the satisfaction of the Surveyor prior to the application of the protective coating.~~

~~(b) An airtight test is carried out prior to the application of the protective coating.~~

~~(2) An airtight test is to be carried out in accordance with **(a)** through **(f)** below:~~

~~(a) An air pressure of 0.015 *MPa* is to be applied during the test.~~

~~(b) Prior to examination, air pressure in the tank is to be raised to 0.02 *MPa* and kept at this~~

~~level for about 1 hour to reach a stabilized state and then lowered to the test pressure. The test may be conducted without lowering the pressure, provided the Society is satisfied of the safety of the personnel involved in the test.~~

~~(c) Welds are to be coated with an efficient indicating liquid.~~

~~(d) A U-tube filled with water up to a height corresponding to the test pressure is to be fitted to verify the test pressure. The U-tube is to have a cross-section larger than that of the pipe supplying the air. In addition, the test pressure is also verified by means of one master pressure gauge or other equivalent means.~~

~~(e) The Airtight test is to be carried out prior to the application of a protective coating, on all fillet welds, penetration welds and erection welds on tank boundaries. Regarding other welds on tank boundaries, an airtight test after coating is acceptable, provided that visual inspection on the welds was carefully done before coating to the satisfaction of the Surveyor.~~

~~However, airtight tests before coating may also be required on selected locations of pre-erection manual or automatic welds, at the discretion of the Surveyor, taking account of the quality control operations in the shipyard.~~

~~(f) Any other recognized method may be accepted when deemed so by the Surveyor.~~

~~(3) Hose tests are to be carried out with a pressure in the hose of not less than 0.2 *MPa* at a maximum distance of 1.5 *m*. The nozzle diameter is not to be less than 12 *mm*.~~

~~**3** With respect to the provisions of **2.1.5(1), Part B of the Rules**, the watertightness of watertight doors (including other watertight closing appliances of internal openings required to be watertight for ships subject to the requirements of **Chapter 4, Part C of the Rules**) is to be confirmed by hose tests specified in **-2(3)** above, unless hydrostatic tests were carried out with the head of water specified in **13.3.3-1, Part C** or **13.3.3-1, Part CS of the Rules** after installation in the ship. The hose tests are to be carried out from each side of the doors unless exposure to floodwater is anticipated only from one side. Where a hose test is not practicable because of possible damage to installations around the door, it may be replaced by means deemed appropriate by the Society.~~

~~4~~2 With respect to the provisions of **2.1.5(~~3~~2), Part B of the Rules**, the inert gas supply piping system, after installation, is to be subjected to an airtight test to at least 1.25 times the maximum working pressure of system. However, in cases where pressure relief valves are provided for the system, the airtight test pressure is to be not less than the setting pressure of pressure relief valve.

B2.5 Alterations

B2.5.1 Examination of Altered Parts

Sub-paragraph -5 has been added as follows.

5 In applying the requirements specified in **2.5.1, Part B of the Rules**, the tightness of such boundaries are to be verified by the tests stipulated in **Annex B2.1.5-1 "Testing Procedures of Watertight Compartments"** in cases where any modifications or repairs have been carried out which affects the tightness of the watertight boundary.

Annex B2.1.5-1 has been added as follows.

Annex B2.1.5-1 TESTING PROCEDURES OF WATERTIGHT COMPARTMENTS

1.1 General

The test procedures specified in this Annex are to confirm the watertightness of tanks and watertight boundaries as well as the structural adequacy of tanks which make up the watertight subdivisions of ships. These procedures may also be applied to verify the weathertightness of structures and shipboard outfitting. The tightness of all tanks and watertight boundaries of ships being newly constructed and ships undergoing major conversions or major repairs is to be confirmed by these test procedures prior to the delivery of the ship. “Major repairs” refers to repairs affecting the tightness of watertight boundaries.

1.2 Application

1.2.1 Application

1 All gravity tanks and other boundaries required to be watertight or weathertight are to be tested in accordance with this Procedure and proven to be tight and structurally adequate as follows. “Gravity tanks” refers to a tank that is subject to vapour pressure not greater than 0.07*MPa*.

(1) Gravity Tanks for their tightness and structural adequacy

(2) Watertight Boundaries Other Than Tank Boundaries for their watertightness

(3) Weathertight Boundaries for their weathertightness

2 The testing of structures not listed in **Table 1** or **Table 2** is to be specially considered.

1.3 Test types and Definitions

1.3.1 Tests

1 The following two types of tests are specified in this requirement:

(1) Structural Test

A test to verify the structural adequacy of tank construction. This may be a hydrostatic test or, where the situation warrants, a hydropneumatic test.

(2) Leak Test

A test to verify the tightness of a boundary. Unless a specific test is indicated, this may be a hydrostatic/hydropneumatic test or an air test. A hose test may be considered an acceptable form of leak test for certain boundaries, as indicated by **Table 1, Footnote 3**.

2 The definition of each test type is as follows:

Hydrostatic Test: (Leak and Structural)	A test wherein a space is filled with a liquid to a specified head.
Hydropneumatic Test: (Leak and Structural)	A test combining a hydrostatic test and an air test, wherein a space is partially filled with a liquid and pressurized with air.
Hose Test: (Leak)	A test to verify the tightness of a joint by a jet of water with the joint visible from the opposite side.

Air Test: (Leak)	A test to verify tightness by means of air pressure differential and leak indicating solution. It includes tank air test and joint air tests, such as compressed air fillet weld tests and vacuum box tests.
Compressed Air Fillet Weld Test: (Leak)	An air test of fillet welded tee joints wherein leak indicating solution is applied on fillet welds.
Vacuum Box Test: (Leak)	A box over a joint with leak indicating solution applied on the welds. A vacuum is created inside the box to detect any leaks.
Ultrasonic Test: (Leak)	A test to verify the tightness of the sealing of closing devices such as hatch covers by means of ultrasonic detection techniques.
Penetration Test: (Leak)	A test to verify that no visual dye penetrant indications of potential continuous leakages exist in the boundaries of a compartment by means of low surface tension liquids (i.e. dye penetrant test).

1.4 Test Procedures

1.4.1 General

Tests are to be carried out in the presence of a Surveyor at a stage sufficiently close to the completion of work with all hatches, doors, windows, etc. installed and all penetrations including pipe connections fitted, and before any ceiling and cement work is applied over the joints. Specific test requirements are given in **1.4.4** and **Table 1**. For the timing of the application of coating and the provision of safe access to joints, see **1.4.5**, **1.4.6** and **Table 3**.

1.4.2 Structural Test Procedures

1 Type and time of test

Where a structural test is specified in **Table 1** or **Table 2**, a hydrostatic test in accordance with **1.4.4-1** will be acceptable. Where practical limitations (strength of building berth, light density of liquid, etc.) prevent the performance of a hydrostatic test, a hydropneumatic test in accordance with **1.4.4-2** may be accepted instead.

A hydrostatic test or hydropneumatic test for the confirmation of structural adequacy may be carried out while the ship is afloat, provided the results of a leak test are confirmed to be satisfactory before the ship is afloat.

2 Testing schedule for new construction or major structural conversion is as follows.

(1) The tank boundaries are to be tested from at least one side. The tanks for structural test are to be selected so that all representative structural members are tested for the expected tension and compression.

(2) Structural tests are to be carried out for at least one tank of a group of tanks having structural similarity (i.e. same design conditions, alike structural configurations with only minor localised differences determined to be acceptable by the attending Surveyor) on each vessel provided all other tanks are tested for leaks by an air test. The acceptance of leak testing using an air test instead of a structural test does not apply to cargo space boundaries adjacent to other compartments in tankers and combination carriers or to the boundaries of tanks for segregated cargoes or pollutant cargoes in other types of ships.

(3) Additional tanks may require structural testing if found necessary after the structural testing of the first tank.

(4) Where the structural adequacy of the tanks of a vessel were verified by the structural testing required in Table 1, subsequent vessels in the series (i.e. sister ships built from the same plans at the same shipyard) may be exempted from structural testing of tanks, provided that:

(a) Water-tightness of boundaries of all tanks is verified by leak tests and thorough inspections are carried out.

(b) Structural testing is carried out for at least one tank of each type among all tanks of each sister vessel.

(c) Additional tanks may require structural testing if found necessary after the structural testing of the first tank or if deemed necessary by the attending Surveyor.

For cargo space boundaries adjacent to other compartments in tankers and combination carriers or boundaries of tanks for segregated cargoes or pollutant cargoes in other types of ships, the provisions of **(2)** above shall apply in lieu of preceding **(b)**.

(5) Sister ships built (i.e. keel laid) two years or more after the delivery of the last ship of the series, may be tested in accordance with **(4)** above at the discretion of the Society, provided that:

(a) general workmanship has been maintained (i.e. there has been no discontinuity of shipbuilding or significant changes in the construction methodology or technology at the yard, shipyard personnel are appropriately qualified and demonstrate an adequate level of workmanship as determined by the Society) and:

(b) an enhanced NDT programme is implemented for the tanks not subject to structural tests.

(6) For the watertight boundaries of spaces other than tanks structural testing may be exempted, provided that the water-tightness of boundaries of exempted spaces is verified by leak tests and inspections. Structural testing may not be exempt and the requirements for structural testing of tanks in **(1)** to **(5)** above shall apply, for ballast holds, chain lockers and a representative cargo hold if intended for in-port ballasting.

1.4.3 Leak Test Procedures

1 For the leak tests specified in **Table 1**, tank air tests, compressed air fillet weld tests, vacuum box tests in accordance with **1.4.4-4** through **1.4.4-6**, or their combination, will be acceptable. Hydrostatic or hydropneumatic tests may also be accepted as leak tests provided that **1.4.5**, **1.4.6** and **1.4.7** are complied with. Hose tests will also be acceptable for such locations as specified in **Table 1**, **Footnote 3**, in accordance with **1.4.4-3**.

2 Air tests of joints may be carried out in the block stage provided that all work on the block that may affect the tightness of a joint is completed before the test. See also **1.4.5-1** for the application of final coatings and **1.4.6** for the safe access to joints and the summary in **Table 3**.

1.4.4 Test Methods

1 Hydrostatic test

Unless another liquid is approved, hydrostatic tests are to consist of filling the space with fresh water or sea water, whichever is appropriate for testing, to the level specified in **Table 1** or **Table 2**.

In cases where a tank for higher density cargoes is to be tested with fresh water or sea water, the testing pressure height is to be specially considered.

All external surfaces of the tested space are to be examined for structural distortion, bulging and buckling, other related damage and leaks.

2 Hydropneumatic test

Hydropneumatic tests, where approved, are to be such that the test condition, in conjunction with the approved liquid level and supplemental air pressure, will simulate the actual loading as far as practicable. The requirements and recommendations for tank air tests in **-4** will also apply to hydropneumatic tests.

All external surfaces of the tested space are to be examined for structural distortion, bulging and buckling, other related damage and leaks.

3 Hose test

Hose tests are to be carried out with the pressure in the hose nozzle maintained at least at 0.2 *MPa* during the test. The nozzle is to have a minimum inside diameter of 12 *mm* and be at a perpendicular distance from the joint not exceeding 1.5 *m*. The water jet is to impinge directly upon the weld.

Where a hose test is not practical because of possible damage to machinery, electrical equipment insulation or outfitting items, it may be replaced by a careful visual examination of welded connections, supported where necessary by means such as a dye penetrant test or ultrasonic leak test or the equivalent.

4 Tank air test

All boundary welds, erection joints and penetrations, including pipe connections, are to be examined in accordance with approved procedure and under a stabilized pressure differential above atmospheric pressure not less than 0.015 *MPa*, with a leak indicating solution such as soapy water/detergent or a proprietary brand applied.

A U-tube with a height sufficient to hold a head of water corresponding to the required test pressure is to be arranged. The cross sectional area of the U-tube is not to be less than that of the pipe supplying air to the tank. Instead of using a U-tube, two calibrated pressure gauges may be acceptable to verify required test pressure.

A double inspection is to be made of tested welds. The first is to be immediately upon applying the leak indication solution; the second is to be after approximately four or five minutes in order to detect those smaller leaks which may take time to appear.

5 Compressed air fillet weld test

In this air test, compressed air is injected from one end of a fillet welded joint and the pressure verified at the other end of the joint by a pressure gauge. Pressure gauges are to be arranged so that an air pressure of at least 0.015 *MPa* can be verified at each end of all passages within the portion being tested.

Note: Where a leak test is required for fabrication involving partial penetration welds, a compressed air test is also to be applied in the same manner as to fillet weld where the root face is large.

6 Vacuum box test

A box (vacuum testing box) with air connections, gauges and an inspection window is placed over the joint with a leak indicating solution applied to the weld cap vicinity. The air within the box is removed by an ejector to create a vacuum of 0.020 – 0.026 *MPa* inside the box.

7 Ultrasonic test

An ultrasonic echo transmitter is to be arranged inside of a compartment and a receiver is to be arranged on the outside. The watertight/weathertight boundaries of the compartment are scanned with the receiver in order to detect an ultrasonic leak indication. A location where sound is detectable by the receiver indicates a leakage in the sealing of the compartment.

8 Penetration test

A test of butt welds or other weld joints uses the application of a low surface tension liquid at one side of a compartment boundary or structural arrangement. If no liquid is detected on the opposite sides of the boundaries after the expiration of a defined period of time, this indicates tightness of the boundaries. In certain cases, a developer solution may be painted or sprayed on the other side of the weld to aid leak detection.

9 Other test

Other methods of testing may be considered by the Society upon submission of full particulars prior to the commencement of testing.

1.4.5 Applocation of Coating

1 Final coating

For butt joints welded by an automatic process, the final coating may be applied any time before the completion of a leak test of spaces bounded by the joints, provided that the welds have been carefully inspected visually to the satisfaction of the Surveyor.

Surveyors reserve the right to require a leak test prior to the application of final coating over

automatic erection butt welds.

For all other joints, the final coating is to be applied after the completion of the leak test of the joint. See also **Table 3**.

2 Temporary coating

Any temporary coating which may conceal defects or leaks is to be applied at the time as specified for the final coating (see **-1** above). This requirement does not apply to shop primer.

1.4.6 Safe Access to Joints

For leak tests, safe access to all joints under examination is to be provided. See also **Table 3**.

1.4.7 Hydrostatic or Hydropneumatic Tightness Test

In cases where the hydrostatic or hydropneumatic tests are applied instead of a specific leak test, examined boundaries must be dew-free, otherwise small leaks are not visible.

Table 1 Test Requirements for Tanks and Boundaries

	Tank or boundary to be tested	Test type	Test head or pressure	Remarks
1	Double bottom tanks[*4]	Leak and structural[*1]	The greater of - top of the overflow, - to 2.4 *m* above top of tank[*2], or - to bulkhead deck	
2	Double bottom voids[*5]	Leak	See **1.4.4-4** through **-6**, as applicable	including pump room double bottom and bunker tank protection double hull required by **Part 3 of the Rules for Marine Pollution Prevention Systems**
3	Double side tanks	Leak and structural[*1]	The greater of - top of the overflow, - to 2.4 *m* above top of tank[*2], or - to bulkhead deck	
4	Double side voids	Leak	See **1.4.4-4** through **-6**, as applicable	
5	Deep tanks other than those listed elsewhere in this table	Leak and structural[*1]	The greater of - top of the overflow, or - to 2.4 *m* above top of tank[*2]	
6	Cargo oil tanks	Leak and structural[*1]	The greater of - top of the overflow, - to 2.4 *m* above top of tank[*2], or - to top of tank[*2] plus setting of any pressure relief valve	
7	Ballast hold of bulk carriers	Leak and structural[*1]	Top of cargo hatch coaming	
8	Peak tanks	Leak and structural[*1]	The greater of - top of the overflow, or - to 2.4 *m* above top of tank[*2]	After peak to be tested after installation of stern tube
9	.1 Fore peak spaces with equipment	Leak	See **1.4.4-3** through **-6**, as applicable	
	.2 Fore peak voids	Leak and structural[*1,9]	To bulkhead deck	
	.3 Aft peak spaces with equipment	Leak	See **1.4.4-3** through **-6**, as applicable	

	.4 Aft peak voids	Leak	See **1.4.4-4** through **-6**, as applicable	After peak to be tested after installation of stern tube
10	Cofferdams	Leak	See **1.4.4-4** through **-6**, as applicable	
11	.1 Watertight bulkheads	Leak[*8]	See **1.4.4-3** through **-6**, as applicable [*7]	
	.2 Superstructure end bulkheads	Leak	See **1.4.4-3** through **-6**, as applicable	
12	Watertight doors below freeboard or bulkhead deck	Leak[*6,7]	See **1.4.4-3** through **-6**, as applicable	
13	Double plate rudder blades	Leak	See **1.4.4-4** through **-6**, as applicable	
14	Shaft tunnels clear of deep tanks	Leak[*3]	See **1.4.4-3** through **-6**, as applicable	
15	Shell plating	Leak[*3]	See **1.4.4-3** through **-6**, as applicable	For shell plating of the areas listed in item 1 through item 10, refer to the corresponding item
16	Shell doors	Leak[*3]	See **1.4.4-3** through **-6**, as applicable	
17	Weathertight hatch covers and closing appliances	Leak[*3.7]	See **1.4.4-3** through **-6**, as applicable	Hatch covers closed by tarpaulins and battens excluded
18	Dual purpose tanks/dry cargo hatch covers	Leak[*3,7]	See **1.4.4-3** through **-6**, as applicable	In addition to structural test in item 6 or 7
19	Chain lockers	Leak and structural[*1]	Top of chain pipe	
20	L.O. sump. tanks and other similar tanks/spaces under main engines	Leak	See **1.4.4-3** through **-6**, as applicable	
21	Ballast ducts	Leak and structural[*1]	The greater of - ballast pump maximum pressure, or - setting of any pressure relief valve	
22	Fuel Oil Tanks	Leak and structural[*1]	The greater of - top of the overflow, - to 2.4 *m* above top of tank[*2], or - to top of tank[*2] plus setting of any pressure relief valves, or - to bulkhead deck	

Notes:

1 Refer to section **1.4.2-2**

2 The top of a tank is the deck forming the top of the tank, excluding any hatchways.

3 Hose Test may also be considered as a medium of the test. See **1.3.1-2**.

4 Including tanks arranged in accordance with the provisions of **6.1.1-3, Part C of the Rules**.

5 Including duct keels and dry compartments arranged in accordance with the provisions of **6.1.1-3, Part C of the Rules**, and/or oil fuel tank protection and pump room bottom protection arranged in accordance with the provisions of **1.2.3** and **3.2.5, Part 3 of the Rules for Marine Pollution Prevention Systems** respectively.

6 Where water tightness of a watertight door has not been confirmed by prototype test, testing by filling watertight spaces with water is to be carried out. See **13.3.3-1, Part C of the Rules**.

7 As an alternative to the hose testing, other testing methods listed in **1.4.4-7** through **-9** may be applicable subject to adequacy of such testing methods being verified. For watertight bulkheads (item 11.1) alternatives to the hose testing may only be used where a hose test is not practicable.

8 A "Leak and structural test", see **1.4.2-2** is to be carried out for a representative cargo hold if intended for in-port ballasting. The filling level requirement for testing cargo holds intended for in-port ballasting is to be the maximum

loading that will occur in-port as indicated in the loading manual.

9 Structural test may be waived where demonstrated to be impracticable to the satisfaction of the Society.

10 Tests of piping systems in each part of the ship are to be carried out as specified in **12.6, 13.17**, and **14.6, Part D of the Rules**.

Table 2 Additional Test Requirements for Special Service Ships/Tanks

	Type of Ship/Tank	Structures to be tested	Type of Test	Test Head or Pressure	Remarks
1	Liquefied gas carriers	Integral tanks	Leak and structural	Refer to **Part N of the Rules**	
		Hull structure supporting membrane or semi-membrane tanks			
		Independent tanks type A			
		Independent tanks type B			
		Independent tanks type C			
2	Edible liquid tanks	Independent tanks	Leak and structural	The greater of - top of the overflow, or - to 0.9 *m* above top of tank[*1]	
3	Chemical carriers	Integral or independent cargo tanks	Leak and structural[*3]	The greater of - to 2.4 *m* above top of tank[*1], or - to top of tank1 plus setting of any pressure relief valve	Where a cargo tank is designed for the carriage of cargoes with specific gravities larger than 1.0, an appropriate additional head is to be considered[*2]

Notes:

1 Top of tank is deck forming the top of the tank excluding any hatchways.

2 For gravity tanks that are to be loaded with cargoes having a cargo density exceeding 1.0, a hydrostatic test is to be carried out with a head of water to the height obtained from the following formula above the top of the tank.

$\frac{H}{2}(\gamma - 1) + 2.4$ *(m)*

H : Vertical distance measured from the lower edge of the bulkhead plate of the tank to the top of the tank (*m*)

γ : Density of cargoes loaded in the tank.

Where L exceeds 150 *m*, or H is exceptionally large in comparison with L, the manner of the hydrostatic test is to be considered by the Society.

3 For pressure tanks, these tests are to be carried out in accordance with **4.23.6, Part N of the Rules**. In applying **4.23.6, Part N of the Rules**, "design vapour pressure" is to be read as "design pressure."

Table 3 Application of Leak Test, Coating and Provision of Safe Access For Type of Welded Joints

Type of welded joints		Leak test	Coating[*1]		Safe Access[*2]	
			Before leak test	After leak test but before structural test	Leak test	Structural test
Butt	Automatic	Not required	Allowed[*3]	*N/A*	Not required	Not required
	Manual or Semi-automatic[*4]	Required	Not allowed	Allowed	Required	Not required
Fillet	Boundary including penetrations	Required	Not allowed	Allowed	Required	Not required

Notes:

1 Coating refers to internal (tank/hold coating), where applied, and external (shell/deck) painting. It does not refer to shop primer.

2 Temporary means of access for verification of the leak test.

3 The condition applies provided that the welds have been carefully inspected visually to the satisfaction of the Surveyor.

4 Flux Core Arc Welding (FCAW) semiautomatic butt welds need not be tested provided that careful visual inspections show continuous uniform weld profile shape, free from repairs, and the results of NDE testing show no significant defects.

EFFECTIVE DATE AND APPLICATION (Amendment 3-5)

1. The effective date of the amendments is 1 January 2016.

2. Notwithstanding the amendments to the Guidance, the current requirements may apply to ships for which the date of contract for construction* is before the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.

Amendment 3-6

B5 SPECIAL SURVEYS

B5.2 Special Surveys for Hull, Equipment, Fire extinction and Fittings

B5.2.5 Close-up Surveys

Sub-paragraph -4 has been added as follows.

4 Close-up surveys are to be carried out for the accessible parts of cargo hold hatch covers whose internals are impossible to structurally access.

B5.2.6 Thickness Measurements

Sub-paragraph -7 has been added as follows.

7 Thickness measurements are to be carried out for the accessible parts of cargo hold hatch covers whose internals are impossible to structurally access.

B5.2.7 Pressure Tests

Sub-paragraph -4(1) has been amended as follows.

4 With respect to the pressure tests for the cargo tanks of tankers and ships carrying dangerous chemicals in bulk, when pressure tests are conducted in the presence of the Master or any other representative personnel of the ship, such pressure tests may be regarded as the pressure tests required for Special Surveys at the discretion of the Surveyor provided the following **(1)** to **(5)** conditions are complied with:

(1) The procedure (including information such as fill heights, the tanks being filled and the bulkheads being tested) for the pressure test has been submitted by the owner and reviewed by the Society prior to the pressure test being carried out.
(2) There is no record of leakage, distortion or substantial corrosion that would affect the structural integrity of the tank.
(3) The pressure test has been satisfactorily carried out within special survey window not more than 3 months prior to the date of the survey on which the internal examination or close-up survey is completed.
(4) The satisfactory results of the pressure test are recorded in the ship's logbook.
(5) The internal and external condition of the tanks and associated structure are found satisfactory by the Surveyor at the time of the internal examination and close-up survey.

B12 SURVEYS FOR MOBILE OFFSHORE DRILLING UNITS AND SPECIAL PURPOSE BARGES

B12.2 Classification Survey during Construction

B12.2.7 Classification Survey of Units not Built Under Survey

Sub-paragraph -2 has been amended as follows.

2 "Where deemed necessary by the Society" stipulated in **12.2.7-4, Part B of the Rules** refers to situations where the difference between the light ship displacement obtained from the lightweight survey specified in **12.5.2-~~5~~4(3), Part B of the Rules** and the light ship displacement obtained from a stability experiment is found to be greater than 1% of the displacement of the unit in full load condition. This excludes units constructed before 1 May, 1991.

B12.3 Annual Surveys

B12.3.2 Annual Surveys for Hull, Equipment, Fire Extinguishing Systems, and Fittings

Sub-paragraphs -2 and -3 have been amended as follows.

2 For mooring systems specified in **12.3.2-2(~~1~~3)(j), Part B of the Rules** the following examinations are to be carried out.

(1) Chain cable
   (a) Thorough examination of chain cables as far as accessible
   Special attention is to be paid to the chain stopper and chain cables contacting pockets.
   (b) Diameter measurement of chain links that are substantially corroded or whose mean diameters measured at the last Special Survey are less than 96% of the original
   In addition, non-destructive tests, and measurement of the length of 3 links or 5 links and the bending angle of chain links are to be carried out as far as practicable.
   Where the results come under the provisions of **B12.5.2-~~2~~4**, such chain links are to be discarded, and connecting shackles inserted or replaced by new chain links.

(2) Wire ropes
   Visual inspection as far as accessible
   Particular attention needs to be paid to the parts that have become flat, where individual wires are broken, and are worm or corroded.

(3) Windlass, fairleads and winches
   General inspection of pockets, gears and drums of windlasses, fairleads and winches as far as practicable

3 Surveys stipulated in **12.3.2-2(~~2~~3)(k), Part B of the Rules** are to be in accordance with the following:

(1) The general condition, including the painting condition, of the drilling derricks is to be examined as far as accessible.
(2) Bolt tightness is to be examined as far as accessible.
(3) It is to be confirmed that escape routes are maintained in a safe condition and clear of obstacles.

(4) In cases where welded connections are repaired, repaired parts of welds are to be subject to non-destructive tests.

B12.4 Intermediate Surveys

B12.4.2 Intermediate Surveys for Hull, Equipment, Fire Extinguishing Systems, and Fittings

Sub-paragraph -3 has been added as follows.

1 Where survey items for the Intermediate Survey are carried out at the time of the Docking Survey, they may be dispensed with.
2 The performance test of the closing appliances specified in **12.4.2-2(2), Part B of the Rules** may be dispensed with if the closing appliances are in satisfactory condition.
3 The term "preload tank" in **12.4.2-3, Part B of the Rules** refers to a tank within the hull of a self-elevating unit which is periodically filled with salt water ballast and used to preload the footings of the unit prior to commencing drilling operations.

B12.5 Special Surveys

Paragraph B12.5.2 has been amended as follows.

B12.5.2 Special Surveys for Hull, Equipment, Fire Extinguishing Systems, and Fittings

1 The wording "deemed appropriate by the Society" in **12.5.2-2(1)(b), Part B of the Rules** refers to cases where close-up inspections and thickness measurements are required to sufficiently confirm the actual average condition of the structure.
2 Internal examination and testing of void spaces, compartments filled with foam or corrosion inhibitors, and tanks used only for lubrication oil, light fuel oil, diesel oil, fresh water, drinking water or other non-corrosive products may be waived, provided that the Surveyor considers their condition to be satisfactory upon general examination.
~~1~~3 The points on the hull structure where the thickness measurements are taken are to be determined in advance so that the same points are measured at each Special Survey.
~~2~~4 For mooring systems specified in **12.5.2-2(~~4~~6), Part B of the Rules** the following examinations are to be carried out.
((1) to (7) are omitted.)
~~3~~5 The surveys of units while afloat specified in **12.5.2-~~4~~3**, **-~~5~~4** and **-~~6~~5, Part B of the Rules,** only applies to units approved to have the In-water Survey in lieu of the Docking Survey Moreover, the surveys required by Special Surveys or equivalent thereto are to be carried out at the appropriate times before the next Docking Survey and the record of the surveys reported to the Surveyor.
~~4~~6 The result of the lightweight survey specified in **12.5.2-~~5~~4(3), Part B of the Rules** is to be recorded in the Classification Survey Report. However, for units constructed before 1st May, 1991, the lightweight survey may be dispensed with.
~~5~~7 In cases where welded connections are repaired, repaired parts of welds are to be subject to non-destructive tests.

B12.6 Docking Surveys

B12.6.1 General

Sub-paragraph -1 has been amended as follows.

1 Where a Docking Survey is replaced by an in-water survey, the plans and documents specified in **12.2.2-1(1)(l), Part B of the Rules**, which include following information, are to be submitted to the Society for approval. In addition, said plans and documents are to be made available on board.
(1) Areas to be surveyed;
(2) Extent of underwater cleaning;
(3) Non-destructive testing locations (including NDT methods);
(4) Nomenclature; and
(5) Forms for the recording of any damage or deterioration found.
(-2 to -5 are omitted.)

Paragraph B12.6.2 has been amended as follows.

B12.6.2 Docking Survey

1 Where an internal inspection of the ballast compartments is conducted at the Intermediate Survey, internal inspection of these parts may be dispensed with at the Dock Survey considering the results and date of completion of these surveys.
2 In cases where a docking survey is replaced by an in-water survey, the following requirements are to be complied with:
(1) In-water or internal thickness measurements of suspect areas may be required in conjunction with the in-water survey. In addition, in-water non-destructive testing may also be required for fracture detection.
(2) In-water surveys are to be carried out under the condition that the in-water visibility and the cleanliness of the hull below the waterline is clear enough to permit a meaningful examination which allows the Surveyor and the diver or ROV pilot to determine the condition of the plating, appendages and the welding.

EFFECTIVE DATE AND APPLICATION (Amendment 3-6)

1. The effective date of the amendments is 1 January 2016.
2. Notwithstanding the amendments to the Guidance, the current requirements may apply to the surveys for which the application is submitted to the Society before the effective date.