19-380

RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part B Class Surveys

Rules for the Survey and Construction of Steel Ships
Part B 2019 AMENDMENT NO.1
Guidance for the Survey and Construction of Steel Ships
Part B 2019 AMENDMENT NO.1

Rule No.39 / Notice No.26 14 June 2019
Resolved by Technical Committee on 1 August 2018 / 30 January 2019

ClassNK
NIPPON KAIJI KYOKAI

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

RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part B Class Surveys

2019 AMENDMENT NO.1

Rule No.39 14 June 2019

Resolved by Technical Committee on 1 August 2018 / 30 January 2019

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

Rule No.39 14 June 2019
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 1-1

Chapter 1 GENERAL

1.1 Surveys

1.1.3 Intervals of Class Maintenance Surveys*

Sub-paragraph -1(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
(a) ~~Ordinary~~ Surveys of propeller shafts and stern tube shafts are to be carried out as specified in the following **(~~a~~i)** to **(~~h~~iii)** corresponding to the kind of shaft, etc.~~:~~ unless alternative means are provided to assure the condition of the propeller shaft assembly.
(~~a~~i) Ordinary Surveys of ~~P~~propeller shafts Kind 1 or stern tube shafts Kind 1 (hereinafter referred to as "shafts Kind 1" in this ~~chapter~~ Part) are to be carried out within 5 *years* from the date of completion (i.e. the survey due date) 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~~ii) Ordinary Surveys of ~~P~~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~~**1)** and ~~ii~~**2)**.

~~i~~1) Concurrently with Special Surveys; and

~~ii~~2) Within 36 *months* from the date of completion (i.e. the survey due date) 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)**.~~

~~(c) 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 iii) For keyless connection shafts lubricated with water lubricated bearings, the maximum interval between 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.~~

(b) For oil lubricated or freshwater lubricated shafts Kind 1, the Partial Surveys specified in **8.1.2** can be carried out instead of the Ordinary Surveys specified in **8.1.1**. The survey interval of the Ordinary Surveys specified in **8.1.1** is, however, not to exceed the limits specified separately by the Society.

(c) For the surveys referred to in **i)** and **ii)** of **(a)** as well as in **(b)** above completed within 3 *months* before the survey due date, the next period will start from the survey due date.

(d) Surveys of the propeller shafts and stern tube shafts of ships affixed with the notation "*PSCM*" or "*PSCM・A*" are to be carried out as specified in **8.1.3**.

(~~h~~e) Regardless of **(a)** to **(~~g~~d)** above, ~~Ordinary~~ ~~S~~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.

1.3 Definitions

Paragraph 1.3.1 has been amended as follows.

1.3.1 Terms*

The definitions of terms which appear in this Part are as specified in the following. Terms not defined here are as defined in other parts of the Rules.

((1) to (24) are omitted.)

(25) The terminology used in the application of propeller shaft and stern tube shaft surveys is as specified in the following **(a)** to **(~~h~~p)**:

(a) "Shafts" mean propeller shafts as specified in the following **(b)** and stern tube shafts as specified in the following **(c)**, but exclude the intermediate shaft(s) which is(are) considered part of the propulsion shafting inside the vessel.

(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.

(i) "Service records" are regularly recorded data showing in-service conditions of the shaft(s) and include, as applicable: lubricating oil temperature, bearing temperature and oil consumption records (for oil lubricated bearings) or water flow, water temperature, salinity, pH, make-up water and water pressure (for closed loop fresh water lubricated bearings depending on design).

(j) "Oil sample examination" is a visual examination of the stern tube lubricating oil taken in the presence of the Surveyor with a focus on water contamination.

(k) "Lubricating oil analysis" is the analysis to be carried out as specified in the following **i)** to **iii)**:

i) The lubricating oil analysis is to be carried out at regular intervals not exceeding 6 *months*.

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

iii) Oil samples to be submitted for the analysis are, in principle, to be taken under service conditions.

(l) "Fresh water sample test" is the test to be carried out in accordance with the following **i)** to **iv)**:

i) The fresh water sample test is, in principle, to be carried out at regular intervals not exceeding 6 *months*.

ii) Fresh water samples are to be taken in accordance with the following **1)** to **4)**:

1) The sample is to be taken under service conditions (i.e. with a rotating shaft and the system at service temperature) and are to be representative of the water circulating within the stern tube.

2) The sample is to be taken from the same agreed position in the system, before the filters, if any fitted in the freshwater lubrication system, which is to be positively identified.

3) At time of survey the sample for the test is to be taken in the presence of the Surveyor.

4) The sample, unless supervised by the Surveyor, is to be collected under the direct supervision of the Chief Engineer.

iii) Analysis results are to be retained on board and made available to the Surveyor.

iv) The fresh water sample test is to include the following **1)** to **3)** parameters:

1) chlorides content;

2) pH value; and

3) presence of bearing particles or other particles (only for laboratory analysis, and not required for tests carried out in the presence of the Surveyor).

(m) "Keyless connection" is the forced coupling methodology between the shaft and the propeller without a key achieved through the interference fit of the propeller boss on the shaft tapered end.

(n) "Keyed connection" is the forced coupling methodology between the shaft and the propeller with a key and keyway achieved through the interference fit of the propeller boss on the shaft tapered end.

(o) "Flanged connection" is the coupling methodology, between the shaft and the propeller, achieved by a flange, built in at the shaft aft end, bolted to the propeller boss.

(p) "Alternative means" means shafting arrangements such as, but not limited to, an approved condition monitoring scheme and/or other reliable approved means for assessing and monitoring the condition of the tail shaft, bearings, sealing devices and the stern tube lubricant system capable to assure the condition of the propeller shaft assembly with an equivalent level of safety as obtained by survey methods specified in this Part; this, however, excludes propeller shafts adopting the preventive maintenance system specified in **8.1.3**.

(26) (Omitted)

Chapter 3 ANNUAL SURVEYS

3.3 Annual Surveys for Machinery

3.3.1 General Examinations*

Sub-paragraph -1 has been amended as follows.

1 At Annual Surveys for Machinery, a general examination of all the machinery in the engine room ~~and~~ as well as the following ~~inspections~~ **(1)** to **(4)** inspections are to be carried out:
((1) and (2) are omitted.)

(3) For ships ~~adopting the preventive maintenance system in accordance with the requirements in **8.1.3**~~ affixed with the notation "*PSCM*" or "*PSCM・A*", the records of the parameters monitored are to be reviewed, ~~and~~ in addition to a general examination ~~is to be carried out in order~~, so as to ascertain that the relevant installations ~~have been~~ are well maintained.

(4) For ships ~~affixed with the notation "*APSS・O*" or "*APSS・W*" which periodically perform oil analysis or freshwater sample tests~~ other than those referred to in **(3)** above with oil lubricated or freshwater lubricated bearings, it is to be checked as to whether lubricating oil analysis or fresh water sample tests are regularly carried out. In cases where lubricating oil analysis or water sample tests are carried out, ~~a general examination of the shafting system and a review of all the condition monitoring data available on board the ship are to be carried out in order to ascertain that the system is well maintained~~ it is to be checked as to whether the reference standards deemed appropriate by the Society are complied with based upon the lubricating oil analysis or fresh water sample test reports, in addition to a general examination.

Chapter 6 DOCKING SURVEYS

6.1 Docking Surveys

Paragraph 6.1.3 has been amended as follows.

6.1.3 Other Surveys*

1 For ~~each~~ ships ~~adopting the preventive maintenance system for propulsion shafting system in accordance with the requirements in **8.1.3**~~ affixed with the notation "*PSCM*" or "*PSCM・A*", the records of the parameters monitored are to be reviewed, in addition to a general examination ~~of the shafting system and review of all condition monitoring data available on board the ship on the system are to be carried out in order~~, so as to ascertain that ~~the system is~~ relevant installations are well maintained.

2 For ships ~~affixed with the notation "*APSS・O*" or "*APSS・W*" which periodically perform oil analysis or freshwater sample tests~~ other than those referred to in **-1** above with oil lubricated or freshwater lubricated bearings, it is to be checked as to whether lubricating oil analysis or fresh water sample tests are regularly carried out. In cases where lubricating oil analysis or water sample tests are carried out, ~~a general examination of the shafting system and a review of all the condition monitoring data available on board the ship are to be carried out in order to ascertain that the system is well maintained~~ it is to be checked as to whether the reference standards deemed appropriate by the Society are complied with based upon the lubricating oil analysis or fresh water sample test reports, in addition to a general examination.

Table B6.1 has been amended as follows.

Table B6.1 Requirements for Docking Surveys

Items	Examinations
(Omitted)	
4 ~~After end of stern bush~~ Bush of stern tube bearing or shaft bracket bearing	・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~~ is to be measured and recorded.
5 Sealing devices for stern tube and shaft bracket bearing	・In the case of oil or freshwater lubricated stern tube bearings, 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.
(Omitted)	

Chapter 8 PROPELLER SHAFT AND STERN TUBE SHAFT SURVEYS

Section 8.1 has been amended as follows.

8.1 Propeller Shaft and Stern Tube Shaft Surveys

8.1.1 Ordinary Surveys*

Ordinary Surveys of propeller and stern tube shafts 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~~ with oil lubricated or freshwater lubricated stern tube bearings~~, the examinations specified in the following **(1)** to **(3)**~~ are to be carried out~~.~~ in accordance with the following **(1)** and **(2)**:

(1) Examinations are to be carried out in accordance with the following **(a)** to **(i)** after confirming that the results of the examinations specified in the following **(2)** are satisfactory. In cases where the results of the examinations specified in the following **(2)** or the examinations specified in the following **(a)** to **(i)** are not satisfactory, the Ordinary Survey specified in **8.1.1** is to be carried out.
   (a) In the case of keyed connections, the examinations specified in item 2 of **Table B8.1** are to be carried out.
   (b) Checking and recording the bearing weardown measurements are to be carried out.
   (c) A visual inspection of all accessible parts of the shafting system is to be carried out.
   (d) The examinations specified in item 6 of **Table B8.1** are to be carried out.
   (e) Confirmation that the seal liner is found to be or placed in a satisfactory condition is to be carried out.
   (f) Verification of satisfactory conditions of inboard and outboard seals, and of the satisfactory installation of the propeller is to be carried out.
   (g) In the case of keyed connections, the examinations specified in item 9 of **Table B8.1** are to be carried out.
   (h) The examinations specified in items 12 and 13 of **Table B8.1** are to be carried out.
   (i) Verification that the main engines have not been operated within the barred speed range for torsional vibration is to be carried out.

(2) The examinations required by **(1)** above are to be carried out in accordance with the following **(a)** to **(d)**:
   (a) Review of service records is to be carried out. Confirmation of bearing temperature may, however, be omitted in cases where the installation of devices to measure temperature is not required.
   (b) The review specified in the following **i)** and **ii)** is to be carried out.
      i) For oil lubricated shafts, review of test records of the lubricating oil analysis is to be carried out to confirm that the reference standards deemed appropriate by the Society are complied with.
      ii) For freshwater lubricated shafts, review of test records of the fresh water sample test is to be carried out to confirm that the reference standards deemed appropriate by the Society are complied with.
   (c) An oil sample examination (for oil lubricated shafts) or fresh water sample test (for closed system fresh water lubricated shafts) is to be carried out.
   (d) Verification of no reported repairs by grinding or welding of shafts and/or propellers is to

be carried out.

~~(1) Visual inspection of all accessible parts of the shafting system~~

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

~~(3) Examinations specified in 2, 6, 9, 12 and 13 in **Table B8.1** as well as the following **(a)** to **(c)**. However, the requirements of 2 and 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) Seal liner found to be or placed in a satisfactory condition~~

~~(c) Verification of the satisfactory conditions of inboard and outboard seals~~

2 ~~At Partial Surveys for~~ In the case of 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, ~~-~~3, ~~-~~4, ~~-~~5~~,~~ and ~~-~~7 ~~and -8~~ in **Table B8.1** may be replaced with a general examination of the shafting system and, for the weardown measuring and recording specified in item 8 in **Table B8.1**, they may be carried out while the propeller is installed in lieu of the timing after re-installation; this, however, is provided that all condition monitoring data taken according to the approved preventive maintenance system is found to be within permissible limits. ~~For requirements other than -1, -3, -4, -5, -7 and -8~~ Furthermore, omission of the survey items of 2, 9 and 10 in **Table B8.1**~~, the propeller shaft may be examined in accordance with the requirements for the partial surveys of propeller shafts Kind 1*C*~~ may be allowed except in the case of keyed connections. ~~The examination required by survey item -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)** 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 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)** to **iv)** being analy~~z~~sed each time:

i) ~~W~~water content;

ii) ~~S~~salinity (~~S~~sodium);

iii) ~~C~~content of shaft metal and bearing metal particles; and

iv) ~~O~~oxidation of oil.

(b) Lubricating oil consumption rate

(c) Bearing temperature

(d) Weardown of the propeller shaft ~~or the stern tube shaft~~ at ~~the after bearing of~~ the stern tube bearing

(2) Based upon Society approved preventive maintenance systems, at least the following **(a)** to **(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)** to **iv)** being analyzed each time:
   i) ~~W~~water content;
   ii) ~~S~~salinity (~~S~~sodium);
   iii) ~~C~~content of shaft metal and bearing metal particles; and
   iv) ~~O~~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) Weardown of the propeller shaft ~~or the stern tube shaft~~ at the ~~after bearing of the~~ stern tube bearing

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

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.

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
2 Propeller connections	
-1 ~~Shafts having keyed propeller~~ Keyed 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 deemed appropriate by the Surveyor all around the shaft in way of the forward portion of the taper section, including the keyway. For shafts provided with liners, the *NDE* is to be extended to the after edge of the liner.
-2 ~~Shafts having keyless propeller~~ 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 deemed appropriate by the Surveyor 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][4] 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 flange~~ 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 ~~s~~Surveyor, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method[1] deemed appropriate by the Surveyor.
3 Propeller shaft, stern tube shaft, and coupling bolts	Examination of the sleeves, the fillet of the coupling flange to the intermediate shaft or to the stern tube shaft and the coupling bolts 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 the Surveyor~~s~~, based on the results of external examinations, deems such addition testing to be necessary. In addition, anti-corrosion covers are to be removed for shafts ~~of~~ Kind 2.
4 Stern tube bearing[1]	Examination of the stern tube bearings
5 Clearances between bush of the stern tube bearing[2] and either the propeller shaft or the stern tube shaft ~~and the after bearing of the stern tube~~	Checking and recording the bearing clearances between the bush and the shaft
6 Propellers	Verification that the propeller is free of damages which may cause the propeller to be out of balance
7 ~~Stern tube s~~Sealing ~~systems~~ device for stern tube[3]	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 stern tube bearings, weardown of the propeller shaft or the stern tube shaft at ~~the after bearing of~~ the stern tube bearing	Measuring and ~~R~~recording the bearing weardown ~~measurements~~ (after re-installation)
9 Propeller boss surfaces in contact with the propeller shaft taper	Examination of the propeller boss surface~~s~~
10 Controllable pitch propeller connections	Examination of the pitch control gear and working parts as well as, by an efficient crack detection method, the propeller blade fixing bolts
11 Water lubrication lines	Where water lubricated stern tube bearings are adopted, the water piping for lubrication is to be examined.
12 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 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
13 Lubricating oil or lubricating freshwater	~~Where oil or freshwater lubricated stern tube bearings are adopted, e~~Examination of the lubricating oil or lubricating freshwater record book

(Notes)

1 This includes shaft bracket bearings. The same applies hereinafter in this Chapter.

2 This includes bush of shaft bracket bearings. The same applies hereinafter in this Chapter.

3 This includes sealing devices for shaft bracket bearings. The same applies hereinafter in this Chapter.

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

~~2~~4 For shafts with water lubricated bearings, it is recommended that the survey specified in **1.1.3-1(6)~~(g)~~(a)iii)** also be carried out in cases where ~~the next survey due date is less than~~ the date 15 *years* after the date of completion of the previous survey specified in **1.1.3-1(6)~~(g)~~(a)iii)** is earlier than the next survey due date.

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 14 June 2019.

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 until the first propeller shaft and stern tube shaft surveys scheduled on or after 1 January 2016 are completed.

3. Notwithstanding the provision of preceding **2.**, the amendments to the Rules may apply, upon request of the owner, to ships other than ships the delivery of which is on or after 1 January 2016 before the first propeller shaft and stern tube shaft surveys scheduled on or after 1 January 2016 are completed.

Amendment 1-2

Chapter 2 CLASSIFICATION SURVEYS

2.1 Classification Survey during Construction

2.1.2 Submission of Plans and Documents for Approval*

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

1 When it is intended to build a ship for classification by the Society, the following plans and documents are to be submitted for the approval by the Society before the work is commenced. The plans and documents may be submitted for examination by the Society prior to making an application for the classification of the ship as stipulated otherwise by the Society.
((1) is omitted.)
(2) Machinery
((a) is omitted.)
(b) Main and auxiliary engines (including their attachments):
Plans and data specified in **2.1.3-1(1)**, **3.1.2(1)** and **4.1.~~2~~3(1), Part D** in relation to the kind of engine as well as documents showing specifications of louvers for emergency generator rooms and closing appliances of ventilators fitted to the rooms (if they are of a power-operated type.)
((c) to (i) are omitted.)
((3) to (7) are omitted.)

2.1.3 Submission of Other Plans and Documents

Sub-paragraph -1(7) has been amended as follows.

1 When it is intended to build a ship to the classification with the Society the following plans and documents are to be submitted, in addition to those required in **2.1.2**:
((1) to (6) are omitted.)
(7) The following plans and documents related to machinery:
(a) Main and auxiliary engines (including their attachments):
Plans and data specified in **2.1.3-1(2)** and **(3)**, **3.1.2(2)** and **4.1.~~2~~3(2), Part D**
((b) to (d) are omitted.)
((8) to (14) are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 14 June 2019.
2. Notwithstanding the amendments to the Rules, the current requirements apply to gas turbines whose type is the same type of those for which the application for approval is submitted to the Society before the effective date.

Amendment 1-3

Chapter 2 CLASSIFICATION SURVEYS

2.1 Classification Survey during Construction

2.1.2 Submission of Plans and Documents for Approval*

Sub-paragraph -1(5) has been amended as follows.

1 When it is intended to build a ship for classification by the Society, the following plans and documents are to be submitted for the approval by the Society before the work is commenced. The plans and documents may be submitted for examination by the Society prior to making an application for the classification of the ship as stipulated otherwise by the Society.
((1) to (4) are omitted.)
(5) Ships using low-flashpoint fuels
((a) to (x) are omitted.)
(y) Plans and documents of the low-flashpoint fuel equipment and fittings specified in **1.2, Annex 1, Part GF of the Guidance**
(z) Plans and documents for the gas-fuelled boilers specified in **1.3, Annex 2, Part GF of the Guidance**
(aa) Plans and documents for the Gas Combustion Units (*GCU*s) specified in **1.3, Annex 2A, Part GF of the Guidance**
(~~aa~~ab) Plans and documents for the gas-fuelled engines specified in **1.3, Annex 3** and **1.3, Annex 4, Part GF of the Guidance**
(~~ab~~ac) Arrangements and construction of ventilation systems (including materials, ventilation capacity, etc.)
(~~ac~~ad) Arrangements of ventilation inlets and exhaust outlets
(~~ad~~ae) Ventilation duct diagrams (including design pressures, materials, and arrangements and construction of fittings)
(~~ae~~af) Details of bunkering manifold connections
(~~af~~ag) Drawings showing distance between fuel tanks and shell plating at each section
(~~ag~~ah) Arrangements, capacity calculation sheets and details of drip trays (including materials, thermal protection for the hull structure and drainage arrangements)
(~~ah~~ai) Access routes and means of access to protected spaces within hold spaces
(~~ai~~aj) Arrangements of air lock doors, air lock ventilation capacity calculation sheets and details of air lock alarm systems
(~~aj~~ak) Other plans and documents required by **Part GF**
((6) and (7) are omitted.)

Chapter 3 ANNUAL SURVEYS

Table B3.7 has been amended as follows.

Table B3.7 Performance Tests at Annual Surveys

Items	Examinations
1 Valves for oil tanks	Operation tests for the arrangements for remote closing of valves for fuel oil tanks, lubricating oil tanks and other flammable oil tanks are to be carried out, as far as practicable and as appropriate.
2 Fuel oil pumps, cargo pumps, ventilating fans and boiler draught fans	Operation tests for emergency stopping means are to be carried out.
3 Emergency electrical power source	Operation tests for the emergency source of electrical power and its associated equipment are to be carried out in order to ascertain that the whole system is in good working order. Automatically operated equipment is to be tested in the automatic mode.
4 Communication systems	Operation tests for the means of communication between the navigation bridge and the machinery control position and between the navigation bridge and the steering gear compartment are to be carried out.
5 Steering gears	Performance tests are to be carried out for the main and auxiliary steering gears including their associated equipment and control systems;
6 Bilge systems	Operation tests for the valves (including ones for emergency use), cocks, strainers, pumps, reach-rods and level alarms of the bilge systems are to be carried out.
7 Safety devices	Operation tests for the safety devices, etc. specified in the following (a) to (e) are to be carried out. However, the tests may be omitted at the Surveyor's discretion based on the general examination, reports of working conditions at sea and inspection records taken by the ship's crew.
(a) Main propulsion machinery and auxiliary machinery	Operation tests of the following safety/alarm devices on prime movers of main propulsion machinery; electric generators; auxiliary machinery essential for propulsion; and auxiliary machinery for manoeuvring and crew safety are to be carried out. Where deemed necessary by the Surveyor, the maintenance records of the cooling water and lubricating oil are required to be presented for review. (i) Overspeed protective devices (ii) Automatic shut-off and alarm devices in case of loss or low pressure of the lubricating oil (iii) Automatic shut-off devices in case of abnormally low pressure of the main condenser vacuum for main steam turbines
(b) Boilers, thermal oil heaters ~~and~~, incinerators and gas combustion units (*GCU*s)	Operation tests for the safety devices, alarm devices and pressure indicators ~~specified in **Chapter 9, Part D**~~ are to be carried out. Calibration records for the pressure indicators are to be ascertained and the relieving gears of the safety valves are to be examined and tested to verify satisfactory operation. However, the relief valves provided on the exhaust gas economizers are to be tested by the Chief Engineer at sea prior to the Annual Survey within the period specified in **1.1.3-1(1)**. This test is to be recorded in the logbook for review by the attending surveyor. Where deemed necessary by the Surveyor, the control records of the boiler water and thermal heater oil are required to be presented for review.
(c) Monitoring devices	Operation tests for pressure indicators, thermometers, ammeters, voltmeters and revolution meters are to be carried out.
(d) Automatic control devices or remote control devices	Operation tests for automatic and remote control devices of auxiliary machinery essential for propulsion, manoeuvring, and crew safety as well as the means of remotely controlling the propulsion machinery from the navigating bridge (including the control, monitoring, reporting, alert and safety actions) are to be carried out.
(e) Engineer's Alarm	It is to be confirmed that the engineer's alarm is clearly audible in the engineers' accommodation.

Chapter 5 SPECIAL SURVEYS

Table B5.27 and Table B5.29 have been amended as follows.

Table B5.27 Special Requirements for Ships Carrying Liquefied Gases in Bulk

Items	Examinations
1 Cargo tanks	The following examinations are to be carried out [*1]: (a) An internal examination of all cargo tanks (b) A visual examination of insulation[*2] or cargo tank surface (if insulation is not fitted) Special attention is to be paid to chocks, supports, keys and other parts of the tank foundations. Removal of insulation may be required where deemed necessary by the Surveyor. (c) Thickness measurements for cargo tank plate (where deemed necessary by the Surveyor) (d) Non-destructive test for independent tank of Type *B* in accordance with the approved program This program is to be prepared according to the cargo tank design. Cargo tanks other than independent tanks of Type *B* are to be examined by non-destructive tests on welded connections of the tank shell, main structural members and other parts liable to bear high stress[*3]. However, non-destructive testing for independent tanks of Type *C* cannot be dispensed with totally. (e) Leak tests of all cargo tanks However, the leak test of membrane tanks, semi-membrane tanks and independent tanks below deck may be omitted, if it is verified by the log book or other proper means that gas detecting devices are in normal condition and no leak is recorded. Where there is any doubt on the integrity of any of the cargo tanks as a result of the examinations (a) through (e) above, the tank is to be tested under the pressures specified below. For independent tanks of Type *C*: Not less than 1.25 times maximum allowable design pressure (hereinafter referred to as *MARVS*) of pressure relief valves For independent tanks of Type *A* and *B* and integral tanks: Appropriate pressure according to the cargo tank design For independent tanks of Type *C*, either of the following tests (i) or (ii) is to be carried out at every second Special Survey in addition to examinations (a) through (e). (i) Tests at a pressure 1.25 times *MARVS*, and thereafter, the non-destructive test stipulated in (d) (ii) Non-destructive test according to the program prepared for the cargo tank design[*4]
2 Hold spaces and secondary barriers	・ Tank supporting and surrounding hull structures in hold spaces, secondary barriers and their insulation are to be visually examined. ・ For membrane containment systems, it is to be verified that secondary barriers keep a specific level of tightness required in the system design in accordance with programs and acceptance criteria approved in advance. However, low differential pressure tests are not to be considered an acceptable test for the tightness of secondary barriers. For membrane containment systems with glued secondary barriers, if the verification results do not satisfy the approved acceptance criteria, an investigation is to be carried out and additional testing such as thermographic or acoustic emissions testing is to be carried out. ・ For other cargo containment systems, in cases where there is any doubt about integrity of secondary barriers, the integrity is to be verified by pressure or vacuum test or other proper means.[*5]
3 Venting system for cargo tanks	Pressure relief valves for cargo tanks are to be overhauled, readjusted, performance-tested and sealed.[*6] Pressure/vacuum relief devices and associated safety systems for interbarrier spaces and hold spaces are to be examined, overhauled and tested depending on their design.[*6]

Table B5.27 Special Requirements for Ships Carrying Liquefied Gases in Bulk (Continued)

Items	Examinations
4 Cargo and process piping	Examinations (a) and (b) are to be carried out. Removal of insulation may be required where deemed necessary by the Surveyor. (a) Where deemed necessary by the Surveyor; whole or a part of the valves and associated fittings are to be overhauled, or a pressure test at a pressure 1.25 times *MARVS* is to be carried out and after the pipes that were removed are reinstalled, a leak test is to be carried out (b) Pressure relief valves are to be visually examined and whole or a part of these valves are to be overhauled, readjusted, performance tested and sealed.
5 Cargo handling equipment	Examinations and tests (a) through (c) are to be carried out. (a) Cargo pumps, cargo gas compressors and gas blowers, and their prime movers are to be overhauled and performance tests for safety devices are to be carried out. Overhaul of electric motors as prime movers may be dispensed with.[*7] (b) Heat exchangers, pressure vessels and evaporators are to be overhauled and pressure relief valves are to be performance tested. If an internal examination of vessels is impracticable, a pressure test of vessels and a performance test of pressure relief valves are to be carried out.[*7] (c) The following tests (i) through (iii) are to be carried out for refrigerating equipment. (i) Overhaul of pumps and compressors and performance tests of pressure vessels such as condensers, evaporators, inter-coolers, oil separators and relief valves[*7] (ii) Leak test of pressure vessels and heat exchangers at a pressure of not less than 90% of the set pressure of relief valves (iii) Leak test of refrigerant piping system at a pressure of not less than 90% of set pressure of relief valves (d) Gas combustion units (*GCU*s) are to be overhauled.
6 Emergency shutdown devices	For emergency shutdown valves, open-up examinations and leakage testing of valve seats are to be carried out. [*6 *8]
7 Electrical installations in hazardous areas	Examinations specified in item 2 for tankers of **Table B5.25** are to be carried out.

Table B5.29 Special Requirements for Ships Using Low-flashpoint Fuels

Items	Examinations
1 Fuel storage tanks	The following examinations and testing are to be carried out [*1]: (a) Internal examinations of all fuel storage tanks. Vacuum insulated independent fuel storage tanks of type *C*, however, need not be examined internally. Where fitted, the vacuum monitoring system is to be examined, and records are to be reviewed. (b) Visual examinations of thermal insulation[*2] or surfaces of fuel storage tanks without thermal insulation i) Special attention is to be paid in way of chocks of tank foundations, tank supports, keys, etc. Removal of thermal insulation may be required where deemed necessary by the Surveyor. ii) Non-destructive testing may be required if conditions raise doubt to the structural integrity. (c) Thickness measurements for tank plates may be required where deemed necessary by the Surveyor. (d) Non-destructive testing for independent fuel storage tanks of Type *B* in accordance with the approved programme is to be carried out. The programme is to be that prepared according to fuel storage tank design. Fuel storage tanks other than independent fuel storage tanks of Type *B* are to be examined by non-destructive testing on welded connections of the tank plates, main structural members and parts where high stress is deemed likely to occur where deemed necessary by the Surveyor.[*3] (e) Leakage testing of all fuel storage tanks Where there is any doubt regarding the integrity of a fuel storage tank as a result of examinations specified in (a) to (e) above, such a fuel storage tank is to be tested by hydraulic or hydro-pneumatic testing under the pressures specified below: Independent fuel storage tanks of Type *C*: a pressure not less than 1.25 times the maximum allowable relief valve setting (hereinafter referred to as "*MARVS*"); or For integral tanks and for independent tanks of Type *A* and *B*: an appropriate pressure according to fuel storage tank design, as far as practicable, with the pressure at the top of the tank corresponding at least to the *MARVS*. For all independent fuel storage tanks of Type *C*, either the following i) or ii) examination is to be carried out at every second Special Survey in addition to examinations (a) to (e). i) Hydraulic or hydro-pneumatic testing at a pressure not less than 1.25 times *MARVS*, and the non-destructive testing specified in (d) ii) Non-destructive testing according to a programme prepared based upon fuel storage tank design[*4] Where water cannot be tolerated and the fuel storage tank cannot be dried prior to putting the tank into service, the Surveyor may accept alternative testing fluids or alternative means of testing.
2 Tank support arrangements, tank fixing arrangements, etc.	・ Tank support arrangements, anti-rolling or anti-pitching devices, and surrounding hull structures and their thermal insulation are to be visually examined. Non-destructive testing may be required if conditions raise doubt to the structural integrity. ・ For membrane tanks, it is to be verified that the gas-tightness of secondary barriers is kept on the level of tightness required for system design in accordance with the programme and acceptance criteria approved in advance. Low differential pressure testing, however, is not to be adopted for testing the tightness of secondary barriers. For glued secondary barriers, if the verification results do not satisfy the required level of gas-tightness, an investigation is to be carried out to analyse the causes of failure, and additional testing such as thermographic or acoustic emission testing is to be carried out taking into account the analysis. ・ For other secondary barriers, gas-tightness is to be verified by pressure or vacuum testing or other proper means in cases where there is any doubt.[*5]

Table B5.29 Special Requirements for Ships Using Low-flashpoint Fuels (Continued)

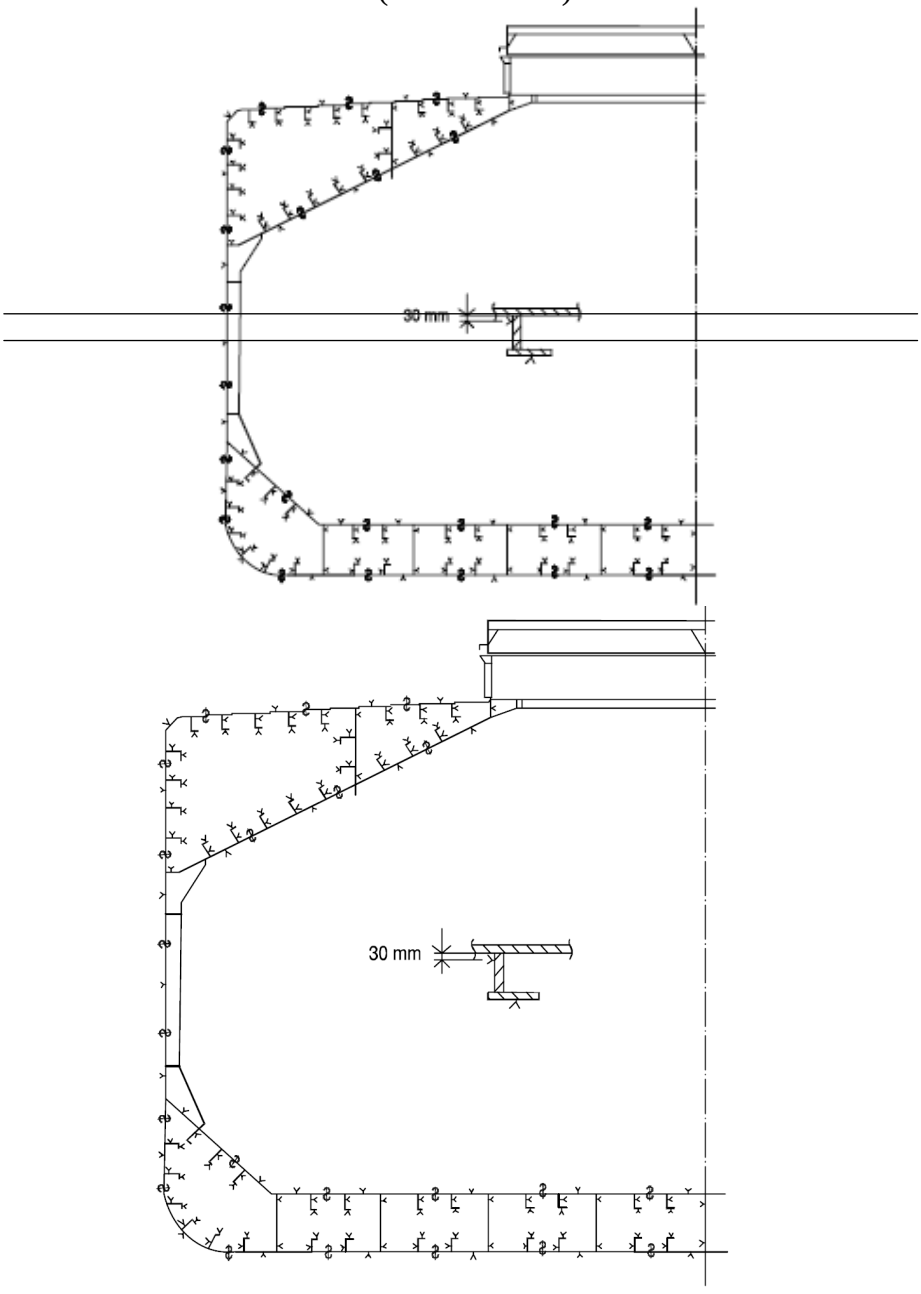
Items	Examinations
3 Venting systems for fuel containment systems	・ The pressure relief valves for the fuel storage tanks are to be opened for examination, adjusted, function tested and sealed.[*6] If the tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, such non-metallic membranes are to be replaced. ・ The pressure/vacuum relief valves, rupture disc and other pressure relief devices for interbarrier spaces and fuel storage hold spaces are to be opened, examined, tested and readjusted as necessary, depending on their design.[*7] ・ The vacuum protection systems for fuel storage tanks are to be overhauled and tested appropriately for the design.[*8]
4 Fuel piping and process piping systems, etc.	The following examinations and testing are to be carried out. (a) All piping for fuel storage, fuel bunkering, and fuel supply such as venting, compressing, refrigerating, liquefying, heating, storing, burning or otherwise handling the fuel and liquid nitrogen installations are to be examined. Removal of thermal insulation from the piping and opening for examination may be required where deemed necessary by the Surveyor. (b) Where deemed suspect by the Surveyor during (a) above, a hydrostatic test to 1.25 times the *MARVS* for the pipeline is to be carried out. After reassembly, the complete piping is to be tested for leaks. Where water cannot be tolerated and the piping cannot be dried prior to putting the system into service, the Surveyor may accept alternative testing fluids or alternative means of testing. (c) Pressure relief valves for the fuel supply and bunkering piping is to be opened for examination, adjusted, and function tested and sealed. Where a proper record of continuous overhaul and retesting of individually identifiable relief valves is maintained, consideration will be given to acceptance on the basis of opening, internal examination, and testing of a representative sampling of valves, including each size and type of liquefied gas or vapor relief valve in use, provided there is logbook evidence that the remaining valves have been overhauled and tested since crediting of the previous Special Survey. (d) All emergency shut-down valves, check valves, block and bleed valves, master gas valves, remote operating valves, isolating valves for pressure relief valves in the fuel storage, fuel bunkering, and fuel supply piping systems are to be examined and proven operable. A random selection of valves is to be opened for examination. (e) Leakage testing of the emergency shut-down valves opened in accordance with **(d)** above is to be carried out.
5 Components of bunkering systems, fuel containment systems ~~and~~, gas consumers and fuel supply systems for low-flashpoint fuels	The following examinations and testing are to be carried out. (a) Fuel pumps and fuel compressors as well as their prime movers are to be overhauled, and performance testing of safety devices is to be carried out. Overhauling of electric motors for prime movers, however, may be omitted.[*9] (b) Heat exchangers, pressure vessels, including process pressure vessels, evaporators and other components used in connection with fuel handling are to be overhauled. Pressure relief systems are to be performance tested. If an internal examination of the pressure vessels, including process pressure vessels, is impracticable, pressure testing of the vessels and performance testing of pressure relief systems are to be carried out.[*9] (c) The examinations specified in the following i) to iii) are to be carried out for refrigerating equipment. i) Overhauling of pumps and compressors and performance testing of pressure vessels such as condensers, evaporators, inter-coolers and oil separators and the relief systems[*9] ii) Leakage testing of pressure vessels and heat exchangers at a pressure not less than 90% of the setting pressure of their relief systems iii) Leakage testing of refrigerant piping systems at a pressure of not less than 90% of the setting pressure of their relief systems (d) General examinations of inert gas generators are to be carried out. (e) Gas combustion units (GCUs) are to be overhauled.

Table B5.29 Special Requirements for Ships Using Low-flashpoint Fuels (Continued)

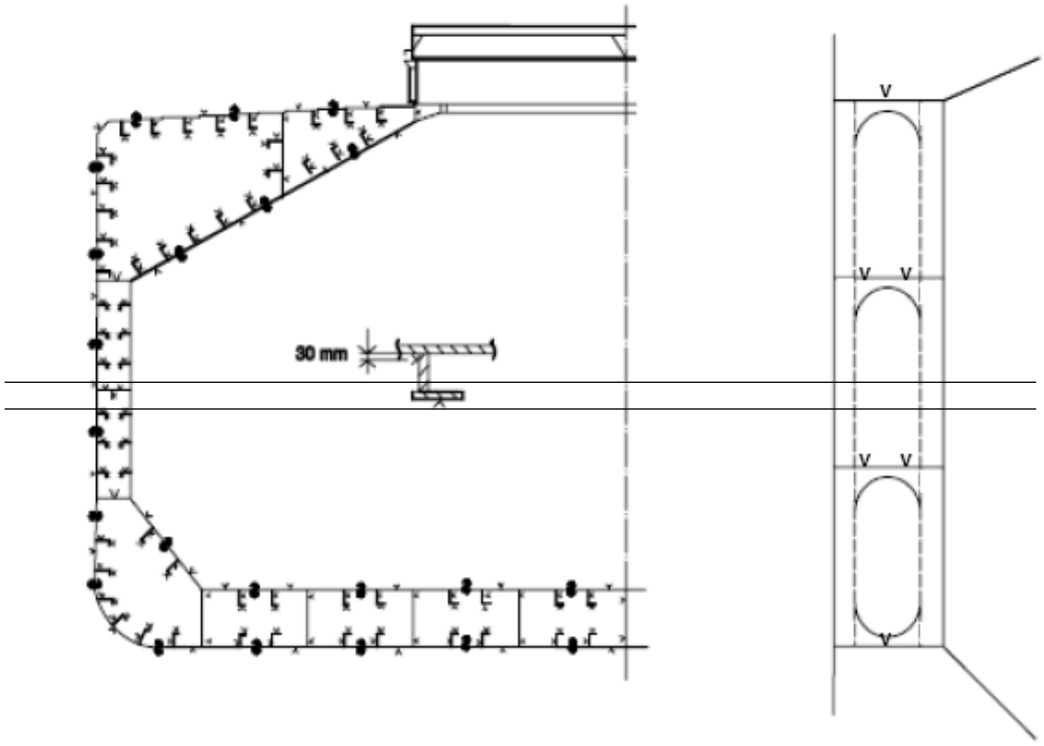
Items	Examinations
6 Electrical installations	The following examinations and testing are to be carried out. (a) Examination of electrical equipment to include the physical condition of electrical cables and supports, intrinsically safe, explosion proof, or increased safety features of electrical equipment. (b) Testing of systems for de-energizing electrical equipment which is not certified for use in hazardous areas. (c) An electrical insulation resistance test of the circuits terminating in, or passing through, the hazardous zones and spaces is to be carried out. However, this test may be omitted at the discretion of the Surveyor, if accurate test records of the insulation resistance can be verified. (d) The earthing between fuel storage tanks or fuel piping systems (fuel pipes, vent pipes, etc.) and hull structures is to be examined. (e) Electrical installations in hazardous areas are to be examined in detail and confirmation that they conform to the requirements in **4.2.7, Part H** is to be carried out. (f) Performance tests of interlock devices associated with pressurized protected type electrical equipment and electrical equipment installed in pressurized or ventilated areas are to be carried out. In addition, functional testing of pressurized equipment and associated alarms is to be carried out.
7 Safety Systems	Gas detectors, temperature sensors, pressure sensors, level indicators, and other equipment providing input to the fuel safety system are to be tested to confirm satisfactory operating condition. (a) Proper response of the fuel safety system upon fault conditions is to be verified. (b) Pressure, temperature and level indicating equipment are to be calibrated in accordance with the manufacturer's requirements.

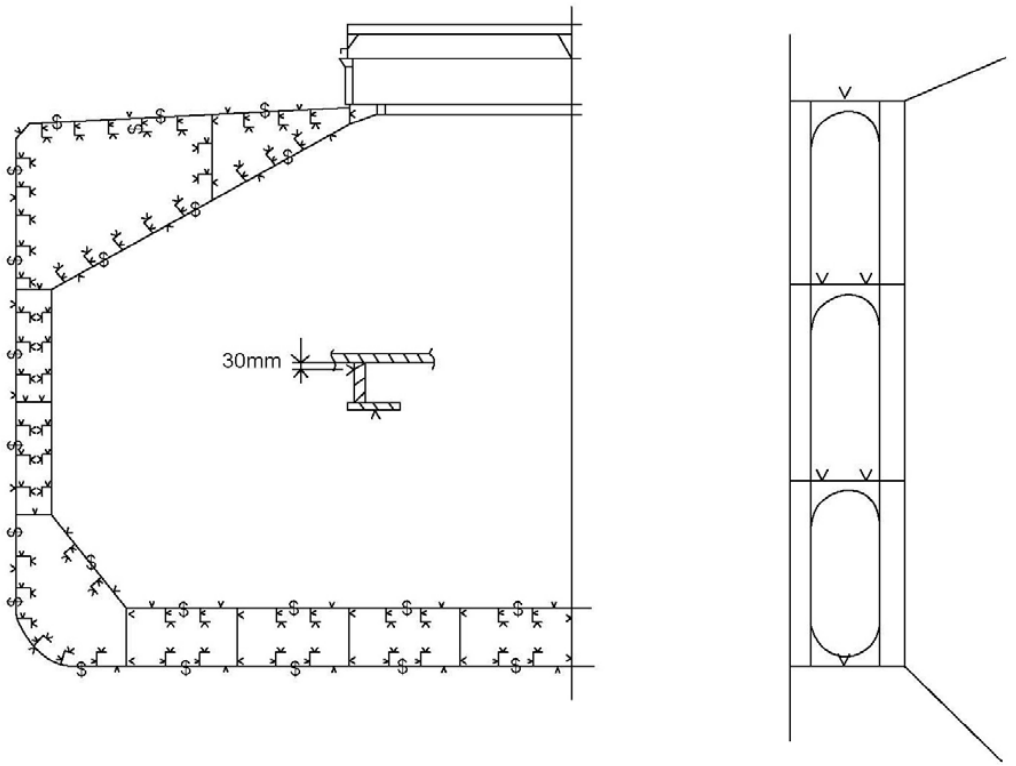
Fig. B5.1 has been amended as follows.

Fig. B5.1 Example of Locations subject to Thickness Measurements in Transverse Sections (Bulk Carriers)



Single side bulk carriers



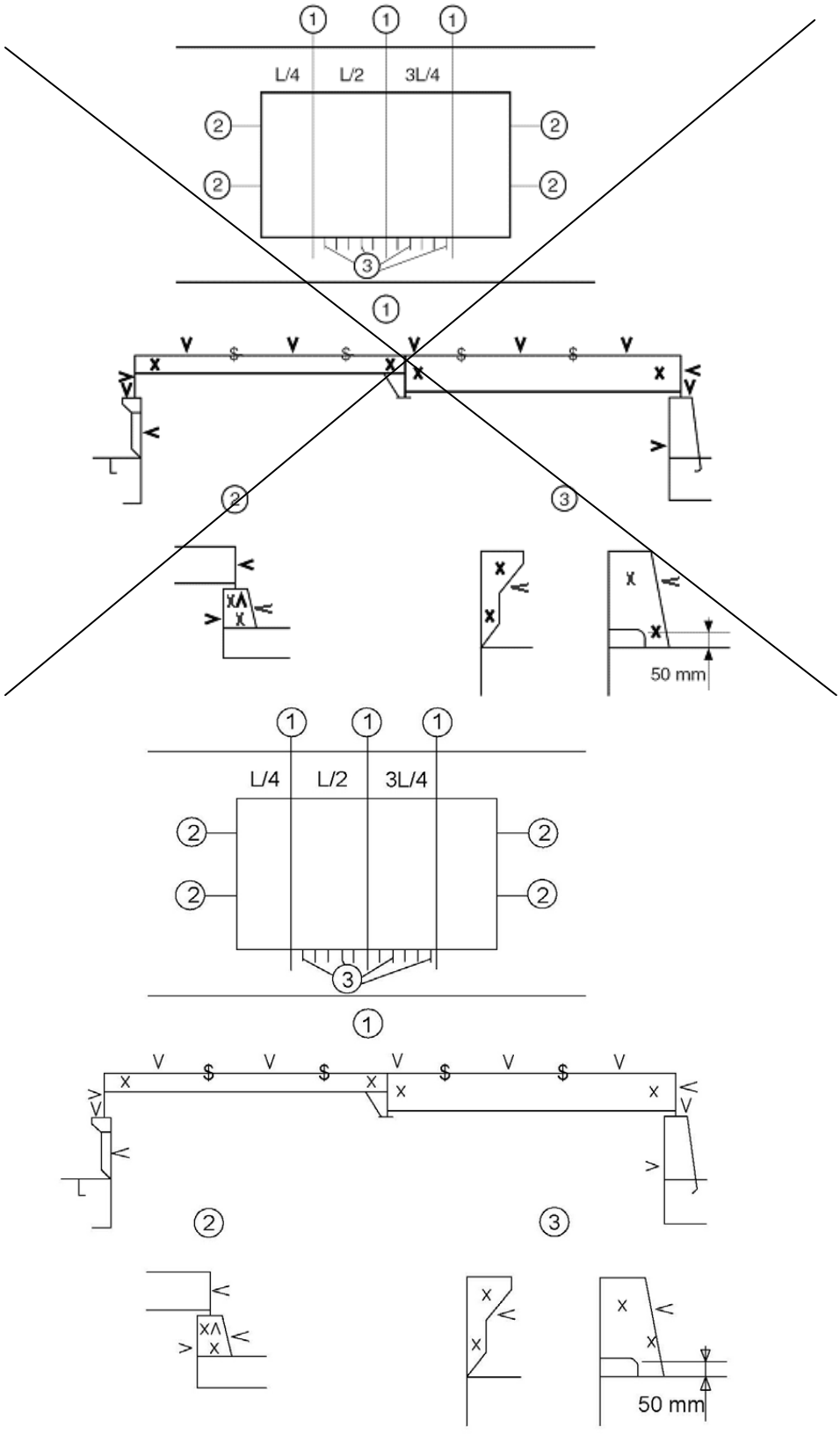


Double side bulk carriers

Note: Measurements are to be taken for both the port and starboard sides of the selected transverse section.

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)

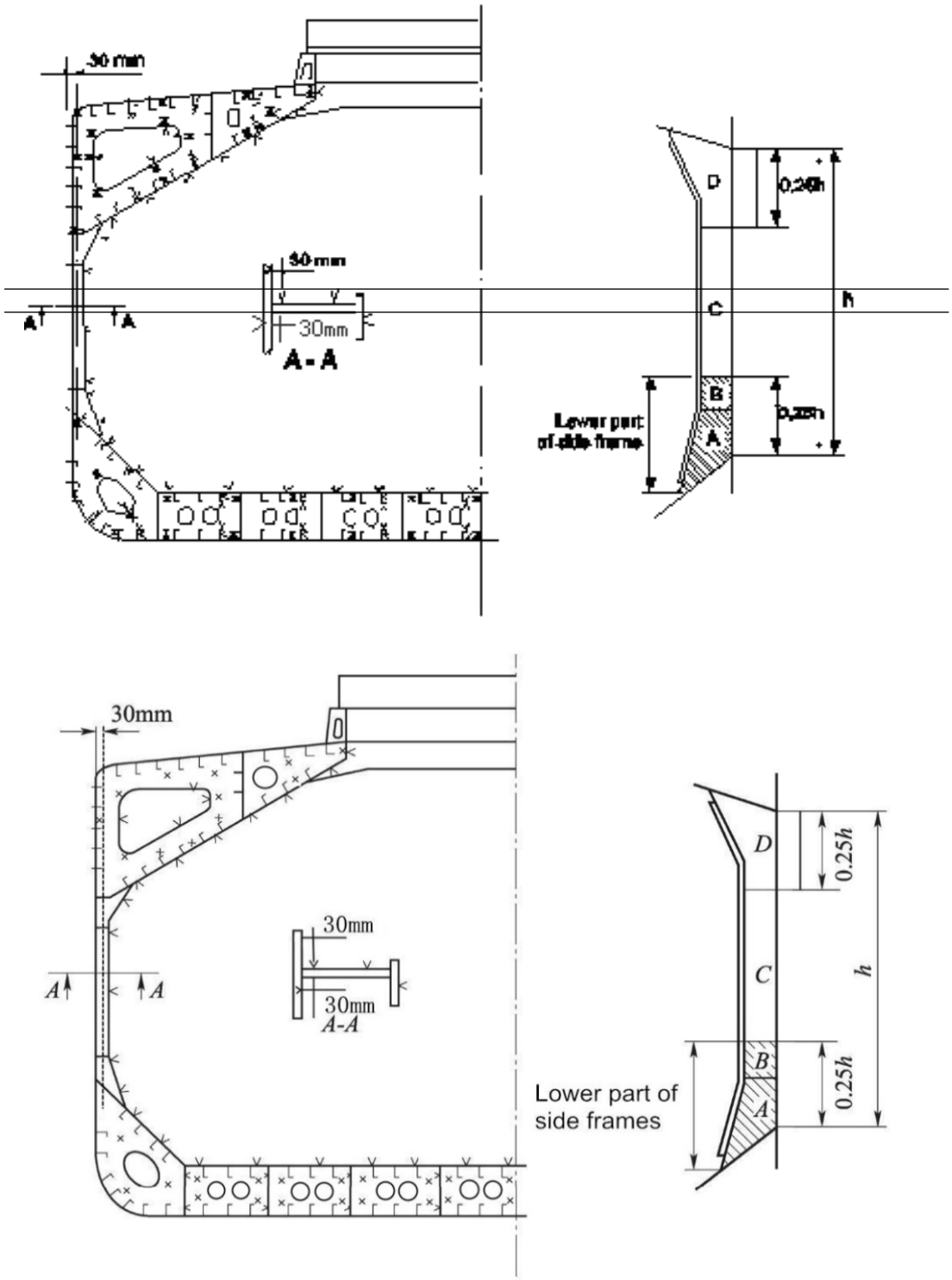


Notes:

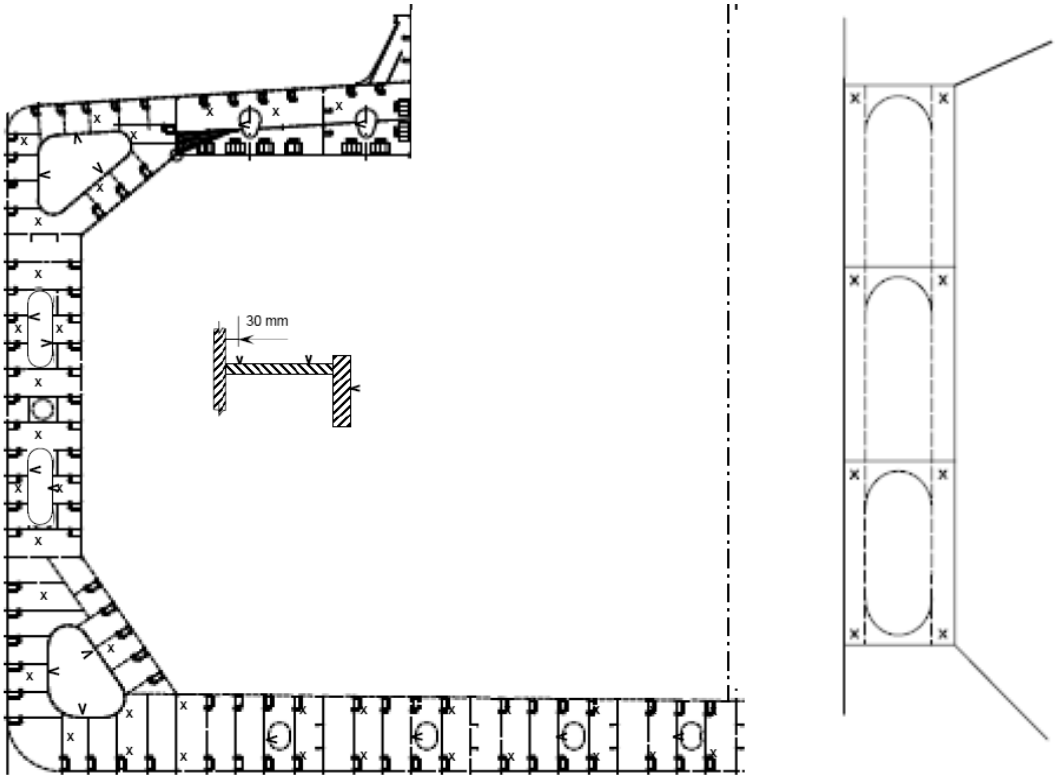
1. Three sections at $L/4$, $L/2$, $3L/4$ of hatch cover length, including:
   - one measurement of each hatch cover plate and skirt plate
   - measurements of adjacent beams and stiffeners
   - one measurement of coaming plates and coaming flanges, for each side
2. Measurements of both ends of hatch cover skirt plates, coaming plates and coaming flanges
3. One measurement (two points for web plates and one point for face plates) of one out of three hatch coaming brackets and bars, on both sides and both ends

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 bulk carriers



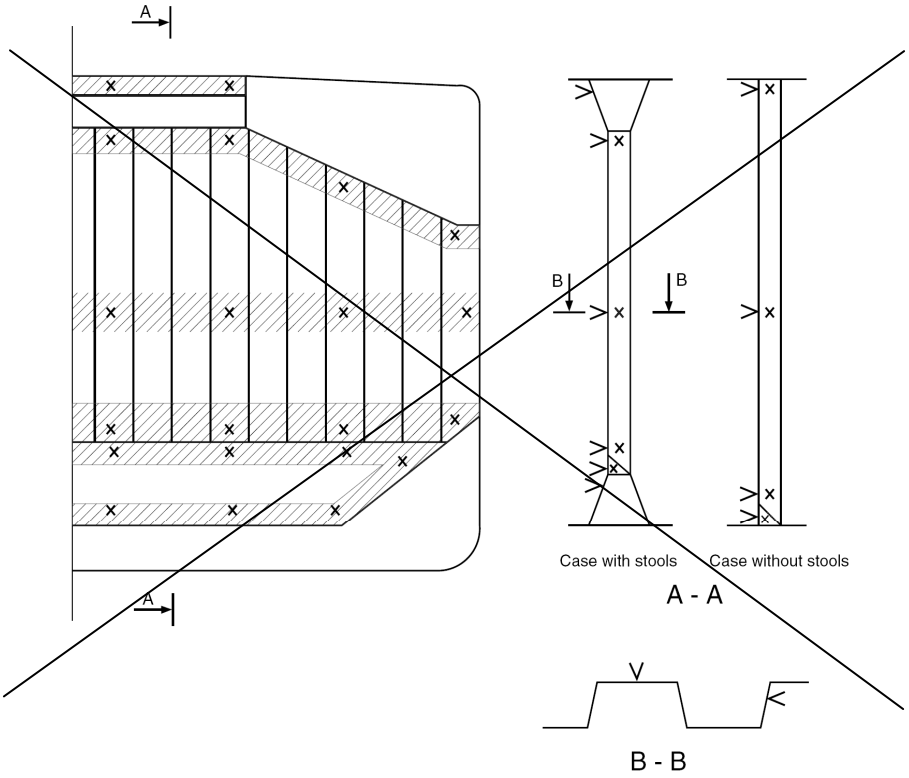
Double side bulk carriers

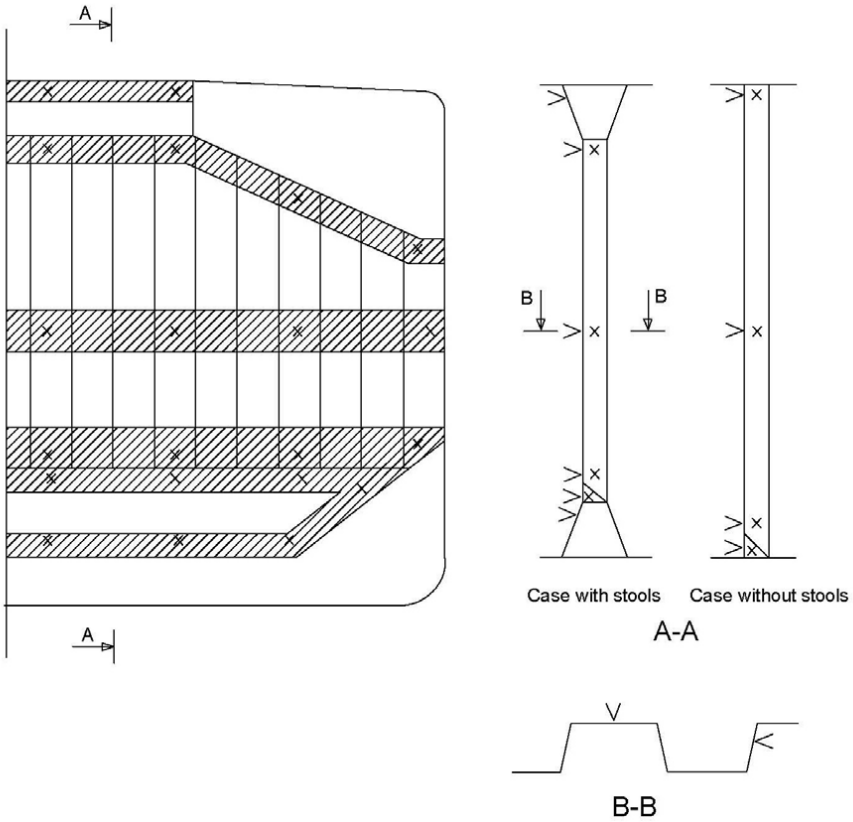
Note:

The gauging pattern for web plates is to be a three point pattern for zones A, C and D, and a two point pattern for zone B (see figure). The gauging report is to reflect the average reading. The average reading is to be compared with the allowable thickness. If the web plate has general corrosion then this pattern is to be expanded to a five-point pattern.

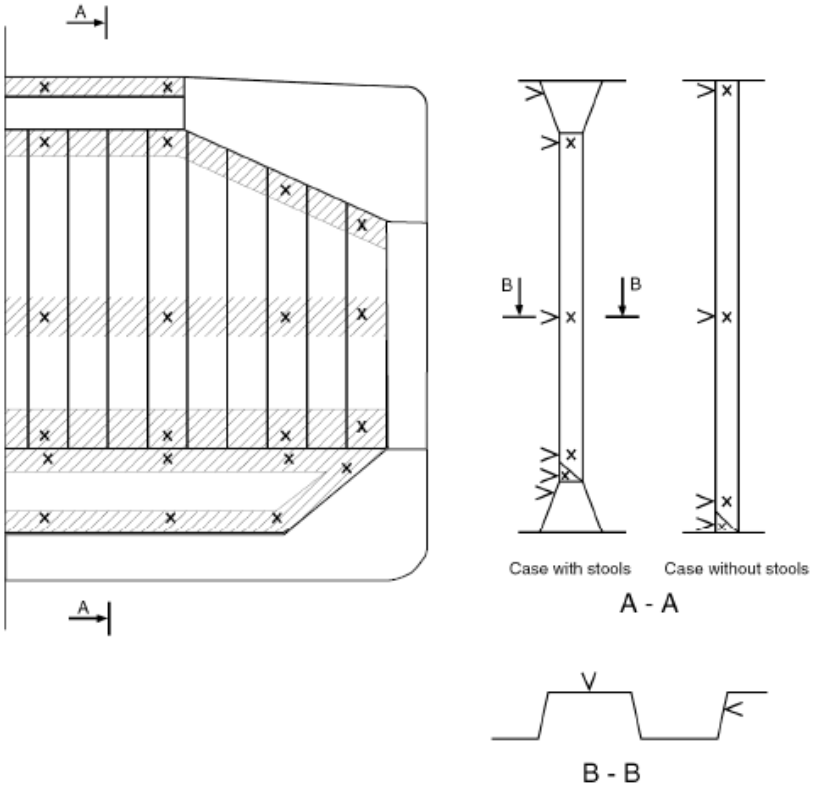
Fig. B5.4 has been amended as follows.

Fig. B5.4 Example of Locations subject to Thickness Measurements on Cargo Hold Transverse Bulkheads





Single side bulk carriers



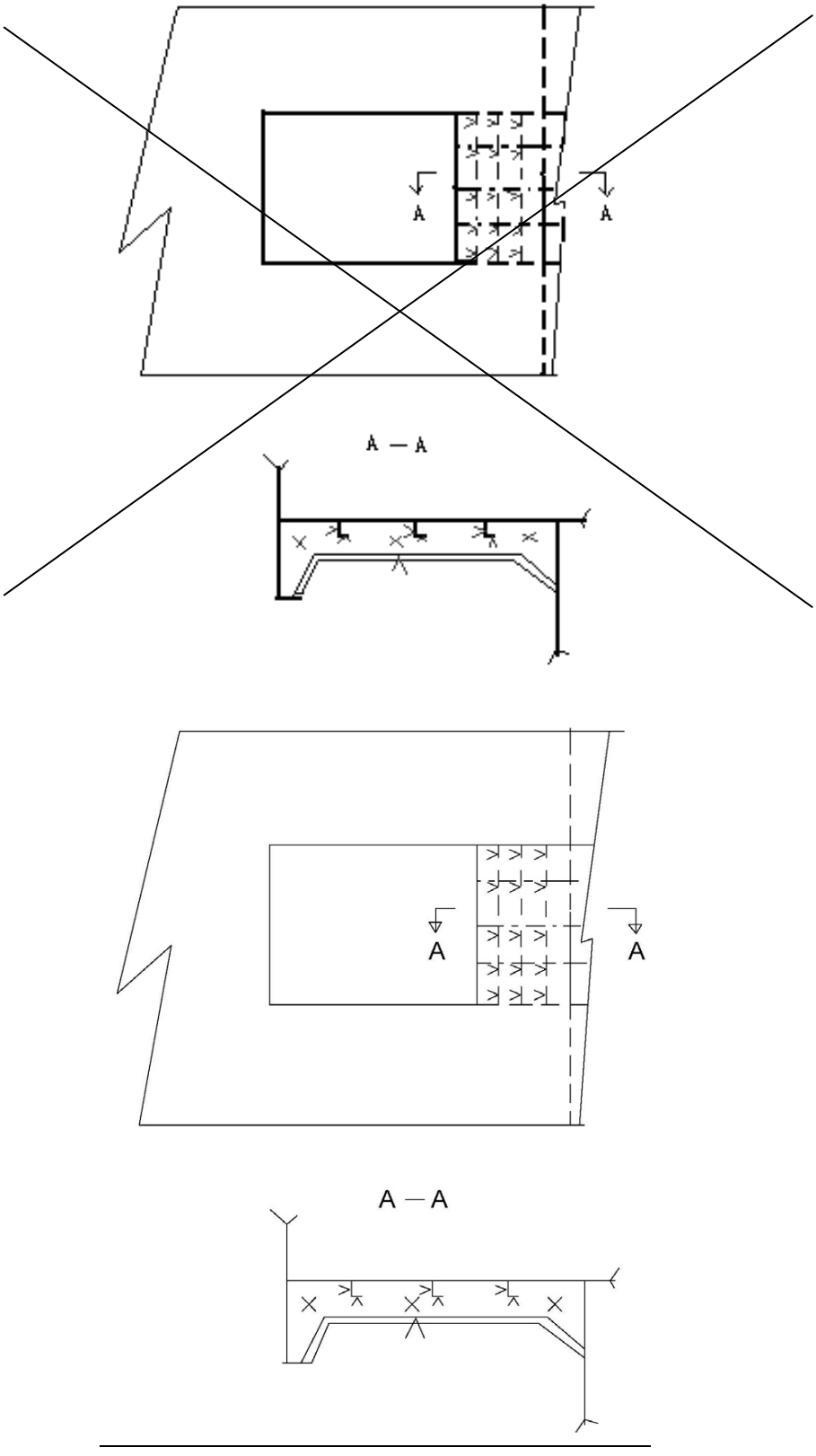
Double side bulk carriers

Note:

Measurements are to be taken in each shaded area as shown in A-A and B-B

Fig. B5.6 has been amended as follows.

Fig. B5.6 Example of Locations subject to Thickness Measurements on Underdeck Structures (Bulk Carriers)



Chapter 7 BOILER SURVEYS

Table B7.1 has been amended as follows.

Table B7.1 Requirements of Boiler Survey

Items	Examinations
1 Pressure parts of boilers	To be internally examined with the manholes, cleaning holes and inspection holes dismantled. Where considered to be necessary for external examination by the Surveyor, the parts are to be examined to the Surveyor's satisfaction with the insulation around the parts removed.(2)
2 Superheaters, economizers and exhaust gas economizers	To be examined internally and externally. For exhaust gas economizers of the shell type, all accessible welded joints are to be subject to a visual examination for cracking and non-destructive testing may be requested where deemed necessary by the Surveyor.(2)
3 Combustion parts of boilers and thermal oil heaters(1)	The furnaces, combustion chambers, combustion gas chambers, etc. are internally examined with their doors opened.(2)
4 Valves and cocks	The principal mountings and their fastening bolts or studs are to be opened up and examined.
5 Thickness of plates and tubes and size of stays	To be measured where deemed necessary by the Surveyor.
6 Safety valves and relevant parts of boilers, superheaters and thermal oil heaters(1)	The safety valves are to be adjusted under steam to a pressure not more than 103 % the approved working pressure after the open-up examination. The pressure gauge used for this adjustment is to be calibrated properly. The relieving gears of the valves are to be examined and tested to verify satisfactory operation. However, for exhaust gas economizers, if steam cannot be raised at port, the relief valves may be set by the chief engineer at sea, and the results recorded in the logbook for review by the Surveyor. The general conditions of relief pipes for thermal oil heaters are to be examined. The popping pressure of safety valves fitted on thermal oil heaters is to be ascertained.
7 Safety devices, alarm devices and automatic combustion control devices	These devices are to be tested ~~in accordance with the requirements in **Chapter 9, Part D** of the Rules~~ in order to ascertain that they are in good working conditions after the above examinations.
8 Review of the records of the logbook	Review of the following records since last boiler survey is to be carried out. (1) Operation (2) Maintenance (3) Repair history (4) Quality control of the feed water or thermal oil

EFFECTIVE DATE AND APPLICATION (Amendment 1-3)

1. The effective date of the amendments is 14 June 2019.

Amendment 1-4

Chapter 3 ANNUAL SURVEYS

Table B3.2 has been amended as follows.

Table B3.2 General Examination

Items	Examination
(1 to 25 are omitted.)	
Additional Requirement for Tankers, Ships Carrying Dangerous Chemicals in bulk and Ships Carrying Liquefied Gases in bulk	
26 Piping	・ Confirmation that cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in cargo pump room, cargo compressor rooms and on weather decks are in good condition. ・ Confirmation that the earthing between hull structures and cargo piping systems (cargo oil pipes, vent pipes, tank washing pipes, etc.) is in good condition.
27 Cargo tank	・ Confirmation that the cargo tank openings, including gaskets, covers, coamings and screens are in good condition. ・ Confirmation that the cargo tank pressure/vacuum valves and devices to prevent the passage of flame are in good condition. ・ Confirmation that the cargo tank venting, cargo tank purging and gas-freeing and other ventilation systems are in good condition. ・ Confirmation that the earthing between hull structures and the cargo tank is in good condition.
28 Wire gauze to prevent the passage of flame	・ Confirmation, as far as practicable, that the wire gauze to prevent the passage of flame on vents to all bunker, oily-ballast and oily-slop tanks and void spaces are in good condition.
29 Safe access to the bow	・ Confirmation that the means of safe access to the bow is in good condition.
30 Emergency towing arrangements	・ Confirmation that emergency towing arrangements for ships of not less than 20,000 tonnes deadweight are in good condition.
Additional Requirement for Bulk Carriers over 10 *years* of age	
31 Piping in the cargo holds	・ Confirmation that all piping and penetrations in cargo holds, including overboard piping, are in good condition.
Additional Requirement for General Dry Cargo Ships of not less than 500 *gross tonnage* and over 15 *years* of age	
32 Piping in the cargo holds	・ Confirmation that all piping and penetrations in cargo holds, including overboard piping, are in good condition.

Note:

Examination of suspect areas identified at previous surveys is to be carried out.

Table B3.9 has been amended as follows.

Table B3.9 Special Requirements for Ships Carrying Liquefied Gases in Bulk (Continued)

Items	Examinations
7 Personnel protection	General examination of the equipment shown in (a) to (d) is to be carried out in addition to performance tests of decontamination shower and eye wash. (a) Protection equipment (b) Safety equipment (c) Stretcher and medical first-aid equipment (d) The following equipment if required by the provisions of **Part N**: i) respiratory protection for emergency escape purpose ii) decontamination showers and an eye wash iii) shelter in emergency
8 Stability Instrument	Functional tests are to be carried out on stability instruments fitted in accordance with the requirements of **2.2.3, Part N**.
9 Miscellaneous	The general condition of the equipment shown in (a) to (~~p~~o) is to be examined. The contents of items (~~k~~j) and (~~l~~k) are to be checked and confirmation that they are kept on board is to be made. Regarding the arrangements for ventilation systems of spaces in the cargo area specified in (c), operation tests are to be carried out. (a) Facilities associated with damage stability requirements such as cross flooding equipment and watertight doors, as far as accessible. Where it is difficult to carry out a general examination of cross flooding equipment, alternative examinations considered appropriate by the Society may be carried out instead. (b) Closing devices of windows, doors and other openings of the wheelhouse, superstructures, and deckhouses that are required to be gas/vapour-tight; and the arrangements for the air locks. (c) Arrangements for ventilation systems, including their spare fans or impellers, of enclosed spaces in the cargo area and spaces in the cargo area normally entered during cargo handling operations. (d) Fixed or portable trays or insulation that protects the deck located beneath the cargo hose connection against cargo leakage. (e) Gas-tight bulkhead penetrations including gas-tight shaft sealings, as far as accessible. (f) Heating arrangements of structural hull steel, as far as accessible. (g) Cargo hoses. ~~(h) Earthing between hull structures and cargo pipes as far as accessible.~~ (~~i~~h) Bow and stern loading and unloading arrangements (in particular, the electrical equipment, firefighting arrangements and means of communication between the cargo control room and the shore location) and their related installations, emergency muster station and other equipment required for special cargoes. (~~j~~i) Electrical installations in hazardous area. (~~k~~j) Cargo log book, operational records and manuals related to cargo containment system and cargo handling system. (~~l~~k) The *IMO Code* for gas carriers or the Rules incorporating the provisions of this *Code* (~~m~~l) Cargo control room (~~n~~m)Gas detection arrangements for cargo control rooms and the measures taken to exclude ignition sources where such spaces are not gas-safe (~~o~~n) The bilge, ballast and oil fuel arrangements specified in **3.7, Part N** (~~p~~o) The wheelhouse doors and windows, sidescuttles and windows in superstructure and deckhouse ends in the cargo area

Chapter 4 INTERMEDIATE SURVEYS

Table B4.5 to Table B4.8 have been amended as follows.

Table B4.5 Additional Requirements at Intermediate Surveys

Items	Examinations
1 Refrigerating Machinery	Examination of refrigerant leakage while the machinery is in operation and the general condition of the safety devices are to be carried out.
Requirements for Tankers	
~~1 Earthing~~	~~The earthing between cargo oil tanks/cargo piping systems (cargo oil pipes, vent pipes, tank washing pipelines, etc.) and hull structures is to be examined as far as accessible.~~
~~2~~1 Electrical installations in hazardous areas	(a) Electrical installations in hazardous areas are to be examined in detail and confirmation that they conform to the requirements in **4.2.7**, **Part H** is to be carried out. In addition, confirmation that the installations are in good condition is to be made by measuring the insulation resistance. However, this measurement may be omitted at the discretion of the Surveyor, if accurate measurement records of the insulation resistance can be verified. (b) Performance tests of interlock devices associated with pressurized protected type electrical equipment and electrical equipment installed in pressurized or ventilated areas are to be carried out.

Table B4.6 Special Requirements for Ships Carrying Liquefied Gases in Bulk

Items	Examinations
1 Piping of fixed gas detecting instruments	General examination is to be carried out.
2 Cargo tank pressure relief valves with non-metallic membranes	If the cargo tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, it is to be confirmed that such non-metallic membranes are maintained in good condition.
3 Electrical installations in hazardous areas	Examinations ~~specified in item 2~~ for tankers of **Table B4.5** are to be carried out.
~~4 Earthing~~	~~The earthing between cargo tanks and/or cargo piping systems (cargo pipes, vent pipes, etc.) and hull structures is to be examined visually as far as accessible.~~
~~5~~4 Drainage system for leaked cargo	Performance test of drainage system for leaked cargo in interbarrier spaces and hold spaces is to be carried out.
~~6~~5 Fire fighting system in enclosed gas dangerous spaces	Fixed piping is to be tested by passing air through it. Performance test of alarming devices for emergency escape is to be carried out.
~~7~~6 Personnel Protection	Where air compressors are used with the safety equipment, performance tests of the air compressors are to be carried out.

Table B4.7 Special Requirements for Ships Carrying Dangerous Chemicals in Bulk

Items	Examinations
1 Electrical installations in hazardous areas	Examinations ~~specified in item 2~~ for tankers of **Table B4.5** are to be carried out.
~~2 Earthing~~	~~The earthing between cargo tanks and/or cargo piping systems (cargo pipes, vent pipes, etc.) and hull structures is to be examined visually as far as accessible.~~
~~3~~2 Fire fighting system in enclosed gas dangerous spaces	Fixed piping is to be tested by passing air through it. Performance test of alarming devices for emergency escape is to be carried out.
~~4~~3 Personnel Protection	Where air compressors are used with the safety equipment, performance tests of the air compressors are to be carried out.

Table B4.8 Special Requirements for Ships Using Low-flashpoint Fuels

Items	Examinations
1 Piping of gas detection systems	General examinations are to be carried out.
2 Fuel storage tank pressure relief valves with non-metallic membranes	In cases where fuel storage tank relief valves with non-metallic membranes are main or pilot valves, it is to be confirmed that such non-metallic membranes are maintained in good condition.
3 Electrical installations in hazardous areas	~~The~~ ~~e~~Examinations ~~specified in item 2 of requirements~~ for tankers of~~in~~ **Table B4.5** are to be carried out.
~~4 Electrical bonding~~	~~The current condition of the electrical bonding between hull structures and fuel storage tanks or piping is to be verified.~~
~~5~~4 Bilge systems for interbarrier spaces, fuel storage hold spaces and tank connection spaces	Performance testing of bilge systems is to be carried out.
~~6~~5 Fire-fighting system in enclosed hazardous areas	Fixed piping is to be tested by passing air through it.
~~7~~6 Safety Systems	Gas detectors, temperature sensors, pressure sensors, level indicators, and other equipment providing input to the fuel safety system are to be randomly tested to confirm satisfactory operating condition. Proper response of the fuel safety system upon fault conditions is to be verified.

Chapter 5 SPECIAL SURVEYS

Table B5.25 has been amended as follows.

Table B5.25 Additional Requirements at Special Surveys for Machinery

Items	Examinations
1 Diesel engines (main propulsion machinery and auxiliary machinery for propulsion, manoeuvring and personnel safety)	(a) The essential part of the crankcase and cylinder jacket, the foundation bolts, the chock liners and the tie rod bolts are to be generally examined. (b) The doors of the crankcase and the explosion relief devices of the crankcase and scavenge space are to be generally examined. (c) The anti-vibration dampers, detuners, balancers, and compensators are to be generally examined. (d) The crankshaft alignment is to be checked and if necessary, adjusted.
2 Electrical installations	(a) The switchboards (including those for emergency), distribution boards, cables, etc. are, as far as practicable, to be generally examined. (b) Insulation resistance of the generators and switchboards (the both including those for emergency use), the motors and the cables are to be tested to ensure that they are placed in good order, and to be adjusted if it is found not to comply with the requirements **2.18.1**, **Part H**. However, where a proper record of measurement is maintained and deemed appropriate by the Surveyor, consideration may be given to accepting recent readings.
3 Refrigerating machinery	(a) Safety devices are to be generally examined to ascertain that they are placed in good order. (b) The machinery is to be examined while in operation to ascertain that there is no leakage of refrigerant.
4 Spare parts and associated fittings	Spare parts and their associated fittings for machinery are to be examined.
Requirements for Tankers	
~~1 Earthing~~	~~The earthing between cargo oil tanks or cargo piping systems (cargo oil pipes, vent pipes, tank washing pipelines, etc.) and hull structures is to be examined visually as far as accessible.~~
~~2~~1 Electrical installations in hazardous areas	(a) Electrical installations in hazardous areas are to be examined in detail and confirmation that they conform to the requirements in **4.2.7**, **Part H** is to be carried out. In addition, confirmation that the installations are in good order is to be made by measuring the insulation resistance. However, this measurement may be omitted at the discretion of the Surveyor, if accurate measurement records of the insulation resistance can be verified. (b) Performance tests of interlock devices associated with pressurized protected type electrical equipment and electrical equipment installed in pressurized or ventilated areas are to be carried out.

Table B5.27 has been amended as follows.

Table B5.27 Special Requirements for Ships Carrying Liquefied Gases in Bulk

Items	Examinations
(1 to 6 are omitted.)	
7 Electrical installations in hazardous areas	Examinations ~~specified in item 2~~ for tankers of **Table B5.25** are to be carried out.

Notes:
((*1) to (*8) are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 1-4)

1. The effective date of the amendments is 14 June 2019.

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

Amendment 1-5

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

12.2 Classification Survey during Construction

12.2.6 Sea Trials and Stability Experiments*

Sub-paragraph -2(3) has been added as follows.

2 Stability Experiments
((1) and (2) are omitted.)
(3) Where a computer for stability calculation is on board the units as a supplement to the stability information booklet, an operation manual for the computer is to be provided on board. After the computer is installed on board, a functional test to ensure that it is working correctly is to be carried out.

EFFECTIVE DATE AND APPLICATION (Amendment 1-5)

1. The effective date of the amendments is 14 June 2019.
2. Notwithstanding the amendments to the Rules, the current requirements 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 1-6

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

12.3 Annual Surveys

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

Sub-paragraph -2 has been amended as follows.

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

At Annual Surveys, the following surveys are to be 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. Close-up surveys using remote inspection techniques (RIT) may be accepted subject to prior special consideration by the surveyor. In such cases, the close-up surveys using RIT is to be carried out under the direction, and in the presence, of the surveyor.
((1) to (3) are omitted.)

12.4 Intermediate Surveys

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

Sub-paragraph -2 has been amended as follows.

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

At Intermediate surveys, the following surveys are to be 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. Close-up surveys using remote inspection techniques (RIT) may be accepted subject to prior special consideration by the surveyor. In such cases, the close-up surveys using RIT is to be carried out under the direction, and in the presence, of the surveyor.
((1) and (2) are omitted.)

12.5 Special Surveys

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

Sub-paragraph -2 has been amended as follows.

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

At Special surveys, the following surveys are to be 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. Close-up surveys using remote inspection techniques (RIT) may be accepted subject to prior special consideration by the surveyor. In such cases, the close-up surveys using RIT is to be carried out under the direction, and in the presence, of the surveyor.
((1) to (7) are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 1-6)

1. The effective date of the amendments is 1 July 2019.

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

Amendment 1-7

Chapter 1 GENERAL

1.1 Surveys

1.1.9 Machinery Verification Runs

Sub-paragraph -3 has been added as follows.

1 At the time of a special survey, a dock trial in the presence of the attending surveyor is to be carried out to confirm the satisfactory operation of main and auxiliary machinery. If significant repairs have been carried out to main or auxiliary machinery or steering gear, the Surveyor may deem a sea trial necessary.
2 At the time of extended drydocking, a dock trial may be required at the discretion of the attending surveyor to confirm the satisfactory operation of main and auxiliary machinery. If significant repairs have been carried out to main or auxiliary machinery or steering gear, the Surveyor may deem a sea trial necessary.
3 For electric propulsion ships, at the time of the machinery verification runs specified in **-1** and **-2** above, the satisfactory operation of electric propulsion plants is to be confirmed.

1.3 Definitions

1.3.1 Terms*

Sub-paragraphs (27) and (28) have 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 (26) are omitted.)
(27) "Electric propulsion ships" are ships which rely solely on electric propulsion motors for their propulsion.
(28) "Electric propulsion plants" are the following electrical installations of electric plopulsion ships.
(a) Generating plants for propulsion
(b) Elecric motors for propulsion
(c) Electrical installations that are necessary for the satisfactory operation of **(a)** and **(b)** (e.g. control gears for electric motors, semiconductor converters, and transformers)

Chapter 3 ANNUAL SURVEYS

3.3 Annual Surveys for Machinery

3.3.1 General Examinations*

Sub-paragraph -3 has been added as follows.

1 At Annual Surveys for Machinery, general examination of all the machinery in the engine room and the following inspections **(1)** to **(4)** are to be carried out:

(1) It is to be ascertained that the main propulsion machinery, power transmission machinery, shafting systems, prime movers other than main propulsion machinery, boilers, thermal oil heaters, incinerators, pressure vessels, auxiliaries, piping systems, control systems, electrical installations and switchboards are placed in good order.

(2) It is to be ascertained that the engine room, boiler spaces and means of escape are placed in good order with respect to dangers of fire and explosion.

(3) For ships adopting the preventive maintenance system in accordance with the requirements in **8.1.3**, the records of the parameters monitored are to be reviewed and a general examination is to be carried out in order to ascertain that the relevant installations have been well maintained.

(4) For ships affixed with the notation "*APSS・O*" or "*APSS・W*" which periodically perform oil analysis or freshwater sample tests, a general examination of the shafting system and a review of all the condition monitoring data available on board the ship are to be carried out in order to ascertain that the system is well maintained.

2 At Annual Surveys for tankers, ships carrying liquefied gases in bulk and ships carrying dangerous chemicals in bulk, the following inspections **(1)** and **(2)** are to be carried out in addition to the items in **-1** above.

(1) It is to be checked that each pump foundations are intact.

(2) It is to be ascertained that ventilation systems in cargo pump rooms and electrical installations in hazardous areas are placed in good order.

3 At Annual Surveys for electric propulsion ships, it is to be ascertained as far as practical for electric propulsion systems that forced cooling apparatuses (including filters), supports and coverings of cables, capacitor elements of propulsion semiconductor converters for propulsion, windings of generating plants and electric motors for propulsion, slip rings, commutators and brushes, etc. are in good condition.

3.3.2 Performance Tests*

1 At Annual Surveys for Machinery, performance tests for the systems and devices listed in **Table B3.7** are to be carried out in order to ascertain that they are in good working order.

2 (Omitted)

Table B3.7 has been amended as follows.

Table B3.7 Performance Tests at Annual Surveys

Items	Examinations
1 Valves for oil tanks	Operation tests for the arrangements for remote closing of valves for fuel oil tanks, lubricating oil tanks and other flammable oil tanks are to be carried out, as far as practicable and as appropriate.
2 Fuel oil pumps, cargo pumps, ventilating fans and boiler draught fans	Operation tests for emergency stopping means are to be carried out.
3 Emergency electrical power source	Operation tests for the emergency source of electrical power and its associated equipment are to be carried out in order to ascertain that the whole system is in good working order. Automatically operated equipment is to be tested in the automatic mode.
4 Communication systems	Operation tests for the means of communication between the navigation bridge and the machinery control position and between the navigation bridge and the steering gear compartment are to be carried out.
5 Steering gears	Performance tests are to be carried out for the main and auxiliary steering gears including their associated equipment and control systems;
6 Bilge systems	Operation tests for the valves (including ones for emergency use), cocks, strainers, pumps, reach-rods and level alarms of the bilge systems are to be carried out.
7 Safety devices	Operation tests for the safety devices, etc. specified in the following (a) to (e) are to be carried out. However, the tests may be omitted at the Surveyor's discretion based on the general examination, reports of working conditions at sea and inspection records taken by the ship's crew.
(a) Main propulsion machinery and auxiliary machinery	Operation tests of the following safety/alarm devices on prime movers of main propulsion machinery; electric generators; auxiliary machinery essential for propulsion; and auxiliary machinery for manoeuvring and crew safety are to be carried out. Where deemed necessary by the Surveyor, the maintenance records of the cooling water and lubricating oil are required to be presented for review. (i) Overspeed protective devices (ii) Automatic shut-off and alarm devices in case of loss or low pressure of the lubricating oil (iii) Automatic shut-off devices in case of abnormally low pressure of the main condenser vacuum for main steam turbines
(b) Boilers, thermal oil heaters and incinerators	Operation tests for the safety devices, alarm devices and pressure indicators specified in **Chapter 9, Part D** are to be carried out. Calibration records for the pressure indicators are to be ascertained and the relieving gears of the safety valves are to be examined and tested to verify satisfactory operation. However, the relief valves provided on the exhaust gas economizers are to be tested by the Chief Engineer at sea prior to the Annual Survey within the period specified in **1.1.3-1(1)**. This test is to be recorded in the logbook for review by the attending surveyor. Where deemed necessary by the Surveyor, the control records of the boiler water and thermal heater oil are required to be presented for review.

Table B3.7 Performance Tests at Annual Surveys (Continued)

Items	Examinations
(c) Monitoring devices	Operation tests for pressure indicators, thermometers, ammeters, voltmeters and revolution meters are to be carried out.
(d) Automatic control devices or remote control devices	Operation tests for automatic and remote control devices of auxiliary machinery essential for propulsion, manoeuvring, and crew safety as well as the means of remotely controlling the propulsion machinery (including electric propulsion plants for electric propulsion ships) from the navigating bridge (including the control, monitoring, reporting, alert and safety actions) are to be carried out.
(e) Engineer's Alarm	It is to be confirmed that the engineer's alarm is clearly audible in the engineers' accommodation.

Chapter 5 SPECIAL SURVEYS

5.3 Special Surveys for Machinery

Paragraph 5.3.1 has been amended as follows.

5.3.1 General Examinations*

At Special Surveys for Machinery, in addition to the general examination and inspections specified in **3.3.1**, the verification runs specified in **1.1.9-1** and **-3**, and the surveys specified in **Table B5.25** are to be carried out.

Table B5.25 has been amended as follows.

Table B5.25 Additional Requirements at Special Surveys for Machinery

Items	Examinations
1 Diesel engines (main propulsion machinery and auxiliary machinery for propulsion, manoeuvring and personnel safety)	(a) The essential part of the crankcase and cylinder jacket, the foundation bolts, the chock liners and the tie rod bolts are to be generally examined. (b) The doors of the crankcase and the explosion relief devices of the crankcase and scavenge space are to be generally examined. (c) The anti-vibration dampers, detuners, balancers, and compensators are to be generally examined. (d) The crankshaft alignment is to be checked and if necessary, adjusted.
2 Electrical installations	(a) The switchboards (including those for emergency), distribution boards, cables, etc. are, as far as practicable, to be generally examined. (b) Insulation resistance of the generators and switchboards (the both including those for emergency use), the motors and the cables; the main circuits of control gears for electric propulsion motors and semiconductor converters for propulsion of electric propulsion ships are to be tested to ensure that they are placed in good order, and to be adjusted if it is found not to comply with the requirements **2.18.1**, **Part H**. However, where a proper record of measurement is maintained and deemed appropriate by the Surveyor, consideration may be given to accepting recent readings.
3 Refrigerating machinery	(Omitted)
4 Spare parts and associated fittings	
Requirements for Tankers	
1 Earthing	(Omitted)
2 Electrical installations in hazardous areas	

EFFECTIVE DATE AND APPLICATION (Amendment 1-7)

1. The effective date of the amendments is 14 December 2019.

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

Amendment 1-8

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

12.2 Classification Survey during Construction

Paragraph12.2.2 has been amended as follows.

12.2.2 Submission of Plans and Documents*

1 Submission of Plans and Documents for Approval

With respect to the Classification Survey during Construction, the following plans and documents are to be submitted to the Society for approval before the work is commenced.

(1) Hull
- (a) Cross sections (showing the maximum load line and load line during towing)
- (b) Longitudinal sections
- (c) Details of inspection facilities
- (d) Details of welding procedures
- (e) Details of painting and corrosion control procedures
- (f) Temporary mooring arrangements, towing arrangements
- (g) Arrangements and construction of positioning systems
- (h) Summary of distributions of fixed and variable weights
- (i) Plan indicating design loads for all decks
- (j) Stability information booklet
- (k) Loading manual, where the loading manual is to be provided in accordance with the requirements of **7.6.1-2, Part P**
- (l) Details of maintenance and inspection procedures and docking plan and in-water inspection procedures
- (m) For self-elevating units, construction of all legs, leg connections to bottom mats or spud cans, leg tanks and leg jacking or other elevating systems
- (n) For column-stabilized units, construction of all columns, lower hull, upper hull, bracing, footings
- (o) For large storage units, rupture hatches arrangements
- (p) For mobile offshore drilling units, the following plans and documents:
  - i) Arrangement of drilling derricks, details of drilling derrick constructions and relevant documents
  - ii) Arrangement of equipment installed on drill floors
  - iii) Details of drill floors and substructure constructions
  - iv) Plans and documents indicating and specifying arrangements, specifications (including type, capacity, etc.), and the number, etc. of the breathing devices specified in **15.2.12, Part P**
- (q) Other plans and/or documents deemed necessary by the Society.

(2) Machinery
- (a) For Machinery installations relating to the safety of the unit and installations or systems related to the propulsion of the unit (only applicable to unit's with main propulsion machinery): plans and documents required in the relevant Chapters in **Part D**.
- (b) For machinery installations used solely for operation that is the purpose of the unit, plans and documents specified in **Chapters 9** and **10, Part D**

(c) For self-elevating units, construction and control diagrams of the jacking system
(d) For units with a dynamic positioning system, construction and control diagrams of the dynamic positioning system
(e) For units complying with **12.1.1-3**, testing procedures for machinery and electrical provisions or installations
(f) Other plans and/or documents deemed necessary by the Society

(3) Operations
(a) Operating manual specified in **18.1, Part P**
(b) Other plans and/or documents deemed necessary by the Society.

2 Submission of Plans and Documents for Reference

With respect to the Classification Survey during Construction, the following plans and documents are to be submitted for reference in addition to the plans and documents specified in **-1**.

(1) Method and calculation sheets of structural analysis for relevant loading condition
(2) Data or documents on environmental parameters used for determination of design loads (including data such as past measurement data, the effect of wave breakers, and towing routes) and calculation methods of total external forces and moments due to wind, waves, tidal currents, reactions to mooring or positioning systems and other loads
(3) Documents on the effects of icing or snow on loading, stability and projected area
(4) Calculation sheets for intact and damage stability in all conditions
(5) Documents relating to ~~the~~ requirements ~~of~~ **(2)** to **(4)**, where the loads and stability are determined using appropriate model tests or computing methods
(6) Calculation of significant operational loads from the drilling derricks and other equipment on the supporting structure
(7) For self-elevating units, calculations substantiating adequacy of the structure to transmit forces between legs and hull through the jacking or other elevating systems
(8) For units which rest on the sea bottom, calculation of the unit's ability to resist overturning
(9) Lines
(10) Cross curves ~~of~~for stability
(11) Curves ~~of~~for righting moments and wind heeling moments
(12) Capacity plans and sounding tables ~~of~~ tanks
(13) Methods and locations of non-destructive inspections, and procedures ~~of~~for thickness measurements;
(14) Plans indicating arrangements of watertight compartments, openings, and their respective closing appliances, etc. necessary for calculation of stability
(15) For machinery installations relating to the safety of the unit, and installations or systems related to the propulsion of the unit (only applicable to unit's with main propulsion machinery): plans and documents required in the relevant ~~C~~chapters ~~in~~of **Part D**
(16) For machinery installations used solely for operations that ~~is~~are the purpose of the unit: plans and documents indicating safety devices of machinery installations and those specified in **Chapters 9** and **10, Part D**
~~(17) Operating manual specified in **18.1, Part P**~~
(~~18~~17) For large storage units, hydraulic test procedures for hull, evaluation sheets ~~of~~for rupture hatches, and periodical inspection procedures including self-checking of rupture hatches
(~~19~~18) Procedures of sea trials and stability experiments
(~~20~~19) Calculation sheets ~~on~~for positioning systems
(~~21~~20) Procedures ~~for~~of testing the dynamic positioning systems (including test items of Periodical Surveys, test procedures, criteria, etc.)
(~~22~~21) Other plans and/or documents deemed necessary by the Society.

3 Notwithstanding the requirements in **-1** and **-2**, part of the plans and documents specified in **-1**

and **-2** may be omitted in accordance with provisions specified otherwise by the Society, in cases where the unit or machinery is to be built at the same place of manufacture based on plans and documents which have already been approved.

EFFECTIVE DATE AND APPLICATION (Amendment 1-8)

1. The effective date of the amendments is 1 January 2020.

2. Notwithstanding the amendments to the Rules, the current requirements 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.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

Part B Class Surveys

2019 AMENDMENT NO.1

Notice No.26 14 June 2019

Resolved by Technical Committee on 30 January 2019

Notice No.26 14 June 2019
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 1-1

B1 GENERAL

B1.1 Surveys

B1.1.3 Intervals of Class Maintenance Surveys

Sub-paragraphs -3 to -7 have been amended as follows.

3 ~~The timing (s~~Survey due dates~~)~~ of Ordinary Surveys of the propeller shafts Kind 1 and stern tube shafts Kind 1 specified in **1.1.3-1(6)(a)i), Part B of the Rules** may be extended ~~subject to the carrying out of Occasional Surveys~~ in accordance with the following **(1)** to **(43)** after carrying out an Occasional Survey, except for propeller shafts of ships affixed with the notation "*PSCM*" or "*PSCM・A*" subject also to Note 1 of **Table B8.1.3-1**~~:~~.

(1) ~~For~~ The following **(a)** and **(b)** apply in the case of oil lubricated ~~bearings~~ or freshwater lubricated shafts~~,~~ ~~the following **(a)** to **(c)** are to apply:~~ subject to the following **-4**.

(a) Extension of 1 *year*

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

i) Examinations are to be carried out in accordance with the following **1)** to **3)**:

1) Review of the previous weardown and/or clearance (between the bush and the shaft) recordings is to be carried out.

2) The examinations specified in **8.1.2-1(2), Part B of the Rules** are to be carried out.

3) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition is to be obtained.

ii) A visual inspection of all accessible parts of the shafting system is to be carried out.

iii) Verification that the propeller is free of damages which may cause the propeller to be out of balance is to be carried out.

iv) Verification of the effectiveness of the inboard seal and outboard seals is to be carried out.

v) The examinations specified in items 12 and 13 of **Table B8.1, Part B of the Rules** are to be carried out.

~~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;~~

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

~~iv) Review of the previous recordings of the weardown and/or clearance between the shaft and the bearing;~~

~~v) Verification of maintenance records of the stern tube sealing devices;~~

~~vi) Verification that main engines have not been operated within 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~~

~~viii) Carrying out the examinations specified in items 12 and 13 in **Table B8.1, Part B of the Rules.**~~

(b) Extension of 3 *months*

The survey due date may be extended for up to 3 *months* in cases where~~, after the execution of~~ a survey ~~consisting of~~ is carried out in accordance with the following ~~**i) and ii)**~~ **i)** to **iv)**~~, examined parts are proven to be in good condition~~ and the shaft condition is confirmed to be satisfactory.

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

i) Examinations are to be carried out in accordance with the following **1)** to **3)**:

1) Review of the previous weardown and/or clearance (between the bush and the shaft) recordings is to be carried out.

2) The examinations specified in **8.1.2-1(2), Part B of the Rules** are to be carried out.

3) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition is to be obtained.

ii) A visual inspection of all accessible parts of the shafting system is to be carried out.

iii) Verification of the effectiveness of the inboard seal is to be carried out.

iv) The examinations specified in items 12 and 13 of **Table B8.1, Part B of the Rules** are to be carried out.

~~(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 **(d)** 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 **5)** to verify that the test results comply with the criteria for parameters determined by the ship's management based upon the reference standards shown in **(d)** below and by taking into account its experience and knowledge. After the review, freshwater sample tests are to be carried out in accordance with the following **2)** to **5)** 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 and sodium 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) Sampling is to be carried out in accordance with the following:~~

~~• Samples are to be taken under service conditions (i.e., with a rotating shaft and the system at service temperature) and are to be representative of the water circulating within the stern tube.~~

~~• Samples are to be taken from the same pre-determined suitable position (before the filters, if any are fitted) in the system.~~

~~• Samples are to be collected under the direct supervision of the Chief Engineer, except when taking in the presence of a Surveyor.~~

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

~~5) The extent of make-up water in the system is to be checked.~~

~~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*.~~

~~(d) The reference standards for the criteria of the parameters specified in **(a)iii)** above are as follows:~~

~~i) Chloride and sodium content (upper limits)~~

~~1) Chloride content: 60 *ppm*~~

~~2) Sodium content: 70 *ppm*~~

~~ii) PH value~~

~~Lower limit values determined based upon characteristics of the corrosion inhibitors used, but not to be less than 11~~

~~iii) Bearing particles and other particles~~

~~1) Metallic content (upper limits)~~

~~Iron (Fe): 25 *ppm*~~

~~Chromium (Cr): 5 *ppm*~~

~~Nickel (Ni): 5 *ppm*~~

~~Copper (Cu): 40 *ppm*~~

~~Silicon (Si): 30 *ppm*~~

~~2) Bearing particles (non-metallic content)~~

~~No polymer resins are to be found by micro-filter and/or microscopic testing.~~

(~~3~~2) ~~For~~ The following **(a)** and **(b)** apply in the case of water lubricated ~~bearings~~ shafts~~, the following **(a)** to **(c)** are to apply:~~ subject to the following ~~-~~**5**.

(a) Extension of 1 *year*

The survey due date may be extended for up to 1 *year* in cases where~~, after the execution of~~ a survey ~~consisting of~~ is carried out in accordance with the following **i)** to ~~**viii)**~~**vi)**~~,~~ ~~examined parts are proven to be in good condition~~ and the shaft condition is confirmed to be satisfactory.

~~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~~ Examinations are to

be carried out in accordance with the following ~~**1) and 2)**~~ **1)** to **4)**:

1) Review of the previous clearance (between the bush and the shaft) recordings is to be carried out.

~~1~~2) ~~Review of~~ ~~s~~Service records~~, regularly recorded data showing in-service conditions of the shaft(s); and~~ are to be reviewed.

~~2~~3) Verification of no reported repairs by grinding or welding of shafts and/or propellers is to be carried out.

4) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition is to be obtained.

ii~~i~~) A ~~V~~visual inspection of all accessible parts of the shafting system~~;~~ is to be carried out.

iii~~v~~) Verification that the propeller is free of damages which may cause the propeller to be out of balance~~;~~ is to be carried out.

iv) Checking and recording the clearances ~~of bearing between the shaft and its bearings;~~ between the bush and the shaft are to be carried out.

v~~i~~) Verification of the effectiveness of the inboard seal~~;~~ is to be carried out.

vi~~i~~) ~~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~~ The examinations specified in items 11 of **Table B8.1, Part B of the Rules** are to be carried out.

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

(b) Extension of 3 *months*

The survey due date may be extended for up to 3 *month* in cases where~~, after the execution of the verifications 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~~ a survey is carried out in accordance with the following **i)** to **v)** and the shaft condition is confirmed to be satisfactory.

i) Examinations are to be carried out in accordance with the following **1)** to **4)**:

1) Review of the previous clearance (between the bush and the shaft) recordings is to be carried out.

2) Service records are to be reviewed.

3) Verification of no reported repairs by grinding or welding of shafts and/or propellers is to be carried out.

4) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition is to be obtained.

ii) A visual inspection of all accessible parts of the shafting system is to be carried out.

iii) Verification that the propeller is free of damages which may cause the propeller to be out of balance is to be carried out.

iv) Verification of the effectiveness of the inboard seal is to be carried out.

v) The examinations specified in items 11 of **Table B8.1, Part B of the Rules** are to be carried out.

~~(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~~3) The Occasional Surveys specified in **(1)** and **(2)** above are, in principle, to be carried out within 1 *month* of the survey due date, and the extension specified in **(1)** and **(2)** above counts from said survey due date. 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** At the Confirmatory Surveys for the "proper maintenance" of shafts in **1.1.3-1(6)(b)i), Part B of the Rules,** it is to be confirmed that at least at the following **(1)** through **(3)** are properly monitored and recorded, and that the lubricating conditions of the shafting system are maintained properly based upon those parameters. As for criteria for said parameters, the requirements specified in **-**3 "Criteria for Parameters" in Item 4 "Approval Conditions" in **Table B8.1.3-1** are to be applied mutatis mutandis.~~

~~(1) Lubricating oil sampling and analysis carried out regularly at intervals not exceeding 6 months (Each analysis is to include water content, chlorides content, shaft metal content, bearing metal particle content, and oil oxidation degree.)~~

~~(2) Lubricating oil consumption rate~~

~~(3) Bearing temperature~~

~~**5** For shafts where Ordinary Surveys are postponed for 2 *years* in accordance with **1.1.3-1(6)(b)i), Part B of the Rules** the proper maintenance specified in **-4** above is to be conducted until the next Ordinary Survey.~~

4 The following **(1)** and **(2)** apply in the case of an extension of the survey due date specified in **-3(1)** above until an Ordinary Survey specified in **8.1.1, Part B of the Rules** or a Partial Survey specified in **8.1.2, Part B of the Rules** is completed.

(1) No more than two consecutive "1 *year*" extensions can be granted. No further extension of another type (that in accordance with **-3(1)(b)** above) can be granted.

(2) No more than one "3 *months*" extension can be granted. In the event an additional extension is requested, an Occasional Survey in accordance with **-3(1)(a)** above is to be carried out, and the survey due date, prior to the previous extension, is to be extended for up to 1 *year*.

5 The following **(1)** and **(2)** apply in the case of an extension of the survey due date specified in **-3(2)** above until an Ordinary Survey specified in **8.1.1, Part B of the Rules** is completed.

(1) No more than one "1 *year*" extension can be granted. No further extension of another type (that in accordance with **-3(2)(b)** above) can be granted.

(2) No more than one "3 *months*" extension can be granted. In the event an additional extension is requested, an Occasional Survey in accordance with **-3(2)(a)** above is to be carried out, and the survey due date, prior to the previous extension, is to be extended for up to 1 *year*.

6 ~~The~~ Upon postponement of the Ordinary Surveys of propeller shafts Kind 1 other than those of ships affixed with the notation "*PSCM*" or "*PSCM・A*" 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**, the interval of the Ordinary Surveys of such shafts ~~are~~ is not to exceed the following limits:

(1) 6 *years* for shafts Kind 1*A*

(2) ~~8~~12 *years* for shafts Kind 1*B*, shafts Kind 1*C* and shafts Kind 1*W* ~~(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~~ Due dates of the "non-destructive examination (*NDE*)" specified in **1.1.3-1(6)~~(g)~~(a)iii)**, **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~~ a survey specified in **i)** to **v)** of **-3(2)(b)** above is carried out and the shaft condition is confirmed to be satisfactory. In such cases, further extension of the due date according to **(a)** or **(b)** of **-3(2)** above is not allowed until the non-destructive examination (*NDE*) is completed. The provisions of **-3(3)** above apply to the calculation of the extension of the due date.

~~(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.~~

B3 ANNUAL SURVEYS

B3.3 Annual Surveys for Machinery

B3.3.1 General Examinations

Sub-paragraph -2 has been amended as follows.

2 The ~~phrases "lubricating oil analysis" and "freshwater sample tests" specified~~ "reference standards deemed appropriate by the Society" referred to in **3.3.1-1(4), Part B of the Rules** refer to ~~the "lubricating oil analysis" and "freshwater sample tests" specified in **2.2.1-2(2)** and **2.3.1-2(2)** of **Annex B1.1.3-7 "Alternative Propeller Shaft Survey Methods"**, respectively.~~ the following **(1)** and **(2)**:

(1) those specified in **B8.1.2-1** for oil lubricated shafts; and

(2) those specified in **B8.1.2-2** for freshwater lubricated shafts.

B6 DOCKING SURVEYS

B6.1 Docking Surveys

Paragraph B6.1.3 has been amended as follows.

B6.1.3 Other Surveys

The ~~phrases "lubricating oil analysis" and "freshwater sample tests" specified~~ "reference standards deemed appropriate by the Society" referred to in **6.1.3-2, Part B of the Rules** refer to ~~the "lubricating oil analysis" and "freshwater sample tests" specified in **2.2.1-2(2)** and **2.3.1-2(2)** of **Annex B1.1.3-7 "Alternative Propeller Shaft Survey Methods"**, respectively.~~ the following **(1)** and **(2)**:

(1) those specified in **B8.1.2-1** for oil lubricated shafts; and

(2) those specified in **B8.1.2-2** for freshwater lubricated shafts.

B8 PROPELLER SHAFT AND STERN TUBE SHAFT SURVEYS

Section B8.1 has been amended as follows.

B8.1 Propeller Shaft and Stern Tube Shaft Surveys

B8.1.1 Ordinary Surveys

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~~ in the case of 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~~ in the case of oil lubricated bearings~~:~~
~~As rule,~~ To be standardized as 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~~ in the case of freshwater lubricated bearings~~:~~
Weardown value used as reference for repairs specified by the manufacturer.

B8.1.2 Partial Surveys

1 The "reference standards deemed appropriate by the Society" referred to in **8.1.2-1(2)(b)i), Part B of the Rules** means the reference standards specified in the following **(1)** and **(2)**:

(1) Metal particles (upper limits)
(a) Iron (Fe): 50 *ppm*
(b) Tin (Sn): 20 *ppm*
(c) Lead (Pb): 20 *ppm*
(d) Sodium (Na): 80 *ppm*

(2) IR Oxidation and separated water (upper limits)
(a) IR oxidation @ 5.85μm: 10 (*Abs.unit*/*cm*)
(b) Separated water: 1.0 *%*

2 The "reference standards deemed appropriate by the Society" referred to in **8.1.2-1(2)(b)ii), Part B of the Rules** means the reference standards specified in the following **(1)** and **(2)**:

(1) Chloride content and sodium content (upper limits)
(a) Chloride: 60 *ppm*
(b) Sodium (Na): 70 *ppm*

(2) pH
Lower limit values determined based upon characteristics of the corrosion inhibitors used, but not to be less than 11

(3) Bearing particles and other particles
(a) Metal particles (upper limits)
i) Iron (Fe): 25 *ppm*
ii) Chromium (Cr): 5 *ppm*
iii) Nickel (Ni): 5 *ppm*
iv) Copper (Cu): 40 *ppm*
v) Silicon (Si): 30 *ppm*
(b) Bearing particles (non-metallic content)

No polymer resins are to be found by micro-filter and/or microscopic testing.

B8.1.3 Preventive Maintenance System

1 The wording "appropriate stern tube sealing devices as approved by the Society" specified in **8.1.3, Part B of the Rules**, means stern tube sealing devices capable of being repaired and replaced without withdrawing the shaft.

2 The preventive maintenance system specified in **8.1.3, Part B of the Rules~~,~~** is to be approved in accordance with the procedures specified in **Table B8.1.3-1**.

~~**3** The wording "where deemed appropriate by the Society" in **8.1.3, Part B of the Rules** means those cases where it is difficult to sufficiently draw out the propeller from the propeller shaft for those ships in which the distance between the propeller and the rudder plate is short and where no sign of slippage between the shaft and propeller has been confirmed. However, even in such cases, the propeller is to be drawn out from its shaft as far as possible and the condition of the propeller boss bore is to be checked by the surveyor.~~

~~4~~3 The wording "properly monitored" in **8.1.3(1), Part B of the Rules**, as it pertains to "bearing temperature", is to be achieved by either of the following monitoring and recording devices 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~~4 The wording "properly monitored" in **8.1.3(2), Part B of the Rules**, as it pertains to "bearing temperature", is to be achieved by at least one device provided for measuring the temperature of the metal at the aft end bottoms of stern tubes.

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 and Stern Tube 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
	(1. to 4. are omitted.)
5. After Approval	(-1 to -3 are omitted.) -4 The ship is, no later than the survey due date specified in **1.1.3-1(6)(a)i), Part B of the Rules**[1, 2], to be subject to ~~the applicable survey items specified in **Table B8.1**~~ a Partial Survey in accordance with **(a)** to **(i)** of **8.1.2-1(1), Part B of the Rules**[3, 4] after the examinations specified in the following (1) to (4) are carried out and the shaft condition is confirmed to be satisfactory ~~(excluding survey items 1, 3, 4, 5, 7 and 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~~ with keyless connections, the maximum interval of two consecutive surveys according to the requirements applied to Partial Surveys, including survey items 2~~,~~ and 9 ~~and 10~~ specified in **Table B8.1, Part B of the Rules** ~~may be extended[1] until the earlier date of the following **(1)** or **(2)**~~ or Ordinary Surveys (specified in **8.1.1, Part B of the Rules**) is not to exceed 15 *years*[5, 6]. ~~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.~~ In all cases where the results of the examinations specified in the following (1) to (4) or the Partial Survey are not satisfactory, an Ordinary Survey specified in **8.1.1, Part B of the Rules** 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 15 *years* after the propeller shaft survey (including survey items 2, 9 and 10 in **Table B8.1, Part B of the Rules**) was completed except in the case when one extension for no more than three months is granted[2]~~ (1) Review of service records, including those specified in (2) and (3) of 4.-3, is to be carried out. (2) Review of test records of the lubricating oil analysis is to be carried out to confirm that the reference standards specified in 4.-3 are complied with. (3) An oil sample examination is to be carried out. (4) Verification of no reported repairs by grinding or welding of shafts and/or propellers is to be carried out.
6. Cancellation of Approval	Where the following **-1** to **-3** is applicable, the Society may cancel the ship's approval to adopt the preventive maintenance system for ~~the~~ propeller shafts. In ~~this~~ such cases, the Society is to notifi~~es~~y the ship's management of the cancellation, and the ship is to undergo the propeller shaft survey immediately in accordance with the requirements of **8.1.1, Part B of the Rules**. -1 Where any improper conduct is found regarding entries in the records such as those for oil analysis results. -2 Where it is regarded by the Society that proper maintenance is not carried out according to the approved manual. -3 Where the shipowner or ship management company has changed, or cancellation of the approval to adopt the preventive maintenance system has been requested by the ship's management.

(Notes)

1 In cases where the survey due date is to be extended, the provisions of **-3(1)** and **-4** of **B1.1.3** apply, replacing "examinations specified in **8.1.2-1(2), Part B of the Rules**" with "examinations specified in (1) to (4) of 5.-4. in **Table B8.1.3-1**". The provisions of **B1.1.3-3(3)** apply to the calculation of the extension of the due date.

2 For required surveys completed within 3 *months* before the survey due date, the next period will start from the survey due date.

3 The Ordinary Survey specified in **8.1.1, Part B of the Rules** may be carried out upon request of the shipowner.

~~1~~4 ~~The carrying out of~~ In the case of keyless connections, it is recommended that either the Partial Survey, including survey items 2~~,~~ and 9 ~~and 10~~ specified in **Table B8.1**, **Part B of the Rules** ~~is recommended~~ or the Ordinary Survey specified in **8.1.1, Part B of the Rules** be carried out in cases where ~~the next survey due date will be earlier than~~ the date 15 *years* after the date of completion of the previous Partial ~~s~~Survey~~, which included the~~ including survey items 2~~,~~ and 9 ~~and 10~~

specified in **Table B8.1**, **Part B of the Rules**, or the previous Ordinary Survey is earlier than the next survey due date.

~~2~~5 In cases where the due date of the Partial Survey, including survey items 2 and 9 specified in **Table B8.1**, **Part B of the Rules**, or an Ordinary Survey is to be extended, the provisions of **B1.1.3-3(1)(b)** apply, replacing "examinations specified in **8.1.2-1(2), Part B of the Rules**" with "examinations specified in (1) to (4) of 5.-4 in **Table B8.1.3-1**". In such cases, ~~N~~no further extension of the due date can be granted until such a Partial Survey or Ordinary Survey is completed. The provisions of **B1.1.3-3(3)** apply to the calculation of the extension of the due date.

6 For the Partial Surveys specified in **8.1.2, Part B of the Rules** or the Ordinary Surveys specified in **8.1.1, Part B of the Rules** completed within 3 *months* before the due date, the next period will start from the due date.

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

Annex B1.1.3-7 ALTERNATIVE PROPELLER SHAFT AND STERN TUBE 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~~ ~~S~~survey in accordance with **2.2** (Method 1, Method 2 or Method 3).

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~~ ~~S~~survey in accordance with **2.3** (Method 1, Method 2 or Method 3).

3 ~~In applying~~ Notwithstanding **-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~~ the next period will start from the survey due date.

2.1.2 Extensions of Survey Due Date

1 The survey due dates specified in **2.1.1** may be extended after examinations are carried out in accordance with the following **(1)** and **(2)** subject to -**2** below ~~:~~.

(1) ~~For shafts with oil lubricated or freshwater lubricated bearings, s~~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~~ of 30 *months*

The survey due date may be extended for up to 30 *months* ~~When~~ in cases where ~~the results of~~ a survey is carried out in accordance with the following **i)** to **vii)** ~~are~~ and the shaft condition is confirmed to be 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, including those specified in the following **(b)** and **(c)**, can be granted until an Ordinary Survey is carried out.~~

i) Examinations are to be carried out in accordance with the following **1)** and **2)**:

1) ~~verification~~ Examinations are to be carried out in accordance with ~~**2.2.1-2**~~**(1)** to **(~~3~~4)** of **2.2.1-2**~~, as applicable, for~~ in the case of oil lubricated bearings or in accordance with ~~**2.3.1-2**~~**(1)** to **(~~3~~4)** of **2.3.1-2**~~, as applicable, for~~ in the case of freshwater lubricated bearings~~; and~~.

2) ~~e~~Confirmation from the ~~e~~Chief ~~e~~Engineer that the shafting arrangement is in good working condition is to be obtained~~:~~.

ii) ~~e~~Checking and recording the bearing weardown measurements are to be carried out, as far as practicable~~:~~.

iii) A visual inspection of all accessible parts of the shafting system is to be carried out~~:~~.

iv) ~~v~~Verification that the propeller is free of damages which may cause the propeller to be out of balance is to be carried out~~:~~.

v) ~~v~~Verification of the effectiveness of the inboard seal and outboard seals is to be carried out~~:~~.

vi) ~~e~~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 is to be carried out~~; and~~.

vii) ~~e~~Examination of the lubricating oil or lubricating freshwater record book is to be carried out.

(b) Extension ~~up to~~ of 1 *year*

The survey due date may be extended for up to 1 *year* ~~When~~ in cases where ~~the results of~~ a survey is carried out in accordance with the following **i)** ~~and~~ to **~~ii~~v)** ~~are~~ and the condition is confirmed 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 until an Ordinary Survey is carried out. In the event an additional extension is requested the provisions of **(a)** above are to be applied and the shaft survey due date, prior to the previous extension(s), may be extended for a maximum of 30 *months*.~~

i) Examinations are to be carried out in accordance with the following **1)** to **3)**:

~~i~~1) ~~r~~Review of the previous weardown and/or clearance (between the bush and the shaft) recordings are to be carried out~~, and~~.

~~ii) those specified in **(a)i), iii), iv), v), vi)** and **vii)** above.~~

2) Examinations are to be carried out in accordance with **(1)** to **(4)** of **2.2.1-2** in the case of oil lubricated bearings or in accordance with **(1)** to **(4)** of **2.3.1-2** in the case of freshwater lubricated bearings.

3) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition is to be obtained.

ii) A visual inspection of all accessible parts of the shafting system is to be carried out.

iii) Verification that the propeller is free of damages which may cause the propeller to be out of balance is to be carried out.

iv) Verification of the effectiveness of the inboard seal and outboard seals is to be carried out.

v) 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 is to be carried out.

vi) Examination of the lubricating oil or lubricating freshwater record book is to be carried out.

(c) Extension ~~up to~~ of 3 *months*

The survey due date may be extended for up to 3 *months* ~~When~~ in cases where ~~the results of~~ a survey is carried out in accordance with the following **i)** and **~~ii~~v)** ~~are~~ and the shaft condition is confirmed to be 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 provisions of **(a)** or **(b)** above is to be applied and the survey due date, prior to the previous extension, may be extended for a maximum of 30 *months* or one *year*.~~

~~i) those specified in **(b)i)** above as well as in **(a)i), iii), vi),** and **vii)** above; and~~

i) Examinations are to be carried out in accordance with the following **1)** to **3)**:

1) Review of the previous weardown and/or clearance (between the bush and the shaft) recordings are to be carried out.

2) Examinations are to be carried out in accordance with **(1)** to **(4)** of **2.2.1-2** in the case of oil lubricated bearings or in accordance with **(1)** to **(4)** of **2.3.1-2** in the

case of freshwater lubricated bearings.

3) Confirmation from the Chief Engineer that the shafting arrangement is in good working condition is to be obtained.

ii) A visual inspection of all accessible parts of the shafting system is to be carried out.

iii) ~~v~~Verification of the effectiveness of the inboard seal is to be carried out.

iv) 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 is to be carried out.

v) Examination of the lubricating oil or lubricating freshwater record book is to be carried out.

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

2 The following **(1)** to **(3)** apply in the case of an extension of the survey due date specified in **-1** above until a survey according to **Table 2.1** or **2.2 B of the Rules** is completed.

(1) No more than one "30 *months*" extension can be granted. No further extension according to **(b)** or **(c)** of **-1(1)** above can be granted.

(2) No more than two consecutive "1 *year*" extensions can be granted. In the event an additional extension is requested, an extension survey in accordance with **-1(1)** above is to be carried out and the survey due date, prior to the previous (one or two) extension(s), is extended for up to 2.5 *years*.

(3) No more than one "3 *months*" extension can be granted. In the event an additional extension is requested, an extension survey in accordance with **(b)** or **(a)** of **-1(1)** above is to be carried out, and the survey due date, prior to the previous extension, is extended for up to 1 *year* or 30 *months*, respectively.

2.1.3 15-year Interval ~~Ordinary~~ Surveys

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

(1) ~~For~~ In the case of shafts with keyless ~~or flange~~ connections ~~shafts~~ ~~with~~ and oil lubricated bearings, the maximum interval between the two surveys carried out according to **Tables 2.1** or **2.2** in accordance with the provision of **2.2.1** is not to exceed 15 *years*~~,~~. ~~except in the case when one extension for no more than three *months* is granted~~ This due date may be extended for up to 3 *months* in accordance with **2.1.2-1(1)(c)**. ~~In this context,~~ ~~i~~In cases where an application is submitted in order to newly affix the notation "*APSS・O*" to ships without "*APSS・O*" or "*APSS・W*", 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~~ ~~S~~survey carried out according to **Table 2.1** or **2.2**.

(b) In ~~the~~ cases of ships affixed with the notation "*PSCM*" or "*PSCM・A*", the date of completion of the ~~examinations specified in~~ Partial Survey carried out in accordance with 5.-4 of **Table B8.1.3-1**, **Part B of the Guidance** (including survey items 2~~,~~ and 9 ~~and 10~~

of **Table B8.1, Part B of the Rules**) is regarded as the date of completion of the previous ~~Ordinary~~ ~~S~~survey carried out according to **Table 2.1** or **2.2**.

(2) ~~For~~ In the case of shafts with freshwater lubricated bearings, the maximum interval between two surveys carried out according to **Table 2.1** in accordance with the provision of **2.3.1** is not to exceed 15 *years*~~.~~ ~~except in the case when one extension for no more than three *months* is granted~~ This due date may be extended for up to 3 *months* in accordance with **2.1.2-1(1)(c)**. ~~In this context,~~ ~~i~~In cases where an application is submitted in order to newly affix the notation "*APSS・W*" to ships without ~~said notation~~ "*APSS・O*" or "*APSS・W*", the date of completion of the previous Ordinary Survey is regarded as the date of completion of the previous ~~Ordinary~~ ~~S~~survey carried out according to **Table 2.1**.

2 For surveys referred to in **(1)** and **(2)** of **-1** above completed within 3 *months* before the due date, the next period will start from the survey due date.

3 In cases of extensions of the due date specified in **(1)** or **(2)** of **-1** above, further extension of the due date is not allowed until the following **(1)** or **(2)** take place. The provisions of **2.1.2-1(3)** above apply to the calculation of the extension of the due date.

(1) Completion of a survey according to **Table 2.1** or a survey according to **Table 2.2** in accordance with **2.2.1** in the case of shafts with keyless connections and oil lubricated bearings; or

(2) Completion of a survey according to **Table 2.1** in the case of shafts with freshwater lubricated bearings.

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 shafts with keyed connections, ~~Ordinary~~ ~~S~~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~~ examinations specified in the following **(1)** to **(3)** are to be carried out. When the results of the ~~verification~~ examinations 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, a~~n~~ ~~Ordinary~~ ~~S~~survey in accordance with **Table 2.1** is to be carried out.

(1) Review of service records, including confirmation of bearing temperature records, ~~regularly recorded data showing in-service conditions of the shaft(s), which may include lubricating oil temperature, bearing temperature and oil consumption records;~~ is to be carried out.

(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~~ is to be carried out to confirm that the standards specified in **B8.1.2-1, Part B of the Guidance** are complied with.

~~(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 shafts and/or propellers is to be carried out.

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~~ ~~S~~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~~ examinations specified in the following **(1)** to **(~~3~~4)** are to be carried out. When the results of the ~~verification~~ examinations specified in the following **(1)** to **(~~3~~4)** or the results of surveys in accordance with the following **Table 2.2** or **2.3** are not satisfactory, a~~n~~ ~~Ordinary~~ ~~S~~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~~ is to be carried out.

(2) Review of test records of freshwater sample tests is to be carried out ~~in accordance with the following **(a)** to **(e)** to verify that the test results comply with the criteria for parameters determined by the ship's management based upon the reference standards shown in **-3** below and by taking into account its experience and knowledge~~ to confirm that the standards specified in **B8.1.2-2, Part B of the Guidance** are complied with.

(3) ~~After the review,~~ A freshwater sample test~~s~~ ~~are~~ is to be carried out ~~in accordance with the following **(b)** to **(e)** 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 and sodium 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) Sampling is to be carried out in accordance with the following **i)** to **iii)**:~~

~~i) Samples are to be taken under service conditions (i.e., with a rotating shaft and the system at service temperature) and are to be representative of the water circulating within the stern tube.~~

~~ii) Samples are to be taken from the same pre-determined suitable position (before the filters, if any are fitted) in the system.~~

~~iii) Samples are to be collected under the direct supervision of the Chief Engineer, except when taking in the presence of a Surveyor.~~

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

~~(e) The extent of make-up water in the system is to be checked.~~

(~~3~~4) Verification of no reported repairs by grinding or welding of shafts and/or propellers is to be carried out.

~~**3** The reference standards for the criteria of the parameters specified in **-2(2)** above are specified in the following **(1)** to **(3)**:~~

~~(a) Chloride and sodium content (upper limits)~~

~~i) Chloride content: 60 *ppm*~~

~~ii) Sodium content: 70 *ppm*~~

~~(b) PH value~~

~~Lower limit values determined based upon characteristics of the corrosion inhibitors used, but not to be less than 11~~

~~(c) Bearing particles and other particles~~

~~i) Metallic content (upper limits)~~

~~Iron (Fe): 25 *ppm*~~

~~Chromium (Cr): 5 *ppm*~~

~~Nickel (Ni): 5 *ppm*~~

~~Copper (Cu): 40 *ppm*~~

~~Silicon (Si): 30 *ppm*~~

~~ii) Bearing particles (non-metal content)~~

~~No polymer resins are to be found by micro-filter and/or microscopic testing.~~

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 deemed appropriate by the Surveyor 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~~4
-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 ~~s~~Surveyor, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method~~s~~ deemed appropriate by the Surveyor.
3 Propeller shaft, stern tube shaft, and coupling bolts	Examination of the sleeves, the fillet of the coupling flange to the intermediate shaft or to the stern tube shaft and the coupling bolts 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 the Surveyor, based on the results of external examinations, deems such addition testing to be necessary. In addition, anti-corrosion covers are to be removed for shafts Kind 2.
4 Stern tube bearing[1]	Examination of the stern tube bearings
~~3~~5 Clearances between bush of the stern tube bearing[2] and the propeller shaft or the stern tube shaft ~~and the after bearing of the stern tube~~	Checking and recording the bearing clearances between the bush and the shaft
~~4~~6 Propellers	Verification that the propeller is free of damages which may cause the propeller to be out of balance
~~5~~7 ~~Stern tube~~ ~~s~~Sealing ~~systems~~ device for stern tube[3]	Verification of the satisfactory conditions of inboard and outboard seals during the re-installation of the shaft and propeller
~~6~~8 Weardown of the propeller shaft or the stern tube shaft at ~~the after bearing of~~ the stern tube bearing	Measuring and ~~R~~recording the bearing weardown measurements (after re-installation)
~~7~~9 Propeller boss surfaces in contact with the propeller shaft taper	Examination of the propeller boss surfaces
~~8~~10 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~~11 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~~12 Lubricating 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.~~

1 This includes shaft bracket bearings. The same applies hereinafter in this Chapter.

2 This includes bush of shaft bracket bearings. The same applies hereinafter in this Chapter.

3 This includes sealing devices for shaft bracket bearings. The same applies hereinafter in this Chapter.

~~2~~4 ~~When the shaft is of~~ For shafts with keyless connections, 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 deemed appropriate by the Surveyor all around the shaft in way of the forward portion of the taper section, including the keyway (if fitted).~~3~~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 ~~s~~Surveyor, the coupling bolts and flange radius are to be examined by means of an approved surface crack detection method[2] deemed appropriate by the Surveyor.
2 Weardown of the propeller shaft or the stern tube shaft at the ~~after bearing of the~~ stern tube bearing	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	Confirmation that the ~~S~~seal liner is 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 of 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.
11 Other	Verification that the main engines have not been operated within the barred speed range for torsional vibration

(Notes)

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

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

~~3~~2 ~~When the shaft is of~~ For shafts with keyless connection~~s~~, 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 bearing	Checking and recording the bearing weardown measurements
2 Shafting systems	Visual Inspection of all accessible parts of the shafting system
3 Propellers	Verification that the propeller is free of damages which may cause the propeller to be out of balance
4 Seal liners	Confirmation that the ~~S~~seal liner is 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.
8 Other	Verification that the main engines have not been operated within the barred speed range for torsional vibration

(Notes)

1 For shafts with keyless connection with oil lubricated bearings ~~having of keyless or flanged connections~~, it is recommended that a~~n Ordinary S~~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~~ the date 15 *years* after the date of completion of the previous ~~Ordinary S~~survey carried out in accordance with **Table 2.1** or **2.2** is earlier than the next survey due date.

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

2.4 Repairs, etc. of Stern Tube Bearings

2.4.1 Repairs, etc. due to Stern Tube ~~after~~ Aft End Weardown

When the weardown at ~~the aft end of~~ the stern tube bearings 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~~ in the case of oil lubricated bearings~~:~~

To be standardized as 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~~ in the case of freshwater lubricated bearings~~:~~

Weardown values used as references for repairs specified by the manufacturer.

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 14 June 2019.

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 until the first propeller shaft and stern tube shaft surveys scheduled on or after 1 January 2016 are completed.

3. Notwithstanding the provision of preceding **2.**, the amendments to the Guidance may apply, upon request of the owner, to ships other than ships the delivery of which is on or after 1 January 2016 before the first propeller shaft and stern tube shaft surveys scheduled on or after 1 January 2016 are completed.

Amendment 1-2

B3 ANNUAL SURVEYS

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

B3.2.2 General Examination

Sub-paragraph -7 has been added as follows.

7 When applying the requirements of item 26 and item 27 of **Table B3.2, Part B of the Rules**, resistance testing is to be carried out for all electrical bonding to confirm that resistance is not greater than 1 *MΩ* in cases where bonding straps are not provided as electrical bonding between fuel storage tanks or fuel piping and hull structures, or in cases where the Surveyor deems such testing to be necessary. However, such measurements may be omitted at the discretion of the Surveyor in cases where accurate measurement records are maintained and can be verified.

B3.4 Special Requirements for Ships Carrying Liquefied Gases in Bulk

Paragraph B3.4.2 has been amended as follows.

B3.4.2 Examinations

1 (Omitted)

~~**2** In application of items 1 and 9(h) of **Table B3.9, Part B of the Rules**, cargo tanks and cargo piping that are not earthed to the hull structure by bonding straps are to be tested at each place to confirm that the resistance is not greater than 1 *MΩ*.~~

~~**3**~~**2** (Omitted)

~~**4**~~**3** (Omitted)

~~**5**~~**4** (Omitted)

~~**6**~~**5** (Omitted)

~~**7**~~**6** (Omitted)

~~**8**~~**7** (Omitted)

~~**9**~~**8** (Omitted)

~~**10**~~**9** In applying item 9(~~j~~i) of **Table B3.9, Part B of the Rules**, it is to be confirmed that electrical equipment in gas-dangerous spaces and zones is in a satisfactory condition and is being properly maintained.

B3.6 Special Requirements for Ships Using Low-flashpoint Fuels

B3.6.2 Examinations

Sub-paragraph -2 has been amended as follows.

2 When applying the requirements of (f) of item 9 of **Table B3.11, Part B of the Rules**, resistance testing is to be carried out for all electrical bonding to confirm that resistance is not greater than 1 *MΩ* in cases where bonding straps are not provided as electrical bonding between fuel storage tanks or fuel piping and hull structures, or the Surveyor deems such testing to be necessary. However, such measurements may be omitted at the discretion of the Surveyor in cases where accurate measurement records are maintained and can be verified.

B4 INTERMEDIATE SURVEYS

B4.3 Intermediate Surveys for Machinery

B4.3.1 General Examinations

Sub-paragraph -2 has been deleted, and Sub-paragraph -3 has been amended as follows.

~~**2** When implementing the requirements in the first line of "Requirements for Tankers" in **Table B4.5, Part B of the Rules**, and electrical bonding straps are not provided for the earthing between the cargo oil tanks / cargo piping systems (cargo oil pipes, vent pipes, tank washing pipelines, etc.) and hull structures, resistance tests are to be carried out to confirm that the resistance at each place is not greater than 1 *MΩ*.~~

~~**3**~~**2** The wording "hazardous areas" ~~in item 2~~ of Requirements for Tankers in **Table B4.5, Part B of the Rules** refers to the hazardous areas specified in **4.2.3-1, -4** and **-5, Part H of the Rules**.

B4.4 Special Requirements for Ships Carrying Liquefied Gases in Bulk

B4.4.2 Examinations

Sub-paragraph -3 has been deleted.

~~**3** In the examination required for item 4 of **Table B4.6, Part B of the Rules**, where bonding straps are not provided as earthing between the hull structures and the cargo tanks / cargo piping, resistance tests are to be carried out to confirm that the resistance at each place is not greater than 1 *MΩ*.~~

B4.5 Special Requirements for Ships Carrying Dangerous Chemicals in Bulk

Paragraph B4.5.2 has been amended as follows.

B4.5.2 Examinations

~~1~~ The wording "hazardous areas" in item 1 of **Table B4.7, Part B of the Rules** refers to the hazardous areas specified in **4.2.3-2, -4** and **-5, Part H of the Rules**. In applying this item, it is to be checked for defective equipment, fixtures and wiring.

~~**2** In the examination required for item 2 in **Table B4.7, Part B of the Rules**, where bonding straps are not provided as earthing between the hull structures and the cargo tanks / cargo piping, resistance tests are to be carried out to confirm that the resistance at each place is not greater than 1 *MΩ*.~~

B4.6 Special Requirements for Ships Using Low-flashpoint Fuels

B4.6.2 Examinations

Sub-paragraph -3 has been deleted.

~~**3** In applying the requirements of item 4 of **Table B4.8, Part B of the Rules**, resistance testing is to be carried out for all electrical bonding to confirm that the resistance is not greater than 1 *MΩ* in cases where bonding straps are not provided as electrical bonding between fuel storage tanks or fuel piping and hull structures.~~

B5 SPECIAL SURVEYS

B5.3 Special Surveys for Machinery

Paragraph B5.3.1 has been amended as follows.

B5.3.1 General Examinations

1 (Omitted)

2 The wording "hazardous areas" ~~in the item 2~~ of Requirements for Tankers in **Table B5.25, Part B of the Rules** refers to the hazardous areas specified in **4.2.3-1, -4** and **-5, Part H of the Rules**.

~~**3** When implementing the requirements in the first line of "Requirements for Tankers" in **Table B5.25, Part B of the Rules**, and electrical bonding straps are not provided for earthing between cargo oil tanks / cargo piping systems (cargo oil pipes, vent pipes, tank washing pipelines, etc.) and hull structures, resistance tests are to be carried out to confirm that the resistance at each place is not greater than 1 *MΩ*.~~

B5.4 Special Requirements for Ships Carrying Liquefied Gases in Bulk

B5.4.2 Examinations

Sub-paragraph -3 has been amended as follows.

3 In applying **5.4.2, Part B of the Rules**, with respect to the functional tests specified in item 8 of **Table B3.9, Part B of the Rules**, reference is to be made to the requirements related to renewal surveys specified in Chapter 4, Part B of *IMO resolution MSC*.267(85) "*International Code on Intact Stability, 2008* (*2008 IS Code*)", notwithstanding the requirements of **B3.4.2-~~5~~4**.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 14 June 2019.

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

Amendment 1-3

B12 SURVEYS FOR MOBILE OFFSHORE DRILLING UNITS AND SPECIAL PURPOSE BARGES

B12.2 Classification Survey during Construction

B12.2.6 Sea Trials and Stability Experiments

Sub-paragraph -3 has been added as follows.

3 The functional tests specified in **12.2.6-2(3), Part B of the Rules** are to be carried out in accordance with **Annex U1.2.2 "GUIDANCE FOR STABILITY COMPUTER", Part U of the Guidance**. "A computer for stability calculation is on board the units as a supplement to the stability information booklet," stipulated in **12.2.6-2(3), Part B of the Rules**, refers to a computer for stability calculation or a computer in which software for stability calculation is installed that can be used at locations such as the navigation bridge and cargo control room.

EFFECTIVE DATE AND APPLICATION (Amendment 1-3)

1. The effective date of the amendments is 14 June 2019.

2. Notwithstanding the amendments to the Guidance, the current requirements 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 1-4

B1 GENERAL

B1.1 Surveys

B1.1.3 Intervals of Class Maintenance Surveys

Sub-paragraph -9(22) has been amended as follows.

9 The Occasional Surveys specified in **1.1.3-3(5), Part B of the Rules** are as specified below:
((1) to (21) are omitted.)
(22) Ships using low-flashpoint fuels
(a) For ships that fall under the following ~~(a~~**i)** or ~~(b~~**ii)**, a survey is to be carried out to verify compliance with the requirements of **Part GF of the Rules** before using low-flashpoint fuels or undertaking to use ~~below-specified~~ different low-flashpoint fuels than specified~~.~~:
~~(a~~i) Ships which convert to using low-flashpoint fuels on or after 1 January 2017; or
~~(b~~ii) Ships which, on or after 1 January 2017, undertake to use low-flashpoint fuels different from those which ~~it was~~they were originally approved to use before 1 January 2017.
(b) For ships that fall under the following **i)** or **ii)**, a survey is to be carried out to verify compliance with the requirements of **GF11.3.1-1**, **GF11.3.1-2**, **GF12.5.2-2** and **GF15.10.1** before using low-flashpoint fuels or undertaking to use different low-flashpoint fuels than specified:
i) Ships which convert to using low-flashpoint fuels on or after 1 July 2019; or
ii) Ships which, on or after 1 July 2019, undertake to use low-flashpoint fuels different from those which they were originally approved to use before 1 July 2019.
((23) and (24) are omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 1-4)

1. The effective date of the amendments is 1 July 2019.

Amendment 1-5

B2 CLASSIFICATION SURVEYS

B2.3 Sea Trials and Stability Experiments

Paragraph B2.3.1 has been amended as follows.

B2.3.1 Sea Trials

1 (Omitted)

2 The Astern test required by **2.3.1-1(2), Part B of the Rules** is to be carried out in accordance with the following **(1)** ~~and~~ to **(~~2~~4)**.

((1) is omitted.)

(2) It is to be confirmed that the machinery is functioning normally while the ship is running astern. The main engine is to be kept at a rate of more than 70% of the maximum continuous revolutions. The ship is to be kept running astern for the periods specified in **(a)** and **(b)** below corresponding to the type of engine and the performance is to be confirmed in accordance with **1.3.2, Part D of the Rules**.

(a) For ships with main engines other than steam turbines
Until the astern speed (rotational speed in rpm) stabilizes.

(b) For ships with steam turbines
A period of at least 15 *minutes*; the astern trial, however, is to be limited to 30 *minutes* or in accordance with manufacturer's recommendation to avoid overheating of the turbine due to the effects of "windage" and friction.

(3) For low pressure (i.e. pressure less than 1 *MPa*) gas-fuelled dual fuel engines, the confirmation specified in **(2)(a)** is to be carried out for all operating modes (i.e. the applicable gas mode, diesel mode, etc. specified in **1.4-3 of Annex 4, Part GF** or **1.4-3 of Annex 4, Part N**).

(4) To high pressure gas-fuelled dual fuel engines, the requirements for low pressure gas-fuelled dual fuel engines specified in **(3)** apply mutatis mutandis.

3 (Omitted)

4 (Omitted)

5 The performance tests of machinery installations required by **2.3.1-1(5), Part B of the Rules** are to include the following **(1)** to **(~~8~~10)** in order to verify that the machinery installations have sufficient normal functions and reliability and are free from detrimental vibration within the numbers of revolutions used. However, these tests may be dispensed with where such tests have been conducted while the ship was anchored or at dockside. The details of these tests may be found in *JIS F* 0801 "Test Code of Propelling Machinery at Sea Trials" or other documents considered equivalent thereto. The preparations specified in **B1.4.2-16** are to be made before tests are carried out.

(1) For diesel engines, the output test shown in **Table B2.3.1-5**, is to be used as the standard. For diesel engines driving generators or auxiliary machinery (excluding auxiliary machinery for specific uses), operating tests may be carried out at the appropriate time after installation on board.

(2) For steam turbines and gas turbines for main propulsion machinery, the output test is to be carried out at 3 or 4 levels of power output selected from normal continuous cruise power run and 4/4, 3/4, 2/4 and 1/4 of the maximum continuous output of the engine.

(3) Operating tests for starting devices

It is to be confirmed that the diesel engines start continuously for the number required by **2.5.3-2, Part D of the Rules**.

(4) Function tests of the alarms and safety devices
Function tests of the alarms and safety devices required by **2.4**, **3.3** and **4.3, Part D of the Rules** are to be carried out.

(5) Fuel suitability
The suitability of residual and other special fuels for use in the engine is to be confirmed. However, this test may be dispensed with where the suitability has already been demonstrated at the shop trial.

(6) Governor tests
For engines for main sources of electrical power (including engines driving generators for both propulsion and main power supply), the characteristics for governors specified in **2.4.2-1, Part H of the Rules** are to be confirmed.

(7) Function tests of the safety devices and alarms of boilers

(8) Function tests of the safety devices and alarms of exhaust gas economizers

(9) Low pressure (i.e. pressure less than 1 *MPa*) gas-fuelled engines are to comply with the requirements specified in **(1)** and **(6)** (in such cases, the terms "diesel engines" and "engines" are to be read as "gas-fuelled engines"). For low pressure gas-fuelled dual-fuel engines, the output tests and governor tests required by the above-mentioned requirements are to be carried out for all operating modes (i.e. the gas mode, diesel mode, etc. specified in **1.4-3 of Annex 4, Part GF** or **1.4-3 of Annex 4, Part N**). The 110% load test is not required for the gas mode.

(10) To high pressure gas-fuelled engines, the requirements for low pressure gas-fuelled engines specified in **(9)** apply mutatis mutandis.

6 (Omitted)

7 (Omitted)

8 (Omitted)

9 The measurements of the torsional vibration for shafting systems required by **2.3.1-1(9), Part B of the Rules** are to be carried out in accordance with the following **(1)** to **(3)**.

(1) Measurements are to be carried out in accordance with the requirements of **8.1.3, Part D of the Rules**. For gas-fuelled engines, the term "diesel engines" is to be read as "gas-fuelled engines".
In cases where the confirmation of engine running conditions specified in **8.1.3-2, Part D of the Rules** is performed at the estimated upper and lower borders by calculation, it is recommended that the fuel index around estimated borders also be confirmed with consideration given to possible differences between estimated borders and actual borders confirmed through measurements.

(2) For low pressure (i.e. pressure less than 1 *MPa*) gas-fuelled dual fuel engines, the measurements specified in **(1)** are to be carried out for both the diesel and gas mode. However, measurements in either diesel mode or in the gas mode (but not both modes) may be omitted where considered appropriate by the Society based upon relevant torsional vibration calculation sheets of diesel and gas mode.

(3) To high pressure gas-fuelled dual fuel engines, the requirements for low pressure gas-fuelled dual fuel engines specified in **(2)** apply mutatis mutandis.

EFFECTIVE DATE AND APPLICATION (Amendment 1-5)

1. The effective date of the amendments is 1 July 2019.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to gas-fuelled engines for which the application for approval is submitted to the Society before the effective date.

Amendment 1-6

B12 SURVEYS FOR MOBILE OFFSHORE DRILLING UNITS AND SPECIAL PURPOSE BARGES

B12.2 Classification Survey during Construction

B12.2.2 Submission of Plans and Documents

Sub-paragraph -5 has been amended as follows.

5 For units specified in **12.1.1-3, Part B of the Rules,** the operating manual specified in **12.2.2~~-2(17)~~ 1(3), Part B of the Rules** is to include operating procedures of any onshore installations.

EFFECTIVE DATE AND APPLICATION (Amendment 1-6)

1. The effective date of the amendments is 1 January 2020.

2. Notwithstanding the amendments to the Guidance, the current requirements 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.