RULES

RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part B Class Surveys

2019 AMENDMENT NO.2

Rule No.103 27 December 2019

Resolved by Technical Committee on 26 July 2017 /
22 July 2019/ 29 November 2019

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

Rule No.103 27 December 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 2-1

Chapter 1 GENERAL

1.1 Surveys

1.1.3 Intervals of Class Maintenance Surveys*

Sub-paragraph -3 has been amended as follows.

3 The classed ships are to be subject to Occasional Surveys when they fall under one of the conditions of **(1)** through **(6)** below. To implement the survey, in lieu of the traditional ordinary surveys where a surveyor is in attendance, the Society may approve survey methods which it considers to be appropriate. Periodical Surveys may substitute for the Occasional Surveys where the survey items of the Occasional Surveys are inspected as a part of the Periodical Surveys.
((1) to (6) are omitted.)

Paragraph 1.1.12 has been added as follows.

1.1.12 Construction Monitoring
1 For ships subject to *SOLAS Chapter II-1 Regulation 3-10*, which are contracted for construction on or after 1 January 2018, surveys for critical structural areas during construction are to be carried out based upon a construction monitoring plan in accordance with the "Guidelines for Hull Construction Monitoring" issued separately by the Society.
2 Notwithstanding **-1**, surveys for other ships may be carried out based upon a construction monitoring plan in accordance with the "Guidelines for Hull Construction Monitoring" upon request.

Chapter 2 CLASSIFICATION SURVEYS

2.1 Classification Survey during Construction

2.1.2 Submission of Plans and Documents for Approval*

Sub-paragraph -14 has been amended as follows.

14 For ships whose surveys for construction monitoring are carried out in accordance with the requirements in **1.1.12**, drawings indicating critical structural areas are to be submitted to the Society for approval prior to the commencement of the survey. ~~For ships subject to *SOLAS Chapter II-1 Regulation 3-10*, which are contracted for construction on or after 1 January 2018, drawings showing areas requiring special attention throughout the ship's life, including critical structural areas, are to be submitted for approval by the Society.~~

2.1.3 Submission of Other Plans and Documents

Sub-paragraph -1(15) has been added 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 (14) are omitted.)
(15) For ships whose surveys for construction monitoring are carried out in accordance with the requirements in **1.1.12**, a construction monitoring plan is to be submitted prior to the commencement of the survey.

2.1.6 Documents to be Maintained On Board*

Sub-paragraph -8 has been added as follows.

8 For ships whose surveys for construction monitoring are carried out in accordance with the requirements in **1.1.12**, the Surveyor confirms that drawings indicating critical structural areas, construction monitoring plan and all construction monitoring survey records are kept on board the ship.

Chapter 3 ANNUAL SURVEYS

3.2 Annual Surveys for Hull, Equipment, Fire Extinction and Fittings

3.2.1 Examination of Plans and Documents*

1 At Annual Surveys, the management conditions of plans and documents listed in **Table B3.1** are to be examined.

Table B3.1 has been amended as follows.

Table B3.1 Examination of Plans and Documents

Items	Examination
(1 to 12 are omitted.)	
13 Drawings indicating critical structural areas, construction monitoring plan and all construction monitoring survey records	・ For ships affixed with the notation "*HCM*" or "*HCM-GBS*", confirmation that the documents are kept on board is to be made.

Table B3.2 has been amended as follows.

Table B3.2 General Examination

Items	Examination
1 Shell plating 2 Weather deck plating	・ Confirmation that areas visible above the load waterline are in good condition.
3 Openings on deck and outside of the hull	・ Confirmation that the means of securing the weathertightness of cargo hatchways, other hatchways and other openings on the freeboard and superstructure decks are in good condition. ・ Confirmation that the watertight integrity of the closures to any openings in the ship's side below the freeboard deck is in good condition. ・ Confirmation that the side scuttles and deadlights are in good condition.
4 Casings of engine room	・ Confirmation that the following are in good condition: exposed engine casings and their openings; and skylights of the engine room and boiler room and their closing appliances.
5 Ventilators	・ Confirmation that the ventilators including their coamings and closing appliances are in good condition.
6 Air pipes	・ Confirmation that the air pipes including their coamings and closing appliances are in good condition. ・ For closing appliances, open up examinations may be required depending upon their condition.
(7 to 32 are omitted.)	

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

Section 3.8 has been added as follows.

3.8 Special Requirements for Ships Affixed with the Notation "*HCM*" or "*HCM-GBS*"

3.8.1 General

In addition to the requirements of **3.2** and **3.3**, the requirements of **3.8** apply to the Annual

Surveys of ships affixed with the notation "*HCM*" or "*HCM-GBS*".

3.8.2 Surveys

In cases where considered necessary by the Surveyor, examinations are to be carried out on the ship's structure, taking into account areas subject to construction monitoring survey.

Chapter 4 INTERMEDIATE SURVEYS

Section 4.8 has been added as follows.

4.8 Special Requirements for Ships Affixed with the Notation "*HCM*" or "*HCM-GBS*"

4.8.1 General

In addition to the requirements of **4.2** and **4.3**, the requirements of **4.8** apply to the Annual Surveys of ships affixed with the notation "*HCM*" or "*HCM-GBS*".

4.8.2 Surveys

In cases where considered necessary by the Surveyor, examinations are to be carried out on the ship's structure, taking into account areas subject to construction monitoring survey.

Chapter 5 SPECIAL SURVEYS

Table B5.8 has been amended as follows.

Table B5.8 Requirements for Thickness Measurements for Cargo Ships

Special Survey	Structural members subject to thickness measurement
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Suspect areas 2. All bow doors, inner doors, side shell doors and stern doors when deemed necessary by the Surveyor (plating and stiffeners)
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas 2. Each plate in one section of the strength deck plating for the full beam of the ship within 0.5 *L* amidships 3. All bow doors, inner doors, side shell doors and stern doors when deemed necessary by the Surveyor (plating and stiffeners)
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas 2. Each plate and member in two transverse sections within 0.5 *L* amidships. (in way of two different cargo spaces, if applicable). When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. 3. Internals in fore and aft. Peak ballast tank 4. Both ends and middle part of each hatch side and end coaming (plating and stiffeners) 5. All cargo hold hatch covers (plating and stiffeners) 6. All bow doors, inner doors, side shell doors and stern doors when deemed necessary by the Surveyor (plating and stiffeners)
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas 2. Following portions of structural members: (1) All exposed main deck plates, full length (2) Each plate and member in three transverse sections of cargo areas within 0.5 *L* amidships. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) All wind and water strakes, port and starboard, full length 3. Representative exposed superstructure deck plating (poop, bridge and forecastle deck) 4. All keel plates, full length, and an appropriate number of bottom plates in way of cofferdams, machinery spaces and aft end of tanks 5. Plating of sea chests, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor) 6. In all cargo holds, all lowest strakes and strakes in way of tween decks of all watertight transverse bulkheads in cargo spaces together with internals in way 7. Structural members specified in 3. to 6. of Special Survey No.3

Table B5.10-1 has been amended as follows.

Table B5.10-1 Requirements of Thickness Measurements for Oil Tankers and Ships Carrying Dangerous Chemicals in Bulk with integral tanks

Special Surveys	Structural members subject to thickness measurement
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Suspect areas 2. One section of deck plating for the full beam of the ship within the cargo area (in way of a ballast tank, if any, or a cargo tank used primarily for water ballast) 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examinations specified in **5.2.2**
Special Survey for ships over 5 years and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas 2. Within the cargo area: (1) Each deck plate (2) One transverse section. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. Selected wind and water strakes outside the cargo area 5. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examinations specified in **5.2.2**
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas 2. Within the cargo area: (1) Each deck plate (2) Two transverse sections. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. Selected wind and water strakes outside the cargo area 5. All wind and water strakes within the cargo area 6. Internals in fore and aft. ~~**Peak**~~ peak ballast tank 7. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examinations specified in **5.2.2** 8. For ships carrying dangerous chemicals in bulk, selected steel cargo pipes outside cargo tanks and ballast pipes passing through cargo tanks

Table B5.10-1 Requirements of Thickness Measurements for Oil Tankers and Ships Carrying Dangerous Chemicals in Bulk with integral tanks (Continued)

Special Surveys	Structural members subject to thickness measurement
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas 2. Within the cargo area: (1) Each deck plate (2) Three transverse sections. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) Each bottom plate 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. All wind and water strakes 5. Internals in fore peak tank and after peak ballast tank 6. All exposed main deck plating outside the cargo area 7. Representative exposed superstructure deck plating (poop, bridge and forecastle deck) 8. All keel plates, full length, and an appropriate number of bottom plates in way of cofferdams, machinery space, and aft end of tanks 9. Plating of sea chests, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor) 10. Cargo oil, fuel oil, ballast, vent pipes including vent masts and headers, inert gas pipes and all other piping in pump room and on weather decks, when deemed necessary by the Surveyor as a consequence of general examinations specified in **5.2.2** 11. For ships carrying dangerous chemicals in bulk, selected steel cargo pipes outside cargo tanks and ballast pipes passing through cargo tanks

Table B5.10-2 has been amended as follows.

Table B5.10-2 Requirements of Thickness Measurements for Ships Carrying Liquefied Gases in Bulk

Special Surveys	Structural members and so forth subject to thickness measurement
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Suspect area 2. One transverse section of deck plating for the full beam of the ship within 0.5 *L* amidships in way of a ballast tank, if any 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern
Special Survey for ships over 5 years and up to 10 *years* of age (Special Survey No.2)	1. Suspect area 2. Within the cargo area: (1) Each deck plate (2) One transverse section within 0.5 *L* amidships in way of a ballast tank, if any. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. Selected wind and water strakes outside the cargo area
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect area 2. Within the cargo area (1) Each deck plating (2) Two transverse sections. At least one section is to include a ballast tank within 0.5 *L* amidships, if any. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) All wind and water strakes 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. Selected wind and water strakes outside the cargo area 5. Internals in fore peak tank and after peak ballast tank
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect area 2. Within the cargo area: (1) Each deck plate (2) Three transverse sections. At least one section is to include a ballast tank within 0.5 *L* amidships, if any. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) Each bottom plate (4) Duct keel plating and internals 3. Structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. All wind and water strakes 5. Internals in fore peak tank and after peak ballast tank 6. All exposed main deck plating outside the cargo area 7. Representative exposed superstructure deck plating (poop, bridge and forecastle deck) 8. All keel plates, full length, and an appropriate number of bottom plates in way of cofferdams, machinery space, and aft end of tanks 9. Plating of sea chests, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor)

Table B5.15 has been amended as follows.

Table B5.15 Requirements of Thickness Measurements for Bulk Carriers

Special Surveys	Structural members subject to thickness measurement
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Suspect areas 2. At least structural members subject to close-up survey for general assessment and recording of corrosion pattern 3. Air pipes and sounding pipes in cargo holds in way of tank top 4. All cargo hold hatch coamings (plating and stiffeners) 5. All cargo hold hatch covers (plating and stiffeners)
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas 2. Structural members within the cargo length area: (1) Two transverse sections of deck plating, outside the line of cargo hatch openings (2) All strength deck plating, where log cargoes or other cargoes that are prone to accelerate corrosion are loaded 3. At least structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. All piping arrangements in cargo holds. Depending upon the results of close-up surveys, may be omitted at the discretion of the Surveyor. 5. All cargo hold hatch coamings (plating and stiffeners) 6. All cargo hold hatch covers (plating and stiffeners) ~~4~~7. Wind and water strakes in way of the transverse sections of 2.(1) above ~~5~~8. Selected wind and water strakes outside the cargo length area
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas 2. Structural members within the cargo length area: (1) Each deck plating outside the line of cargo hatch openings (2) Two transverse sections, one in the midship area, outside the line of cargo hatch openings. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. 3. At least structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. All piping arrangements in cargo holds. Depending upon the results of close-up surveys, may be omitted at the discretion of the Surveyor. 5. All cargo hold hatch coamings (plating and stiffeners) 6. All cargo hold hatch covers (plating and stiffeners) ~~4~~7. Internals in fore and aft peak ballast tanks ~~5~~8. All wind and water strakes within the cargo length area ~~6~~9. Selected wind and water strakes outside the cargo length area

Table B5.15 Requirements of Thickness Measurements for Bulk Carriers (Continued)

Special Surveys	Structural members subject to thickness measurement
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas 2. Structural members within the cargo length area: (1) Each deck plating outside the line of cargo hatch openings (2) Three transverse sections, one in the midship area, outside the line of cargo hatch openings. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) Each bottom plate 3. At least structural members subject to close-up survey for general assessment and recording of corrosion pattern 4. All piping arrangements in cargo holds. Depending upon the results of close-up surveys, may be omitted at the discretion of the Surveyor. 5. All cargo hold hatch coamings (plating and stiffeners) 6. All cargo hold hatch covers (plating and stiffeners) ~~4~~7. Internals in fore and aft peak ballast tanks ~~5~~8.All exposed main deck plating outside the cargo length area ~~6~~9.Representative exposed superstructure deck plating (poop, bridge and forecastle deck) ~~7~~10.All keel plates, full length, and an appropriate number of bottom plates in way of cofferdams, machinery space, and aft end of tanks ~~8~~11.Plating of sea chests, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor) ~~9~~12.All wind and water strakes

Table B5.21 has been amended as follows.

Table B5.21 Requirements of Thickness Measurements for General Dry Cargo Ships of Not less than 500 *gross tonnage*

Special Surveys	Structural members subject to thickness measurement
Special Survey for ships up to 5 *years* of age (Special Survey No.1)	1. Suspect areas 2. At least the following structural members for general assessment and recording of corrosion pattern: (1) In cargo holds where cargoes highly corrosive to steel such as logs, salt, coal, and sulfide ore have been loaded: lower parts of web (thinnest parts of web in case of built-up type frame) and their lower end brackets of at least three hold frames at forward, middle and aft parts on both sides of each cargo hold (2) At least one plate of lowest strake and strakes in way of tween decks of all watertight transverse bulkheads in cargo spaces specified in (1) above together with internals in way (3) For top side tanks, bilge hopper tanks and deep tanks used as ballast tanks: both ends and middle part (including face plate) of one transverse ring or corresponding main structural members in one tank selected arbitrarily from each type
Special Survey for ships over 5 *years* and up to 10 *years* of age (Special Survey No.2)	1. Suspect areas 2. Following portions of structural members within 0.5 *L* amidships; (1) Each plate in one section of the strength deck plating for the full beam of the ship (2) Each strength deck plate in way of water ballast tanks, if any (3) Each strength deck plate on or underneath which log cargoes or other cargoes that are prone to accelerate corrosion have been carried 3. At least the following structural members for general assessment and recording of corrosion pattern: (1) In cargo holds specified in 2.(1) of Special Survey No.1 above: lower and upper parts of web (thinnest parts of web in case of built-up type frame) and their end brackets of a sufficient number (at least 1/3 of total number) of frames at forward, middle, and aft parts on both sides of each cargo hold (2) All plates of lowest strake and strakes in way of tween decks of all watertight transverse bulkheads in cargo spaces specified in **(1)** above together with internals in way (3) In cargo holds other than **(1)** above, structural members specified in 2.(1) and (2) of Special Survey No.1 above. (4) For top side tanks, bilge hopper tanks and deep tanks used as ballast tanks: both ends and middle part (including face plate) of approximately half the number of transverse rings or corresponding main structural members and at least one plate of upper and lower ends of each bulkhead in one tank selected arbitrarily from each type (5) For remaining top side tanks, bilge hopper tanks and deep tanks used as ballast tanks: both ends and middle part of one transverse ring or corresponding main structural members (including face plate) (6) Other structural members subject to close-up survey (7) Air pipes and sounding pipes in cargo holds in way of tank top 4. All cargo hold hatch coamings (plating and stiffeners) 5. All cargo hold hatch covers (plating and stiffeners)

Table B5.21 Requirements of Thickness Measurements for General Dry Cargo Ships of Not less than 500 *gross tonnage* (Continued)

Special Surveys	Structural members subject to thickness measurement
Special Survey for ships over 10 *years* and up to 15 *years* of age (Special Survey No.3)	1. Suspect areas 2. Structural members within the cargo length area: (1) Each deck plating outside the line of cargo hatch openings (2) Each deck plating inside the line of cargo hatch openings within 0.5 *L* amidships (3) Each plate and member in two transverse sections, one in the midship area, within 0.5 *L* amidships. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (4) All wind and water strakes 3. Selected wind and water strakes outside the cargo length area 4. At least the following structural members for general assessment and recording of corrosion pattern: (1) Lower and upper parts of web (thinnest parts of web in case of built-up type frame) and their end brackets of a sufficient number (at least 1/3 of total number) of frames at forward, middle, and aft parts on both sides of each cargo hold (2) Other structural members subject to close-up survey (3) Air pipes and sounding pipes in cargo holds in way of tank top 5. Internals in fore and aft peak ballast tank 6. All cargo hold hatch coamings (plating and stiffeners) 7. All cargo hold hatch covers (plating & stiffeners)
Special Survey for ships over 15 *years* of age (Special Survey No.4 and subsequent Special Surveys)	1. Suspect areas 2. Following portions of structural members (1) All exposed main deck plates, full length (2) Each plate and member in three transverse sections, one in the midship area, within 0.5 *L* amidships. When the selected section is a transversely framed section, adjacent frames and their end connections in way of the transverse section are to be included. (3) Each bottom plate within cargo length area, including lower turn of bilge (4) Duct keel or pipe tunnel plating and internals within cargo length area 3. All wind and water strakes 4. At least the following structural members for general assessment and recording of corrosion pattern: (1) Structural members subject to close-up survey (2) Air pipes and sounding pipes in cargo holds in way of tank top 5. Representative exposed superstructure deck plating (poop, bilge and forecastle deck) 6. All keel plate full length, and an appropriate number of bottom plates in way of cofferdams, machinery spaces and aft end of tanks 7. Plating of sea chests, and shell plating in way of overboard discharges (as deemed necessary by the Surveyor) 8. Structural members specified in 5. to 7. of Special Survey No.3 above

Section 5.8 has been added as follows

5.8 Special Requirements for Ships Affixed with the Notation "*HCM*" or "*HCM-GBS*"

5.8.1 General

In addition to the requirements of **5.2** and **5.3**, the requirements of **5.8** apply to the Annual Surveys of ships affixed with the notation "*HCM*" or "*HCM-GBS*".

5.8.2 Surveys

In cases where considered necessary by the Surveyor, examinations are to be carried out on the ship's structure, taking into account areas subject to construction monitoring survey.

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 27 December 2019.

Amendment 2-2

Chapter 1 GENERAL

1.1 Surveys

1.1.2 Class Maintenance Surveys*

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

2 Class Maintenance Surveys consist of Periodical Surveys, Planned Machinery Surveys, Occasional Surveys and Unscheduled Surveys, which are as specified in the following **(1)** to **(4)**. At each of these surveys, inspections, tests or examinations are to be carried out to verify that all necessary items are in good order.

((1) is omitted.)

(2) Planned Machinery Survey

(a) Continuous Machinery Survey (CMS): The Survey consists of open-up examinations of machinery and equipment specified in **Chapter 9** of this Part which are to be carried out systematically, continuously and sequentially so that each survey interval for all CMS items does not exceed five *years*.

(b) Planned Machinery Maintenance Scheme (PMS): The Survey consists of open-up examinations of machinery and equipment specified in **Chapter 9** of this Part which are to be carried out based upon an open-up inspection by the shipowner according to the machinery maintenance scheme approved by the Society.

(c) Condition Based Maintenance Scheme (CBM): The Survey consists of open-up examinations of machinery and equipment specified in **Chapter 9** of this Part which are to be carried out based upon the results of condition monitoring and diagnosis according to a machinery condition based maintenance scheme approved by the Society.

((3) and (4) are omitted.)

1.1.3 Intervals of Class Maintenance Surveys*

Sub-paragraph -2 has been amended as follows.

2 Planned Machinery Surveys are to be carried out as specified below in **(1)** ~~and~~to ~~**(2)**~~**(3)**.

(1) In the Continuous Machinery Survey, each survey item or part is to be examined at the interval not exceeding 5 *years*.

(2) In the Planned Machinery Maintenance Scheme, each survey item or part is to be examined according to the survey schedule table specified in **9.1.3** and at the general examination (including review of maintenance records) which is to be carried out every year.

(3) In the Condition Based Maintenance Scheme, each survey item or part is to be examined according to the survey schedule table specified in **9.1.4** and at the annual survey.

Chapter 9 has been amended as follows.

Chapter 9 PLANNED MACHINERY SURVEYS

9.1 Planned Machinery Surveys

9.1.1 Application*

In a Planned Machinery Survey, surveys in accordance with the applicable requirements prescribed in **9.1.2** ~~and **9.1.3**~~ to **9.1.4** are to be carried out. In cases where **9.1.3** or **9.1.4** is adopted, the survey items to be covered by the scheme are to be determined according to the shipowner's (or the ship management company's) application, while the rest of the items are to apply **9.1.2**.

9.1.2 Continuous Machinery Surveys (CMS)*

In a Continuous Machinery Survey (hereinafter referred to as "CMS" in this Chapter), every item specified in **Table B9.1** is to be surveyed in accordance with the following **(1)** to **(3)**:

(1) The above items are to be surveyed systematically, continuously and sequentially in accordance with the survey schedule table approved by the Society so that each survey interval for all CMS items ~~may~~does not exceed 5 *years*.

(2) During the CMS, when any defect or damage is found, similar machinery and equipment, or a part of them, may be required to be opened up for further examination as deemed necessary by the Surveyor, and all the defective items or failures found are to be repaired to the Surveyor's satisfaction.

(3) Survey items deemed appropriate by the Society may be delegated to overhaul inspections by the shipowner (or the ship management company). In this case, the records of the overhaul inspections of the machinery and equipment concerned are to be ascertained as soon as possible. When it is regarded that satisfactory maintenance has not been carried out, an open-up examination in the presence of the Surveyor may be required.

9.1.3 Planned Machinery Maintenance Scheme (PMS)*

1 A shipowner (or ship management company) that has an established maintenance system may apply to adopt the planned maintenance method in which the shipowner is permitted to carry out planned overhaul inspections and maintenance as specified in **(1)** to **(4)** in place of the open-up surveys specified in **Table B9.1**. ~~In addition to **(1)**, the shipowner (or ship management company) may apply to adopt the condition monitoring maintenance method as specified in **(2)** which is based on the results of condition monitoring and diagnoses for the machinery and equipment.~~

(1) The planned maintenance method is to be implemented in accordance with the machinery maintenance scheme approved by the Society.

(2) The Society will perform a general examination yearly on every item including review of the maintenance records in order to ascertain that the machinery and equipment covered are placed in good order.

(3) Where it is regarded that satisfactory maintenance has not been carried out for any of the machinery and equipment, an open-up examination of the item in the presence of the Surveyor may be required.

(4) For machinery and equipment deemed necessary by the Society, open-up examinations in the presence of the Surveyor are to be performed according to the survey schedule table based on the machinery maintenance scheme.

~~(2) The condition monitoring maintenance method is to be implemented in accordance with the machinery maintenance scheme approved by the Society. When any abnormalities are found~~

~~through the condition monitoring data or diagnoses, the shipowner (or ship management company) is to request an examination in the presence of the Surveyor as soon as possible in accordance with the survey schedule table based on the machinery maintenance scheme. The Society will perform a general examination yearly on every item including review of the condition monitoring data and the maintenance records in order to ascertain that the machinery and equipment covered are placed in good order. Where it is regarded that satisfactory maintenance has not been carried out for any of the machinery and equipment, an open-up examination of the item in the presence of the Surveyor may be required. The planned overhaul inspections and maintenance method is to be required where the condition monitoring maintenance method is not applied.~~

2 The survey of machinery for which condition monitoring and maintenance is carried out according to a machinery maintenance scheme approved by the Society on or before 31 December 2019 is to be in accordance with requirements specified otherwise by the Society.

9.1.4 Condition Based Maintenance Scheme (CBM)*

A shipowner (or ship management company) that has an established maintenance system may apply to adopt the method in which maintenance of machinery is carried out according to the results of condition monitoring and diagnosis, as specified in the following **(1)** to **(6)**, in place of the open-up surveys specified in **Table B9.1**.

(1) The condition based maintenance method is to be implemented in accordance with a machinery maintenance scheme for CBM approved by the Society.

(2) In cases where no abnormality is found in the results of condition monitoring and diagnosis, a general examination may be carried out as an alternative to the open-up examinations specified in **Table B9.1** based upon manufacturer recommendations regarding maintenance. In cases where an abnormality is found, the shipowner (or ship management company) is to request an examination in the presence of the Surveyor as soon as possible in accordance with the survey schedule table based on the machinery maintenance scheme for CBM.

(3) The condition monitoring system is to be approved by the Society.

(4) The condition monitoring and diagnosis is not to replace routine surveillance or the chief engineer's responsibility for making decisions in accordance with his judgement.

(5) The Society confirms on a yearly basis that the condition monitoring system works effectively and is in good condition; this includes inspection of condition monitoring records and machinery maintenance records subject to the scheme so as to confirm said machinery is in good condition, and that maintenance was carried out in cases where monitoring parameter of the machinery exceeded its limiting value.

(6) Where it is regarded that satisfactory maintenance has not been carried out for any of the machinery and equipment, an open-up examination of the item in the presence of the Surveyor may be required.

9.1.4~~5~~5 Periodical Surveys*

In place of the Planned Machinery Surveys prescribed in **9.1.2** ~~**and 9.1.3**~~ to **9.1.4**, the surveys specified in **Table B9.1** may be carried out at Special Surveys prescribed in **1.1.3** to ascertain that all the machinery is placed in good order. However, at Special Surveys of ships equipped with two or more propeller shafting systems driven by identical main engines, surveys of the main engine components that were examined in accordance with the requirements for Special Surveys after the Classification Survey during Construction or the previous Special Survey may be omitted where deemed appropriate by the Surveyor, considering the time the engines were examined, the service history of the engines, the present condition and whether or not they were subject to a Classification Survey during Construction.

(Table B9.1 is omitted.)

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

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

2. Notwithstanding the amendments to the Rules, the current requirements apply to the planned machinery survey for which the application of adoption is submitted to the Society before the effective date.

Amendment 2-3

Chapter 1 GENERAL

1.1 Surveys

1.1.3 Intervals of Class Maintenance Surveys*

Sub-paragraph -1(2) 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) Annual Surveys
Annual Surveys are to be carried out within three *months* before or after each anniversary date.

(2) Intermediate Surveys
Intermediate Surveys are to be carried out as specified in **(a)** or **(b)** below. Annual Surveys are not required to be carried out when an Intermediate Survey is carried out.
   (a) Intermediate Surveys are to be carried out at the time of the second or ~~the~~ third Annual Survey after the Classification Survey during Construction or a Special Survey; or
   (b) In lieu of **(a)** above, Intermediate Surveys for ~~bulk carriers, oil tankers and ships carrying dangerous chemicals in bulk with integral tanks that are over 10 *years* of age and general dry cargo ships of not less than 500 *gross tonnage* over 15 *years* of age~~ cargo ships over 10 *years* of age may be commenced at any time between the second and third Annual Surveys and be completed at the time of the second or ~~the~~ third Annual Survey.

(3) Special Surveys
Special Surveys are to be carried out as specified in **(a)** and **(b)** below.
   (a) Special Surveys are to be carried out within 3 *months* before the date of expiry of the *Certificate of Classification*;
   (b) Special Surveys may be commenced at or after the 4th Annual Survey and be completed within 3 *months* before the date of expiry of the *Certificate of Classification* ; or

((4) to (6) are omitted.)

1.1.6 Modification of the Requirements*

Sub-paragraph -5 has been amended as follows.

5 For Intermediate Surveys for cargo ships up to 10 *years* of age carried out at the time of the third Annual Survey in accordance with the requirements in **1.1.3-1(2)(a)**, examinations required for Intermediate Surveys carried out during the period between the 2nd and 3rd Annual Surveys as a part of another survey may be given special consideration or omitted at the discretion of the Surveyor. However, at a minimum the examinations required in **Chapter 3** are to be carried out at the Intermediate Survey.

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

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

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 2-4

Chapter 2 CLASSIFICATION SURVEYS

2.3 Sea Trials and Stability Experiments

2.3.2 Stability Experiments*

Sub-paragraph -1 has been amended as follows.

1 In the Classification Survey, stability experiments are to be carried out upon completion of the ship. The lightship displacement and the longitudinal, transverse and vertical position of its centre of gravity are to be determined. In addition, a stability information booklet, which is to be prepared on the basis of the particulars of stability determined by the results of stability experiments and to be approved by the Society, is to be provided on board.

EFFECTIVE DATE AND APPLICATION (Amendment 2-4)

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

2. Notwithstanding the amendments to the Rules, the current requirements apply to ships other than ships that fall under the following:

(1) for which the contract for construction is placed on or after the effective date; or

(2) in the absence of a contract for construction, the keels of which are laid or which are at *a similar stage of construction* on or after 1 July 2020; or

(3) the delivery of which is on or after 1 January 2024.

(Note) The term "*a similar stage of construction*" means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 *tonnes* or 1% of the estimated mass of all structural material, whichever is the less.

Amendment 2-5

Chapter 15 SURVEYS FOR WORK-SHIPS

15.2 Classification Surveys during Construction

15.2.2 Submission of Plans and Documents*

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

1 In the Classification Survey during Construction, the followings plans and documents in addition to those plans and documents specified in relevant requirements in **2.1.2** are to be submitted to the Society for approval 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) Plans for the installations and machinery for the intended work (hereinafter referred to as "work-related installations"). This is to include the following **(a)** and **(b)** in the case of ships to which **4.4.2-3, Part O** applies.
   (a) The method for annual survey of the towing winch specified in **1.4.2-10** of **Annex 4.4.2-3, Part O**
   (b) The performance capabilities and operating instructions of the towing winch emergency release system specified in **1.5.1-3** of **Annex 4.4.2-3, Part O**

(2) Plans for the supporting structures of work-related installations

(3) The following plans and documents for dynamic positioning systems in cases where such a system is installed on the ship
   (a) Arrangements and construction of the dynamic positioning system
   (b) Construction and control diagrams of the dynamic positioning system

(4) For self-elevating ships, the following plans and documents:
   (a) Construction of all legs, leg connections to bottom mats or spud cans, leg tanks and leg jacking or other elevating systems
   (b) Construction and control diagrams of jacking systems

15.2.3 Presence of Surveyor*

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

1 During the Classification Surveys, with respect to the stages of work related to hull construction, equipment, machinery and electrical installations, the presence of a Surveyor is required at the following stages in addition to those specified in **2.1.4**:

(1) When performance tests, including the tests specified in **1.5** of **Annex 4.4.2-3, Part O**, are carried out on work-related installations

(2) For ships with a dynamic positioning system, when components of the dynamic positioning system are installed on the ship and tests are carried out in accordance with the testing procedure

2 The requirements specified in **-1** may be modified having regard to the actual status of the facilities, technical abilities and quality control of the place of manufacture, except in the case of sea trials and the tests specified in **1.5** of **Annex 4.4.2-3, Part O**.

3 For the tests specified in **-1**, the applicant is to prepare test plans for review by the Society prior to testing. Test records and/or measurement records are to be submitted to the Society as required.

15.2.5 Documents to be Maintained On Board

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

At the completion of a classification survey, the Surveyor is to confirm that the finished versions of the following in addition to all of the applicable drawings, plans, manuals, lists, etc. listed in **2.1.6**, are on board.

(1) Operating manuals
(2) Testing procedure for dynamic positioning systems, for ships with a dynamic positioning system
(3) The following **(a)** and **(b)** in the case of ships to which **4.4.2-3, Part O** applies:
  (a) The method for annual survey of the towing winch specified in **1.4.2-10** of **Annex 4.4.2-3, Part O**
  (b) The performance capabilities and operating instructions of the towing winch emergency release system specified in **1.5.1-3** of **Annex 4.4.2-3, Part O**

15.3 Annual Surveys

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

Sub-paragraph -2 has been amended as follows.

1 It is to be verified that the following documents and booklets have been kept on board and are readily available.

(1) Relevant items listed **Table B3.1** corresponding to the ship's hull structure and purpose
(2) Operating manuals
(3) Testing procedure for dynamic positioning systems, for ships with a dynamic positioning system

2 Annual Surveys for Hulls, Equipment, Fire Extinguishing Systems and Fittings

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

(1) A general examination of ~~W~~work-related installations and their supporting structures.
(2) An inspection according to the method specified in **15.2.5(3)(a)** in the case of ships to which **4.4.2-3, Part O** applies.

3 For self-elevating ships, general examinations of the following items are to be carried out in addition to **-1** and **-2** as far as practicable down to the waterline.

(1) Leg structures
(2) Jack frames, leg supporting structures and upper hulls or adjacent platform structures

4 For ship-type ships and barge-type ships, general examinations of surrounding constructions of openings such as moon pools are to be carried out in addition to **-1** and **-2** as far as practicable down to the waterline.

EFFECTIVE DATE AND APPLICATION (Amendment 2-5)

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

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.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

Part B Class Surveys

2019 AMENDMENT NO.2

Notice No.70 27 December 2019

Resolved by Technical Committee on 22 July 2019/ 29 November 2019

Notice No.70 27 December 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 2-1

B1 GENERAL

B1.1 Surveys

B1.1.3 Intervals of Class Maintenance Surveys

Sub-paragraph -11 has been added as follows.

11 The wording "the Society may approve the survey methods which it considers to be appropriate." in **1.1.3-3, Part B of the Rules** means survey methods which the Society considers to be able to obtain information equivalent to that obtained through traditional ordinary surveys where a surveyor is in attendance.

B2 CLASSIFICATION SURVEYS

B2.1 Classification Survey during Construction

B2.1.2 Submission of Plans and Documents for Approval

Sub-paragraph -10 has been amended as follows.

10 The "~~areas requiring special attention throughout the ship's life, including~~ drawings indicating critical structural areas" referred to in **2.1.2-14, Part B of the Rules** means drawings indicating locations which have been identified from calculations to require monitoring or from the service history of similar or sister ships to be sensitive to cracking, buckling or corrosion which would impair the structural integrity of the ship. The following **(1)** and **(2)** are to be considered depending on the subject ships: ~~are to be consistent with information included in the Ship Construction File specified in **2.1.6-3(13), Part B of the Rules**. In addition, drawings are to include the critical structural areas indicated in the ship structural access manuals specified in **35.2.6, Part C of the Rules**.~~

(1) For ships subject to the provisions of **35.2, Part Cof the Rules**, drawings are to include the critical structural areas indicated in the ship structural access manuals specified in **35.2.6, Part C of the Rules.**

(2) For ships subject to *SOLAS Chapter II-1 Regulation 3-10*, drawings are to be consistent with information "areas requiring special attention throughout the ship's life, including critical structural areas" included in the Ship Construction File specified in **2.1.6-3(13), Part B of the Rules**.

B2.1.4 Presence of Surveyor

Sub-paragraphs -1 to -7 have been renumbered to Sub-paragraphs -2 to -8, and Sub-paragraph -1 has been added as follows.

1 At the tests for the equipment prescribed in **2.1.4-1(1), Part B of the Rules**, in lieu of the traditional ordinary surveys where a surveyor is in attendance, the Society may approve the survey methods which it considers to be able to obtain information equivalent to that obtained through traditional ordinary surveys.

~~**1**~~**2** (Omitted)
~~**2**~~**3** (Omitted)
~~**3**~~**4** (Omitted)
~~**4**~~**5** (Omitted)
~~**5**~~**6** (Omitted)
~~**6**~~**7** (Omitted)
~~**7**~~**8** (Omitted)

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 27 December 2019.

Amendment 2-2

B1 GENERAL

B1.1 Surveys

B1.1.2 Class Maintenance Surveys

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

1 Modifications and changes that are subject to Occasional Surveys referred to in **1.1.2-2(3), Part B of the Rules** are as specified in **(1)** through **(5)** below:

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

(4) Change in the loading manuals, the stability information and other similar documents

When a modification is intended that alters the principal data of the ship, ~~a new loading manual, stability information and other similar documents are to be prepared based on the new data and approved by the Society. When differences of lightweight and lightship longitudinal centre of gravity from the original values to values calculated for after conversion exceed either of the following limits, an inclining test is to be carried out~~ following **(a)** to **(d)** apply.

(a) When the differences between the original values of lightweight and lightship centre of gravity and the values calculated after conversion exceed either of the following deviation limits, an inclining test is to be carried out. In addition, the loading manual and stability information are to be amended using the altered principal data of the ship and then be approved by the Society.

~~(a~~i) Lightweight: 2% ~~of the original value or 2 *tonnes*, whichever is greater~~

~~(b~~ii) Lightship longitudinal centre of gravity: 1% of ~~subdivision length (L_s) as defined in **4.1.2(6), Part C** or **4.1.2(6), Part CS of the Rules**~~ length for freeboard (L_f), as applicable. For ships other than those of 500 *gross tonnage* and above engaged on international voyages, 1% of length of ship (L) can be applied.

(iii) Lightship vertical centre of gravity: 1%

(b) When a ship does not exceed the deviation limits specified in **(a)** above, but exceeds either of the following deviation limits, the loading manual and stability information are to be amended using the altered principal data and then be approved by the Society.

(i) Lightweight: 1%

(ii) Lightship longitudinal centre of gravity: 0.5% of length for freeboard (L_f), as applicable. For ships other than those of 500 *gross tonnage* and above engaged on international voyages, 0.5% of length of ship (L) can be applied.

(iii) Lightship vertical centre of gravity: 0.5%

(c) When multiple alterations are made to a ship in service over a period of time and each alternation is within the deviation limits specified in **(a)** and **(b)** above, the deviation limits specified in **(a)** and **(b)** above are also to be applied to the cumulative total changes to the principal data from the most recent inclining or lightweight measurement.

(d) When the differences in the original values for draught, still water bending moment and shear force and the values calculated after conversion exceed 2%, the loading manual and stability information are to be amended using the altered principal data of the ship and then be approved by the Society.

((5) is omitted.)

B2 CLASSIFICATION SURVEYS

B2.3 Sea Trials and Stability Experiments

B2.3.2 Stability Experiments

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

5 In applying **2.3.2-3, Part B of the Rules**, in cases where the following **(1)** is satisfied and the Administration specially approves the dispensation of inclining tests, such tests may be dispensed with.

(1) a lightweight measurement is to be carried out, and it is to be confirmed that the deviation of lightweight between **(a)** and **(b)** below does not exceed a value specified in **Table B2.3.2-1**, and the deviation of lightship longitudinal centre of gravity between **(a)** and **(b)** does not exceed 0.5% of ~~subdivision length (L_s) as defined in **4.1.2(6), Part C** or **4.1.2(6), Part CS of the Rules**~~ length for freeboard (L_f), as applicable. For ships other than those of 500 *gross tonnage* and above engaged on international voyages, 0.5% of length of ship (L) can be applied. For the purpose of this requirement, a sister ship is a ship built by the same yard from the same plan.
   (a) Lightweight and lightship longitudinal centre of gravity determined by a lightweight check of the ship intended.
   (b) Lightweight and lightship longitudinal centre of gravity of a lead sister ship or those values which are determined by detailed calculation regarding differences, where the ship is modified from a lead sister ship.

Table B2.3.2-1 Acceptable Deviation of Lightweight Regarding Dispensation of Inclining Tests

Length for freeboard (L_f)	$L_f < 50\ m$	$50\ m \leq L_f \leq 160\ m$	$160\ m < L_f$
Acceptable deviation, as given by a ratio of deviation to the lightweight of the lead ship subjected to the inclining test	2%	Obtained by linear interpolation	1%

Sub-paragraph -6(1) has been amended as follows.

6 Where the stability experiment was dispensed with in accordance with the provisions of **2.3.2-3, Part B of the Rules** and **-5** above, lightweight and lightship centre of gravity are to be determined as follows.

(1) Lightweight ~~and~~ as well as lightship longitudinal centre of gravity and lightship transverse centre of gravity are to be derived from **-5(1)** above.

(2) Lightship vertical centre of gravity is to be the higher of either the lead sister ship's value or the calculated value for the considered ship.

B2.5 Alterations

B2.5.1 Examination of Altered Parts

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

1 In applying the requirements specified in **2.5.1, Part B of the Rules**, in the case of the "application of modification, etc. which affects a main particular of a ship" (hereinafter referred to as "application of major conversion"), the following are to apply, except in cases where specified by the Society or Administration:

(1) A "Major Conversion", for example, refers to (but is not limited to) the following cases:
   (a) Alteration of the dimensions of a ship; for example, the lengthening of a ship by adding a new midbody.
   (b) Change of ship type; for example, the conversion from tanker to bulk carrier.
   (c) Modification of construction which affects necessary requirements related to ship subdivisions. ~~In this case~~ For ships not falling under any of the following **i)** to **iii)**, with respect to Required Subdivision Index (*R*) and Attained Subdivision Index (*A*) that are specified in **4.2, Part C of the Rules**, it is demonstrated that the *A/R* ratio calculated for the ship after such a modification is not less than the *A/R* ratio calculated for the ship before the modification. However, in cases where the ship's *A/R* ratio before modification is equal to or greater than 1, it is necessary that the ship's *A/R* ratio after modification be equal to or greater than 1.
      i) Ships for which the building contract is placed on or after 1 January 2020
      ii) In the absence of a building contract, the keel of ships is laid or which are at a similar stage of construction on or after 1 July 2020
      iii) The delivery of ships is on or after 1 January 2024.

Sub-paragraph -4 has been deleted, and Sub-paragraphs -5 and -6 have been renumbered to Sub-paragraphs -4 and -5.

~~**4** The stability experiment may be dispensed with in accordance with **B2.3.2-5**, where sufficient reliable stability data can be obtained from the stability experiments conducted before the alterations were made or from other adequate means and a special approval is given by the Society.~~

~~5~~4 In applying the requirements specified in **2.5.1, Part B of the Rules**, the tightness of such boundaries are to be verified by the tests stipulated in **Annex B2.1.5-1 "Testing Procedures of Watertight Compartments"** in cases where any modifications or repairs have been carried out which affects the tightness of the watertight boundary.

~~6~~5 In applying **2.5.1, Part B of the Rules**, the astern response characteristics of ships considered by the Society to have undergone significant repairs which impact the response characteristics of their propulsion systems are to be verified after such repairs are carried out by correspondingly applying the requirements for the astern tests carried out at Classification Surveys during Construction (See **2.3.1, Part B of the Rules** and **B2.1.4**). The tests are to demonstrate the satisfactory operation of the equipment or system under realistic service conditions at least over the manoeuvring range of the propulsion plant, for both ahead and astern directions. Depending on the actual extent of the repair, the Society may accept a reduction of the test plan.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

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

2. Notwithstanding the amendments to the Guidance, the current requirements apply to ships other than ships that fall under the following:

(1) for which the contract for construction is placed on or after the effective date; or

(2) in the absence of a contract for construction, the keels of which are laid or which are at *a similar stage of construction* on or after 1 July 2020; or

(3) the delivery of which is on or after 1 January 2024.

(Note) The term "*a similar stage of construction*" means the stage at which the construction identifiable with a specific ship begins and the assembly of that ship has commenced comprising at least 50 *tonnes* or 1% of the estimated mass of all structural material, whichever is the less.

Amendment 2-3

B2 CLASSIFICATION SURVEYS

B2.1 Classification Survey during Construction

B2.1.4 Presence of Surveyor

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

1 At the surveys for fire extinguishing systems referred to in **2.1.4-1(15), Part B of the Rules**, the following examinations are to be carried out. Where it is impractical to carry out the examinations on board the ship, the examinations may be replaced with examinations carried out at the place of manufacture under the presence of the Surveyor.

(1) Confirmation that the fire extinguishing system is installed according to the approved plans
(2) Confirmation that a fire control plan is posted correctly
(3) For fire extinguishing systems, fire detecting systems and manually operated call points:
((a) to (j) are omitted.)
(k) Foam firefighting appliances for helidecks and helicopter landing areas (except for portable foam applicators provided at helicopter landing areas)
i) Piping tests by delivering water
ii) Performance tests of the system by delivering foam. This test is not necessary when following items **1)** and **2)** are confirmed.
1) Confirmation that water and foam concentrates are mixed in appropriate proportions
2) Confirmation that fluid can be released from the outlet by performing the test specified **i)** above

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

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.
* For high speed craft, "1%" is to be read as "3%".

Amendment 2-4

B3 ANNUAL SURVEYS

B3.3 Annual Surveys for Machinery

B3.3.1 General Examinations

Sub-paragraph -3 has been amended as follows.

3 In general examinations specified in **3.3.1-1, Part B of the Rules**, for ships ~~equipped with~~ where harmonic filters are installed on the main busbars of electrical distribution systems ~~which include harmonic filters~~, except in cases where the filters are installed for single application frequency drives such as pump motors, it is to be ascertained that the harmonic filters are placed in good order and either of the following **(1)** or **(2)** is to be verified~~, except in cases where the filters are installed for single application frequency drives such as pump motors~~.

(1) ~~For harmonic filters included in the electrical distribution systems described in either the following **(a) or (b),**~~ For ships fitted with facilities to continuously monitor ~~the records of~~ the Total Harmonic Distortion (THD) values experienced by the main busbars as specified in **2.12.4-1, Part H of the Rules**, records of THD values are to be verified.

~~(a) Electrical distribution systems on board ships for which the date of contract for construction is on or after 1 July 2017.~~

~~(b) Electrical distribution systems on board ships for which the date of contract for construction is before 1 July 2017, but which are newly fitted with harmonic filters on or after 1 July 2017.~~

(2) For ~~harmonic filters~~ ships other than **(1)~~(a) or (b)~~** above, correct operation of harmonic filters is to be confirmed by verifying that the maximum Total Harmonic Distortion (THD) value of the main busbar on board the ship is measured under typical seagoing conditions as close as possible to the date of the Annual Survey and the value does not exceed the acceptable limit.

EFFECTIVE DATE AND APPLICATION (Amendment 2-4)

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

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

Amendment 2-5

B9 has been amended as follows.

B9 PLANNED MACHINERY SURVEYS

B9.1 Planned Machinery Surveys

B9.1.3 Planned Machinery Maintenance Scheme (PMS)

1 Application of PMS

~~(1) PMS generally applies to machinery and equipment installed in the following ships.~~

~~(a) Ships with machinery and equipment less than 15 *years* old at the time of application.~~

~~(b) Ships operated by a shipowner or ship management company that has an established maintenance system and organization.~~

~~(2)~~ PMS may appl~~ies~~y to the open-up examinations of machinery and equipment prescribed in **B9.1.2-1**.

2 Terms

The definition~~s~~ of ~~terms~~ "maintenance management system" which appears in **B9.1.3** ~~are as specified in the following **(1)** and **(2)**.~~ is

~~(1) Maintenance management system~~

~~A~~ a computer system for managing the maintenance and inspection plans of machinery and its components that are subject to the Planned Machinery Maintenance Scheme.

~~(2) Condition monitoring system~~

~~A system which is composed of displays for diagnosing the deterioration trend of the machinery and its components from data continuously or periodically measured by sensors and computers for saving and maintaining this data~~

3 Application Procedure for PMS

To apply for PMS, the shipowner or ship management company or representative is to submit an Application for PMS accompanying the following documents to the Society.

(1) Documents for approval (3 sets: one each for the ship's file, shipowner's file and Society's file)
  (a) Machinery maintenance scheme
  (b) Survey schedule table
  (c) Function descriptions for maintenance management system
  ~~(d) The following documents in addition to **(a)** through **(c)** above, when applying for the condition monitoring maintenance method~~
    ~~i) Function description for condition monitoring system~~
    ~~ii) Condition monitoring procedures and sensor lists~~
    ~~iii) Kinds and contents of output information~~

(2) Documents for reference (1 set)
  (a) Sample form of machinery maintenance records
  (b) Organization chart identifying the section and the personnel responsibility for the machinery maintenance

4 Approval of PMS

Conditions for approval of PMS are as follows:

(1) ~~Planned maintenance method~~ Machinery maintenance scheme

The machinery maintenance scheme for PMS ~~made based on the planned maintenance system~~

~~is to cover the maintenance plans not only for survey items but for all machinery. It~~ is to specify maintenance works such as overhaul inspection, replacement of parts and general inspection with their time schedule and/or running hours for each item of machinery and equipment including their parts. The scheme is to be prepared based on the inspection and maintenance intervals recommended by the manufacturers of the machinery and equipment with input from the experience and knowledge of the shipowner and ship management company. The inspection intervals for all items covered by PMS are generally planned not to exceed 5 *years*. However, for the items whose overhaul intervals are specified on the basis of their running hours, longer intervals may be accepted as long as the intervals are based on the manufacturer's recommendations. When the machinery maintenance scheme is changed, the amended scheme is to be submitted to the Society for approval.

~~(2) Condition monitoring maintenance method~~

~~The machinery maintenance scheme is to cover the maintenance plan for all the machinery as **(1)** above. For machinery, equipment and parts with a condition monitoring system which complies with the following requirements, the inspection intervals may be prolonged until an abnormal condition is observed. In this case, the machinery maintenance scheme for PMS is also to cover all condition monitoring functions, criteria for judgment and procedures for monitoring, analysis and handling (including reporting observed abnormal conditions to the Society) of the system.~~

~~(a) Condition monitoring systems are to be suited to diagnosing any deterioration of equipment or its components on the basis of the data from sensors or centralized machinery monitoring and control systems. The sensors are to be subject to the tests specified in **18.7.1, Part D of the Rules**.~~

~~(b) Condition monitoring systems are to be suited to diagnosing the condition of equipment or its components on the basis of independent or coalesced data or their trends.~~

~~(c) Back-ups of the data can be made.~~

~~(3)~~(2) Survey Schedule Table

Survey intervals of the survey items are not to exceed those specified in the machinery maintenance scheme. The following items are to be generally opened and examined in the presence of the Surveyor. ~~Where the condition monitoring maintenance method is applied, the items are to be opened and examined only when an abnormal condition is observed.~~

(a) Rotors, casings, main bearings, couplings between turbine and reduction gear, nozzle valves and manoeuvring valves for main steam turbine
(b) Auxiliary steam turbine for main generator
(c) Reduction gears for main propulsion
(d) Flexible couplings for main propulsion
(e) Other items deemed necessary by the Society.

When this survey schedule table is amended, the amended survey schedule table is to be submitted to the Society for approval.

~~(4)~~(3) Machinery Maintenance Records

Machinery maintenance records are to include at least the following items. These records are to be retained on board the ship at all times.

(a) Date of maintenance work
(b) Signature by the Chief Engineer
(c) Details of maintenance work and results
(d) Total running hours (parts replacement intervals and overhaul intervals)
(e) Names of parts replaced
(f) Measuring data (including original design dimensions and allowable tolerance)
(g) The condition of damage and repair method

(h) Results of visual examinations of lubricating oil conditions carried out through open-up examinations of the lubricating oil filters, etc. of crankpins, crank journals, thrust shafts and bearings of main diesel engines (in cases where the principle components of such engines were inspected through independent open-up surveys conducted by chief engineers)

~~(5) Condition monitoring records~~

~~Condition monitoring records are to include at least the following items.~~

~~(a) Date of condition monitoring and relevant content of survey~~

~~(b) Signature of the Chief Engineer at the condition monitoring~~

~~(c) Contents and results of condition monitoring (including criteria for judgment)~~

~~(6)~~(4) Chief Engineer

The Chief Engineer in charge of PMS is to be a person designated by the shipowner or ship management company.

~~(7)~~(5) Computer

Computers used for ~~condition monitoring and diagnosis systems~~ maintenance management system are to satisfy the following requirements specified in **(a)** through **(f)**:

(a) Computers are to be configured so that the effects of a system failure in part of the circuits or devices can be limited to a certain range as far as possible.

(b) Each system component is to be protected against overvoltages (electrical noise) likely to enter through input/output terminals.

(c) Central processing units and important peripheral devices are to have a self-monitoring function.

(d) Important programmes and data are not to be deleted in the event of a temporary failure of the external source of power supply.

(e) Spare parts for important system components that require specialist services for repairs are to be supplied in readily replaceable part units.

(f) It is recommended that the software is approved in accordance with **Annex B9.1.3-4 "PROCEDURES FOR APPROVAL OF PMS/CBM MANAGEMENT SOFTWARE"**.

5 Surveys for PMS

(1) Initial Survey

The initial survey is to be carried out by the Surveyor within 1 *year* from the date of approval for application of PMS, and it is to be verified that planned machinery maintenance is being carried out in accordance with the approval scheme.

(2) Annual Survey

General examinations (including review of maintenance records) are to be carried out yearly to confirm that the planned machinery maintenance is being carried out by the designated Chief Engineer in accordance with the approved scheme on relevant machinery, equipment, and parts, and that these items are in good condition. ~~Where the condition monitoring maintenance method is applied, it is to be verified that condition monitoring has been properly carried out and as a result of which, machinery, equipment and parts are in good order. Confirmation that the condition monitoring system and maintenance management system are being operated effectively and are also in good order is to be made. Condition monitoring data and the results of the diagnosis are to be evaluated before the survey and are to be retained on board at all times.~~

~~(3) Special Survey~~

~~Where the condition monitoring maintenance method is applied, confirmation that the condition monitoring system and maintenance management system are being operated effectively and are also in good order is to be made. Condition monitoring data and the results~~

~~of the diagnosis are to be evaluated before the survey and are to be retained on board at all times.~~

~~(4)~~(3) Open-up Survey

The items prescribed in ~~-4(3)~~**(2)** above are to be opened and examined in the presence of the Surveyor in accordance with the survey schedule table.

~~(5)~~(4) Occasional Survey

Any damage to items covered by PMS ~~or any abnormal conditions observed by the condition monitoring system specified in -4(2)~~ are to be reported to the Society immediately. Upon review of the reports, the Society may request an occasional survey when considered necessary.

6 Surveys based on condition monitoring and diagnosis

The wording "requirements specified otherwise by the Society" in **9.1.3-2**, **Part D of the Rules** means the following:

(1) Annual Survey

It is to be verified that condition monitoring has been properly carried out and as a result of which, machinery, equipment and parts are in good order. Confirmation that the condition monitoring system and maintenance management system are being operated effectively and are also in good order is to be made. If as a result of this confirmation, the Society deems that proper maintenance has not been carried out, an open-up examination in the presence of the surveyor may be required. Condition monitoring data and the results of the diagnosis are to be evaluated by the Society before the survey and are to be retained on board at all times.

(2) Occasional Survey

Any damage to items covered by PMS or any abnormal conditions observed by the condition monitoring system are to be reported to the Society according to the approved machinery maintenance scheme without delay. Upon review of the reports, the Society may request an occasional survey when considered necessary.

~~6~~**7** Cancellation of PMS

The Society may cancel approval for PMS when it is considered difficult to continue PMS for any of the following reasons.

(1) It is found that PMS is not operated in accordance with the approved scheme

(2) Damages or deficiencies found on items covered by PMS have not been rectified by the due date ~~recommended~~

(3) When the shipowner or ship management company has been changed

(4) When the class of the ship has been transferred

(5) When the shipowner or ship management company requests cancellation of the approval

B9.1.4 Condition Based Maintenance Scheme (CBM)

1 General

The purpose of a condition based maintenance scheme is to obtain maintenance efficiency by performing maintenance at the early stage of an abnormality detected by condition monitoring and diagnosis and by continuously using components when no abnormality is found. The condition monitoring systems are to be arranged to provide an equivalent or greater degree of confidence in the condition of the machinery to traditional survey techniques.

2 Application of CBM

(1) The wording "an established maintenance system" in **9.1.4**, **Part B of the Rules** refers to those which satisfy the requirements of **Rules for the Audit and Registration of Safety Management Systems** or their equivalent. In addition, all personnel involved in condition monitoring and diagnosis are to be properly qualified.

(2) CBM may apply to items subjected to the open-up examinations of machinery and equipment prescribed in **B9.1.2-1**.

3 Terms

The definitions of terms which appear in **B9.1.4** are as specified in the following **(1)** to **(5)**.

(1) Condition monitoring

Acquisition and processing of information and data that indicate the state (The machine state deteriorates if faults or failures occur.) of machineries, equipment or its components over time

(2) Diagnostic

Examination of symptoms and syndromes to determine the nature of faults or failures

(3) Condition based maintenance

Maintenance performed as governed by **B9.1.4**.

(4) Condition monitoring system

A system which is composed of displays for diagnosing the deterioration trend of the machineries, equipment, and its components from data continuously or periodically measured by sensors and computers for saving and maintaining this data

(5) Maintenance management system

A computer system for managing the maintenance and inspection plans of machineries, equipment, and its components which are subject to the Condition Based Maintenance Scheme

4 Application Procedure for CBM

To apply for CBM, the shipowner or ship management company or representative is to submit an Application for CBM accompanying the following documents to the Society. The baseline data specified in **(1)(i)** may be submitted to the Society so as to be approved before the implementation survey specified in **-6(2)**.

(1) Documents for approval (3 sets: one each for the ship's file, shipowner's file and Society's file)

(a) Machinery maintenance scheme for CBM

(b) Survey schedule table

(c) List of the machinery, etc. subject to the scheme

(d) List of equipment comprising the condition monitoring system as well as function descriptions and maintenance instructions for the condition monitoring system

(e) List of sensors

(f) Kinds and contents of output information from the condition monitoring system (kinds of abnormalities, maintenance recommendations, remaining years of service life, etc.)

(g) List of limiting parameters used in condition monitoring (alarms and warnings determined from manufacturer recommendations or international standards)

(h) Procedures for changes to software systems and limiting parameters

(i) Baseline data

(j) Function descriptions for maintenance management system

(k) Qualification of personnel and organizations responsible for analysing condition monitoring results

(2) Documents for reference (1 set)

(a) Sample form of condition monitoring records

(b) Sample form of machinery maintenance records

(c) Organization chart identifying the section and the personnel responsibility for the condition monitoring and diagnosis

5 Approval of CBM

Conditions for approval of CBM are as follows:

(1) Machinery maintenance scheme for CBM

The machinery maintenance scheme for CBM is to include maintenance and management of the records of machinery, equipment or associated components subject to the scheme and

specify the following **(a)** to **(d)**. When the machinery maintenance scheme is changed, the amended scheme is to be submitted to the Society for approval.

(a) The functions of the condition monitoring system

(b) Procedures related to condition monitoring and diagnosis

(c) Handling procedures in cases where an abnormality is found (including procedures for creating maintenance records and reporting to the Society)

(d) Procedures for identifying defects and failures that were not prevented by condition monitoring and diagnosis and for modifying the machinery maintenance scheme for CBM accordingly

(2) Condition monitoring system

The condition monitoring system is to satisfy the following requirements specified in **(a)** to **(h)**. In cases where this system is modified, that modification is to be approved by the Society.

(a) The computer collects data from sensors or centralized machinery monitoring and control systems. The sensors are to be subject to the tests equivalent to those specified in **18.7.1, Part D of the Rules**.

(b) The hardware and software of the computer is to comply with **B9.1.3-4(5)(a)** to **(e)** and **Annex D18.1.1 "COMPUTER BASED SYSTEMS", Part D of the Guidance**.

(c) In addition to **(b)**, the software is to have condition monitoring function specified in **Annex B9.1.3-4 "PROCEDURES FOR APPROVAL OF PMS/CBM MANAGEMENT SOFTWARE"** and be suited to diagnosing any deterioration of machinery, equipment or associated components on the basis of the data from the sensors or centralized machinery monitoring and control systems specified in **(a)**. The software is to be suitable for diagnosing the condition of equipment or its components on the basis of independent or coalesced data, or their trends.

(d) The condition monitoring system is to produce condition monitoring records.

(e) In cases where condition monitoring and diagnosis are conducted on board ships, the condition monitoring system is to be such that no specialized knowledge of data analysis is required to use the system.

(f) In cases where remote condition monitoring and diagnosis are conducted (i.e. the data sent from the ship is analyzed remotely), the condition monitoring systems are to include a communication function to transfer the data collected by the sensors or centralized machinery monitoring and control systems specified in **(a)**. Particular attention is to be paid to the cyber safety and security of said communication function. The system equipped on board is to be arranged to store the condition monitoring data in the event of loss of the communication function and transfer the data after the communication function is restored.

(g) In cases where limiting parameters are modified, such modifications are to be identified.

(h) The condition monitoring system is to include a method for backing up data at regular intervals.

(3) Maintenance management system

The maintenance management system is to have the maintenance records function specified in **Annex B9.1.3-4 "PROCEDURES FOR APPROVAL OF PMS/CBM MANAGEMENT SOFTWARE"**. This function may be incorporated into the condition monitoring system specified in **(2)**.

(4) Survey Schedule Table

Annual surveys are to be performed to confirm that the machinery maintenance scheme for CBM is being properly implemented. In cases where there is any damage to the machinery, equipment or associated components subject to the scheme or an abnormality is found in the results of condition monitoring and diagnosis, the shipowner (or ship management company)

is to promptly report this to the Society and apply for an occasional survey if instructed to do so by the Society. When this survey schedule table is amended, the amended survey schedule table is to be submitted to the Society for approval.

(5) Condition monitoring record

Condition monitoring records are to include at least the following items.

(a) Condition monitoring data, including all data since last open-up inspection, the original baseline data specified in **-6(2)** and relevant maintenance data.

(b) Signature of the chief engineer

(c) Contents and results of condition monitoring and diagnosis (including criteria for judgment)

(6) Machinery maintenance record

The machinery maintenance records are to include the items specified in **B9.1.3-4(3)** for the machinery, equipment or associated components subject to the scheme. Those records are to be created by the chief engineer and always to be available on board the ship.

(7) Chief engineer and other ship personnel

The machinery maintenance scheme for CBM is to be implemented by a chief engineer designated by the shipowner or ship management company. Access to the condition monitoring system and maintenance management system is to be permitted only to the chief engineer and other ship personnel who are designated by the shipowner or ship management company.

6 Surveys of CBM

(1) Installation survey

It is to be confirmed in the presence of the Surveyor that the equipment necessary for condition monitoring and diagnosis, e.g. sensors, are installed and available in accordance with the machinery maintenance scheme for CBM. In addition, a set of baseline readings is to be taken.

(2) Implementation survey

An implementation survey is to be carried out no earlier than 6 months after the installation survey and no later than the first periodical survey (i.e. the Annual Survey, Intermediate Survey or Special Survey specified in **1.1.3-1**, **Part B of the Rules**). At the implementation survey the following **(a)** to **(f)** are to be verified. At this implementation survey, a report which specifies the implementation status of these items is to be submitted to the Society. The baseline data are to be approved by the Society prior to the implementation survey

(a) Baseline data are incorporated in the condition monitoring system.

(b) Condition monitoring and maintenance are conducted in accordance with the machinery maintenance scheme for CBM (including a comparison of condition monitoring results to the baseline data).

(c) Condition monitoring records and machinery maintenance records are available on board the ship and the contents of said records are sufficient as an alternative to the open-up surveys specified in **Table B9.1**, **Part B of the Rules**.

(d) The familiarity of the chief engineer and other designated personnel with the operation of the machinery maintenance scheme for CBM.

(e) Records of any limiting parameters that have been modified.

(f) In cases where there is any failure on machinery, equipment or associated components subject to the scheme, appropriate modification of the machinery maintenance scheme for CBM has been undertaken to address said failure.

(3) Annual survey

An annual survey is to be carried out to verify that the scheme is being correctly operated and maintenance of machinery, equipment or associated components whose condition monitoring

and diagnosis results were abnormal since the last survey has been carried out. At the annual survey the following **(a)** to **(g)** are to be verified. In cases where it is deemed necessary by the Surveyor (in consideration of the results of this verification) open-up examinations, function tests, confirmatory tests and readings of condition monitoring parameters may be required as far as practicable. In addition, condition monitoring records and maintenance records are to be available on board ships.

(a) The results of condition monitoring and diagnosis (including confirmation of maintenance records and general inspections) of machinery, equipment and associated components subject to the scheme are good.

(b) Condition monitoring systems and maintenance management systems work effectively and are in good condition.

(c) Records of any limiting parameters that have been modified since the last survey

(d) Written details of breakdowns or malfunctions

(e) The familiarity of the chief engineer and other designated personnel with the operation of the machinery maintenance scheme for CBM.

(f) In cases where there is a failure of machinery, equipment or associated components subject to the scheme, appropriate modification of the machinery maintenance scheme for CBM has been undertaken based to address said failure.

(g) The following documents are available on board ships

i) Documents specified in **-4(1)** and **(2)**

ii) Maintenance instructions issued by manufacturers or shipyards

iii) Condition monitoring records and initial obtained baseline data specified in **-5(5)**

iv) Machinery maintenance records specified in **-5(6)**

v) Reference documents (trend investigation procedures, etc.)

(4) Occasional Survey

Any damage to machinery, equipment or associated components subject to the scheme or any abnormality observed by the condition monitoring and diagnosis is to be reported to the Society immediately according to an approved machinery maintenance scheme for CBM. Upon review of the reports, the Society may request an occasional survey if necessary. Any machinery part that is damaged and subsequently replaced by a spare part is to be retained on board where possible until examined by the Surveyor.

7 Cancellation of CBM

The Society may cancel all or part of approval for CBM scheme when it is considered difficult to continue CBM scheme for any of the following reasons. In such cases, items which have been monitored under the scheme since the last survey are to be subjected to surveys deemed appropriate by the Society.

(1) It is found that CBM scheme is not operated in accordance with the approved scheme

(2) Damages or deficiencies found on items covered by CBM scheme have not been rectified by the due date

(3) When the shipowner or ship management company has been changed

(4) When the class of the ship has been transferred

(5) When the shipowner or ship management company requests the cancellation of approval

(6) When deemed appropriate by the Society (e.g. a critical deficiency in the condition monitoring system is not expected to be rectified.)

Annex B9.1.3-4 PROCEDURES FOR THE APPROVAL OF PMS/CBM MANAGEMENT SOFTWARE

1.1 General

Paragraph 1.1.1 has been amended as follows.

1.1.1 Scope

1 These procedures apply to the tests, examinations, etc. of the computer software required by ships adopting the Planned Machinery Maintenance Scheme (hereinafter referred to as "PMS") or the Condition Based Maintenance Scheme (hereinafter referred to as "CBM") in accordance with the requirements given in **B9.1.3-4~~(7)~~(5) (f)** or **B9.1.4-5(2)(c)**.

2 The approval of system software developed to manage all internal ship operations is to follow these procedures.

3 The software used on ships which is not subject to CBM need not comply with **1.3.3**.

Section 1.3 has been amended as follows.

1.3 Function

1.3.1 Planned Maintenance Function

Software is to have the following planned maintenance functions:

(1) It is to be capable of registering the maintenance plans ~~not only~~ for those survey items required by the machinery maintenance scheme (PMS) ~~but for all machinery~~.

(2) It is to be capable of specifying the time schedule of maintenance or running hours for each item of machinery and equipment including their parts.

(3) It is to be capable of displaying a list of at least the following items. The list is to classify the registered machinery, equipment and their parts and to be displayed in a tree structure format, etc.
   (a) Names of machinery, equipment and their parts
   (b) Maintenance items
   (c) Maintenance interval (next inspection date or running hour)
   (d) Maintenance schedule (It is to be able to directly input the inspection date or calculate from the maintenance interval)
   (e) Person in charge of maintenance

(4) Maintenance intervals are not, in principle, to exceed five years. Maintenance intervals are to be capable of being displayed on the list of maintenance within a term which is arbitrarily designated.

(5) In cases where there are maintenance items which expire after the maintenance period, such items are to be easily identified.

1.3.2 Maintenance Records Function

The software is to have the following maintenance record functions:

(1) It is to be capable of managing and recording the results of the maintenance conducted by the planned maintenance specified in **1.3.1.** The items regarding management and record are to be included the following:
   (a) Names of machinery, equipment and their parts

(b) Maintenance items and results (including an exchange of parts)
(c) Maintenance completion date
(d) Total running hour
(e) Next inspection date
(f) Measurement data (including original design dimensions and allowable tolerance) However, such data is only required in cases where measurements are taken.
(g) The condition of damage and the repair method in cases where damage was found.

(2) List of the maintenance items within the designated term is to be displayed. Such lists are to include the name of machinery, equipment and their parts together with the maintenance items and the maintenance completion date.

(3) Past maintenance records are to be displayed in cases where machinery, equipment and their parts are arbitrarily selected.

1.3.3 Condition Monitoring Function

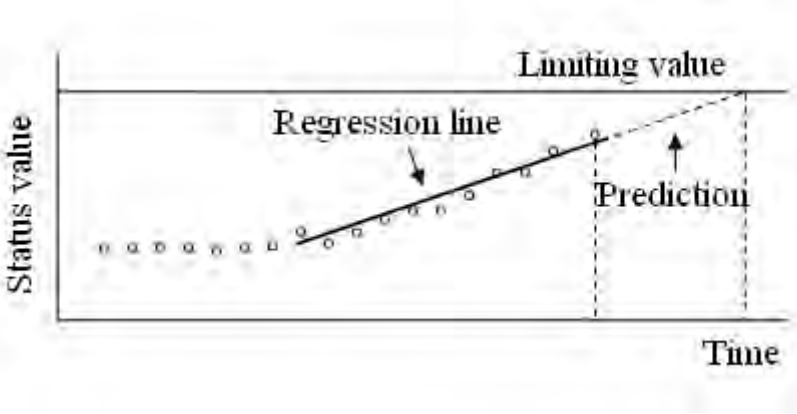
1 The software is to have a function for the condition monitoring of machinery, equipment and their parts as necessary. Such condition monitoring is to be capable of analysis such as trend analysis if necessary. In cases where trend analysis is adopted, the following requirements are to be satisfied:

(1) In cases where measurement data is affected by temperature, running speed, load, etc., the data is to be standardized and trend analysis is to be conducted against the index except in those cases where trend analysis is conducted against measurement data obtained during steady operating conditions.

(2) The limiting parameters~~upper limit and lower limit values~~ of measurement data are to be determined in accordance with the recommended values of the manufacturer or through statistical processing based on ~~initial values~~ baseline data. In cases where such values are determined by the manufacturer through statistical processing, limiting parameters ~~values~~ are to be automatically calculated based on accumulated data. However, these values may be determined by other methods deemed appropriate by the Society.

(3) Trends of measurement data together with relevant limiting values are to be able to be displayed by a simple operation. (See **Fig. 1.3.3-1**)

Fig. 1.3.3-1 Trend Display



2 Software may use diagnostic technology such as complex algorithms, machine learning and statistical knowledge obtained from data from machinery, etc. installed on other ships in order to identify the acceptability of continued service for machinery, equipment and components, or whether maintenance is required. The software need not follow machinery manufacturer recommended maintenance instructions or use manufacturer specified limiting parameters; in such cases, however, the software is to be approved in accordance with machinery manufacturer

recommendations, industry standards and its usage history on other ships registered by the Society.

3~~2~~ Maintenance management based on the condition monitoring specified in **-1** above is to satisfy the following:

(1) Planned maintenance
  (a) Machinery, equipment and their parts are to be capable of being registered apart from those which are periodically during open up examination.
  (b) The registration of the machinery, equipment and their parts which apply to condition monitoring are to include the following items:
    i) Names of machinery, equipment and their parts
    ii) Kind of measured signal
    iii) Measurement interval
    iv) Limiting value (This value is to be set up for each kind of measured signal)

(2) Measuring process and recording
  (a) Measurement date and measurement value are to be recorded.
  (b) In cases where open up examinations are conducted, it is to be capable of recording the same results of the maintenance specified in **1.3.2**.

Form 1

APPLICATION FOR THE APPROVAL OF PMS/CBM MANAGEMENT SOFTWARE

(☐Initial, ☐Renewal, ☐Modification)

To: Machinery Department, NIPPON KAIJI KYOKAI
4-7, Kioi-cho, Chiyoda-ku, Tokyo 102-8567, JAPAN

Ref. No.:
Date:

Name of Applicant: _____

Address: _____

TEL: _____

FAX: _____

E-mail: _____

We hereby apply for the approval of the following software in accordance with the requirements given in Annex B9.1.3-4, Part B of the Guidance for the Survey and Construction of Steel Ships.

Name of product	
Revision No.	
Name of Manufacturer and Address of Manufacturer	
Documents Attached	
Note	

Notes:
1. One copy of this application is to be submitted.
2. ☐check where appropriate.

EFFECTIVE DATE AND APPLICATION (Amendment 2-5)

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

2. Notwithstanding the amendments to the Guidance, the current requirements apply to the planned machinery survey for which the application of adoption is submitted to the Society before the effective date.

3. Notwithstanding the amendments to the Guidance, the current requirements apply to the PMS/CBM management software for which the application of approval is submitted to the Society before the effective date.