RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

Part B Class Surveys

Rules for the Survey and Construction of Steel Ships
Part B 2017 AMENDMENT NO.3
Guidance for the Survey and Construction of Steel Ships
Part B 2017 AMENDMENT NO.3

Rule No.92 / Notice No.96 25 December 2017
Resolved by Technical Committee on 26 July 2017

ClassNK
NIPPON KAIJI KYOKAI

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

RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part B Class Surveys

2017 AMENDMENT NO.3

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Rule No.92 25 December 2017
AMENDMENT TO THE RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

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

Part B CLASS SURVEYS

Amendment 3-1

Chapter 3 ANNUAL SURVEYS

Table B3.2 has been amended as follows.

Table B3.2 General Examination

Items	Examination
(Omitted)	
24 Portable gas detecting instruments	・ Confirmation that portable gas detecting instruments are in good condition. (This includes the confirmation of calibration records.)
(Omitted)	

Chapter 5 SPECIAL SURVEYS

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

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. ~~Each deck plating in one transverse section~~ 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 ~~within the cargo area~~) 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**
(Omitted)	

EFFECTIVE DATE AND APPLICATION (Amendment 3-1)

1. The effective date of the amendments is 25 December 2017.

Amendment 3-2

Chapter 1 GENERAL

1.2 Specialized Ships, Installations, and Apparatus

Paragraph 1.2.4 has been added as follows.

1.2.4 Surveys of Selective Catalytic Reduction (SCR) Systems, etc.*

Surveys of selective catalytic reduction (SCR) systems, exhaust gas recirculation (EGR) systems or exhaust gas cleaning systems (EGCS) are to be carried out as specified separately by the Society.

EFFECTIVE DATE AND APPLICATION (Amendment 3-2)

1. The effective date of the amendments is 1 January 2018.

2. Notwithstanding the amendments to the Rules, the current requirements apply to SCR systems, EGR systems and EGCS whose applications for approval are submitted to the Society before the effective date installed on ships for which the date of contract for construction* is before the effective date.

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

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

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

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

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

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

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

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

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

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

Note:
This Procedural Requirement applies from 1 July 2009.

Amendment 3-3

Chapter 3 ANNUAL SURVEYS

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

3.2.1 Examination of Plans and Documents*

Sub-paragraph -2 has been amended as follows.

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

2 For ships subject to *SOLAS Chapter II-1 Regulation 3-10*, ~~the following **(1)** to **(3)** related to~~ the Ship Construction File in **2.1.6-3** are to be ~~verified upon completion of the survey~~ examined in accordance with **(1)** to **(5)** below:

(1) For a Ship Construction File stored on board a ship, the Surveyor is to examine the information included in it on board the ship.

(2) For a Ship Construction File stored in an onshore archive, the Surveyor is to examine the list of information included in it stored in the onshore archive.

(~~1~~3) The Surveyor is to confirm upon completion of the survey that ~~T~~the Ship Construction File has been updated whenever any modification of the documentation included in it has taken place.

(~~2~~4) The Surveyor is to confirm upon completion of the survey that ~~A~~any addition and/or renewal of materials used for the construction of the hull structure are documented within the list of materials specified in **2.1.6-3(19)**.

(~~3~~5) The Surveyor is to confirm that ~~T~~the Ship Construction File is available to the Society and the flag state throughout the ship's life.

Chapter 4 INTERMEDIATE SURVEYS

4.2 Intermediate Surveys for Hull, Equipment, Fire Extinction and Fittings

4.2.1 Examination of Plans and Documents

Sub-paragraph -2 has been amended as follows.

1 At Intermediate Surveys, the management conditions of plans and documents specified in **3.2.1** are to be examined.

2 For ships subject to *SOLAS Chapter II-1 Regulation 3-10*, ~~the following **(1)** to **(3)** related to~~ the Ship Construction File in **2.1.6-3** are to be ~~verified upon completion of the survey~~ examined in accordance with **(1)** to **(5)** below:

(1) For a Ship Construction File stored on board a ship, the Surveyor is to examine the information included in it on board the ship.

(2) For a Ship Construction File stored in an onshore archive, the Surveyor is to examine the list of information included in it stored in the onshore archive.

(~~1~~3) The Surveyor is to confirm upon completion of the survey that ~~T~~the Ship Construction File has been updated whenever any modification of the documentation included in it has taken place.

(~~2~~4) The Surveyor is to confirm upon completion of the survey that ~~A~~any addition and/or renewal of materials used for the construction of the hull structure are documented within the list of materials specified in **2.1.6-3(19)**.

(~~3~~5) The Surveyor is to confirm that ~~T~~the Ship Construction File is available to the Society and the flag state throughout the ship's life.

Chapter 5 SPECIAL SURVEYS

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

5.2.1 Examination of Plans and Documents

Sub-paragraph -2 has been amended as follows.

1 At Special Surveys, the management conditions of plans and documents specified in **3.2.1** are to be examined.

2 For ships subject to *SOLAS Chapter II-1 Regulation 3-10*, ~~the following **(1)** to **(3)** related to~~ the Ship Construction File in **2.1.6-3** are to be ~~examined upon completion of the survey~~ examined in accordance with **(1)** to **(5)** below:

(1) For a Ship Construction File stored on board a ship, the Surveyor is to examine the information included in it on board the ship.

(2) For a Ship Construction File stored in an onshore archive, the Surveyor is to examine the list of information included in it stored in the onshore archive.

(~~1~~3) The Surveyor is to confirm upon completion of the survey that ~~T~~the Ship Construction File has been updated whenever any modification of the documentation included in it has taken place.

(~~2~~4) The Surveyor is to confirm upon completion of the survey that ~~A~~any addition and/or renewal of materials used for the construction of the hull structure are documented within the list of materials specified in **2.1.6-3(19)**.

(~~3~~5) The Surveyor is to confirm that ~~T~~the Ship Construction File is available to the Society and the flag state throughout the ship's life.

EFFECTIVE DATE AND APPLICATION (Amendment 3-3)

1. The effective date of the amendments is 1 January 2018.

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 3-4

Chapter 3 ANNUAL SURVEYS

3.6 Special Requirements for Ships Using Low-flashpoint Fuels

Paragraph 3.6.1 has been amended as follows.

3.6.1 General

In addition to the applicable requirements of the previous sections, the requirements of **3.6** are to be applied at Annual Surveys of ships using low-flashpoint fuels. ~~Examinations of inerted fuel tanks or other inerted spaces, however, may be omitted at the discretion of the attending surveyor.~~

3.6.2 Examinations*

At Annual Surveys of ships using low-flashpoint fuels, the examinations of spaces, structures and facilities, etc. specified in **Table B3.11** are to be carried out in order to ascertain them being in good order. The extent of the survey may be increased to include additional performance testing, operational testing or open-up examinations in cases where deemed necessary by the attending surveyor.

Table B3.11 has been amended as follows.

Table B3.11 Special Requirements for Ships Using Low-flashpoint Fuels

Items	Examinations
1 Fuel containment systems*1	The following (a) to (i) are to be carried out, so far as applicable. ~~General conditions of fuel tanks, secondary barriers and their thermal insulation and general conditions of sealing arrangements for fuel tanks or tank covers penetrating decks are to be examined as far as accessible. At the first Annual Survey after delivery, the examinations specified in (a) and (b) of item 1 and item 2 of **Table B5.29** as well as an examination of the general condition of the fuel tank foundations are to be carried out.~~ (a) External examination of the storage tanks including secondary barrier if fitted and accessible (b) General examination of the fuel storage hold place (c) Internal examination of tank connection space (d) External examination of tank and relief valves (e) Verification of satisfactory operation of tank monitoring system (f) Examination and testing of installed bilge alarms and means of drainage of the compartment (g) Examination of the general condition of the thermal insulation of fuel storage tanks and secondary barriers as far as accessible (h) Examination of the general condition of the sealing arrangements for fuel storage tanks or tank covers penetrating decks as far as accessible (i) At the first Annual Survey after delivery, the examinations specified in (a) and (b) of item 1 and item 2 of **Table B5.29** as well as an examination of the general condition of the fuel storage tank connection to the hull are to be carried out when deemed necessary by the Surveyor.
2 Pressure relief systems for fuel containment systems and fuel storage hold spaces	Pressure relief valves, vacuum protection systems and safety systems for fuel storage tanks, interbarrier spaces, and fuel storage hold spaces, as well as their associated protection screens and vent piping are to be examined generally as far as accessible. It is to be confirmed that records of sealing of pressure relief valves for fuel storage tanks and their pressure setting are maintained on board.
3 Bunkering systems and fuel supply systems for low-flashpoint fuels*1	The following (a) to (c) are to be carried out, so far as applicable. ~~General conditions of those specified in (a) to (c) below are to be examined during bunkering and fuel supply operations as far as practical. General examinations and performance testing of shut-off devices for stopping fuel transfer are to be carried out.~~ (a) Examination of bunkering stations and the fuel bunkering system, including liquid level gauges, high level alarms and valves associated with emergency shutdown systems (~~a~~b) ~~Bunkering~~ Examination of the fuel supply system, ~~equipment~~ including fuel heat exchangers, vaporizers, pumps and compressors, during working condition as far as practicable ~~(b) Fuel and process piping and its thermal insulation as far as accessible~~ (~~c~~c) Examination of ~~A~~automatic and manual stopping devices for fuel pumps and compressors
4 Fuel Handling Piping, Machinery and Equipment	Piping and its insulation, hoses, emergency shut-down valves, remote operating valves, relief valves, machinery and equipment for fuel storage, fuel bunkering, and fuel supply such as venting, compressing, refrigerating, liquefying, heating, cooling or otherwise handling the fuel are to be examined, as far as practicable. Stopping of pumps and compressors upon emergency shut-down of the system is to be confirmed as far as practicable.

Table B3.11 Special Requirements for Ships Using Low-flashpoint Fuels (Continued)

Items	Examinations
~~4~~5~~Gauging, detecting, safety, and alarming devices~~ Control, Monitoring and Safety Systems	(a) General examinations and performance testing of those specified in the following ~~(a~~i) to ~~(e~~iii) are to be carried out. Simulation testing or other suitable methods may be used in cases where it is difficult to carry out testing under actual operating conditions. ~~(a) Liquid level gauges, high level alarms and valves associated with emergency shutdown systems~~ ~~(b~~i) Temperature indication equipment and associated alarms ~~(c~~ii) Pressure gauges and associated alarms for fuel tanks, interbarrier spaces and fuel storage hold spaces ~~(d) Fixed and portable gas detecting instruments and associated alarms~~ ~~(e~~iii) Oxygen content meters (b) The following i) to v) are to be carried out. i) Gas detection equipment, including both fixed and portable instruments, and other leakage detection equipment in compartments containing fuel storage, fuel bunkering, and fuel supply equipment or components or associated systems, including indicators and alarms, is to be confirmed in satisfactory operating condition. Recalibration of the gas detection systems is to be verified in accordance with the manufacturers' recommendations. ii) Verification of the satisfactory operation of the control, monitoring and shutdown systems, including automatic shutdown systems, of the fuel supply and bunkering systems is to be carried out. General examinations and performance testing, simulation testing or other suitable methods in cases where it is difficult to carry out performance testing under actual operating conditions for liquid level gauges, high level alarms and valves associated with emergency shutdown systems for bunkering are to be carried out. iii) Testing of the remote and local closing of the installed main tank valve is to be carried out. iv) Testing of the remote and local closing of the master fuel valve for each engine compartment and verification of satisfactory operation of the fuel supply system control, monitoring and shut-down systems are to be carried out during working condition as far as practicable. v) Operational test, as far as practicable, of the shutdown of *ESD* protected machinery spaces is to be carried out.
~~5~~6Environmental control systems	Means for inerting specified in the following (a) to (c) is to be examined~~General examinations of those specified in (a) to (c) are to be carried out~~. (a) Systems for gas freeing and purging and gas sampling devices for fuel storage tanks (b) Inert gas generators and inert gas storage systems (c) Pressure control systems, means for preventing backflow of gases and monitoring systems for inert gas associated systems
7 Ventilating System	Examination of the ventilation system, including portable ventilating equipment where fitted, is to be made for spaces containing fuel storage, fuel bunkering, and fuel supply units or components or associated systems, including air locks, tank connection spaces, *ESD*-protected machinery spaces, fuel preparation rooms including pump rooms and compressor rooms, fuel valve rooms, control rooms and spaces containing gas burning equipment as well as double pipes and ducts. Where alarms, such as differential pressure and loss of pressure alarms, are fitted, these should be operationally tested as far as practicable.
~~6~~8Fire-extinguishing arrangements	General conditions of fire-fighting systems for enclosed hazardous areas and alarm devices for emergency escape are to be examined.

Table B3.11 Special Requirements for Ships Using Low-flashpoint Fuels (Continued)

Items	Examinations
~~7~~9Other	General conditions of those specified in the following (a) to (k) are to be examined. Checking the contents of items (~~i~~j) ~~and~~to (k) and confirmation that they are maintained on board are to be carried out. (a) Closing appliances for openings such as windows and doors of the wheelhouse, deckhouses and superstructures that are required to be capable of being closed; and the arrangements for the air locks ~~(b) Ventilation systems for hazardous areas, non-hazardous areas with entry openings to hazardous areas (including enclosed hazardous areas), tank connection spaces, *ESD* protected machinery spaces, fuel preparation rooms, bunkering stations and fuel piping~~ (~~a~~b) Portable and fixed ~~D~~drip trays and insulation for the protection of the ship's structure in the event of leakage~~for fuel piping systems~~ (~~b~~c) Fuel preparation rooms, including ~~F~~fuel pump~~s~~ and compressor~~s~~ rooms, and the sealing of shafts penetrating gas-tight bulkheads (~~c~~d) Means for preventing excessive cooling of hull structures (~~d~~e) Approved fuel hoses (~~e~~f) Electrical bonding arrangements in hazardous areas, such as those between hull structures and fuel piping or fuel storage tanks, including bonding straps where fitted (~~f~~g) Equipment specially required depending upon fuel type (~~g~~h) Electrical ~~installations~~equipment and bulkhead/deck penetrations including access openings in hazardous areas[*2] (~~h~~i) Bunker delivery notes for low-flashpoint fuel delivered as well as the operational procedures (**17.2.2-3, Part GF**)[*3] and emergency procedures (**17.2.2-4, Part GF**) for ships using low-flashpoint fuels (~~i~~j) The *IMO International Code of Safety for Ships using Gases or Other Low-flashpoint Fuels* (k) Logbooks/Records[*4]

Notes:

(*1) Insulation need not be removed, but any deterioration or evidence of dampness is to be investigated.

(*2) The electrical equipment and bulkhead/deck penetrations including access openings are to be examined for continued suitability for their intended service and installation area.

(*3) The manufacturer/builder instructions and manuals covering the operations, safety and maintenance requirements and occupational health hazards relevant to fuel storage, fuel bunkering, and fuel supply and associated systems for the use of the fuel, are to be confirmed as being aboard the vessel.

(*4) The logbooks and operating records are to be examined with regard to correct functioning of the gas detection systems, fuel supply/gas systems, etc. The hours per day of the reliquefaction plant, gas combustion unit, as applicable, the boil-off rate, and nitrogen consumption (for membrane containment systems) are to be considered together with gas detection records.

Chapter 4 INTERMEDIATE SURVEYS

4.6 Special Requirements for Ships Using Low-flashpoint Fuels

Paragraph 4.6.1 has been amended as follows.

4.6.1 General

In addition to the applicable requirements of the previous sections, the requirements of **4.6** are to be applied at Intermediate Surveys of ships using low-flashpoint fuels. ~~Examinations of inerted fuel tanks or other inerted spaces, however, may be omitted at the discretion of the attending surveyor.~~

4.6.2 Examinations*

At Intermediate Surveys of ships using low-flashpoint fuels, the examinations of structures and facilities, etc. specified in **Table B4.8** are to be carried out in order to ascertain them being in good order, in addition to the examinations specified in **3.6.2**.

Table B4.8 has been amended as follows.

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

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

Chapter 5 SPECIAL SURVEYS

5.6 Special Requirements for Ships Using Low-flashpoint Fuels

5.6.1 General

In addition to the applicable requirements of previous sections, the requirements of **5.6** are to be applied at Special Surveys of ships using low-flashpoint fuels.

5.6.2 Examinations*

At Special Surveys of ships using low-flashpoint fuels, the examinations specified in **Table B5.29** are to be carried out thoroughly in order to ascertain them being in good order, in addition to the examinations specified in **4.6.2**.

Table B5.29 has been amended as follows.

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

Items	Examinations
1 Fuel storage tanks	The following examinations and testing are to be carried out [*1]: (a) Internal examinations of all fuel storage tanks. ~~For v~~Vacuum insulated independent fuel storage tanks of type *C*, however, ~~examinations are to be as deemed appropriate by the Society~~need not be examined internally. Where fitted, the vacuum monitoring system is to be examined, and records are to be reviewed. (b) Visual examinations of ~~surfaces of~~ thermal insulation[*2] or surfaces of fuel storage tanks without thermal insulation i) Special attention is to be paid ~~to the~~in way of chocks of tank foundations, tank supports, keys, etc. ~~of tank foundations~~. Removal of thermal insulation may be required where deemed necessary by the Surveyor. ii) Non-destructive testing may be required if conditions raise doubt to the structural integrity. (c) Thickness measurements for ~~fuel~~ tank plates may be required where deemed necessary by the Surveyor. (d) Non-destructive testing for independent fuel storage tanks of Type *B* in accordance with the approved programme is to be carried out. The programme is to be that prepared according to fuel storage tank design. Fuel storage tanks other than independent fuel storage tanks of Type *B* are to be examined by non-destructive testing on welded connections of the tank plates, main structural members and parts where high stress is deemed likely to occur[~~*3~~] where deemed necessary by the Surveyor.[~~*3~~] ~~For vacuum insulated tanks, however, examinations are to be as deemed appropriate by the Society~~. (e) Leakage testing of all fuel storage tanks Where there is any doubt regarding the integrity of a fuel storage tank as a result of examinations specified in (a) to (e) above, such a fuel storage tank is to be tested by hydraulic or hydro-pneumatic testing under the pressures specified below: Independent fuel storage tanks of Type *C*: a pressure not less than 1.25 times the maximum allowable relief valve setting (hereinafter referred to as "*MARVS*"); or For integral tanks and for ~~I~~independent tanks of Type *A* and *B*: an appropriate pressure according to fuel storage tank design, as far as practicable, with the pressure at the top of the tank corresponding at least to the *MARVS*. For all independent fuel storage tanks of Type *C*, either the following i) or ii) examination is to be carried out at every second Special Survey in addition to examinations (a) to (e). ~~For vacuum insulated tanks, however, examinations are to be as deemed appropriate by the Society.~~ i) Hydraulic or hydro-pneumatic testing at a pressure not less than 1.25 times *MARVS*, and the non-destructive testing specified in (d) ii) Non-destructive testing according to a programme prepared based upon fuel storage tank design[*4] Where water cannot be tolerated and the fuel storage tank cannot be dried prior to putting the tank into service, the Surveyor may accept alternative testing fluids or alternative means of testing.

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

Items	Examinations
2 ~~Fuel storage hold spaces and secondary barriers~~ Tank support arrangements, tank fixing arrangements, etc.	・ ~~Fuel t~~Tank support~~s~~ arrangements, anti-rolling or anti-pitching devices, and surrounding hull structures ~~in fuel storage hold spaces~~ and their thermal insulation are to be visually examined. Non-destructive testing may be required if conditions raise doubt to the structural integrity. ・ For membrane tanks, it is to be verified that the gas-tightness of secondary barriers is kept on the level of tightness required for system design in accordance with the programme and acceptance criteria approved in advance. Low differential pressure testing, however, is not to be adopted for testing the tightness of secondary barriers. For glued secondary barriers, if the verification results do not satisfy the required level of gas-tightness, an investigation is to be carried out to analyse the causes of failure, and additional testing such as thermographic or acoustic emission testing is to be carried out taking into account the analysis. ・ For other secondary barriers, gas-tightness is to be verified by pressure or vacuum testing or other proper means in cases where there is any doubt.[*5]
3 Venting systems for fuel containment systems	・The ~~P~~pressure relief valves ~~systems~~ for the fuel storage tanks are to be ~~overhauled, performance tested~~ opened for examination, adjusted, function tested and sealed.[*6] If the tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, such non-metallic membranes are to be replaced. ・The ~~P~~pressure ~~relief systems and~~ /vacuum relief ~~protection systems~~valves, rupture disc and other pressure relief devices for interbarrier spaces and fuel storage hold spaces are to be opened, examined, tested and readjusted as necessary, depending on their design.~~and~~ [*7] ・The vacuum protection systems for fuel storage tanks are to be overhauled and tested appropriately for the design.[*~~6~~8]
4 Fuel piping and process piping systems, etc.	The following examinations and testing ~~specified in the following (a) and (b)~~ are to be carried out. ~~Removal of thermal insulation may be required where deemed necessary by the Surveyor.~~ (a) All piping for fuel storage, fuel bunkering, and fuel supply such as venting, compressing, refrigerating, liquefying, heating, storing, burning or otherwise handling the fuel and liquid nitrogen installations are to be examined. Removal of thermal insulation from the piping and opening for examination may be required where deemed necessary by the Surveyor. (~~a~~b) Where deemed ~~necessary~~suspect by the Surveyor during (a) above, ~~whole or a part of valves and associated fittings are to be overhauled or pressure tested at a pressure~~ a hydrostatic test to 1.25 times the *MARVS* for the pipeline is to be carried out. After ~~reinsallation~~reassembly, the complete piping is to be tested for leaks ~~of any piping removed for the above examinations, leakage testing is to be carried out on said piping~~. Where water cannot be tolerated and the piping cannot be dried prior to putting the system into service, the Surveyor may accept alternative testing fluids or alternative means of testing. (~~b~~c) ~~Whole or a part of~~ A random selection of pressure relief valves for the fuel supply and bunkering piping ~~are~~is to be ~~overhauled~~ opened for examination, ~~and the overhauled valves are to be performance~~ adjusted, and function tested and sealed. Where a proper record of continuous overhaul and retesting of individually identifiable relief valves is maintained, consideration will be given to acceptance on the basis of opening, internal examination, and testing of a representative sampling of valves, including each size and type of liquefied gas or vapor relief valve in use, provided there is logbook evidence that the remaining valves have been overhauled and tested since crediting of the previous Special Survey. (d) All emergency shut-down valves, check valves, block and bleed valves, master gas valves, remote operating valves, isolating valves for pressure relief valves in the fuel storage, fuel bunkering, and fuel supply piping systems are to be examined and proven operable. A random selection of valves is to be opened for examination. (e) Leakage testing of the emergency shut-down valves opened in accordance with **(d)** above is to be carried out.

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

Items	Examinations
5 Components of ~~P~~bunkering systems, fuel containment systems and fuel supply systems for low-flashpoint fuels	The following examinations and testing ~~specified in the following (a) to (c)~~ are to be carried out. (a) Fuel ~~p~~pumps and fuel ~~gas~~ compressors as well as their prime movers are to be overhauled, and performance testing of safety devices is to be carried out. Overhauling of electric motors for prime movers, however, may be omitted.[*~~7~~9] (b) Heat exchangers, pressure vessels, including process pressure vessels, ~~and~~ evaporators and other components used in connection with fuel handling are to be overhauled. Pressure relief systems are to be performance tested. If an internal examination of the pressure vessels, including process pressure vessels, is impracticable, pressure testing of the vessels and performance testing of pressure relief systems are to be carried out.[*~~7~~9] (c) The examinations specified in the following i) to iii) are to be carried out for refrigerating equipment. i) Overhauling of pumps and compressors and performance testing of pressure vessels such as condensers, evaporators, inter-coolers and oil separators and the relief systems[*~~7~~9] ii) Leakage testing of pressure vessels and heat exchangers at a pressure not less than 90% of the setting pressure of their relief systems iii) Leakage testing of refrigerant piping systems at a pressure of not less than 90% of the setting pressure of their relief systems (d) General examinations of inert gas generators are to be carried out.
~~6 Shutdown systems~~	~~For shutdown valves, overhauling and leakage testing of valve seats are to be carried out.~~[~~*6 *8~~]
~~7~~6 Electrical installations ~~in hazardous areas~~	~~In accordance with item 2 of the requirements for tankers in **Table B5.25.**~~The following examinations and testing are to be carried out. (a) Examination of electrical equipment to include the physical condition of electrical cables and supports, intrinsically safe, explosion proof, or increased safety features of electrical equipment. (b) Testing of systems for de-energizing electrical equipment which is not certified for use in hazardous areas. (c) An electrical insulation resistance test of the circuits terminating in, or passing through, the hazardous zones and spaces is to be carried out. However, this test may be omitted at the discretion of the Surveyor, if accurate test records of the insulation resistance can be verified. (d) The earthing between fuel storage tanks or fuel piping systems (fuel pipes, vent pipes, etc.) and hull structures is to be examined. (e) Electrical installations in hazardous areas are to be examined in detail and confirmation that they conform to the requirements in **4.2.7, Part H** is to be carried out. (f) Performance tests of interlock devices associated with pressurized protected type electrical equipment and electrical equipment installed in pressurized or ventilated areas are to be carried out. In addition, functional testing of pressurized equipment and associated alarms is to be carried out.
7 Safety Systems	Gas detectors, temperature sensors, pressure sensors, level indicators, and other equipment providing input to the fuel safety system are to be tested to confirm satisfactory operating condition. (a) Proper response of the fuel safety system upon fault conditions is to be verified. (b) Pressure, temperature and level indicating equipment are to be calibrated in accordance with the manufacturer's requirements.

Notes:

(*1) For membrane tanks, examinations and testing are to be carried out in accordance with a programme specially prepared according to methods approved for each tank system.

(*2) If visual examinations of the thermal insulation of tanks are impossible, their surrounding structural members are to be examined for cold spots when the fuel storage tanks are cooled. Where the integrity of fuel storage tanks and their thermal insulation is verified by checking the bunker delivery note for the low-flashpoint fuel delivered, however, the examinations of cold spots may be omitted.

(*3) For type *C* tanks, non-destructive testing is not to be totally dispensed with. Parts where high stress is deemed likely to occur:

- ~~connections between fuel tanks and~~ fuel storage tank supports~~,~~ and anti-rolling ~~devices and~~ /anti-pitching devices
- ~~connections between tank plates and~~ web frames or stiffening rings
- ~~connections between tank plates and~~ swash bulkhead boundaries
- ~~connections between tank plates and~~ dome~~s~~ and sump connections to tank shell~~or suction wells~~
- ~~connections between tank plates and~~ foundations for fuel pumps, towers or ladders, etc.
- ~~connections between tank plates and~~ pipe connections ~~supports~~

(*4) If an approved non-destructive testing programme does not exist, non-destructive testing of at least 10% of the length of the welded connections in each highly stressed area given below is to be conducted. This testing is to be carried out from both inside and outside of the tank, as appropriate, with thermal insulation removed, as necessary.

- ~~connections between tanks and~~ fuel storage tank supports~~,~~ and anti-rolling ~~or~~ /anti-pitching devices
- ~~connections between tank plates and~~ stiffening rings
- Y-connections between tank plates and longitudinal bulkheads of bilobe tanks
- ~~connections between tank plates and~~ swash bulkhead boundaries
- ~~connections between tanks and~~ dome~~s~~ and sump connections to the tank shell~~or suction wells~~
- ~~connections between tank plates and~~ foundations for fuel pumps, towers or ladders, etc.
- ~~connections between tanks and~~ pipe connections~~supports~~

(*5) Appropriate pressure or vacuum testing and examinations for cold spots are to be carried out. Where the integrity of thermal insulation is verified by checking the bunker delivery note for the low-flashpoint fuel delivered, however, the examinations for cold spots may be omitted.

(*6) In cases where it is confirmed through the examination of records that the pressure relief valves have been opened for examination, adjusted, function tested and sealed at an interval not exceeding five *years*, general examinations of the pressure relief valves need only be carried out at Special Surveys.

(*7) In cases where it is confirmed through the examination of records that the pressure/vacuum relief valves, rupture disc or other pressure relief devices have been opened, examined, tested and readjusted at an interval not exceeding five *years*, respective general examinations of the pressure/vacuum relief valves, rupture disc or other pressure relief devices need only be carried out.

(*~~6~~8) For systems whose continuous open-up examinations and performance testing since the previous Special Survey have been carried out in the presence of a Surveyor and whose test records are confirmed, visual examinations to the extent as far as practical may be carried out in lieu of the required testing.

(*~~7~~9) For equipment that is overhauled at Planned Machinery Surveys, overhauling at Special Surveys may be replaced by visual examinations to the extent as far as practical.

~~(*8) In cases where conditions of valve bodies and valve seats can be checked without removing their valve casings from the fitted piping, internal examinations for checking such conditions may be carried out in lieu of overhauling. Furthermore, in cases where such examinations confirm valves to be in good condition and not in need of any adjusting or repair, leakage testing of valve seats may be omitted.~~

EFFECTIVE DATE AND APPLICATION (Amendment 3-4)

1. The effective date of the amendments is 1 January 2018.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

Part B Class Surveys

2017 AMENDMENT NO.3

Notice No.96 25 December 2017

Resolved by Technical Committee on 26 July 2017

Notice No.96 25 December 2017
AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

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

Part B CLASS SURVEYS

Amendment 3-1

B1 GENERAL

Section B1.5 has been added as follows.

B1.5 Others

B1.5.1 Portable Atmosphere Testing Instruments for Enclosed Spaces

The wording "suitable means are to be provided for the calibration of all such instruments" in **1.5.1, Part B of the Rules** refers to portable atmosphere testing instruments being calibrated on board or ashore in accordance with the manufacturer's instructions together with corresponding calibration records being kept. In this regard, the calibration of portable atmosphere testing instruments does not include any pre-operational accuracy tests as recommended by the manufacturer.

B3 ANNUAL SURVEYS

B3.3 Annual Surveys for Machinery

B3.3.2 Performance Tests

Sub-paragraph -2 has been amended as follows.

2 In applying item 6 of **Table B3.8, Part B of the Rules** to tankers, a general examination is to confirm that portable instruments for measuring oxygen and portable instruments for measuring flammable vapour concentrations together with a sufficient set of spares~~, and suitable means for the calibration of these instruments~~ specified in **4.5.7(1), Part R of the Rules** are in good condition.

EFFECTIVE DATE AND APPLICATION (Amendment 3-1)

1. The effective date of the amendments is 25 December 2017.

Amendment 3-2

B1 GENERAL

B1.2 Specialized Ships, Installations, and Apparatus

Paragraph B1.2.4 has been added as follows.

B1.2.4 Surveys of Selective Catalytic Reduction (SCR) Systems, etc.

With respect to the wording "specified separately by the Society" in **1.2.4, Part B of the Rules**, reference is to be made to **Annex D1.3.1-5(1) "Guidance for the Survey and Construction of Selective Catalytic Reduction Systems and Associated Equipment", Part D of the Guidance** for selective catalytic reduction (SCR) systems, **Annex D2.1.1-5 "Guidance for the Survey and Construction of Exhaust Gas Recirculation Systems and Associated Equipment", Part D of the Guidance** for exhaust gas recirculation (EGR) systems, and **Annex D1.3.1-5(2) "Guidance for the Survey and Construction of Exhaust Gas Cleaning Systems and Associated Equipment", Part D of the Guidance** for exhaust gas cleaning systems (EGCS).

EFFECTIVE DATE AND APPLICATION (Amendment 3-2)

1. The effective date of the amendments is 1 January 2018.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to SCR systems, EGR systems and EGCS whose applications for approval are submitted to the Society before the effective date installed on ships for which the date of contract for construction* is before the effective date.

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

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

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

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.
For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:
(1) such alterations do not affect matters related to classification, or
(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.
The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

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

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

Note:
This Procedural Requirement applies from 1 July 2009.

Amendment 3-3

B2 CLASSIFICATION SURVEYS

B2.1 Classification Survey during Construction

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

Sub-paragraph -1 has been amended as follows.

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

(1) For ships subject to *SOLAS Convention*, t~~T~~he tests stipulated in *SOLAS Chapter II-1 Regulation 11*, except where specially approved by the Administration; and

(2) The tests stipulated in ~~**Annex B2.1.5-1 "Testing Procedures of Watertight Compartments".**~~ the following **(a)** or **(b)**:

(a) Testing procedures of watertight compartments for ships subject to *SOLAS Convention* (including ships subject to **Part CSR-B&T**) are to be carried out in accordance with **Chapter 1 of Annex B2.1.5-1 "Testing Procedures of Watertight Compartments"**, unless:

i) the shipyard provides documentary evidence of the shipowner's agreement to a request to the Flag Administration for an exemption from the application of *SOLAS Chapter II-1*, *Regulation 11*, or for an equivalency agreeing that the content of **Chapter 2 of Annex B2.1.5-1 "Testing Procedures of Watertight Compartments"** is equivalent to *SOLAS Chapter II-1, Regulation 11*; and

ii) the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.

(b) Testing procedures of watertight compartments are to be carried out in accordance with **Chapter 2 of Annex B2.1.5-1 "Testing Procedures of Watertight Compartments"** for ships not subject to *SOLAS Convention* and ships subject to *SOLAS Convention* (including ships subject to **Part CSR-B&T**) for which:

i) the shipyard provides documentary evidence of the shipowner's agreement to a request to the Flag Administration for an exemption from the application of *SOLAS Chapter II-1*, *Regulation 11*, or for an equivalency agreeing that the content of **Chapter 2 of Annex B2.1.5-1 "Testing Procedures of Watertight Compartments"** is equivalent to *SOLAS Chapter II-1, Regulation 11*; and

ii) the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.

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

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

Annex B2.1.5-1 TESTING PROCEDURES OF WATERTIGHT COMPARTMENTS

Chapter1 SHIPS SUBJECT TO *SOLAS CONVENTION*

1.1 General

1.1.1 General

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

2 Testing procedures of watertight compartments for ships subject to *SOLAS Convention* (including ships subject to **Part CSR-B&T**) are to be carried out in accordance with **Chapter 1**, unless:

(1) the shipyard provides documentary evidence of the shipowner's agreement to a request to the Flag Administration for an exemption from the application of *SOLAS Chapter II-1, Regulation 11*, or for an equivalency agreeing that the content of **Chapter 2 of Annex B2.1.5-1 "Testing Procedures of Watertight Compartments"** is equivalent to *SOLAS Chapter II-1, Regulation 11*; and

(2) the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.

1.2 Application

1.2.1 Application

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

(1) Gravity Tanks for their tightness and structural adequacy

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

(3) Weathertight Boundaries for their weathertightness

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

1.3 Test types and Definitions

1.3.1 Tests

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

(1) Structural Test

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

(2) Leak Test

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

2 The definition of each test type is as follows:

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

1.4 Test Procedures

1.4.1 General

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

1.4.2 Structural Test Procedures

1 Type and time of test

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

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

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

(1) Tanks which are intended to hold liquids, and which form part of the watertight subdivision of the ship, are to be tested for tightness and structural strength as indicated in **Table 1** and **Table 2.**

(~~1~~2) The tank boundaries are to be tested from at least one side. The tanks for structural test are to be selected so that all representative structural members are tested for the expected tension and compression.

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

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

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

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

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

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

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

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

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

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

(~~6~~3) For the watertight boundaries of spaces other than tanks structural testing may be exempted, provided that the water-tightness of boundaries of exempted spaces is verified by leak tests and inspections. Structural testing may not be exempt and the requirements for structural testing of tanks in **(1)** ~~to **(5)**~~ and **(2)** above shall apply, for ballast holds, chain lockers and a representative cargo hold if intended for in-port ballasting.

1.4.3 Leak Test Procedures

1 For the leak tests specified in **Table 1**, tank air tests, compressed air fillet weld tests, vacuum box tests in accordance with **1.4.4-4** through **1.4.4-6**, or their combination, will be acceptable.

Hydrostatic or hydropneumatic tests may also be accepted as leak tests provided that **1.4.5**, **1.4.6** and **1.4.7** are complied with. Hose tests will also be acceptable for such locations as specified in **Table 1**, **Footnote 3**, in accordance with **1.4.4-3**.

2 The application of the leak test for each type of welded joint is specified in **Table 3**.

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

1.4.4 Test Methods

1 Hydrostatic test

Unless another liquid is approved, hydrostatic tests are to consist of filling the space with fresh water or sea water, whichever is appropriate for testing, to the level specified in **Table 1** or **Table 2**. See also **1.4.7**.

In cases where a tank is designed for cargo densities greater than sea water and testing is ~~higher density cargoes is to be tested~~ with fresh water or sea water, the testing pressure height is to simulate the actual loading for those greater cargo densities as far as practicable ~~be specially considered~~.

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

2 Hydropneumatic test

Hydropneumatic tests, where approved, are to be such that the test condition, in conjunction with the approved liquid level and supplemental air pressure, will simulate the actual loading as far as practicable. The requirements and recommendations for tank air tests in **-4** will also apply to hydropneumatic tests. See also **1.4.7**.

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

3 Hose test

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

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

4 Tank air test

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

A U-tube with a height sufficient to hold a head of water corresponding to the required test pressure is to be arranged. The cross sectional area of the U-tube is not to be less than that of the pipe supplying air to the tank. ~~Instead of using a U-tube, two calibrated pressure gauges may be acceptable to verify required test pressure.~~ Arrangements involving the use of two calibrated pressure gauges to verify the required test pressure may be accepted taking into account the provisions in *F5.1* and *F7.4* of *IACS Recommendation No.140*, "Recommendation for Safe Precautions during Survey and Testing of Pressurized Systems".

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

5 Compressed air fillet weld test

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

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

6 Vacuum box test

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

7 Ultrasonic test

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

8 Penetration test

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

9 Other test

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

1.4.5 Application of Coating

1 Final coating

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

Surveyors reserve the right to require a leak test prior to the application of final coating over automatic erection butt welds.

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

2 Temporary coating

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

1.4.6 Safe Access to Joints

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

1.4.7 Hydrostatic or Hydropneumatic Tightness Test

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

Table 1 Test Requirements for Tanks and Boundaries

	Tank or boundary to be tested	Test type	Test head or pressure	Remarks
1	Double bottom tanks[*4]	Leak and structural[*1]	The greater of - top of the overflow, - to 2.4 *m* above top of tank[*2], or - to bulkhead deck	
2	Double bottom voids[*5]	Leak	See **1.4.4-4** through **-6**, as applicable	including pump room double bottom and bunker tank protection double hull required by **Part 3 of the Rules for Marine Pollution Prevention Systems**
3	Double side tanks	Leak and structural[*1]	The greater of - top of the overflow, - to 2.4 *m* above top of tank[*2], or - to bulkhead deck	
4	Double side voids	Leak	See **1.4.4-4** through **-6**, as applicable	
5	Deep tanks other than those listed elsewhere in this table	Leak and structural[*1]	The greater of - top of the overflow, or - to 2.4 *m* above top of tank[*2]	
6	Cargo oil tanks	Leak and structural[*1]	The greater of - top of the overflow, - to 2.4 *m* above top of tank[*2], or - to top of tank[*2] plus setting of any pressure relief valve	
7	Ballast hold of bulk carriers	Leak and structural[*1]	Top of cargo hatch coaming	
8	Peak tanks	Leak and structural[*1]	The greater of - top of the overflow, or - to 2.4 *m* above top of tank[*2]	After peak to be tested after installation of stern tube
9	.1 Fore peak spaces with equipment	Leak	See **1.4.4-3** through **-6**, as applicable	
	.2 Fore peak voids	Leak ~~and structural~~[~~*1,9~~]	See **1.4.4-4** through **-6**, as applicable ~~To bulkhead deck~~	
	.3 Aft peak spaces with equipment	Leak	See **1.4.4-3** through **-6**, as applicable	
	.4 Aft peak voids	Leak	See **1.4.4-4** through **-6**, as applicable	After peak to be tested after installation of stern tube
10	Cofferdams	Leak	See **1.4.4-4** through **-6**, as applicable	
11	.1 Watertight bulkheads	Leak[*8]	See **1.4.4-3** through **-6**, as applicable [*7]	
	.2 Superstructure end bulkheads	Leak	See **1.4.4-3** through **-6**, as applicable	
12	Watertight doors below freeboard or bulkhead deck	Leak[*6,7]	See **1.4.4-3** through **-6**, as applicable	
13	Double plate rudder blades	Leak	See **1.4.4-4** through **-6**, as applicable	
14	Shaft tunnels clear of deep tanks	Leak[*3]	See **1.4.4-3** through **-6**, as applicable	

15	Shell plating	Leak[*3]	See **1.4.4-3** through **-6**, as applicable	For shell plating of the areas listed in item 1 through item 10, refer to the corresponding item
16	Shell doors	Leak[*3]	See **1.4.4-3** through **-6**, as applicable	
17	Weathertight hatch covers and closing appliances	Leak[*3,7]	See **1.4.4-3** through **-6**, as applicable	Hatch covers closed by tarpaulins and battens excluded
18	Dual purpose tanks/dry cargo hatch covers	Leak[*3,7]	See **1.4.4-3** through **-6**, as applicable	In addition to structural test in item 6 or 7
19	Chain lockers	Leak and structural[*1]	Top of chain pipe	
20	L.O. sump. tanks and other similar tanks/spaces under main engines	Leak[*9]	See **1.4.4-3** through **-6**, as applicable	
21	Ballast ducts	Leak and structural[*1]	The greater of - ballast pump maximum pressure, or - setting of any pressure relief valve	
22	Fuel Oil Tanks	Leak and structural[*1]	The greater of - top of the overflow, - to 2.4 *m* above top of tank[*2], or - to top of tank[*2] plus setting of any pressure relief valves, or - to bulkhead deck	

Notes:

1 Refer to section **1.4.2-2**

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

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

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

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

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

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

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

9 ~~Structural test may be waived where demonstrated to be impracticable to the satisfaction of the Society.~~ Where L.O. sump tanks and other similar spaces under main engines intended to hold liquid form part of the watertight subdivision required to satisfy the damage stability requirements of the ship, they are to be tested as per the requirements of Item 5, Deep tanks other than those listed elsewhere in this table.

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

Table 2 Additional Test Requirements for Special Service Ships/Tanks

	Type of Ship/Tank	Structures to be tested	Type of Test	Test Head or Pressure	Remarks
1	Liquefied gas carriers	Integral tanks	Leak and structural	Refer to **Part N of the Rules**	
		Hull structure supporting membrane or semi-membrane tanks	Refer to **Part N of the Rules**	Refer to **Part N of the Rules**	
		Independent tanks type A	Refer to **Part N of the Rules**	Refer to **Part N of the Rules**	
		Independent tanks type B	Refer to **Part N of the Rules**	Refer to **Part N of the Rules**	
		Independent tanks type C	Refer to **Part N of the Rules**	Refer to **Part N of the Rules**	
2	Edible liquid tanks	Independent tanks	Leak and structural[*1]	The greater of - top of the overflow, or - to 0.9 *m* above top of tank[*~~1~~2]	
3	Chemical carriers	Integral or independent cargo tanks	Leak and structural[*~~3~~1,4]	The greater of - to 2.4 *m* above top of tank[*~~1~~2], or - to top of tank[*~~1~~2] plus setting of any pressure relief valve	Where a cargo tank is designed for the carriage of cargoes with specific gravities larger than 1.0, an appropriate additional head is to be considered[*~~2~~3]

Notes:

1 Refer to Section **1.4.2-2**.

~~1~~2 Top of tank is deck forming the top of the tank excluding any hatchways.

~~2~~3 For gravity tanks that are to be loaded with cargoes having a cargo density exceeding 1.0, a hydrostatic test is to be carried out with a head of water to the height obtained from the following formula above the top of the tank.

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

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

γ : Density of cargoes loaded in the tank.

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

~~3~~4 For pressure tanks, these tests are to be carried out in accordance with **4.23.6, Part N of the Rules**. In applying **4.23.6, Part N of the Rules**, "design vapour pressure" is to be read as "design pressure."

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

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

Notes:

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

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

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

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

Chapter2 SHIPS OTHER THAN THOSE SUBJECT TO *SOLAS CONVENTION* AS SPECIFIED IN CHAPTER 1

2.1 General

2.1.1 General

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

2 Testing procedures of watertight compartments are to be carried out in accordance with **Chapter 2 of Annex B2.1.5-1 "Testing Procedures of Watertight Compartments"** for ships not subject to *SOLAS Convention* and ships subject to *SOLAS Convention* (including ships subject to **Part CSR-B&T**) for which:

(1) the shipyard provides documentary evidence of the shipowner's agreement to a request to the Flag Administration for an exemption from the application of *SOLAS Chapter II-1*, *Regulation 11*, or for an equivalency agreeing that the content of **Chapter 2 of Annex B2.1.5-1 "Testing Procedures of Watertight Compartments"** is equivalent to *SOLAS Chapter II-1*, *Regulation 11*; and

(2) the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.

2.2 Application

2.2.1 Application

1 Testing procedures are to be carried out in accordance with the requirements of **Chapter 1** of this Annex in association with the following alternative procedures specified in **-2** to **-6** for **1.4.2-2** and **Table 1**.

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

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

4 Additional tanks may require structural testing if found necessary after the structural testing of the first tank.

5 Where the structural adequacy of the tanks of a vessel were verified by the structural testing required in **Table 1** of **Chapter 1**, subsequent vessels in the series (i.e. sister ships built from the

same plans at the same shipyard) may be exempted from structural testing of tanks, provided that:

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

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

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

For cargo space boundaries adjacent to other compartments in tankers and combination carriers or boundaries of tanks for segregated cargoes or pollutant cargoes in other types of ships, the provisions of **-3** above are to apply in lieu of preceding **(2)**.

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

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

(2) an NDT plan is implemented and evaluated by the Society for the tanks not subject to structural tests. Shipbuilding quality standards for the hull structure during new construction are to be reviewed and agreed during the kick-off meeting. Structural fabrication is to be carried out in accordance with *IACS Recommendation No.47*, "*Shipbuilding and Repair Quality Standard*", *JSQS* or a recognised fabrication standard which has been accepted by the Society prior to the commencement of fabrication/construction. The work is to be carried out in accordance with the Rules and under survey of the Society.

EFFECTIVE DATE AND APPLICATION (Amendment 3-3)

1. The effective date of the amendments is 1 January 2018.

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

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

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

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

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

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

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

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

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

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

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

Note:
This Procedural Requirement applies from 1 July 2009.

Amendment 3-4

B2 CLASSIFICATION SURVEYS

B2.1 Classification Survey during Construction

B2.1.6 Documents to be Maintained On Board

Sub-paragraphs -4 and -5 have been renumbered to sub-paragraphs -6 and -7, and sub-paragraphs -4 and -5 have been added as follows.

(-1 and -2 are omitted.)

3 The Ship Construction File stipulated in **2.1.6-3, Part B of the Rules** is to be in accordance with ~~the following~~ **(1)** and **(2)** below:

(1) The Ship Construction File, limited to the items to be retained on board, is to be available on board.

(2) The Ship Construction File is to be appropriately updated at any major event, including, but not limited to, substantial repair and corrosion, or any modification to the ship structure. Documented procedures for updating the Ship Construction File are to be included within the Safety Management System.

4 Confirmation of the Ship Construction File specified in **2.1.6-3, Part B of the Rules** is to be carried out in accordance with **(1)** to **(4)** below:

(1) The Ship Construction File is to be reviewed in order to confirm that it contains the required information. In this context, however, "review" only means to examine the Ship Construction File to confirm that **(a)** and **(b)** below are present in the copies of the Ship Construction File stored on board and in the onshore archive. This "review" is not to be intended to be an assessment of any drawings or documents in order to verify their compliance with the applicable requirements.

  (a) Drawings and documents required by the requirements in **2.1.6-3** and **Table B2.1, Part B of the Rules**

  (b) The possible additional drawings or documents provided by the shipyard, as per the Ship Construction File's list of drawings and documents

(2) Confirmation that storage location of drawings and documents are specified as either "onboard" or "onshore archive" is to be made. In addition, for the drawings or documents for which the normal storage location is specified as onshore archive in **Table B2.1, Part B of the Rules**, confirmation that storage location of such documents is specified as on board ship is to be made.

(3) For a Ship Construction File stored on board a ship, the Surveyor is to verify upon completion of ship construction that the information is placed on board the ship.

(4) For the Ship Construction File stored in an onshore archive, the Surveyor is to verify upon completion of ship construction that the information is stored at the onshore archive by examining the list of information included in the onshore archive.

5 Confirmation that the Ship Construction File is available as specified in **2.1.6-4, Part B of the Rules** is to be carried out in accordance with **(1)** and **(2)** below:

(1) For a Ship Construction File stored on board the ship, the Surveyor is to confirm that the Ship Construction File is accessible.

(2) For a Ship Construction File stored in an onshore archive, the Surveyor is to confirm that the service contract with of the onshore archive is valid.

~~4~~**6** The certificates specified in **2.1.6-7, Part B of the Rules** are those such as the ones issued for each piece of equipment, device, etc., type approval certificates valid at the time of the Classification Survey, or others applicable. With regard to fire pumps, hose test records after installation on board may be accepted. In addition, unless equipment or devices on board are renewed after the ship has entered service, these certificates need not be updated.

~~5~~**7** "Noise survey report" in **2.1.6-1(2)(r), Part B of the Rules** refers to the report in **4.2**, **Annex B2.3.1-1(11) "PROCEDURES FOR ON BOARD NOISE MEASUREMENTS"**. It is recommended that documents containing the noise exposure level determined in accordance with **3.3.6**, **Annex B2.3.1-1(11) "PROCEDURES FOR ON BOARD NOISE MEASUREMENTS"** are attached to the "Noise survey report".

B3 ANNUAL SURVEYS

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

B3.2.1 Examination of Plans and Documents

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

(-1 to -5 are omitted.)

6 Confirmation of the updating of the Ship Construction File as specified in **3.2.1-2(3), Part B of the Rules** is to be carried out in accordance with **(1)** and **(2)** below:

(1) For a Ship Construction File stored on board the ship, in the case of any major event, including, but not limited to, substantial repair and conversion, or any modification to ship structures, the Surveyor is to verify that the updated information is kept on board the ship. If the updating of the Ship Construction File kept on board is not completed at the time of survey, the Surveyor is to records it and requires confirmation at the next periodical survey.

(2) For a Ship Construction File stored in an onshore archive, in the case of any major event, including, but not limited to, substantial repair and conversion, or any modification to ship structures, the Surveyor is to verify that the updated information is stored in the onshore archive by examining the list of information included in the onshore archive or kept on board the ship. If the updating of the Ship Construction File Supplement stored in the onshore archive is not completed at the time of survey, the Surveyor records it and requires confirmation at the next periodical survey.

7 Confirmation that the Ship Construction File is available as specified in **3.2.1-2(5), Part B of the Rules** is to be carried out in accordance with **(1)** and **(2)** below:

(1) For a Ship Construction File stored on board the ship, the Surveyor is to confirm that the Ship Construction File is accessible.

(2) For a Ship Construction File stored in an onshore archive, the Surveyor is to confirm that the service contract with of onshore archive is valid.

B4 INTERMEDIATE SURVEYS

B4.2 Intermediate Surveys for Hull, Equipment, Fire Extinction and Fittings

Paragraph B4.2.1 has been added as follows.

B4.2.1 Examination of Plans and Documents

1 Confirmation of the updating of the Ship Construction File as specified in **4.2.1-2(3), Part B of the Rules** is to be carried out in accordance with **B3.2.1-6**.

2 Confirmation that the Ship Construction File is available as specified in **4.2.1-2(5), Part B of the Rules** is to be carried out in accordance with **B3.2.1-7**.

B5 SPECIAL SURVEYS

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

Paragraph B5.2.1 has been added as follows.

B5.2.1 Examination of Plans and Documents

1 Confirmation of the updating of the Ship Construction File as specified in **5.2.1-2(3), Part B of the Rules** is to be carried out in accordance with **B3.2.1-6**.

2 Confirmation that the Ship Construction File is available as specified in **5.2.1-2(5), Part B of the Rules** is to be carried out in accordance with **B3.2.1-7**.

EFFECTIVE DATE AND APPLICATION (Amendment 3-4)

1. The effective date of the amendments is 1 January 2018.

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

Amendment 3-5

B3 ANNUAL SURVEYS

Section B3.6 has been amended as follows.

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

B3.6.1 General

The requirements of **3.6, Part B of the Rules** need not be applied to ships examined in accordance with **3.4, Part B of the Rules**.

B3.6.2 Examinations

~~2~~1 When applying the requirements of item ~~5~~6 of **Table B3.11, Part B of the Rules**, it is to be verified that ship masters have checked the inert gas control system for each thermal insulation layer of membrane tanks to verify proper operation.

~~1~~2 When applying the requirements of (~~e~~f) of item~~s~~ ~~7~~9 of **Table B3.11, Part B of the Rules**, resistance testing is to be carried out for all electrical bonding to confirm that resistance is not greater than 1 *MΩ* in cases where bonding straps are not provided as electrical bonding between fuel storage tanks or fuel piping and hull structures.

B4 INTERMEDIATE SURVEYS

Section B4.6 has been amended as follows.

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

B4.6.1 General

The requirements of **4.6, Part B of the Rules** need not be applied to ships examined in accordance with **4.4, Part B of the Rules**.

B4.6.2 Examinations

1 The sentence "it is to be confirmed that such non-metallic membranes are maintained in good condition" in item 2 of **Table B4.8, Part B of the Rules** means the following: visual examinations are to be carried out to verify no cracks and deterioration; and it is to be confirmed membranes are renewed at intervals not exceeding 3 *years*, have been properly adjusted, and have been tested for performance. In cases where relief valves are approved for use for membranes whose renewal intervals exceed 3 *years* in accordance with **6.4.1-3, Annex 1, Part GF of "Guidance for Equipment and Fittings of Ships Using Low-flashpoint Fuels"**, it is to be confirmed that they are renewed at approved intervals.

2 The term "hazardous areas" in item 3 of **Table B4.8, Part B of the Rules** means the hazardous areas specified in **12.5, Part GF**, and **-4** and **-5** of **4.2.3, Part H of the Rules**.

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

B5 SPECIAL SURVEYS

Section B5.6 has been amended as follows.

B5.6 Special Requirements for Ships Using Low-flashpoint Fuels

B5.6.1 General

The requirements of **5.6, Part B of the Rules** need not be applied to ships examined in accordance with **5.4, Part B of the Rules**.

B5.6.2 Examinations

1 The phrase "programme and acceptance criteria approved" in item 2 of **Table B5.29, Part B of the Rules** means those prepared by fuel containment system designers and approved by the Society.

2 The term "hazardous areas" in item ~~7~~6 of **Table B5.29, Part B of the Rules** means the hazardous areas specified in **12.5, Part GF**, and **-4** and **-5 of 4.2.3, Part H of the Rules**.

EFFECTIVE DATE AND APPLICATION (Amendment 3-5)

1. The effective date of the amendments is 1 January 2018.