CCS Rule Change Notice For:

RULES FOR CLASSIFICATION OF SEA-GOING STEEL SHIPS

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CHINA CLASSIFICATION SOCIETY

CCS Rule Change Notice For:

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PART ONE

CONTENTS

CHAPTER 2 SCOPE AND CONDITIONS OF CLASSIFICATION

Appendix 1 LIST OF CLASS NOTATIONS FOR SEA-GOING SHIPS

Type Notations **Table A**

Class notation	Description		Technical requirements①
~~LNG Carrier~~	~~LNG carriers~~	~~Liquefied gas carriers dedicated to carrying liquefied natural gas. The notations Type 1G/Type 2G/Type 2PG/ Type 3G or Type IG/Type IIG/Type IIPG/ Type IIIG are to be added for preventive measures to preclude the escape of cargo, as stated in column Description for the notation Liquefied Gas Carrier. Where LNG carriers are adapted for FSUs, the notation "LNG-FSU" (Liquefied Nature Gas-Floating Storage Unit) is to be added after LNG Carrier and separated by a comma ",", i.e. LNG Carrier, LNG-FSU~~	~~Rules for Construction and Equipment of Ships Carrying Liquefied Gases in Bulk and/or Implementation Guidelines for Liquefied Nature Gas Carriers Adapted for Floating Storage Units~~
LNG Carrier	LNG carriers	Liquefied gas carriers dedicated to carrying liquefied natural gas. The notations Type 1G/Type 2G/Type 2PG/ Type 3G or Type IG/Type IIG/Type IIPG/ Type IIIG are to be added for preventive measures to preclude the escape of cargo, as stated in column Description for the notation Liquefied Gas Carrier	Rules for Construction and Equipment of Ships Carrying Liquefied Gases in Bulk
		Where LNG carriers are adapted for FSUs, the notation "LNG-FSU" (Liquefied Nature Gas-Floating Storage Unit) is to be added after LNG Carrier and separated by a comma ",", i.e. LNG Carrier, LNG-FSU	Rules for Construction and Equipment of Ships Carrying Liquefied Gases in Bulk; Implementation Guidelines for Liquefied Nature Gas Carriers Adapted for Floating Storage Units
		Where LNG carriers are fitted with LNG regasification systems, the notation "REGAS" is to be added after LNG Carrier and separated by a comma ",", i.e. LNG Carrier, REGAS	Rules for Construction and Equipment of Ships Carrying Liquefied Gases in Bulk; Chapters 1 and 4 of the Rules for Construction and Equipment of Liquefied Natural Gas Floating Storage and Regasification Units; Section 4, Chapter 7 of the Rules for Offshore Oil and Gas Processing Systems
Power Barge （X_1, …, X_N）	Power Vessel	The barges or self-propelled ships on which a power plant using natural gas or fuel oil as a fuel is installed to serve as a power generation resource supplying external power. For self-propelled ships, the word 'ship' is to be used in place of the word 'barge'. Meanings of X_N are as follows: Natural Gas Fuel: for power vessels using natural gas as a fuel; HV: for power vessels with an output voltage above 15 kV; S: for power vessels supplying power to ships fitted with high voltage shore connection (HVSC) systems in compliance with IEC 80005-1. Note: The above X_N are all optional	Guidelines for Survey of Power Vessels

Special Equipment and System Notations **Table G**

① The technical requirements listed in this Table is the basic ones for ships assigned to the notation, in other cases, special consideration is to be given by CCS according to the ship's specific conditions.

Class notation	Description		Technical requirements
DFD	Dual fuel diesel engine used as power plant	The class notation may be assigned to liquefied gas ~~LNG~~ carriers fitted with dual fuel diesel engines as power plant in compliance with the requirements of the Guidelines	Guidelines for Design and Installation of Gas~~Dual~~ Fuel Engine Systems of Liquefied Gas Carriers ~~2007~~
GF	Gas fuel only engine used as power plant	The class notation may be assigned to liquefied gas carriers fitted with gas fuel only engines as power plant in compliance with the requirements of the Guidelines	Guidelines for Design and Installation of Gas Fuel Engine Systems of Liquefied Gas Carriers

CHAPTER 5 SURVEYS AFTER CONSTRUCTION

Section 1 GENERAL PROVISIONS

5.1.5 Definitions

5.1.5.1 For the purpose of this Chapter, the following definitions apply to all ships:

(21) **Remote Inspection Techniques(RIT)** is a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor(refer to IACS Rec.42).

5.1.6 Preparations for survey

5.1.6.2 Access to structures

(5) For Surveys conducted by use of a remote inspection technique, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

①Unmanned robot arm

②Remotely Operated Vehicles (ROV)

③Unmanned Aerial Vehicles / Drones

④Other means acceptable to CCS.

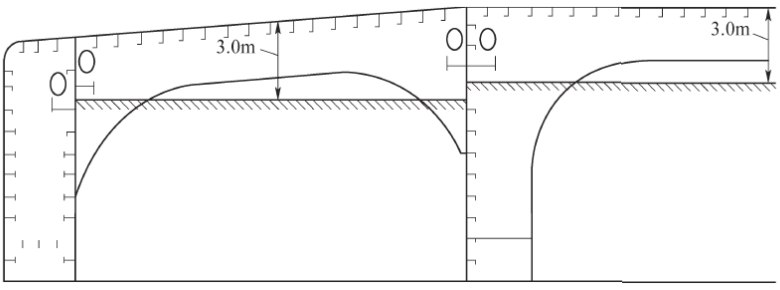
5.1.6.4 Survey at sea or at anchorage[①]

(5) Self-propelled ships having the notation ESP (hereinafter referred to as ESP ships) are to comply with, in addition to 5.1.6.4(1) to (4), the following requirements:

② If the depth of the webs is more than 1.5 m, rafts or boats alone may be allowed only:

b. if a permanent means of access is provided in each bay[②] to allow safe entry and exit. This means:

(b) access to deck from a longitudinal permanent platform having ladders to deck in each end of the tank. The platform is, for the full length of the tank, be arranged in level with, or above, the maximum water level needed for rafting of under deck structure. For this purpose, the ullage corresponding to the maximum water level is to be assumed not more than 3 m from the deck plate measured at the midspan of deck transverses and in the middle length of the tank, e.g. in respect to oil tankers (including double hull oil tankers) and chemical tankers, see Figure 5.1.6.4(5)②.



[①] Reference is made to IACS Recommendation No.39 − Guidelines for Use of Boats or Rafts for Close-up Surveys.

[②] Bay is the area between adjacent transverse frames or transverse bulkheads.

Figure 5.1.6.4(5)② Maximum water level in a tank

5.1.6.5 Survey programme

(2) In developing the survey programme, the following documentation is to be collected and consulted with a view to reasonably selecting tanks, areas, and structural elements to be examined:

② For oil tankers and chemical tankers:

j. inspections by the owner's personnel during the last 3 years with reference to structural deterioration in general, leakages in tank boundaries and piping and condition of the coating and corrosion protection system, if any. Guidance for reporting is shown in Appendix 12 of this Chapter;

5.1.8 Reporting and evaluation of survey

5.1.8.1 The data and information on the structural condition of the ship collected during the survey is to be evaluated for acceptability and continued structural integrity of the ship.

(1) For CSR bulk carriers, the ship's longitudinal strength is to be evaluated by using the thickness of structural members measured, renewed and reinforced, as appropriate, during the special surveys carried out after the ship reached 15 years of age (or during the special survey no. 3, if this is carried out before the ship reaches 15 years of age) in accordance with the criteria for longitudinal strength of the ship's hull girder for CSR bulk carriers specified in ~~Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments~~Common Structural Rules[①].

5.1.11 Thickness measurements and close-up surveys

5.1.11.1 In any kind of survey, i.e. special, intermediate, annual or other surveys having the scope of the foregoing ones, thickness measurements, ~~when required by Table 5.4.4.2(17)①, Table 5.5.4.5(1), Table 5.6.4.4(1)①, Table 5.7.4.5(1)①, Table 5.8.4.4(1)a, Table 5.16.4.5(1),~~ of structures in areas where close-up surveys are required, are to be carried out simultaneously with close-up surveys.

5.1.11.2 Consideration may be given by the attending Surveyor to allow use of Remote Inspection Techniques (RIT) as an alternative to close-up survey. Surveys conducted using a RIT are to be completed to the satisfaction of the attending Surveyor. When RIT is used for a close-up survey, temporary means of access for the corresponding thickness measurements as specified in this Chapter is to be provided unless such RIT is also able to carry out the required thickness measurements.

5.1.11.3 For structure built with a material other than steel, alternative thickness measurement requirements may be developed and applied as deemed necessary by CCS.

5.1.17 Acceptance criteria

(1) General

① For CSR ships, the acceptance criteria are in accordance with Common Structural Rules[②] ~~Section 12 "Ship in Operation Renewal Criteria", PART NINE and Chapter 13 "Ships in Operation, Renewal Criteria", PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments~~ and as specified in (2) to (4) below.

(2) Acceptance criteria for pitting corrosion of CSR ships

① Side structures of bulk carriers

If pitting intensity in an area where coating is required, according to Common Structural Rules[③] ~~Section 5, Chapter 3 of PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments~~, is higher than 15% (see Figure 5.1.5.1(20)), thickness measurements are to be performed to check the extent of pitting corrosion. The 15% is based on pitting or grooving on only one side of a plate.

② Other structures

For plates with pitting intensity less than 20% (see Figure 5.1.5.1(20)), the measured thickness t_m of any individual measurement is to meet the lesser of the following criteria:

$$t_m \geq 0.7\ (t_{\text{as-built}} - t_{\text{vol add}})\ \text{mm}$$

[①] Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments, or Ch.13, PART 9-1 of the Rules (2015 version) and its amendments.

[②] Section 12, PART NINE and Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments, or Ch. 13, PART 9-1 of the Rules (2015 version) and its amendments.

[③] Section 5, Chapter 3 of PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments or Section 4, Chapter 3 of PART 9-1 of the Rules (2015 version) and its amendments.

$$t_m \geq t_{ren} - 1 \text{ mm}$$

where:

$t_{as\text{-}built}$ As-built thickness of the member, in mm;

$t_{vol\ add}$ Voluntary thickness addition; thickness, in mm, voluntarily added as the Owner's extra margin for corrosion wastage in addition to t_C;

t_{ren} Renewal thickness; minimum allowable thickness, in mm, below which renewal of structural members is to be carried out. For oil tankers, t_{ren} is renewal criteria for general corrosion as defined in Common Structural Rules[①];

t_C Total corrosion addition, in mm, defined in ~~PART NINE and PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments~~ Common Structural Rules[②];

t_m Measured thickness, in mm, on one item, i.e. average thickness on one item using the various measurements taken on this same item during periodical ship's in service surveys.

The average thickness across any cross section in the plating is not to be less than the renewal criteria for general corrosion given in Common Structural Rules[③] ~~paragraph 1.4.2.1, Section 12, PART NINE or Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments~~.

(3) Acceptance criteria for edge corrosion of CSR ships

② The average measured thickness across the breadth or height of the stiffener is not to be less than that defined in Common Structural Rules[④] ~~paragraph 1.4.2.1, Section 12, PART NINE or Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments~~.

③ Plate edges at openings for manholes, lightening holes etc. may be below the minimum thickness given in Common Structural Rules[⑥] ~~paragraph 1.4.2.1, Section 12, PART NINE or Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments~~ provided that:

(a) the maximum extent of the reduced plate thickness, below the minimum given in Common Structural Rules[⑥] ~~paragraph 1.4.2.1, Section 12, PART NINE or Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments~~, from the opening edge is not more than 20% of the smallest dimension of the opening and does not exceed 100 mm;

(4) Acceptance criteria for grooving corrosion of CSR ships

② Structural members with areas of grooving greater than those in ①above are to be assessed based on the criteria for general corrosion as defined in Common Structural Rules[⑤] ~~paragraph 1.4.2.1, Section 12, PART NINE or Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments~~ using the average measured thickness across the plating/stiffener.

5.1.18 Remote Inspection Techniques (RIT)[⑥]

5.1.18.1 The RIT is to provide the information normally obtained from a close-up survey. RIT surveys are to be carried out in accordance with the requirements given here-in and the requirements of IACS Recommendation 42'Guidelines for Use of Remote Inspection Techniques for surveys'.These considerations are to be included in the proposals for use of a RIT which are to be submitted in advance of the survey so that satisfactory arrangements can be agreed with CCS.

5.1.18.2 The equipment and procedure for observing and reporting the survey using a RIT are to be discussed and agreed with the parties involved prior to the RIT survey, and suitable time is to be allowed to set-up, calibrate and test all equipment beforehand.

5.1.18.3 When using a RIT as an alternative to close-up survey, if not carried out by CCS itself, it is to be conducted by a firm approved as a service supplier according to Appendix 8 of this Chapter and is to be witnessed by an attending surveyor of CCS.

5.1.18.4 The structure to be examined using a RIT is to be sufficiently clean to permit meaningful

① Paragraph 1.4.2.1, Section 12, PART NINE of the Rules (2012 version) and its 2013 and 2014 amendments, or paragraph 2.1.1,Section 2, Chapter 13 of PART 9-1 of the Rules (2015 version) and its amendments.

② Section 3, Chapter 3 of PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments or Section 3, Chapter 3 of PART 9-1 of the Rules (2015 version) and its amendments.

③ Paragraph 1.4.2.1, Section 12, PART NINE and Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments, or Chapter 13 of PART 9-1 of the Rules (2015 version) and its amendments.

④ Paragraph 1.4.2, Section 12, PART NINE and Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments, or Chapter 13 of PART 9-1 of the Rules (2015 version) and its amendments.

⑤ Paragraph 1.4.2, Section 12, PART NINE and Chapter 13, PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments, or Chapter 13 of PART 9-1 of the Rules (2015 version) and its amendments.

⑥ RIT is not applicable for survey of oil tankers and bulk carriers.

examination. Visibility is to be sufficient to allow for a meaningful examination. CCS is to be satisfied with the methods of orientation on the structure.

5.1.18.5 The Surveyor is to be satisfied with the method of data presentation including pictorial representation, and a good two-way communication between the Surveyor and RIT operator is to be provided.

5.1.18.6 If the RIT reveals damage or deterioration that requires attention, the Surveyor may require traditional survey to be undertaken without the use of a RIT.

Section 4 HULL AND EQUIPMENT SURVEYS

5.4.1 General requirements

5.4.1.3 Thickness measurements Acceptance Criteria

(1) The acceptance criteria for thickness measurements are according to Appendix 1 of this Chapter depending on ship's age and structural elements concerned, e.g 2.4[①] for corrugated transverse bulkhead, 2.6[②] for all cargo hatch covers and coamings on exposed decks.

5.4.1.~~3~~4 Special consideration may be given in application of relevant requirements of this Section to commercial ships owned or chartered by Governments, which are utilized in support of military operations or service.

5.4.4 Special surveys

5.4.4.2 Survey items for all ships

(2) All spaces including holds and their 'tween decks where fitted; double bottom, deep, ballast, peak and cargo tanks; pump rooms, pipe tunnels, duct keels, machinery spaces, dry spaces, cofferdams and voids are to be internally examined including the plating and framing, bilges and drain wells, sounding, venting, pumping and drainage arrangements. Internal examination of tanks is to be carried out in accordance with Table 5.4.4.2(2). At special survey No.3 and subsequent special surveys, structural downflooding ducts and structural ventilation ducts are to be internally examined.

Section 6 ADDITIONAL REQUIREMENTS FOR HULL AND EQUIPMENT SURVEYS OF OIL TANKERS

5.6.2 Annual surveys

5.6.2.1 General requirements

(1) The annual survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file.

5.6.4 Special surveys

5.6.4.3 Extent of overall and close-up surveys

Minimum Requirements for Close-up Surveys at Special Surveys of Double Hull Oil Tankers

Table 5.6.4.3(2)②

Special Survey No.1 Age ≤ 5	Special Survey No.2 5 < Age ≤ 10	Special Survey No.3 10 < Age ≤ 15	Special Survey No.4 and Subsequent Age > 15
One web frame (1), in a ballast tank (see Note 1)	All web frames (1), in a ballast tank (see Note 1). The knuckle area and the upper part (5 m approximately) of one web frame in each remaining ballast tank (6)	All web frames (1), in all ballast tanks	As special survey for age from 10 to 15 years. Additional transverse areas as deemed necessary by CCS

① 2006 edition of the Rules or subsequent revisions or corrigenda as applicable.

② For ships contracted for construction on or after 1 July 2012, see 2.20.2.10, Section 20, Chapter 2, PART TWO of 2012 edition of the Rules. For ships contracted for construction on or after 1 July 2016, see 2.20.2.10, Section 20, Chapter 2, PART TWO of 2016 Amendments of the Rules.

One deck transverse (2), in a cargo oil tank	One deck transverse (2), in two cargo oil tanks	All web frames (7), including deck transverse and cross ties, if fitted, in a cargo oil tank. One web frame (7), including deck transverse and cross ties, if fitted, in each remaining cargo oil tank	
One transverse bulkhead (4), in a complete ballast tank (see Note 1)	One transverse bulkhead (4), in each ballast tank (see Note 1)		
One transverse bulkhead (5) in a cargo oil centre tank One transverse bulkhead (5), in a cargo oil wing tank (see Note 2)	One transverse bulkhead (5), in two cargo oil centre tanks One transverse bulkhead (5), in a cargo oil wing tank (see Note 2)	All transverse bulkheads, in all cargo oil (3) and ballast (4) tanks	

(1), (2), (3), (4), (5), (6) and (7) are areas to be subjected to close-up surveys and thickness measurements (see Figure 5.6.4.3(2)②):
(1) Web frame in a ballast tank means vertical web in side tank, hopper web in hopper tank, floor in double bottom tank and deck transverse in double deck tank (where fitted), including adjacent structural members. In fore and aft peak tanks, web frame means a complete transverse web frame ring including adjacent structural members.
(2) Deck transverse, including adjacent deck structural members (or external structure on deck in way of the tank, where applicable).
(3) Transverse bulkhead complete in cargo tanks, including girder system, adjacent structural members (such as longitudinal bulkheads) and internal structure of lower and upper stools, where fitted.
(4) Transverse bulkhead complete in ballast tanks, including girder system and adjacent structural members, such as longitudinal bulkheads, girders in double bottom tanks, inner bottom plating, hopper side, connecting brackets.
(5) Transverse bulkhead lower part in cargo tanks, including girder system, adjacent structural members (such as longitudinal bulkheads) and internal structure of lower stool, where fitted.
(6) The knuckle area and the upper part (5 m approximately), including adjacent structural members. Knuckle area is the area of the web frame around the connections of the slope hopper plating to the inner hull bulkhead and the inner bottom plating, up to 2 m from the corners both on the bulkhead and the double bottom.
(7) Web frame in a cargo oil tank means deck transverse, longitudinal bulkhead vertical girder and cross ties, where fitted, including adjacent structural members.

Notes: 1 Ballast tank: Apart from the fore and aft peak tanks, the term "ballast tank" has the following meaning: ~~means double-bottom tank plus double side tank plus double deck tank, as applicable, even if these tanks are separate.~~

① all ballast compartments (hopper tank, side tank and double-deck tank, if separate from double-bottom tank) located on one side, i.e. portside or starboard side, and additionally double-bottom tank on portside plus starboard side, when the longitudinal central girder is not watertight and, therefore, the doublebottom tank is a unique compartment from portside to starboard side; or

② all ballast compartments (double-bottom tank, hopper tank, side tank and double-deck tank) located on one side, i.e. portside or starboard side, when the longitudinal central girder is watertight and, therefore, the portside double-bottom tank separate from the starboard-side double-bottom tank."

Section 7 ADDITIONAL REQUIREMENTS FOR HULL AND EQUIPMENT SURVEYS OF BULK CARRIERS

5.7.2 Annual surveys

5.7.2.1 General requirements

(1) The annual survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull, weather deck hatch covers, coamings and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file.

5.7.2.3 Weather decks, hatch covers and coamings

(4) Where the cargo hatch securing system does not function properly, repairs are to be carried out under the supervision of ~~the Surveyor~~CCS. Where hatch covers or coamings undergo substantial repairs, the strength of securing devices should be upgraded to comply with Paragraph 8.11.5, Section 11, Chapter 8, PART TWO of the Rules

Section 8 ADDITIONAL REQUIREMENTS FOR HULL AND EQUIPMENT SURVEYS OF CHEMICAL TANKERS

5.8.2 Annual surveys

5.8.2.1 General requirements

(1) The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull and piping are maintained in a satisfactory condition and should take into account the service history, condition and extent of the corrosion prevention system of ballast tanks and areas identified in the survey report file.

Section 9 SURVEYS OF MACHINERY

5.9.4 Special surveys

5.9.4.5 Additional survey requirements for ships having the class notation of inert gas system (IGS)

⑦ at the request of the owner and upon approval by CCS ~~Headquarters~~, a system of continuous surveys may be undertaken whereby the special survey requirements are carried out in regular rotation, i.e. every mechanical item of the inert gas system is to be opened up and examined, so far as practicable, at the specified interval (normally five (5) years). The interval between consecutive examinations of each item is not to exceed five (5) years. Surveys are to be arranged annually for about a fifth of all items. If any defect is found during the survey, related components and parts are to be opened up and examined. Such defects are to be dealt with to the satisfaction of the Surveyor;

Section 11 SURVEYS OF THE OUTSIDE OF THE SHIP'S BOTTOM AND RELATED ITEMS

5.11.3 In-water surveys

5.11.3.2 Conditions for in-water surveys

(2) The in-water survey is to be carried out with the ship in sheltered water and preferably with weak tidal streams and currents. The in-water visibility and the cleanliness of the hull below the waterline is to be clear enough to permit a meaningful examination which allows the surveyor and ~~diver~~ the in-water survey firm to determine the condition of the plating, appendages and the welding. CCS is to be satisfied with the methods of orientation of the divers or Remotely Operated Vehicle (ROV) on the plating, which should make use where necessary of permanent markings on the plating at selected points.

(3) The equipment and procedure for observing and reporting the survey are to be discussed with the parties involved prior to the in-water survey, and suitable time is to be allowed to permit the ~~diving company~~ the in-water survey firm to test all equipment beforehand.

(4) The in-water survey is to be carried out under the surveillance of a surveyor by an in-water survey firm approved as a service supplier according to Appendix 8 of this Chapter ~~by one or more qualified divers under surveillance of a CCS Surveyor. The divers are to be employed by a firm approved as a service supplier by CCS~~. A good two-way communication between the Surveyor and divers is to be provided.

5.11.3.3 Scope of the survey and survey report

(2) Upon completion of an in-water survey, a detailed report together with a video tape and photos showing main parts under survey are to be submitted by ~~the diving firm~~ the in-water survey firm to the Surveyor.

Appendix 8 PROCEDURAL REQUIREMENTS FOR SERVICE SUPPLIERS

3. Definitions

3.2 Service supplier (A service supplier or category of service supplier may be referred to here after simply as 'supplier'): A person or company, not employed by an IACS Member, who at the request of an equipment manufacturer, shipyard, vessel's owner or other client acts in connection with inspection work and provides services for a ship or a mobile offshore ~~drilling~~ unit such as measurements, tests or maintenance of safety systems and equipment, the results of which are used by surveyors in making decisions affecting classification or statutory certification and services.

4. Application

4.1 This procedure applies to the approval of the following categories of service suppliers:

4.1.2 Classification and/or statutory services
(1) Firms engaged in thickness measurements on ships or mobile offshore units except:
① non-ESP ships less than 500 gross tonnage, and
② all fishing vessels.
(2) Firms carrying out in-water survey ~~of~~ on ships and mobile offshore units by diver or Remotely Operated Vehicle (ROV).
(9) Firms engaged in survey using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey of the structure of ships and mobile offshore units.

4.2 Where the results of the following service providers are used by a Surveyor of CCS in making decisions affecting classification services then that service provider must be approved and verified by CCS.
— Firms engaged in thickness measurements on ships or mobile offshore units except:
(1) non-ESP ships less than 500 gross tonnage, and
(2) all fishing vessels.
— Firms carrying out an in-water survey ~~of~~ on ships and mobile offshore units by diver or Remotely Operated Vehicle (ROV).
— Firms engaged in survey using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey of the structure of ships and mobile offshore units.

Annex 1
Special Requirements for Various Categories of Service Suppliers

1. Firms engaged in thickness measurements on ships or mobile offshore units
1.1 Extent of engagement – Thickness measurement of structural material of ships or mobile offshore units except:
(1) non-ESP ships less than 500 gross tonnage, and
(2) all fishing vessels.

3. Firms carrying out an in-water survey ~~of~~ on ships and mobile offshore units by diver or Remotely Operated Vehicle (ROV)
3.1 Extent of engagement – In-water survey in lieu of a docking survey and/or the internal hull survey of compartments filled with water on ships and mobile offshore units by diver or ~~remote~~ Remotely operated vehicle (ROV).
3.2 Training of personnel – The supplier is responsible for the qualification of its divers Remotely Operated Vehicle (ROV) operators and supervisors and for their training in the use of the ~~diving~~ equipment utilised when carrying out inspection. Knowledge of the following is to be documented:
— ship's underwater structure and appendages, ~~tail~~ propeller shaft, propeller, rudder and its bearings, etc.;
— Certification as a thickness measurement firm when conducting thickness measurements under water;
— bearing clearance measurements on rudders and ~~tail~~ propeller shaft;
— Any special equipment necessary for the work carried out. ~~special equipment and tools, e.g. hull cleaners, grinders, cutters, etc~~.
3.3 A plan for training of personnel in the reporting system, minimum rules requirements for relevant ship or unit types, ship's or unit's underwater structure, measuring of bearing clearances, the recognition of corrosion damage, buckling and deteriorated coatings, etc. is to be included.
3.4 Supervisor ~~— The supervisor is to be qualified according to the supplier's general requirements and to have a minimum of two years' experience as a diver carrying out inspection.~~
3.4.1 Diving Supervisor – Diving supervisor shall be qualified according to the supplier's general requirements and shall have a minimum of two years' experience as a diver carrying out inspection.
3.4.2 ROV Supervisor – ROV supervisor shall have a minimum of two (2) years of experience conducting inspections with ROVs.
3.5 Diver and Operators
3.5.1 Divers carrying out inspection – The diver carrying out the inspection is to have had at least one year experience as an assistant diver carrying out inspection (including participation in a minimum of 10 different assignments).
3.5.2 ROV operators- ROV operators shall have at least one year of experience working with ROVs conducting inspections on vessels.
3.6 Equipment ~~— The following are to be available~~:
3.6.1 The following shall be available:

— closed circuit colour television with sufficient illumination equipment;
— two-way communication between diver and surface staff;
— video recording device connected to the closed circuit television;
— still photography camera;
— equipment for carrying out thickness gauging, non-destructive testing and measurements, e.g. clearances, indents, etc., as relevant to the work to be performed;
— equipment for cleaning of the hull~~;~~.

3.6.2 In addition to above 3.6.1, the following shall be available for firms carrying out survey by ROV:

— ~~remote~~ Remotely operated vehicle~~, if applicable.~~;

— Adequate controls or programming for the ROV functions required.

3.7 Procedures and guidelines ~~— The supplier is to have documented operational procedures and guidelines for how to carry out the inspection and how to handle the equipment. These are to include~~:

3.7.1 The supplier shall have documented operational procedures and guidelines for how to carry out the inspection and how to handle the equipment. These shall include:

— two-way communication between diver and surface;
— video recording and closed circuit television operation;
— guidance of the diver along the hull to provide complete coverage of the parts to be inspected~~;~~.

3.7.2 In addition to above 3.7.1, documented operational procedures and guidelines for firms carrying out in-water survey by ROV shall also include:

— guidance for the operation and maintenance of the ~~remote~~ Remotely operated vehicle, if applicable~~.~~;

— methods and equipment to ensure the ROV operator can determine the ROV's location and orientation in relation to the vessel.

16. Firms engaged in survey using Remote Inspection Techniques (RIT) as an alternative means for Close-up Survey of the structure of ships and mobile offshore units

16.1 Definitions:

- Close-Up Survey: A Close-Up Survey is a survey where the details of structural components are within the close visual inspection range of the surveyor i.e. normally within reach of hand.

- Remote Inspection Techniques (RIT): RIT is a means of survey that enables examination of any part of the structure without the need for direct physical access of the surveyor (refer to Rec.42). Remote inspection techniques may include the use of:

- Unmanned Aerial Vehicles (UAV)
- Drones
- Unmanned robot arm
- Remotely Operated Vehicles (ROV)
- Climbers
- Other means acceptable to CCS.

16.2 Extent of engagement – Close-up Survey of ships' structure and mobile offshore units' structure by remote inspection techniques. For in-water close-up survey of the internal compartments by Remotely Operated Vehicle (ROV), suppliers are also to hold separate approval as a "Firm carrying out an in-water survey on ships and mobile offshore units by diver or Remotely Operated Vehicle (ROV)" (see Annex 1, Section 3).

16.3 Training and qualification of operators – The supplier is responsible for the training and qualification of its operators to undertake the remote inspections. UAV Pilots are to be qualified and licenced in accordance with applicable national requirements or an equivalent industrial standard acceptable to the society.

Knowledge of the following shall be documented:

- Marine and/or offshore nomenclatures.
- The structural configuration of relevant ships types and MOUs, including internal structure.
- The remote inspection equipment and its operation.
- Survey plans for examination of hull spaces of various configurations, including appropriate flight plans if using a UAV.
- Thickness measurement (TM) and non-destructive examination (NDE) in accordance with a recognised National or International Industrial NDE Standard when these are part of the service. Suppliers undertaking TMs are to hold separate approval as a'Firm engaged in thickness measurements on ships' (see Annex 1, Section 1).

16.4 Training Plan – the supplier is to maintain a documented training plan for personnel. The plan shall include requirements for training in the minimum Rule requirements for the structure of relevant ships

types and MOUs, the recognition of structural deterioration (including corrosion, buckling, cracking and deteriorated coatings) and use of the reporting system.

16.5 Supervisor – The supervisor shall be certified according to the recognized national requirements or an equivalent industrial standard (e.g. XXX Level) and shall have a minimum of two years' experience in the inspection of ship's and/or MOU's structure.

16.6 Operators – The operator carrying out the inspection shall certified according to the recognized national requirements or an equivalent industrial standard (e.g. YYY Level) and have had at least one year's experience as an assistant carrying out inspections of ship's and/or MOU's structure (including participation in a minimum of five different assignments). The operators of those RIT which require, according to the international and national legislations, to be licensed for their use shall hold valid documentation issued by the appropriate Bodies (e.g. UAV Pilots are to be qualified and licenced in accordance with applicable national requirements).

16.7 Equipment – The following shall be available:

- Remotely operated platform with data capture devices capable of operation within an enclosed space.
- Means of powering the platforms with sufficient capacity to complete the required inspections, including spare batteries if applicable.
- Data collection devices which may include cameras capable of capturing in high definition both video images and still images.
- Illumination equipment.
- High definition display screen with live high definition feed from inspection cameras. (When this is part of the RIT).
- Means of communication.
- Data recording devices, as applicable.
- Equipment for carrying out thickness gauging and/or non-destructive testing, as relevant to the work to be performed (when this is part of the service).

16.8 Procedures and guidelines – The supplier shall have documented operational procedures and guidelines for how to plan, carry out and report inspections; how to handle/operate the equipment; collection and storage of data. These shall include:

- Requirements for preparation of inspection plans when UAV are part of the equipment flight plans shall be included.
- Operation of the remotely operated platforms.
- Operation of lighting.
- Calibration of the data collection equipment.
- Operation of the data collection equipment.
- Two-way communication between the operator, platform, Surveyor, other personnel such as support staff and ships officers and crew.
- Guidance of the operator to provide complete coverage of the structure to be inspected.
- Guidance for the maintenance of the remotely operated platforms, data capture and storage devices and display screens, as applicable.
- Requirements for the collection and validation of data.
- If data is to be stored, then requirements for location attribution (geo-tagging), validation and storage of data.
- Requirements for the reporting of inspections, including the recording of damages and defects found during inspection and repair work.

16.9 Documentation and records - The supplier shall maintain the following:

- Records of training.
- Operator statutory and regulatory certificates and licences.
- Equipment register for UAVs, Robots, data collection devices, data analysis devices and any associated equipment necessary to perform inspections.
- Equipment maintenance manuals and records / logbook.
- Records of calibration.
- UAV / Robot operation logbook.

16.10 Verification – The supplier must have the Surveyor's verification of each separate job, documented in the report by the attending Surveyor(s) signature.

Appendix 11A SURVEY PROGRAMME

10 Minimum thickness of hull structures

This section of the survey programme should specify the minimum thickness for hull structures of this ship that are subject to survey, (indicate either (1) or preferably (2), if such information is available)~~according to (1) or (2) as follows~~:

Appendix 13

RECOMMENDED PROCEDURES FOR THICKNESS MEASUREMENTS[①]

13.2A Recommended Procedures for Thickness Measurements of Bulk Carriers

Notes:

4. The reporting forms shall where appropriate, be supplemented by data presented on structural sketches.

Sheet 10

TM6-BC Report on Thickness Measurement of Miscellaneous Structural Members

Ship's name..... Class Identity No. ..... Report No. .....

STRUCTURAL MEMBER:									SKETCH
LOCATION OF STRUCTURE:									
Description	Org. Thk. mm	Max. Alwb. Dim. mm	Gauged		Diminution P		Diminution S		
			P	S	mm	%	mm	%	

Operators signature: .....

[①] This Appendix is recommendatory. For ESP ships, IMO No. is to be marked in the general particulars.

Notes:
1. This report is to be used for recording the thickness measurement of miscellaneous structural members including the structural items (28), (29)~~,~~ and (30) ~~and (31)~~ as shown on diagram of typical transverse section, Sheet 12 of this document.
2. Guidance for areas of measurement is indicated on Sheet 14 of this document.
3. The single measurements recorded are to represent the average of multiple measurements.
4. The maximum allowable diminution could be stated in an attached document.

13.2B Recommended Procedures for Thickness Measurements of Bulk Carriers Built under ~~PART NINE of the Rules~~ Common Structural Rules[①]

Notes:
1. This document is to be used for recording thickness measurements of bulk carriers built under ~~PART NINE of the Rules~~ Common Structural Rules[①] as required by 5.1.9.3, Section 1, Chapter 5 of this PART.

Sheet 10

TM6-BC(CSR) **Report on Thickness Measurement of Miscellaneous Structural Members**

Ship's name..... Class Identity No. ..... Report No. .....

STRUCTURAL MEMBER:										SKETCH
LOCATION OF STRUCTURE:										
Description	As Built Thk. mm	Voluntary Thickness Addition mm	Renewal Thickness mm (a)	Gauged Thickness mm (b)		Remaining Corr. Addition mm (b)-(a)				
				P	S	P		S		

Operators signature: ……

[①] PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments or PART NINE of the Rules (2015 version) and its amendments.

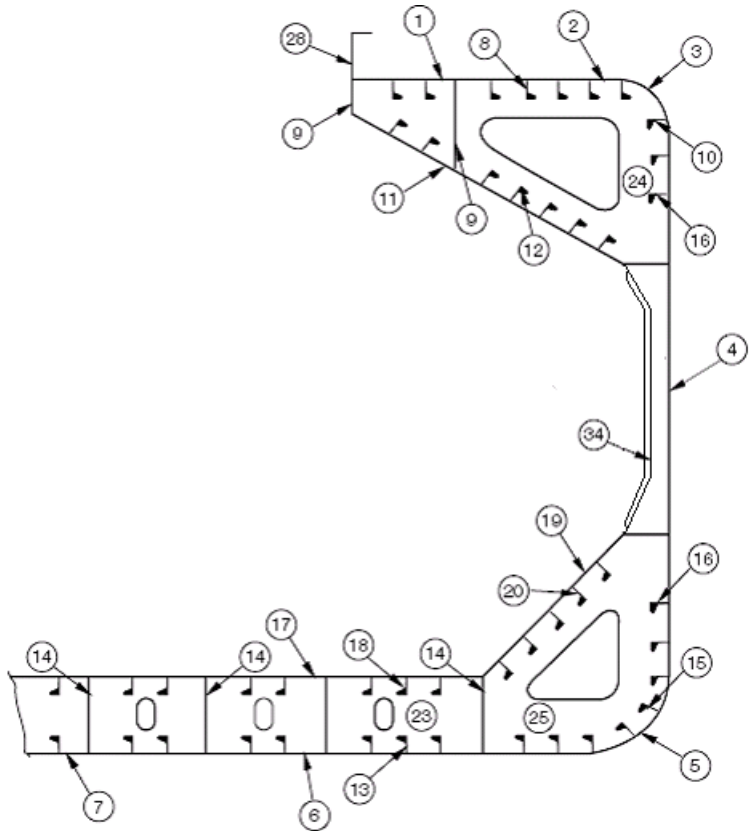
Notes:

1. This report is to be used for recording the thickness measurement of miscellaneous structural members including the structural item (28), (29) and (30)~~, etc~~. as shown on the diagram of typical transverse sections, sheet 12 of this document.
2. Guidance for areas of measurement is indicated on the diagrams shown on Sheet 14 of this document.
3. The single measurements recorded are to represent the average of multiple measurements.
4. The remaining corrosion addition is to be recorded with result of gauged thickness minus renewal thickness. If the result is negative, the structure in way is to be renewed, and the mark "*R*" is to be indicated in the right-hand column. If the result is between 0 and 0.5 mm (0 included), the structure in way is to be additionally gauged, and the mark "*S*" is to be indicated in the right-hand column.

Sheet 12

Thickness Measurement – Bulk Carriers

Typical Transverse Section Indicating Longitudinal and Transverse Members



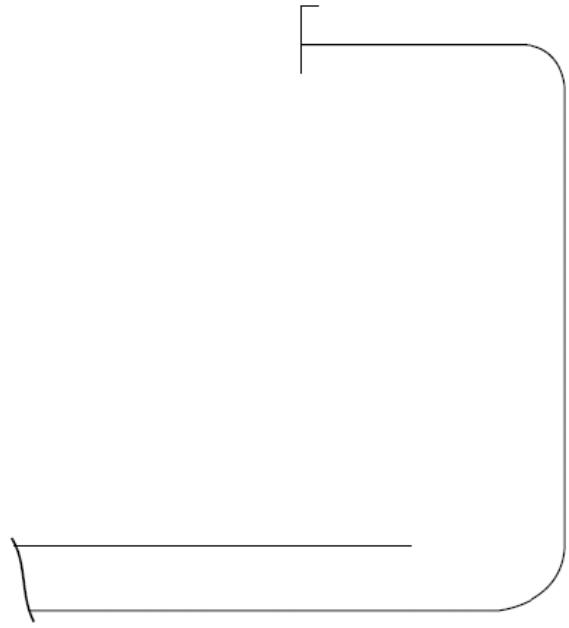
Report on TM2-BC(CSR) (i) & (ii)	Report on TM3-BC(CSR)		Report on TM6-BC(CSR)
1. Strength deck plating	8. Deck longitudinals	17. Inner bottom plating	28. Hatch coamings
2. Stringer plate	9. Deck girders	18. Inner bottom longitudinals	29. Deck plating between hatches
3. Sheerstrake	10. Sheerstrake longitudinals	19. Hopper plating	30. Hatch covers
4. Side shell plating	11. Topside tank sloping plating	20. Hopper longitudinals	~~29.~~

5. Bilge plating	12. Topside tank sloping plating longitudinals	21.	~~30.~~
6. Bottom plating	13. Bottom longitudinals	22.	31.
7. Keel plate	14. Bottom girders	**Report on TM4-BC(CSR)**	32.
	15. Bilge longitudinals	23. Double bottom tank floors	33.
	16. Side shell longitudinals, if any	24. Top side tank transverses	
		25. Hopper side tank transverses	**Report on TM7-BC(CSR)**
		26.	34.Cargo hold frames
		27.	

Sheet 13

Thickness Measurement – Bulk Carriers

Transverse section outline: The diagram may be used for those ships where the diagrams on Sheet 12 are not suitable.



Report on TM2-BC(CSR) (i) & (ii)	**Report on TM3-BC(CSR)**		**Report on TM6-BC(CSR)**
1. Strength deck plating	8. Deck longitudinals	17. Inner bottom plating	28. Hatch coamings
2. Stringer plate	9. Deck girders	18. Inner bottom longitudinals	29. Deck plating between hatches
3. Sheerstrake	10. Sheerstrake longitudinals	19. Hopper plating	30. Hatch covers
4. Side shell plating	11. Topside tank sloping plating	20. Hopper longitudinals	~~29.~~

5. Bilge plating	12. Topside tank sloping plating longitudinals	21.	~~30.~~
6. Bottom plating	13. Bottom longitudinals	22.	31.
7. Keel plate	14. Bottom girders	**Report on TM4-BC(CSR)**	32.
	15. Bilge longitudinals	23. Double bottom tank floors	33.
	16. Side shell longitudinals, if any	24. Top side tank transverses	
		25. Hopper side tank transverses	**Report on TM7-BC(CSR)**
		26.	34.Cargo hold frames
		27.	

13.3B Recommended Procedures for Thickness Measurements of Double Hull Oil Tankers Built under ~~PART NINE of the Rules (2012 version) and its 2013 and 2014 amendments~~ Common Structural Rules[①]

Notes:
1. This document is to be used for recording thickness measurements of double hull oil tankers built under ~~PART NINE of the Rules (2012 version) and its 2013 and 2014 amendments~~ Common Structural Rules[①] as required by 5.1.9.3, Section 1, Chapter 5 of this PART.

13.4B Recommended Procedures for Thickness Measurements of Double Skin Bulk Carriers Built under ~~PART NINE of the Rules~~ Common Structural Rules[②]

Notes:
1. This document is to be used for recording thickness measurements of double skin bulk carriers built under ~~PART NINE of the Rules~~ Common Structural Rules[②] as required by 5.1.9.3, Section 1, Chapter 5 of this PART.

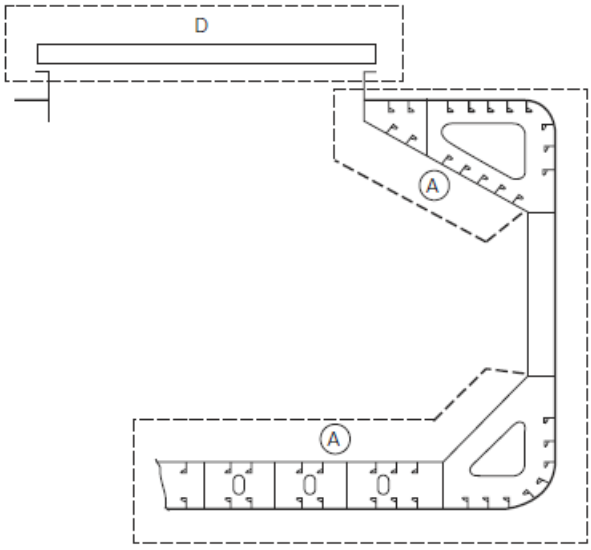
Sheet 13

Close-up Survey and Thickness Measurement Areas

[①] PART NINE of the Rules (2012 version) and its 2013 and 2014 amendments or PART NINE of the Rules (2015 version) and its amendments.
[②] PART TEN of the Rules (2012 version) and its 2013 and 2014 amendments or PART NINE of the Rules (2015 version) and its amendments.

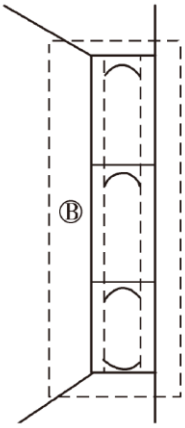
Typical transverse section

Areas (A) and (D)



Thickness to be reported on TM3-DSBC(CSR), TM4-DSBC(CSR) and TM6-DSBC(CSR), as appropriate

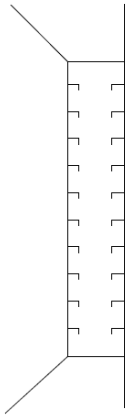
~~Ordinary transverse frame in double skin tank~~
Framing in double-side tanks
Area B



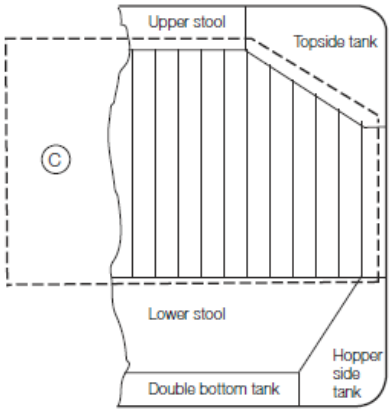
Ordinary transverse frame in double skin tank

Thickness to be reported on TM4-DSBC(CSR)

Ordinary longitudinal structure in double skin tank

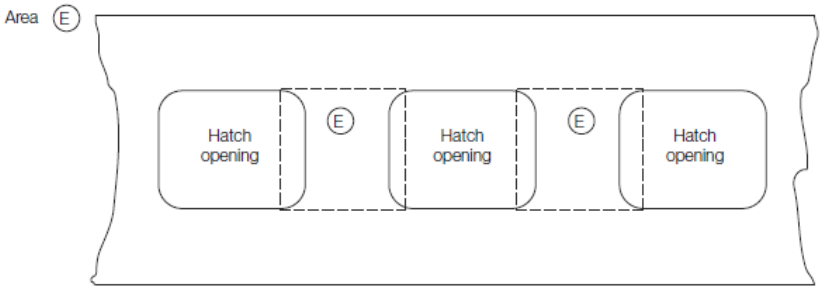


A cargo hold, transverse bulkhead
Area C



Thickness to be reported on TM5-DSBC（CSR)

Typical areas of deck plating and underdeck structure inside line of hatch openings between cargo hold hatches



Thickness to be reported on TM6-DSBC(CSR)

CHAPTER 6 SURVEYS RELATED TO CLASS NOTATIONS

Section 6 SURVEYS RELATED TO CLASS NOTATIONS FOR REFRIGERATED CARGO INSTALLATIONS

6.6.4 Special surveys

6.6.4.4 At the request of the owner and upon approval by CCS ~~Headquarters~~, a system of continuous surveys may be undertaken whereby the special survey requirements are carried out in regular rotation.

CHINA CLASSIFICATION SOCIETY

CCS Rule Change Notice For:

RULES FOR CLASSIFICATION OF SEA-GOING STEEL SHIPS

PART TWO

CONTENTS

Allowable Nominal Surface Pressure P_n **Table 2.20.2.9(2)**

Support material	P_n (N/mm^2) when loaded by	
	Vertical force	Horizontal force (on stoppers)
Hull structural steel	25	40
Hardened steel	35	50
~~Plastic materials on steel~~ Lower friction materials	50	—

CHINA CLASSIFICATION SOCIETY

CCS Rule Change Notice For:

RULES FOR CLASSIFICATION OF SEA-GOING STEEL SHIPS

PART THREE

CONTENTS

CHAPTER 9 DIESEL ENGINES

Section 1 GENERAL PROVISIONS

9.1.9 ~~Dual~~ Gas fuel engines

9.1.9.1 In addition to the relevant provisions of this Chapter, ~~dual~~ gas fuel engines are to comply with the applicable requirements of Appendix 1 of this Chapter and CCS Guidelines for Design and Installation of ~~Dual~~ Gas Fuel Engine Systems of Liquefied Gas Carriers.

CHINA CLASSIFICATION SOCIETY

CCS Rule Change Notice For:

RULES FOR CLASSIFICATION OF SEA-GOING STEEL SHIPS

PART FOUR

CONTENTS

Section 5 PROTECTION

2.5.6.1 Generators are to be protected against short-circuit and overloads by circuit breakers arranged to interrupt simultaneously all insulated poles, and the overload protection is to be adequate for the thermal capacity of the generator. In addition, the following requirements are to be complied with:

(1) for overloads between 10% and 50%, the circuit breaker is to be tripped with a time delay of less than 2 min. It is recommended that the circuit breaker be set within the limits of 125 to 135% of the rated current of the generator and with a time delay of 15 to 30 s;

(2) for overcurrents in excess of 50% but less than the steady short-circuit current of the generator, the circuit breaker is to be tripped after a short-time delay required for the discriminative protection of the system.

It is recommended that the pick-up current for tripping of the circuit-breaker after a short-time delay be set at 200% to 250% of the rated current of the generator and with a maximum time delay of 0.2 s (DC) or 0.6 s (AC);

(3) circuit breakers for three or more generators connected in parallel are also to be provided with instantaneous releases which are to be set slightly greater than the maximum short-circuit current of the generators protected so that the circuit-breaker may break instantaneously. Other equivalent means may also be accepted subject to the agreement of CCS.

CHINA CLASSIFICATION SOCIETY

CCS Rule Change Notice For:

RULES FOR CLASSIFICATION OF SEA-GOING STEEL SHIPS

PART EIGHT

CONTENTS

CHAPTER 3 ADDITIONAL REQUIREMENTS FOR OIL RECOVERY SHIPS

Section 2 CONSTRUCTION AND FIRE SAFETY

3.2.2.2 The position of tanks for recovered oil is to satisfy the following requirements:
(1) they are to be located outside the accommodation and machinery spaces;
(2) they are not to be located below the accommodation and machinery spaces;
(3) they~~Tanks intended for the storage of recovered oil~~ are to be located forward or aft of the accommodation and machinery spaces of category A.
3.2.2.3 Except where permitted by 3.2.2.6, tanks ~~intended~~ for ~~the storage of~~ recovered oil are to be separated from accommodation and machinery spaces by cofferdams. Oil fuel tanks, settling tanks, tanks for ballast water or anti-pollution liquid, enclosed spaces where oil recovery handling equipment is stored, pump rooms for recovered oil and dry compartments other than accommodation spaces may be considered as a cofferdam.
When oil fuel tanks or settling tanks are used as cofferdams, only one common boundary can be provided between each oil fuel tank or settling tank and the tank for recovered oil. The continuous butt welding is to be used for the bulkhead plating of the common boundary. Full penetration welding is to be used for the fillet weld at the connection of the bulkhead to the deck.
3.2.2.6 Where cofferdams are impractical to arrange in accordance with the requirements of 3.2.2.3 on board, any tank adjacent to ~~the~~ other machinery spaces (except for machinery spaces of category A) or pipe tunnel may be accepted for storage of recovered oil, provided that ~~bulkheads of the tank are~~:
(1) tank bulkheads are easily accessible for inspection;
(2) the continuous butt welding is to be used for the bulkhead plating, except that full penetration welding is used for the fillet weld at the connection of the bulkhead to the deck; ~~carried continuously through abutting plate panels, except that full penetration welding may be used at the top of the tank. Welds on tank boundaries are to be reduced to a minimum insofar as practicable.~~
(3) other machinery spaces or pipe tunnels are to be fitted with mechanical ventilation giving at least 20 air changes per hour (calculated based on the tank capacity) and alarms for ventilation failure. The number of air changes required above is to be maintained in case of failure of any ventilation fan. Ventilation fans are to be of non-sparking type. The electric motor fitted in the ventilation duct is to be of certified safe type;
(4) tanks are to be subject to hydraulic testing at special surveys;
(5) the common boundary of tanks is to be subject to thickness measurement at special surveys if necessary.

3.1.4 Division of gas-hazardous zones and safe areas

③ spaces including semi-enclosed spaces on open deck within a 3 m radius of the separator, the hoses and valves used for oil recovery, the openings of recovered oil tanks and the openings of spaces within the hazardous zones of Category 1 such as recovered oil pump rooms or cofferdams. In addition, the relevant provisions for venting outlets of covered oil tanks are to be considered (refer to 3.3.3.2 of this Chapter);

3.2.2.7 All openings (sounding pipes, hatches for the deployment of portable recovered oil pumps and hoses) to tanks for recovered oil are to be located on open deck to prevent accumulation of oil vapour.

3.2.3.4 Oil handling spaces on deck are to be provided with a coaming around all recovered oil pumps, transfer flanges and other connections. Each coaming is to have a height sufficient to prevent recovered oil from entering accommodation, machinery, control and service spaces or passing overboard. The coaming is to have a height of at least 150 mm. Where drains are provided for the coaming, closing devices for these drains are to be permanently attached.

CHAPTER 8 ADDITIONAL REQUIREMENTS FOR SHIPS WITH REGARD TO ENVIRONMENTAL PROTECTION

Section 1 GENERAL PROVISIONS

8.1.2 Definitions and abbreviations

(15) Ships constructed mean ships the keels of which are laid or which are at a similar stage of construction.