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To : All surveyors and whom it may concern

No : 2017-9-E
Date : 2017. 12. 05

Subject	9.107 Notice for Amendments to the KR Technical Rules
Application	refer to below table

- Please be informed that the amendments have been made to the Technical Rules as below and you are kindly requested to apply the amendments on the relevant works.

Amended KR Technical Rules	Contents	Effective date
Rules/Guidance for the Classification of Steel Ships Pt 1	Class Notations, Classification, ESP review of document on board (applied IACS UR : -Z10.2/Z10.4/Z10.5 (Rev.33/14/16) -S14(Rev. 6) -Z17(Rev.12) -Z 23(Rev.6)	2018 1. 1(contract date for ship construction or date of which application for survey is submitted)
Guidance for the Classification of Steel Ships Pt 7	Guidance for Direct Strength Assessment for Ore Carrier(Annex 7-10) (Ballast water load, loads to bilge hopper and lower stool slant plate, boundary condition of FEM model, load case etc. were revised.)	2017 12. 06(date of which application for survey is submitted)
Guidance for Wig Ships	Ship type and special feature notations	2018 1. 1(date of which application for survey is submitted)

Attachment: Amendments of KR Technical Rules----- 1 Copy. <The End>

Kim Chang-wook

(Executive Vice President Technical Division)

Amended Rules for the Classification of Steel Ships

(Part 1 Classification and Surveys)



- Main Amendments -

(1) Effective date : 1 Jan 2018 (Date of which application for survey is submitted)

● To reflect IACS UR Z10.2/Z10.4 & Z10.5(Rev.33/Rev.14 & Rev.16 Nov 2016)

● Regarding to Extended Dry-docking Interval System
- Included LNG Carriers, and Ro-Ro Ship

● Propeller shaft survey
- Deleted application date of new methods to apply the requirements to all ships

● Updated SGS Observation

● To amend unreasonable contents disclosed while implementing the Rules

Present	Amendments
<p style="text-align: center;">Chapter 1 CLASSIFICATION</p> <p style="text-align: center;">Section 1 General <omitted></p> <p style="text-align: center;">Section 2 Character of Classification</p> <p>201. Class notations [See Guidance]</p> <p>The class notations assigned to the ships classed with the Society are to be in accordance with the followings: <omitted></p> <p>(5) Additional installations notations Ships designed for the application of additional installations on hull items will be distinguished after the character of hull by the class notation such as "LI", "<u>CHA</u>", "HMS" or "HMS1", etc. and on machinery items will be distinguished after the character of machinery by the class notation such as "CMA", "UMA", "DPS", "NBS", "IGS", "COW", "STCM" or "RMC", etc.</p> <p>(6) Ship type notations Ships designed in compliance with particular Rules intended to apply to that type of ship will be indicated by the appropriate designations such as Oil Tanker 'ESP'(FBC), Bulk Carrier 'ESP', Cargo Ship, Passenger Ship, Tug Boat, Barge, etc. affixed to the character of hull.</p> <p>(7) Special feature notations When considered necessary by the Society, the special feature notations may be appended to the character of the ship type notations. These special feature notations could consist of the hull structure and the cargo tank type fitted for the kind and nature of cargoes, ice strengthening, in-water survey, cargo loading condition, design temperature, design pressure, the apparent specific gravity of cargoes, <u>corrosion control</u>, direct strength assessment, direct fatigue assessment, hull construction monitoring, and/or longitudinal strength of hull girder in flooded condition for bulk carriers, etc. Also, the restriction of navigation area and condition may be remarked additionally. <hereafter, omitted></p>	<p style="text-align: center;">Chapter 1 CLASSIFICATION</p> <p style="text-align: center;">Section 1 General <same as the present Rules ></p> <p style="text-align: center;">Section 2 Character of Classification</p> <p>201. Class notations [See Guidance]</p> <p>The class notations assigned to the ships classed with the Society are to be in accordance with the followings: <same as the present></p> <p>(5) Additional installations notations <i>(2018)</i> Ships designed for the application of additional installations on hull items will be distinguished after the character of hull by the class notation such as "LI", "<u>LG</u>", "<u>PA</u>", "HMS" or "HMS1", etc. and on machinery items will be distinguished after the character of machinery by the class notation such as "CMA", "UMA", "DPS", "NBS", "IGS", "COW", "STCM" or "RMC", etc.</p> <p>(6) Ship type notations Ships designed in compliance with particular Rules intended to apply to that type of ship will be indicated by the appropriate designations such as Oil Tanker 'ESP'(FBC), Bulk Carrier 'ESP', Cargo Ship, Passenger Ship, Tug Boat, Barge, etc. affixed to the character of hull.</p> <p>(7) Special feature notations <i>(2018)</i> When considered necessary by the Society, the special feature notations may be appended to the character of the ship type notations. These special feature notations could consist of the hull structure and the cargo tank type fitted for the kind and nature of cargoes, ice strengthening, in-water survey, cargo loading condition, design temperature, design pressure, the apparent specific gravity of cargoes, corrosion control, direct strength assessment, direct fatigue assessment, hull construction monitoring, and/or longitudinal strength of hull girder in flooded condition for bulk carriers, etc. Also, the restriction of navigation area and condition may be remarked additionally. <hereafter, same as present></p>

Present	Amendments
<p style="text-align: center;">CHAPTER 2 PERIODICAL AND OTHER SURVEYS</p> <p style="text-align: center;">Section 1 General</p> <p>101. ~ 107. <omitted></p> <p>108. Wear limit on structural members</p> <p>When the thickness of hull structural members or the scantlings of equipment, etc. exceed the wear limit, they have to be renewed with those having the original scantlings or the scantlings considered suitable by the Society. <u>As regards the scantlings of structural members which have been reduced by virtue of an approved system of corrosion control, the present scantlings are to be examined regarding them as having been corroded by the reduced amount since the time of construction.</u> However, when the original scantlings were larger than the required ones, or when deemed appropriate by the Society, these requirements may be modified taking into account of the location, extent, kind of the wear. [See Guidance]</p>	<p style="text-align: center;">CHAPTER 2 PERIODICAL AND OTHER SURVEYS</p> <p style="text-align: center;">Section 1 General</p> <p>101. ~ 107. <omitted></p> <p>108. Wear limit on structural members (2018)</p> <p>When the thickness of hull structural members or the scantlings of equipment, etc. exceed the wear limit, they have to be renewed with those having the original scantlings or the scantlings considered suitable by the Society. As regards the scantlings of structural members which have been reduced by virtue of an approved system of corrosion control, the present scantlings are to be examined regarding them as having been corroded by the reduced amount since the time of construction. However, when the original scantlings were larger than the required ones, or when deemed appropriate by the Society, these requirements may be modified taking into account of the location, extent, kind of the wear. [See Guidance]</p>

Present	Amendments
<p style="text-align: center;">CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME</p> <p style="text-align: center;">Section 1 General</p> <p>101. Application <omitted></p> <p>102. Preparations for survey 1.~ 6. <omitted></p> <p>7. Survey planning meeting</p> <p>(1) The establishment of proper preparation and close co-operation between the attending Surveyor(s) and the Owner's representatives onboard prior to and during the survey are an essential part in the safe and efficient conduct of the survey. During the survey on board safety meetings are to be held regularly.</p> <p>(2) Prior to the commencement of any part of the Special <u>and Intermediate Survey</u>, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance, <u>the thickness measurement company operator(as applicable)</u> and the master of the ship or an appropriately qualified representative appointed by the master or company for the purpose to ascertain that all the arrangements envisaged in <u>the survey programme</u> are in place, so as to ensure the safe and efficient conduct of the survey work to be carried out. 【See Guidance】</p> <p>(3) The following is an indicative list of items that are to be addressed in the meeting.</p> <p>(A) schedule of the vessel(i.e. the voyage, docking and undocking manoeuvres, periods alongside, cargo and ballast operations, etc.)</p>	<p><u>109. Survey planning meeting and safety meetings (2018)</u></p> <p>1. The establishment of proper preparation and close co-operation between the attending Surveyor(s) and the Owner's representatives onboard prior to and during the survey are an essential part in the safe and efficient conduct of the survey. During the survey on board safety meetings are to be held regularly.</p> <p>2. Prior to the commencement of any part of the Special, <u>and Intermediate and Annual Survey</u>, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance, the thickness measurement company operator/<u>other service suppliers</u>(as applicable) and the master of the ship or an appropriately qualified representative appointed by the master or company for the purpose to ascertain that all the arrangements envisaged in the survey programme(<u>ESP Vessel only</u>) <u>or regarding the related surveys</u> are in place, so as to ensure the safe and efficient conduct of the survey work to be carried out. 【See Guidance】</p> <p>3. The following is an indicative list of items that are to be addressed in the meeting.</p> <p>(A) schedule of the vessel(i.e. the voyage, docking and undocking manoeuvres, periods alongside, cargo and ballast operations, etc.)</p>

Present	Amendments
<p>(B) provisions and arrangements for thickness measurements(i.e. access, cleaning/de-scaling, illumination, ventilation, personal safety)</p> <p>(C) extent of the thickness measurements</p> <p>(D) acceptance criteria</p> <p>(E) extent of Close-up Survey and thickness measurement considering the coating condition and suspect areas/areas of substantial corrosion</p> <p>(F) execution of thickness measurements</p> <p>(G) taking representative readings in general and where uneven corrosion/pitting is found</p> <p>(H) mapping of areas of substantial corrosion</p> <p>(I) communication between attending Surveyor(s) the thickness measurement company operator(s) and Owner representative(s) concerning findings</p>	<p><u>(B) confirm vessel's preparation to fulfill survey condition for the related surveys.</u></p> <p><u>(C) hear from the shipmaster of the general conditions of the ship regarding the hull, machinery and equipment</u></p> <p><u>(D) Survey progress scheme, survey requirement and if necessary, survey items attending stages are discussed</u></p> <p><u>(E) Regarding thickness measurement (if applicable)</u></p> <p><u>(a) provisions and arrangements for thickness measurements (i.e. access, cleaning/de-scaling, illumination, ventilation, personal safety)</u></p> <p><u>(b) extends of thickness measurements</u></p> <p><u>(c) acceptance criteria</u></p> <p><u>(d) extent of Close-up Survey and thickness measurement considering the coating condition and suspect areas/areas of substantial corrosion</u></p> <p><u>(e) execution of thickness measurements</u></p> <p><u>(f) taking representative readings in general and where uneven corrosion/pitting is found</u></p> <p><u>(g) mapping of areas of substantial corrosion</u></p> <p><u>(h) communication between attending Surveyor(s) the thickness measurement company operator(s) and Owner representative(s) concerning findings</u></p> <p><u>(F) other necessary items</u></p>

Present	Amendments
<p>109. Procedures for thickness measurements [See Guidance]</p> <ol style="list-style-type: none"> 1. <u>Prior to commencement of the Intermediate or Special Survey, as required by Sec 3, Sec 4, Sec 14, Sec 15 or Ch 3, a meeting is to be held between the attending Surveyor(s), the master of the ship or an appropriately qualified representative appointed by the master or company, the Owner's representative(s) in attendance and the thickness measurement firm's representative(s) so as to ensure the safe and efficient execution of the surveys and thickness measurements to be carried out onboard.</u> 2. <u>Thickness measurements are to be made by an appropriate ultrasonic equipment or other equivalent means and the results of the gaugings are to be reported.</u> 3. <u>Thickness measurements required in the context of hull structural classification surveys, if not carried out by the Society itself, shall be witnessed by a Surveyor. This requires the Surveyor to be on board, while the gaugings are taken, to the extent necessary to control the process.</u> 4. <u>Where the Surveyor is to attend to the thickness measurements in accordance with preceding Par 3, the control of the thickness measurement process, review, verification and record of attendance are to be in accordance with the separate requirement specified by the Society.</u> <p>5. Thickness measurements and Close-up Surveys</p> <p>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 1.2.4 1, Table 1.2.9, Table 1.2.11, Table 1.3.2, Table 1.3.5, Table 1.3.8, Table 1.3.11 or Table 1.3.14 of structures in areas where Close-up Surveys are required shall be carried out simultaneously with Close-up Surveys. For structure built with a material other than steel, alternative thickness measurement requirements may be developed and applied as deemed necessary by the Society. (See Annex 1-5, 1 (1) (B) of the Guidance)</p>	<p>110. Procedures for thickness measurements (2018) [See Guidance]</p> <ol style="list-style-type: none"> 1. <u>The required thickness measurements, if not carried out by the Society itself, are to be witnessed by a Surveyor. The Surveyor is to be on board to the extent necessary to control the process. In this case, the control of thickness measurement process is to be in accordance with the separate requirements specified by the Society.</u> 2. <u>Thickness measurement is normally to be carried out by means of ultrasonic test equipment. The accuracy of the equipment is to be proven to the Surveyor as required. Thickness measurements are to be carried out by a firm approved by the Society in accordance with Annex 1-11 of the Guidance, except that in respect of measurements on non-ESP ships less than 500 gross tonnage and all fishing vessels, the firm need not be so approved.</u> <p>3. Thickness measurements and Close-up Surveys</p> <p>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 1.2.4 1, Table 1.2.9, Table 1.2.11, Table 1.3.2, Table 1.3.5, Table 1.3.8, Table 1.3.11 or Table 1.3.14 of structures in areas where Close-up Surveys are required shall be carried out simultaneously with Close-up Surveys. For structure built with a material other than steel, alternative thickness measurement requirements may be developed and applied as deemed necessary by the Society. (See Annex 1-5, 1 (1) (B) of the Guidance)</p>

Present	Amendments
	<p data-bbox="1160 300 1944 359"><u>4. In all cases the extent of the thickness measurements is to be sufficient as to represent the actual average condition.</u></p> <p data-bbox="1160 379 1944 624"><u>5. A thickness measurement report is to be prepared. The report is to give the location of measurements, the thickness measured as well as corresponding original thickness. Furthermore, the report is to give the date when the measurement was carried out, type of measuring equipment, names of personnel and their qualifications and has to be signed by the operator. The thickness measurement report is to follow the principles as specified in Annex 1-5 of the Guidance.</u></p> <p data-bbox="1160 644 1944 703"><u>6. The Surveyor is to review the final thickness measurements report and countersign the cover page.</u></p>

Present	Amendments
<p>110. Preparations for survey</p> <p>1.~2. <omitted></p> <p>3. Equipment for survey</p> <p>(1) Thickness measurement is normally to be carried out by means of ultrasonic test equipment. The accuracy of the equipment is to be proven to the Surveyor as required. Thickness measurements are to be carried out by a firm approved by the Society in accordance with Annex 1-11 of the Guidance, except that in respect of measurements on non-ESP ships less than 500 gross tonnage and all fishing vessels, the firm need not be so approved.</p> <p>(2) One or more of the following fracture detection procedures may be required if deemed necessary by the Surveyor: [See Guidance]</p> <p>(A) radiographic equipment (B) ultrasonic equipment (C) magnetic particle equipment (D) dye penetrant</p> <p><omitted></p> <p>111. Special consideration for military vessels</p> <p>Special consideration may be given in application of relevant sections of this chapter to commercial vessels owned or chartered by Governments, which are utilized in support of military operations or service.</p> <p>112. Internal examination for ballast tanks with semi-hard coating</p> <p>As for the requirements regarding semi-hard coatings, these coatings, if already applied, will not be accepted form the next Special or Intermediate Survey commenced on or after 1 July 2010, whichever comes first, with respect to waving the annual internal examination of the ballast tanks.</p>	<p>111. Preparations for survey (2018)</p> <p>1.~2. <same as the present></p> <p>3. Equipment for survey (2018)</p> <p>(1) Thickness measurement is normally to be carried out by means of ultrasonic test equipment. The accuracy of the equipment is to be proven to the Surveyor as required. Thickness measurements are to be carried out by a firm approved by the Society in accordance with Annex 1-11 of the Guidance, except that in respect of measurements on non-ESP ships less than 500 gross tonnage and all fishing vessels, the firm need not be so approved.</p> <p>(1) One or more of the following fracture detection procedures may be required if deemed necessary by the Surveyor: [See Guidance]</p> <p>(A) radiographic equipment (B) ultrasonic equipment (C) magnetic particle equipment (D) dye penetrant</p> <p><same as the present></p> <p>112. Special consideration for military vessels (2018)</p> <p>Special consideration may be given in application of relevant sections of this chapter to commercial vessels owned or chartered by Governments, which are utilized in support of military operations or service.</p> <p>113. Internal examination for ballast tanks with semi-hard coating (2018)</p> <p>As for the requirements regarding semi-hard coatings, these coatings, if already applied, will not be accepted form the next Special or Intermediate Survey commenced on or after 1 July 2010, whichever comes first, with respect to waving the annual internal examination of the ballast tanks.</p>

Present	Amendments
<p style="text-align: center;">Section 2 Annual Survey</p> <p>201. Due range</p> <ol style="list-style-type: none"> 1. Annual Survey is to be carried out within 3 months before or after each anniversary date. 2. Annual Survey may be carried out in advance even if it is not due, upon application by the Owner. However, if Annual Survey is carried out more than 3 months earlier than the anniversary date, the anniversary date will be newly assigned to the date of 3 months later than the date on which the survey was completed. The subsequent Annual Survey shall be completed at the interval which will correspond to the new anniversary date. <p style="text-align: center;"><hereafter, omitted></p>	<p style="text-align: center;">Section 2 Annual Survey</p> <p>201. Due range</p> <ol style="list-style-type: none"> 1. Annual Survey is to be carried out within 3 months before or after each anniversary date. 2. Annual Survey may be carried out in advance even if it is not due, upon application by the Owner. However, if Annual Survey is carried out more than 3 months earlier than the anniversary date, the anniversary date will be newly assigned to the date of 3 months later than the date on which the survey was completed. The subsequent Annual Survey shall be completed at the interval which will correspond to the new anniversary date. 3. <u>A survey planning meeting is to be held prior to the commencement of the survey. (2018)</u> <p style="text-align: center;"><hereafter, same as present></p>

Present	Amendments
<p style="text-align: center;">Section 4 Special Survey (Hull, Equipment and Fire-extinguishing Appliances)</p> <p>401. ~ 402. <Omitted></p> <p>403. Requirements of survey</p> <p>1. The Special Survey is to include, in addition to the requirements of the Annual Survey, examination, tests and checks of sufficient extent to ensure that the hull, equipment and related piping, as required in (9), are in satisfactory condition and is fit for the intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and the periodical surveys being carried out at the due dates. The examinations of the hull are to be supplemented by thickness measurements and testing as required in (9) and (13), to ensure that the structural integrity remains effective. The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages, or other structural deterioration, that may be present. [See Guidance]</p> <p>(1) ~ (9) <omitted></p> <p>(10) Fire protection, fire equipment and its operation tests.</p> <p>(11) <u>In tanks to which an approved measure of corrosion control in accordance with Pt 3, Ch 1, Sec 8 is applied, the condition of coating or corrosion protection is to be examined.</u></p> <p>(12) For container ships, equipped with container securing arrangements in accordance with Pt 7, Ch 4, 1002. of the Rules, the container securing arrangements are to be examined as follows:</p> <p>(a) Visual inspection for cell guides and securing devices (cracks, fractures, etc. of welds).</p> <p>(b) Confirmation of comparison between on-board record book and securing devices.</p> <p>(13) Thickness measurement [See Guidance] <hereafter, omitted></p>	<p style="text-align: center;">Section 4 Special Survey (Hull, Equipment and Fire-extinguishing Appliances)</p> <p>401. ~ 402. <same as the present></p> <p>403. Requirements of survey <i>(2018)</i></p> <p>1. The Special Survey is to include, in addition to the requirements of the Annual Survey, examination, tests and checks of sufficient extent to ensure that the hull, equipment and related piping, as required in (9), are in satisfactory condition and is fit for the intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and the periodical surveys being carried out at the due dates. The examinations of the hull are to be supplemented by thickness measurements and testing as required in (9) and (13), to ensure that the structural integrity remains effective. The aim of the examination is to discover substantial corrosion, significant deformation, fractures, damages, or other structural deterioration, that may be present. [See Guidance]</p> <p>(1) ~ (9) <same as the present></p> <p>(10) Fire protection, fire equipment and its operation tests.</p> <p>(11) In tanks to which an approved measure of corrosion control in accordance with Pt 3, Ch 1, Sec 8 is applied, the condition of coating or corrosion protection is to be examined.</p> <p>(11) For container ships, equipped with container securing arrangements in accordance with Pt 7, Ch 4, 1002. of the Rules, the container securing arrangements are to be examined as follows: <i>(2018)</i></p> <p>(a) Visual inspection for cell guides and securing devices (cracks, fractures, etc. of welds).</p> <p>(b) Confirmation of comparison between on-board record book and securing devices.</p> <p><u>(12) Thickness measurement <i>(2018)</i> [See Guidance]</u> <hereafter, same as present></p>

Present

(14) Tank testing

- (a) Tank testings are to be carried out in accordance with **Table 1.2.6.**
- (b) Tanks may be tested afloat at the discretion of the Surveyor, provided that the internal examination of the bottom is also carried out afloat.

Table 1.2.6 Minimum requirements for tank testing

No. of Special Survey Tanks	Special Survey No. 1	Special Survey No. 2	Special Survey No. 3	Special Survey No. 4 and Subsequent
<u>Double bottom tank, deep tank, ballast tank, peak tank and other tank (including holds adopted for the carriage of salt water ballast)</u>	○	○	○	○
Fuel oil tank, lubrication oil tank, fresh water tank	△	△	△	△

(NOTES)

1. Purpose of tank has a priority in application.
2. Boundaries of tanks are to be tested with a head of liquid to the top of air pipes or to near the top of hatches for ballast/cargo holds. Boundaries of fuel oil, lube oil and fresh water tanks are to be tested with a head of liquid to the highest point that liquid will rise under service conditions.
3. ○ : All tanks are to be tested.
△ : Tank testing of fuel oil, lube oil and fresh water tanks may be specially considered based on a satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been carried out according to the requirements with satisfactory results.
4. For the cargo tanks(except cargo tanks for the liquefied natural gas), tests may be dispensed with, provided after an external and internal examination of the tanks, the Surveyor is satisfied with the condition of the tanks.
5. The Surveyor may extend the testing as deemed necessary. **[See Guidance]**

Amendments

(13) Tank testing (2018)

- (a) Tank testings are to be carried out in accordance with **Table 1.2.6**.
- (b) Tanks may be tested afloat at the discretion of the Surveyor, provided that the internal examination of the bottom is also carried out afloat.

Table 1.2.6 Minimum requirements for tank testing

No. of Special Survey Tanks	Special Survey No. 1	Special Survey No. 2	Special Survey No. 3	Special Survey No. 4 and Subsequent
<u>All water tanks (including cargo holds used for ballast and excluding fresh water tank) and all cargo tanks (2018)</u>	○	○	○	○
Fuel oil tank, lubrication oil tank, fresh water tank	△	△	△	△

(NOTES)

1. Purpose of tank has a priority in application.
2. Boundaries of tanks are to be tested with a head of liquid to the top of air pipes or to near the top of hatches for ballast/cargo holds. Boundaries of fuel oil, lube oil and fresh water tanks are to be tested with a head of liquid to the highest point that liquid will rise under service conditions.
3. ○ : All tanks are to be tested.
△ : Tank testing of fuel oil, lube oil and fresh water tanks may be specially considered based on a satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been carried out according to the requirements with satisfactory results.
4. For the cargo tanks(except cargo tanks for the liquefied natural gas), tests may be dispensed with, provided after an external and internal examination of the tanks, the Surveyor is satisfied with the condition of the tanks.
5. The Surveyor may extend the testing as deemed necessary. **[See Guidance]**

Present	Amendments
<p>(15) Where considered necessary by the Surveyor, the effectiveness of shell plating, watertight bulkheads, shaft tunnels, watertight doors and the closing appliances of openings on superstructure end bulkheads is to be confirmed. [See Guidance]</p> <p>(16) Engine room structure is to be examined. Particular attention is to be given to tank tops, shell plating in way of tank tops, brackets connecting side shell frames and tank tops, and engine room bulkheads in way of tank top and bilge wells. Particular attention is to be given to the sea suctions, sea water cooling pipes and overboard discharge valves and their connections to the shell plating. Where wastage is evident or suspect, thickness measurements are to be carried out, and renewals or repairs made when wastage exceeds allowable limits.</p> <p>(17) For all ships except for passenger ships, automatic air pipe heads are to be completely examined(both externally and internally) as indicated in Table 1.2.7. For designs where the inner parts cannot be properly inspected from outside, this is to include removal of the head from air pipe. Particular attention is to be paid to the condition of the zinc coating in heads constructed from galvanized steel.</p> <p>(18) Where a stability instrument is provided on-board, all approved test loading conditions are to be examined.</p> <p>(19) For ships provided with the equipment employed in the mooring of ships at single point mooring specified in Pt 4, Ch 10, 101. 3 and assigned the additional class notation "EQ-SPM", the function and deformation condition of this equipment employed in the mooring of ships at single point mooring and hull supporting structures are to be closely checked and confirmed its satisfactory conditions. Where deemed necessary, non-destructive examinations may be required. [See Guidance]</p> <p><hereafter, omitted></p>	<p>(14) Where considered necessary by the Surveyor, the effectiveness of shell plating, watertight bulkheads, shaft tunnels, watertight doors and the closing appliances of openings on superstructure end bulkheads is to be confirmed. (2018) [See Guidance]</p> <p>(15) Engine room structure is to be examined. Particular attention is to be given to tank tops, shell plating in way of tank tops, brackets connecting side shell frames and tank tops, and engine room bulkheads in way of tank top and bilge wells. Particular attention is to be given to the sea suctions, sea water cooling pipes and overboard discharge valves and their connections to the shell plating. Where wastage is evident or suspect, thickness measurements are to be carried out, and renewals or repairs made when wastage exceeds allowable limits. (2018)</p> <p>(16) For all ships except for passenger ships, automatic air pipe heads are to be completely examined(both externally and internally) as indicated in Table 1.2.7. For designs where the inner parts cannot be properly inspected from outside, this is to include removal of the head from air pipe. Particular attention is to be paid to the condition of the zinc coating in heads constructed from galvanized steel. (2018)</p> <p>(17) Where a stability instrument is provided on-board, all approved test loading conditions are to be examined. (2018)</p> <p>(18) For ships provided with the equipment employed in the mooring of ships at single point mooring specified in Pt 4, Ch 10, 101. 3 and assigned the additional class notation "EQ-SPM", the function and deformation condition of this equipment employed in the mooring of ships at single point mooring and hull supporting structures are to be closely checked and confirmed its satisfactory conditions. Where deemed necessary, non-destructive examinations may be required. [See Guidance] (2018)</p> <p><hereafter, same as present></p>

Present	Amendments
<p style="text-align: center;">Section 5-1 Special Survey (Machinery, Electrical Installations and Additional Installations)</p> <p>501. Due range The due range of Special Survey(Machinery, electrical installations and additional installations) is to be complied with the requirements specified in 401.</p> <p>502. Requirements of survey At the Special Survey(Machinery, electrical installations and additional installations), in addition to the requirements for Intermediate Survey, the following requirements are to be complied with.</p> <p>1. Requirements of main engines and auxiliary engines <omitted></p> <p>2. Requirements of machinery except for main engines and auxiliary engines</p> <p>(1) ~ (12) <omitted></p> <p>(13) The following safety inspections are to be carried out for the cargo refrigerating machinery given in Pt 5, Ch 6, 1201. 1.</p> <p>(a) Leaks of the refrigerants are to be tested while the machinery is examined in running condition. <omitted></p> <p><u>(14) Essential parts of incinerators are to be opened up and internally examined.</u></p> <p><hereafter, omitted></p>	<p style="text-align: center;">Section 5-1 Special Survey (Machinery, Electrical Installations and Additional Installations)</p> <p>501. Due range The due range of Special Survey(Machinery, electrical installations and additional installations) is to be complied with the requirements specified in 401.</p> <p>502. Requirements of survey At the Special Survey(Machinery, electrical installations and additional installations), in addition to the requirements for Intermediate Survey, the following requirements are to be complied with.</p> <p>1. Requirements of main engines and auxiliary engines <omitted></p> <p>2. Requirements of machinery except for main engines and auxiliary engines <i>(2018)</i></p> <p>(1) ~ (12) <same as the present></p> <p>(13) The following safety inspections are to be carried out for the cargo refrigerating machinery given in Pt 5, Ch 6, 1201. 1.</p> <p>(a) Leaks of the refrigerants are to be tested while the machinery is examined in running condition. <same as the present></p> <p>(14) Essential parts of incinerators are to be opened up and internally examined.</p> <p><hereafter, same as present></p>

Present	Amendments
<p style="text-align: center;">Section 6 Docking Survey</p> <p>601. ~ 604. <same as the present></p> <p>605. Extended Dry-docking Interval System</p> <p>1. General</p> <p>(1) The "Extended Dry-docking Interval System" is in any case subject to approval by the relevant flag state. The approval or acceptance of this rule by the relevant flag state doesn't mean the approval for the application of Extended Dry-docking Interval System on the relevant ship, and the separate approval by the each relevant flag state is required for the application of Extended Dry-docking Interval System.</p> <p>(2) The "Extended Dry-docking Interval System" applies to ships with <u>Container Ship notation or Cargo Ship notation and General Dry Cargo Ships specified in Sec 14.</u></p> <p>(3) In application to 601. 1, at the request of the Owners, where deemed appropriate by the Society considering survey history, damage history and coating conditions, etc. it is possible until the ship reaches 15 years of age to perform the first and second Docking Survey due from the completion date of the Classification Survey during Construction or the completion date of the previous Docking Survey as an In-water Survey, and the third Docking Survey has to be performed in dry-dock or on a slipway within 7.5 years from the completion date of the Classification Survey during Construction or the completion date of the previous Docking Survey. [See Guidance]</p> <p style="text-align: center;"><hereafter, omitted></p>	<p style="text-align: center;">Section 6 Docking Survey</p> <p>601. ~ 604. <same as the present></p> <p>605. Extended Dry-docking Interval System</p> <p>1. General</p> <p>(1) The "Extended Dry-docking Interval System" is in any case subject to approval by the relevant flag state. The approval or acceptance of this rule by the relevant flag state doesn't mean the approval for the application of Extended Dry-docking Interval System on the relevant ship, and the separate approval by the each relevant flag state is required for the application of Extended Dry-docking Interval System.</p> <p>(2) The "Extended Dry-docking Interval System" applies to ships with <u>LNG Carriers among the Liquefied Gas Carrier notation, Ro-Ro Ship notation, Container Ship notation, or Cargo Ship notation and General Dry Cargo Ships specified in Sec 14. (2018)</u></p> <p>(3) In application to 601. 1, at the request of the Owners, where deemed appropriate by the Society considering survey history, damage history and coating conditions, etc. it is possible until the ship reaches 15 years of age to perform the first and second Docking Survey due from the completion date of the Classification Survey during Construction or the completion date of the previous Docking Survey as an In-water Survey, and the third Docking Survey has to be performed in dry-dock or on a slipway within 7.5 years from the completion date of the Classification Survey during Construction or the completion date of the previous Docking Survey. [See Guidance]</p> <p style="text-align: center;"><hereafter, same as present></p>

Present	Amendment
<p align="center">Section 7 Surveys of Propeller Shaft and Stern Tube Shaft, Etc.</p> <p>701. General [See Guidance]</p> <p>1. Unless alternative means are provided to assure the condition of the propeller shaft assembly, these requirements apply to all vessels with conventional shafting fitted with a propeller as follows:</p> <p>(1) from 1 January 2016 for ships delivered on or after 1 January 2016;</p> <p>(2) after the first shaft survey scheduled on or after 1 January 2016, for ships delivered before 1 January 2016. Upon the completion of the first shaft survey scheduled on or after 1 January 2016, the designation of dates for the next shaft survey is to be made based upon this Section.</p> <p>2. to 3. <omitted></p> <p>702. Oil lubricated shafts or closed loop system fresh water lubricated shafts</p> <p>1. to 2. <omitted></p> <p>3. Oil lubricated shafts</p> <p>(1) Survey intervals</p> <p>(A) <omitted></p> <p>(B) Survey method and survey interval as per types of propeller connections is as follows:</p> <p>(a) <same as present Rules></p> <p>(b) For Keyless connection, Method1, Method2 or Method3 are applicable and the survey interval for each method is 5 years. The maximum interval between two surveys carried out according to Method1 or Method2 is not to be exceed 15 years, except in the case when one extension for no more than 3 months is granted.</p> <p align="center"><hereafter, omitted></p>	<p align="center">Section 7 Surveys of Propeller Shaft and Stern Tube Shaft, Etc.</p> <p>701. General [See Guidance]</p> <p>1. Unless alternative means are provided to assure the condition of the propeller shaft assembly, these requirements apply to all vessels with conventional shafting fitted with a propeller as follows: <i>(2018)</i></p> <p>(1) from 1 January 2016 for ships delivered on or after 1 January 2016;</p> <p>(2) after the first shaft survey scheduled on or after 1 January 2016, for ships delivered before 1 January 2016. Upon the completion of the first shaft survey scheduled on or after 1 January 2016, the designation of dates for the next shaft survey is to be made based upon this Section.</p> <p>2. to 3. <same as present></p> <p>702. Oil lubricated shafts or closed loop system fresh water lubricated shafts</p> <p>1. to 2. <same as present></p> <p>3. Oil lubricated shafts</p> <p>(1) Survey intervals</p> <p>(A) <same as present Rules></p> <p>(B) Survey method and survey interval as per types of propeller connections is as follows:</p> <p>(a) <same as present Rules></p> <p>(b) For Keyless connection, Method1, Method2 or Method3 are applicable and the survey interval for each method is 5 years. <u>The maximum of two consecutive Method 3 surveys is applicable and the maximum interval between two surveys carried out according to Method1 or Method2 is not to be exceed 15 years, except in the case when one extension for no more than 3 months is granted.</u> <i>(2018)</i> <hereafter, same as present></p>

Present	Amendments
<p>Section 14 Hull Surveys for General Dry Cargo Ships</p> <p>1401. General</p> <p>1.~2. <omitted></p> <p>3. Procedures for thickness measurements</p> <p>(1) <u>The required thickness measurements, if not carried out by the Society itself, are to be witnessed by a Surveyor. The Surveyor is to be on board to the extent necessary to control the process. In this case, the control of thickness measurement process is to be in accordance with the separate requirements specified by the Society.</u></p> <p>(2) <u>The thickness measurement company is to be part of the survey planning meeting to be held prior to commencing the survey.</u></p> <p>(3) <u>Thickness measurements of structures in areas where Close-up Surveys are required shall be carried out simultaneously with Close-up Surveys.</u></p> <p><omitted></p> <p>1402. Annual Survey</p> <p>1. General</p> <p>(1) The due range of Annual Survey is to be in accordance with the requirements of 201.</p> <p>(2) The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull, hatch covers, coamings and piping are maintained in a satisfactory condition.</p> <p><newly added></p> <p><omitted></p> <p>1404. Special Survey</p> <p>1. General</p> <p>(1) ~ (5) <omitted></p> <p>(6) <u>The survey extent of ballast tanks converted to void spaces is to be specially considered in relation to the requirements for ballast tanks.</u></p> <p>Note : For survey of automatic air pipe heads refer to 403. 1 (17). <hereafter, omitted></p>	<p>Section 14 Hull Surveys for General Dry Cargo Ships</p> <p>1401. General</p> <p>1.~2. <same as the present></p> <p>3. Procedures for thickness measurements</p> <p>(1) Follow the procedure for thickness measurement of Ch 2, Sec 1. 110. (2018)</p> <p><same as the present></p> <p>1402. Annual Survey</p> <p>1. General</p> <p>(1) The due range of Annual Survey is to be in accordance with the requirements of 201.</p> <p>(2) The survey is to consist of an examination for the purpose of ensuring, as far as practicable, that the hull, hatch covers, coamings and piping are maintained in a satisfactory condition.</p> <p>(3) A survey planning meeting is to be held prior to the commencement of the survey. (2018)</p> <p><same as the present></p> <p>1404. Special Survey</p> <p>1. General</p> <p>(1) ~ (5) <omitted></p> <p>(6) The survey extent of ballast tanks converted to void spaces is to be specially considered for close-up surveys and thickness measurements in relation to the requirements for ballast tanks. <i>(2018)</i></p> <p>Note : For survey of automatic air pipe heads refer to 403. 1 (17). <hereafter, same as present></p>

Present	Amendments
<p>Section 15 Hull Surveys for Liquefied Gas Carriers 1501. General</p> <p>1. ~ 2. <omitted></p> <p>3. Procedures for thickness measurements</p> <p>(1) The required thickness measurements, if not carried out by the Society itself, are to be witnessed by a Surveyor. The Surveyor is to be on board to the extent necessary to control the process. In this case, the control of thickness measurement process is to be in accordance with the separate requirements specified by the Society.</p> <p>(2) The thickness measurement company is to be part of the survey planning meeting to be held prior to commencing the survey.</p> <p>(3) Thickness measurements of structures in areas where Close-up Surveys are required shall be carried out simultaneously with Close-up Surveys. <omitted></p> <p>1502. Annual Survey</p> <p>1. General</p> <p>(1) The due range of Annual Survey is to be in accordance with the requirements of 201.</p> <p>(2) 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. <newly added> <omitted></p> <p>1503. <omitted></p> <p>1504. Special Survey</p> <p>1. General</p> <p>(1) ~ (5) <omitted></p> <p><u>(6) The survey extent of ballast tanks converted to void spaces is to be specially considered in relation to the requirements for ballast tanks.</u></p> <p>Note : For survey of automatic air pipe heads refer to 403. 1 (17). <hereafter, omitted></p>	<p>Section 15 Hull Surveys for Liquefied Gas Carriers 1501. General</p> <p>1. ~ 2. <same as the present></p> <p>3. Procedures for thickness measurements</p> <p>(1) Follow the procedure for thickness measurement of Ch 2, Sec 1. 110. (2018)</p> <p>1502. Annual Survey</p> <p>1. General</p> <p>(1) The due range of Annual Survey is to be in accordance with the requirements of 201.</p> <p>(2) 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.</p> <p>(3) A survey planning meeting is to be held prior to the commencement of the survey. (2018) <same as the present></p> <p>1503. <omitted></p> <p>1504. Special Survey</p> <p>1. General</p> <p>(1) ~ (5) <same as the present></p> <p>(6) The survey extent of ballast tanks converted to void spaces is to be specially considered for close-up surveys and thickness measurements in relation to the requirements for ballast tanks. (2018)</p> <p>Note : For survey of automatic air pipe heads refer to 403. 1 (17). <hereafter, same as present></p>

Present	Amendments
<p>Section 18 Special Requirements for Ships Subject to Korean Ship Safety Act or Fishing Vessels Act</p> <p>1801. Special requirements for ships subject to Korean Ship Safety Act [See Guidance]</p> <ol style="list-style-type: none"> 1. In application to 202. 2(Fire-extinguishing appliances at Annual Survey), 302. 2(Fire-extinguishing appliances at Intermediate Survey) and 404.(Fire-extinguishing appliances at Special Survey), the survey for fire-extinguishing appliances is to be in accordance with the relevant requirements of <i>Korean Ship Safety Act</i>. 2. In application to 203.(Machinery, electrical installations and additional installations at Annual Survey), insulation resistance test and performance test of electrical installations are to be made. However, these tests may be dispensed with, where it is found that the measured records of insulation resistance remain efficient and they comply with the requirements specified in Pt 6, Ch 1, 1701. 1. 3. In application to 301.(Intermediate Survey), <u>Intermediate Surveys</u> for Ships of 24 m in length and above and 30 years of age and over after launching date are to be carried out within 3 months before or after each anniversary date. 4. At the Intermediate Survey according to Par 3 above, the following relevant requirements are applied only at the Intermediate Survey carried out within 3 months before or after the second or third anniversary date from the completion date of the previous Special Survey in accordance with 301. <ol style="list-style-type: none"> (1) 1403. (2) 1503. (3) Ch 3, 201. 1 (3), (4), (6) and 203. (4) Ch 3, 303. (5) Ch 3, 403. (6) Ch 3, 503. (7) Ch 3, 603. <p style="text-align: center;"><hereafter, omitted></p>	<p>Section 18 Special Requirements for Ships Subject to Korean Ship Safety Act or Fishing Vessels Act</p> <p>1801. Special requirements for ships subject to Korean Ship Safety Act [See Guidance]</p> <ol style="list-style-type: none"> 1. In application to 202. 2(Fire-extinguishing appliances at Annual Survey), 302. 2(Fire-extinguishing appliances at Intermediate Survey) and 404.(Fire-extinguishing appliances at Special Survey), the survey for fire-extinguishing appliances is to be in accordance with the relevant requirements of <i>Korean Ship Safety Act</i>. 2. In application to 203.(Machinery, electrical installations and additional installations at Annual Survey), insulation resistance test and performance test of electrical installations are to be made. However, these tests may be dispensed with, where it is found that the measured records of insulation resistance remain efficient and they comply with the requirements specified in Pt 6, Ch 1, 1701. 1. 3. In application to 301.(Intermediate Survey), <u>Intermediate Surveys and Docking Survey(In-water Survey not to be allowed)</u> for Ships of 24 m in length and above and 30 years of age and over after launching date are to be carried out within 3 months before or after each anniversary date. <i>(2018)</i> 4. At the Intermediate Survey according to Par 3 above, the following relevant requirements are applied only at the Intermediate Survey carried out within 3 months before or after the second or third anniversary date from the completion date of the previous Special Survey in accordance with 301. <ol style="list-style-type: none"> (1) 1403. (2) 1503. (3) Ch 3, 201. 1 (3), (4), (6) and 203. (4) Ch 3, 303. (5) Ch 3, 403. (6) Ch 3, 503. (7) Ch 3, 603.. <p style="text-align: center;"><hereafter, same as present></p>

Present	Amendments
<p style="text-align: center;">CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME</p> <p style="text-align: center;">Section 1 General</p> <p>101. <omitted></p> <p>102. Preparations for survey</p> <p style="padding-left: 20px;">1.~6. <omitted></p> <p>7. Survey planning meeting</p> <p style="padding-left: 20px;">(1) <u>The establishment of proper preparation and close co-operation between the attending Surveyor(s) and the Owner's representatives onboard prior to and during the survey are an essential part in the safe and efficient conduct of the survey. During the survey on board safety meetings are to be held regularly.</u></p> <p style="padding-left: 20px;">(2) <u>Prior to the commencement of any part of the Special and Intermediate Survey, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance, the thickness measurement company operator(as applicable) and the master of the ship or an appropriately qualified representative appointed by the master or company for the purpose to ascertain that all the arrangements envisaged in the survey programme are in place, so as to ensure the safe and efficient conduct of the survey work to be carried out. [See Guidance]</u></p> <p style="text-align: center;"><hereafter, omitted></p>	<p style="text-align: center;">CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME</p> <p style="text-align: center;">Section 1 General</p> <p>101. <same as the present></p> <p>102. Preparations for survey</p> <p style="padding-left: 20px;">1.~6. <same as the present></p> <p>7. Survey planning meeting</p> <p style="padding-left: 20px;">(1) Follow the procedure of Survey planning meeting of Ch 2, Sec 1. 109. (2018)</p> <p style="padding-left: 20px;"><hereafter, same as present></p>

Present	Amendments
<p>103. Documentation on board</p> <p>1.~3 <omitted></p> <p>4. Review of documentation on board</p> <p>(1) Prior to survey, the Surveyor is to examine the completeness of the documentation onboard, and its contents as a basis for the survey.</p> <p>(2) For tankers and bulk carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10, on completion of the survey, the Surveyor is to verify that the update of the Ship Construction File(SCF) has been done whenever a modification of the documentation included in the SCF has taken place. <newly added></p> <p><hereafter, omitted></p>	<p>103. Documentation on board</p> <p>1.~3 <same as the present></p> <p>4. Review of documentation on board</p> <p>(1) <same as the present></p> <p>(2) For tankers and bulk carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10, on completion of the survey, the Surveyor is to verify that the update of the Ship Construction File(SCF) has been done whenever a modification of the documentation included in the SCF has taken place.</p> <p>(A) For the SCF stored on board ship, the surveyor is to examine the information on board ship. In cases where any major event, including, but not limited to, substantial repair and conversion, or any modification to the ship structures, the surveyor is to also verify that the updated information is kept on board the ship. If the updating of the SCF onboard is not completed at the time of survey, the Surveyor records it and requires confirmation at the next periodical survey. (2018)</p> <p>(B) For the SCF stored on shore archive, the surveyor is to examine the list of information included on shore archive. In cases where any major event, including, but not limited to, substantial repair and conversion, or any modification to the ship structures, the surveyor is to also verify that the updated information is stored on shore archive by examining the list of information included on shore archive or kept on board the ship. In addition, the surveyor is to confirm that the service contract with of the Archive Center is valid. If the updating of the SCF Supplement ashore is not completed at the time of survey, the Surveyor records it and requires confirmation at the next periodical survey. (2018)</p> <p><hereafter, same as present></p>

Present	Amendments
<p>104. Procedures for thickness measurements [See Guidance]</p> <p>1. General</p> <p>(1) <u>The required thickness measurements, if not carried out by the Society itself, are to be witnessed by a Surveyor. The Surveyor is to be on board to the extent necessary to control the process. In this case, the control of thickness measurement process, review, verification and record of attendance are to be in accordance with the separate requirements specified by the Society.</u></p> <p>(2) <u>The thickness measurement company is to be part of the survey planning meeting to be held prior to commencing the survey.</u></p> <p>(3) <u>Thickness measurements of structures in areas where Close-up Surveys are required shall be carried out simultaneously with Close-up Surveys.</u></p> <p>(4) <u>In all cases the extent of the thickness measurements is to be sufficient as to represent the actual average condition.</u></p> <p>(5) <u>The thickness measurements are to be carried out by a qualified company certified by the Society.</u></p> <p>2. Locations and number of measurements</p> <p><omitted></p> <p>3. Reporting</p> <p>(1) <u>A thickness measurement report is to be prepared. The report is to give the location of measurements, the thickness measured as well as corresponding original thickness. Furthermore, the report is to give the date when the measurement was carried out, type of measuring equipment, names of personnel and their qualifications and has to be signed by the operator. The thickness measurement report is to follow the principles as specified in Annex 1-5 of the Guidance.</u></p> <p>(2) <u>The Surveyor is to review the final thickness measurements report and countersign the cover page.</u></p> <p><hereafter, omitted></p>	<p>104. Procedures for thickness measurements [See Guidance]</p> <p>1. General (2018)</p> <p>(1) Follow the procedure for thickness measurement of Ch 2, Sec 1 110. (2018)</p> <p>2. Locations and number of measurements</p> <p><same as the present></p> <p>3. Reporting (2018)</p> <p>(1) Follow the procedure for thickness measurement of Ch 2, Sec 1 110.</p> <p><hereafter, same as present></p>

Present	Amendments
<p style="text-align: center;">Section 2 Bulk Carriers</p> <p>201.~203 <omitted></p> <p>204. Special Survey</p> <p>1. General</p> <p>(1) ~(4) <omitted></p> <p>(5) <u>The survey extent of ballast tanks converted to void spaces is to be specially considered in relation to the requirements for ballast tanks.</u></p> <p>(6) A survey in dry dock is to be a part of the Special Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and ballast tanks are to be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.</p> <p>Note : Lower portions of the cargo holds and ballast tanks are considered to be the parts below light ballast water line.</p> <p style="text-align: center;"><hereafter, omitted></p>	<p style="text-align: center;">Section 2 Bulk Carriers</p> <p>201.~203 <same as the present></p> <p>204. Special Survey</p> <p>1. General</p> <p>(1) ~(4) <same as the present></p> <p>(5) <u>The survey extent of ballast tanks converted to void spaces is to be specially considered for close-up survey and thickness measurements in relation to the requirements for ballast tanks. (2018)</u></p> <p>(6) A survey in dry dock is to be a part of the Special Survey. The Overall and Close-up Surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and ballast tanks are to be carried out in accordance with the applicable requirements for Special Surveys, if not already performed.</p> <p>Note : Lower portions of the cargo holds and ballast tanks are considered to be the parts below light ballast water line.</p> <p style="text-align: center;"><hereafter, same as present></p>

Amended Guidance Relating to the Rules for the Classification of Steel Ships

(Part 1 Classification and Surveys)



- Main Amendments -

- (1) Effective date : The contract date for ship construction or the application date for survey on or after 2018.1.1
 - To reflect IACS UR S14(Rev.6 Sep 2016)
 - (The contract date for ship construction on or after 2018.1.1)
 - To reflect IACS UR Z 23(Rev.6 Nov. 2016)
 - (The contract date for ship construction on or after 2018.1.1)
 - To reflect IACS UR Z17(Rev.12 Nov. 2016)
 - To reflect EMSA Shortcoming for corrective action
 - To amend unreasonable contents disclosed while implementing the Rules

Present	Amendments
<p style="text-align: center;">CHAPTER 1 CLASSIFICATION</p> <p style="text-align: center;">Section 1 ~ Section 2 <omitted></p> <p style="text-align: center;">Section 3 Classification Survey during Construction</p> <p>301. ~ 305. <omitted></p> <p>306. Tests</p> <p><u>In application to 306. of the Rules, the term "considered necessary tests" means the tests specified in Pt 6, Ch 2, 302. and 303. of the Rules. (for CMA Ships or UMA Ships as defined in Pt 9, the requirements specified in Pt 9, Ch 3, 204. and 205. of the Rules are to be applied)</u></p> <p><hereafter, omitted></p>	<p style="text-align: center;">CHAPTER 1 CLASSIFICATION</p> <p style="text-align: center;">Section 1 ~ Section 2 <same as present></p> <p style="text-align: center;">Section 3 Classification Survey during Construction</p> <p>301. ~ 305. <same as present></p> <p>306. Tests</p> <p><u>Procedures for Testing Tanks and Tight Boundaries is to be followed specified in Annex 1-16. And in application to 306. of the Rules, the term "considered necessary tests" means the tests specified in Pt 6, Ch 2, 302. and 303. of the Rules. (for CMA Ships or UMA Ships as defined in Pt 9, the requirements specified in Pt 9, Ch 3, 204. and 205. of the Rules are to be applied) <i>(2018)</i></u></p> <p><hereafter, same as present></p>

Present	Amendments
<p style="text-align: center;">CHAPTER 2 PERIODICAL AND OTHER SURVEYS</p> <p style="text-align: center;">Section 1 General</p> <p>101. to 108. <omitted> <newly added></p> <p>109. Procedures for thickness measurements</p> <p>1. In application to 109. 1 of the Rules, "an appropriately qualified representative" means a ship's officer.</p> <p>2. Methods of thickness measurement are to comply with the requirements specified in Annex 1-5 of the Guidance.</p> <p>110. Preparations for survey</p> <p>1. In application to 110. 1 (6) and (7) of the Rules, the Surveyor is to consider following items and so on when require to remove casings, ceilings or linings, and loose insulation. <omitted></p> <p>2. In application to 110. 1 (7) of the Rules, "insulations in way" means the extent of insulations to determine the extent of the poor coating condition behind the insulation.</p> <p>3. In application to 110. 3 (2) of the Rules, "deemed necessary by the Surveyor" means the cases as specified in Ch 1, 801. 2 of the Guidance.</p> <p>4. In application to 110. 4 (4) of the Rules, "at the sole discretion of the Surveyor" means the cases as specified in Ch 3, 102. 6 (3) of the Rules. <hereafter, omitted></p>	<p style="text-align: center;">CHAPTER 2 PERIODICAL AND OTHER SURVEYS</p> <p style="text-align: center;">Section 1 General</p> <p>101. to 108. <same as present></p> <p>109. Survey planing meeting and safety meeting (2018)</p> <p>1. In application to 109. 2 of the Rules, "an appropriately qualified representative" means a ship's officer.</p> <p>110. Procedures for thickness measurements (2018)</p> <p>1. In application to 109. 1 of the Rules, "an appropriately qualified representative" means a ship's officer.</p> <p>1. Methods of thickness measurement are to comply with the requirements specified in Annex 1-5 of the Guidance.</p> <p>111. Preparations for survey</p> <p>1. In application to 110. 1 (6) and (7) of the Rules, the Surveyor is to consider following items and so on when require to remove casings, ceilings or linings, and loose insulation. <same as present></p> <p>2. In application to 111. 1 (7) of the Rules, "insulations in way" means the extent of insulations to determine the extent of the poor coating condition behind the insulation. (2018)</p> <p>3. In application to 111. 3 (1) of the Rules, "deemed necessary by the Surveyor" means the cases as specified in Ch 1, 801. 2 of the Guidance. (2018)</p> <p>4. In application to 111. 4 (4) of the Rules, "at the sole discretion of the Surveyor" means the cases as specified in Ch 3, 102. 6 (3) of the Rules. (2018)</p> <p><hereafter, same as present></p>

Present	Amendments
<p style="text-align: center;">Section 4 Special Survey (Hull, Equipment and Fire-extinguishing Appliances)</p> <p>401. <omitted></p> <p>403. Requirements of survey</p> <p>1. ~ 4. <omitted></p> <p>5. In application to 403. 1 (13) of the Rules, "deemed necessary" means the cases as specified in Ch 1, 801. 3 of the Guidance.</p> <p>6. In application to Table 1.2.6 NOTES 5 of the Rules, "deemed necessary" means the cases as specified in Ch 1, 801. 4 of the Guidance.</p> <p>7. In application to 403. 1 (15) of the Rules, the term "considered necessary by the Surveyor" means the cases as specified in Ch 1, 801. 6 of the Guidance.</p> <p>8. In application to 403. 1 (19) of the Rules, "deemed necessary" means the cases as specified in Ch 1, 801. 2 of the Guidance.</p> <p><hereafter, omitted></p>	<p style="text-align: center;">Section 4 Special Survey (Hull, Equipment and Fire-extinguishing Appliances)</p> <p>401. <same as present></p> <p>403. Requirements of survey</p> <p>1. ~ 4. <same as present></p> <p>5. In application to 403. 1 (12) of the Rules, "deemed necessary" means the cases as specified in Ch 1, 801. 3 of the Guidance. <i>(2018)</i></p> <p>6. In application to Table 1.2.6 NOTES 5 of the Rules, "deemed necessary" means the cases as specified in Ch 1, 801. 4 of the Guidance.</p> <p>7. In application to 403. 1 (14) of the Rules, the term "considered necessary by the Surveyor" means the cases as specified in Ch 1, 801. 6 of the Guidance. <i>(2018)</i></p> <p>8. In application to 403. 1 (18) of the Rules, "deemed necessary" means the cases as specified in Ch 1, 801. 2 of the Guidance. <i>(2018)</i></p> <p><hereafter, same as present></p>

Present	Amendments
<p style="text-align: center;">CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME</p> <p style="text-align: center;">Section 1 General</p> <p>102. Preparations for survey</p> <ol style="list-style-type: none"> 1. In application to 102. 1 (5) of the Rules, the term "when considered necessary and appropriate" means the cases where it may assist in identifying critical structural areas, nomination suspect areas and in focusing attention on structural elements or areas of structural elements which may be particularly susceptible to, or evidence a history of, wastage or damage. 2. In application to 102. 4 (2) of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in Ch 1, 801. 2 of the Guidance. 3. In application to 102. 7 (2) of the Rules, the term "<u>an appropriately qualified representative</u>" means a ship's officer. <p>103. Documentation on board</p> <p>The Owner's inspection reports specified in 103. 3 (1) (E) of the Rules is shown in Annex 1-4 of the Guidance</p> <p>104. Procedure for thickness measurement</p> <p>Methods of thickness measurement are to be comply with the requirements specified in Annex 1-5 of the Guidance.</p>	<p style="text-align: center;">CHAPTER 3 HULL SURVEYS OF SHIPS SUBJECT TO THE ENHANCED SURVEY PROGRAMME</p> <p style="text-align: center;">Section 1 General</p> <p>102. Preparations for survey <i>(2018)</i></p> <ol style="list-style-type: none"> 1. In application to 102. 1 (5) of the Rules, the term "when considered necessary and appropriate" means the cases where it may assist in identifying critical structural areas, nomination suspect areas and in focusing attention on structural elements or areas of structural elements which may be particularly susceptible to, or evidence a history of, wastage or damage. 2. In application to 102. 4 (2) of the Rules, the term "deemed necessary by the Surveyor" means the cases as specified in Ch 1, 801. 2 of the Guidance. 3. In application to 102. 7 (2) of the Rules, the term "<u>an appropriately qualified representative</u>" means a ship's officer. <p>103. Documentation on board</p> <p>The Owner's inspection reports specified in 103. 3 (1) (E) of the Rules is shown in Annex 1-4 of the Guidance</p> <p>104. Procedure for thickness measurement</p> <p>Methods of thickness measurement are to be comply with the requirements specified in Annex 1-5 of the Guidance.</p>

Present	Amendments
<p style="text-align: center;">Section 2 Bulk Carriers</p> <p>201. General <omitted></p> <p>202. Annual Survey</p> <p>1.~5. <omitted></p> <p>6. In application to 202. 6 (2) of the Rules, "the Guidance" means the requirements specified as follows.</p> <p>(1) General</p> <p>(A)~(B) Omitted</p> <p>(C) Extent of thickness measurement</p> <p>(a) Thickness measurement is to be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to Close-up Survey, as described in (B) (a) (i) and (b) (i) above. <u>The minimum requirement for thickness measurement for thickness measurements are suspect areas identified at previous surveys.</u> Where substantial corrosion is found, the extent of thickness measurements should be increased with the requirements of Annex 1-5, Table 14 of the Guidance.</p> <p>(b) <u>The thickness measurement may be dispensed with provided the Surveyor is satisfied by the Close-up Survey, that there is no structural diminution and the hard protective coating where fitted remains effective.</u></p> <p>Ref) Rule Ch 3, 202.6</p> <p>6. Additional Annual Survey requirements for the foremost cargo hold of ships subject to SOLAS XII/9.1</p> <p>(1) Ships subject to SOLAS XII/9.1 are those meeting all the following conditions;</p> <ul style="list-style-type: none"> - Bulk Carriers of 150 m in length and upwards of single side skin construction, - carrying solid bulk cargoes having a density of 1780 kg/m³ and above, - contracted for construction before 1 July 1999, and - constructed with an insufficient number of transverse watertight bulkheads to enable them to withstand flooding of the foremost cargo hold in all loading conditions and remain afloat in a satisfactory condition of equilibrium as specified in SOLAS XII/4.3. 	<p style="text-align: center;">Section 2 Bulk Carriers</p> <p>201. General <same as present></p> <p>202. Annual Survey</p> <p>1.~5. <same as present></p> <p>6. In application to 202. 6 (2) of the Rules, "the Guidance" means the requirements specified as follows.</p> <p>(1) General</p> <p>(A)~(B) Omitted</p> <p>(C) Extent of thickness measurement <i>(2018)</i></p> <p>(a) Thickness measurement is to be carried out to an extent sufficient to determine both general and local corrosion levels at areas subject to Close-up Survey, as described in (B) (a) (i) and (b) (i) above <u>and case of areas found to be suspect at previous surveys, the thickness measurement for suspect areas are to be carried out additionally. The minimum requirement for thickness measurement for thickness measurements are suspect areas identified at previous surveys.</u> Where substantial corrosion is found, the extent of thickness measurements should be increased with the requirements of Annex 1-5, Table 14 of the Guidance.</p> <p>(b) <u>The thickness measurement may be dispensed with provided the Surveyor is satisfied by the Close-up Survey, that there is no structural diminution and the hard protective coating where fitted remains effective.</u></p>

Present			Amendments		
Annex 1-1 Character of Classification			Annex 1-1 Character of Classification		
1. Class Notation			1. Class Notation		
1.1 Ship Type and Special Feature Notations			1.1 Ship Type and Special Feature Notations		
Ship Types	Special Feature Notations	Remarks	Ship Types	Special Feature Notations	Remarks
1. ~ 29. <omitted>			1. ~ 29. <same as present>		
30. Floating Structure	Hotel Restaurant Leisure		30. Floating Structure	Hotel Restaurant Leisure	
			(32)	Port to be installed	Total net lifting capacity
			31. Shiplift and Transfer System (2018)	(port to be specified)	MDL x effective platform length
					(32) : See example given in Ch 1 Section 1 & Section 2 of Guidance for Shiplift and Transfer system

Present

(Remarks) ⁽³²⁾ : <omitted>

Additional Special Feature Notations	Relevant Requirements
<omitted>	
Winterization H (2017)	to ships where materials for hull construction at low temperature specified in Ch 4, Sec 2 of the Guidance for Ships for Navigation in Ice are applied.
Winterization M (2017)	to ships where materials for equipment and components at low temperature specified in compliance with Ch 4, Sec 3 of the Guidance for Ships for Navigation in Ice are applied.
Winterization E1(<i>t</i>), Winterization E2(<i>t</i>), Winterization E3(<i>t</i>) (2017)	to ships where equipment and systems are in compliance with Ch 4, Sec 4, Sec 5 and Sec 6 of the Guidance for Ships for Navigation in Ice in association with a lowest external design air temperature of <i>t</i> degrees Celsius.
Winterization S(A), Winterization S(B), Winterization S(C) (2017)	to ships where stability are in compliance with Ch 4, Sec 7 of the Guidance for Ships for Navigation in Ice in association with the ice accretion values specified in Ch 4, Sec 7 of the Guidance for Ships for Navigation in Ice .
Winterization D(<i>t</i>) (2017)	to ships where alternative designs complied with Ch 4, Sec 8 of the Guidance for Ships for Navigation in Ice in association with a lowest external design air temperature of <i>t</i> degrees Celsius are applied.
Winterization IR (2017)	to ships where ice removal arrangements specified in compliance with Ch 4, Sec 9 of the Guidance for Ships for Navigation in Ice is applied.

<hereafter, omitted>

Amendments

(Remarks) ⁽³³⁾ : <same as present>

Additional Special Feature Notations	Relevant Requirements
<same as present>	
H(<i>t</i>)	to ships where materials for hull construction at an external design air temperature of <i>t</i> degrees Celsius low temperature specified in Ch 4, Sec 2 of the Guidance for Ships for Navigation in Ice are applied.
M(<i>t</i>)	to ships where materials for equipment and components at an external design air temperature of <i>t</i> degrees Celsius low temperature specified in compliance with Ch 4, Sec 3 of the Guidance for Ships for Navigation in Ice are applied.
Winterization (H(<i>t</i>), M(<i>t</i>), E1(<i>t</i>), E2(<i>t</i>), E3(<i>t</i>), S(A), S(B), S(C), D(<i>t</i>), IR) (2018)	to ships where equipment and systems are in compliance with Ch 4, Sec 4, Sec 5 and Sec 6 of the Guidance for Ships for Navigation in Ice in association with an lowest external design air temperature of <i>t</i> degrees Celsius.
S(A), S(B), S(C)	to ships where stability are in compliance with Ch 4, Sec 7 of the Guidance for Ships for Navigation in Ice in association with the ice accretion values specified in Ch 4, Sec 7 of the Guidance for Ships for Navigation in Ice .
D(<i>t</i>)	to ships where alternative designs complied with Ch 4, Sec 8 of the Guidance for Ships for Navigation in Ice in association with an lowest external design air temperature of <i>t</i> degrees Celsius are applied.
IR	to ships where ice removal arrangements specified in compliance with Ch 4, Sec 9 of the Guidance for Ships for Navigation in Ice is applied.

Present

ASFN	Relevant Requirements
<omitted>	
(LC, LC-G, HSLC - SA0, SA1, SA2, SA3, SA4, SA5) (2017)	LC : to Light Craft as specified in Pt 1, Ch 1, 103. (1) of the Rules for the Classification of High Speed and Light Crafts.
	LC-G : to Light Craft as specified in Annex 1 and Annex 2 of the Guidance relating to the Rules for the Classification of High Speed and Light Crafts, 1998 edition.
	HSLC : to High Speed and Light Craft as specified in Pt 1, Ch 1, 103. (2) of the Rules for the Classification of High Speed and Light Crafts.
	SA0, SA1, SA2, SA3, SA4, SA5 : The service restriction notation specified in Pt 3, Ch 1, 121. of the Rules for the Classification of High Speed and Light Crafts.
(HSC), (HSC-A), (HSC-B), (FGHSC)	<omitted>
<hereafter, omitted>	

Amendments

ASFN	Relevant Requirements
<same as present>	
<u>(LC), (LC-G), (HSLC - SA0, SA1, SA2, SA3, SA4, SA5)</u> (2018)	LC : to Light Craft as specified in Pt 1, Ch 1, 103. (1) of the Rules for the Classification of High Speed and Light Crafts.
	LC-G : to Light Craft as specified in Annex 1 and Annex 2 of the Guidance relating to the Rules for the Classification of High Speed and Light Crafts, 1998 edition.
	HSLC : to High Speed and Light Craft as specified in Pt 1, Ch 1, 103. (2) of the Rules for the Classification of High Speed and Light Crafts.
	SA0, SA1, SA2, SA3, SA4, SA5 : The service restriction notation specified in Pt 3, Ch 1, 121. of the Rules for the Classification of High Speed and Light Crafts.
(HSC), (HSC-A), (HSC-B), (FGHSC)	<same as present>
<hereafter, same as present>	

Present	Amendments
<p style="text-align: center;">Appendix 1-11-1 Special Requirements for Various Categories of Service Suppliers</p> <p>1~5. <omitted></p> <p>6. Firms engaged in tightness testing of primary and secondary barriers of gas carrier with membrane cargo containment systems for vessels in service</p> <p>6.1 ~ 6.3 <omitted></p> <p>6.4 Requirements for firms engaged in thermographic testing</p> <p>6.4.1 ~ 6.4.2 <omitted></p> <p>6.4.3 Supervisor</p> <p>The responsible supervisor shall be certified to a recognized national or international industrial standard(e.g. level II, ISO 9712 as amended or SNT-TC-1A as amended) with additional certification in infrared/thermal testing. <u>Certification by the supplier is not allowed and must be obtained through an independent certification body.</u></p> <p>6.4.4 Operators</p> <p>The operators carrying out the imaging shall be certified to a recognized national or international industrial standard(e.g. level II, ISO 9712 as amended or SNT-TC-1A as amended) with additional certification in infrared/thermal testing and shall have adequate knowledge of ship structures sufficient to determine position for each identified image, and of the cargo containment system to understand the basis of the testing. <u>Certification by the supplier is not allowed and must be obtained through an independent certification body.</u></p> <p><hereafter, omitted></p>	<p style="text-align: center;">Appendix 1-11-1 Special Requirements for Various Categories of Service Suppliers</p> <p>1~5. <same as present></p> <p>6. Firms engaged in tightness testing of primary and secondary barriers of gas carrier with membrane cargo containment systems for vessels in service</p> <p>6.1 ~ 6.3 <same as present></p> <p>6.4 Requirements for firms engaged in thermographic testing</p> <p>6.4.1 ~ 6.4.2 <same as present></p> <p>6.4.3 Supervisor</p> <p>The responsible supervisor shall be certified to a recognized national or international industrial standard(e.g. level II, ISO 9712 as amended or SNT-TC-1A as amended) with additional certification in infrared/thermal testing. <u>Certification by the supplier is not allowed and must be obtained through an independent certification body. SNT-TC-1A certified personnel must provide evidence that training on Level II or above has been administered by an independent training body centrally certified to ASNT or a comparable nationally recognized certification scheme. (2018)</u></p> <p>6.4.4 Operators</p> <p>The operators carrying out the imaging shall be certified to a recognized national or international industrial standard(e.g. level II, ISO 9712 as amended or SNT-TC-1A as amended) with additional certification in infrared/thermal testing and shall have adequate knowledge of ship structures sufficient to determine position for each identified image, and of the cargo containment system to understand the basis of the testing. <u>Certification by the supplier is not allowed and must be obtained through an independent certification body. SNT-TC-1A certified personnel must provide evidence that training on Level I or above has been administered by an independent training body centrally certified to ASNT or a comparable nationally recognized certification scheme. (2018)</u> <hereafter, same as present></p>

Present	Amendments
<p>6.4.6 Evaluation of thermographic images Must be carried out by the supervisor or individuals certified to a recognized national or international industrial standard(e.g. level II, ISO 9712 as amended or SNT-TC-1A as amended) with additional certification in infrared/thermal testing. <u>Certification by the supplier is not allowed and must be obtained through an independent certification body.</u></p> <p><hereafter, omitted></p>	<p>6.4.6 Evaluation of thermographic images Must be carried out by the supervisor or individuals certified to a recognized national or international industrial standard(e.g. level II, ISO 9712 as amended or SNT-TC-1A as amended) with additional certification in infrared/thermal testing. <u>Certification by the supplier is not allowed and must be obtained through an independent certification body. SNT-TC-1A certified personnel must provide evidence that training on Level II or above has been administered by an independent training body centrally certified to ASNT or a comparable nationally recognized certification scheme. (2018)</u></p> <p><hereafter, same as present></p>

Present

Annex 1-12 Hull Survey for Classification Survey during Construction

<omitted>

Table 1 Surveyable Items Activities Table									
Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	Statutory requirements and relevant reference	Documentation available to classification Surveyor during construction	Documentation for ship construction file	Specific activities	Classification Society proposals for the project
2	Steel preparation and fit up								
<omitted>									
2.5	Conformity for critical areas with alignment/fit up or weld configuration	Check alignment/fit up/gap against approved drawings	<u>Patrol and review</u>	Rec 47		Shipbuilders and recognised standards and Rules as applicable, approved plan or standard, builder's records	Approved plans of critical areas if applicable	Verify that the information relevant to the latest approved drawings is available at the workstations	
								Verify the processes to ensure satisfactory fit up and alignment at all workstations	
								Verify that edge preparations are re-instated where lost during fitting operations	
								Verify remedial procedures are in place to compensate for wide gaps and alignment deviations	

Amendments

Annex 1-12 Hull Survey for Classification Survey during Construction

<same as present>

Table 1 Surveyable Items Activities Table									
Reference	Shipbuilding function	Survey Requirements for Classification	Survey Method required for Classification	IACS reference*	Statutory requirements and relevant reference	Documentation available to classification Surveyor during construction	Documentation for ship construction file	Specific activities	Classification Society proposals for the project
2	Steel preparation and fit up								
<same as present>									
2.5 <i>(2018)</i>	Conformity for critical areas, when defined, with alignment/fit up or weld configuration	Check alignment/fit up/gap against approved drawings	Patrol and review Witness and review	Rec 47		Shipbuilders and recognised standards and Rules as applicable, approved plan or standard, builder's records	Approved plans of critical areas if applicable	Verify that the information relevant to the latest approved drawings is available at the workstations	
								Verify the processes to ensure satisfactory fit up and alignment at all workstations	
								Verify that edge preparations are re-instated where lost during fitting operations	
								Verify remedial procedures are in place to compensate for wide gaps and alignment deviations	

Present	Amendments
<p style="text-align: center;">Appendix 1-12-2 Requirements for Tankers and Bulk Carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10(Goal-based ship construction standards for bulk carriers and oil tankers)</p> <p>1.~2. <omitted></p> <p>3. Ship Construction File(SCF)</p> <p>3.1 A Ship Construction File(SCF) with specific information on how the functional requirements of the Goal-based Ship Construction Standards for Bulk Carriers and Oil Tankers have been applied in the ship design and construction is to be provided upon delivery of a new ship, and kept on board the ship and/or ashore and updated as appropriate throughout the ship's service. The contents of the Ship Construction File are to conform to the requirements below.</p> <p>3.1.1 The following design specific information is to be included in the Ship Construction File(SCF): <omitted></p> <p>3.1.8 The SCF should be updated throughout the ship's life at any major event, including, but not limited to, substantial repair and conversion, or any modification to the ship structure.</p> <p><newly added></p> <p><hereafter, omitted></p>	<p style="text-align: center;">Appendix 1-12-2 Requirements for Tankers and Bulk Carriers subject to SOLAS Ch II-1 Pt A-1 Reg.3-10 (Goal-based ship construction standards for bulk carriers and oil tankers)</p> <p>1.~2. <same as present></p> <p>3. Ship Construction File(SCF)</p> <p>3.1 A Ship Construction File(SCF) with specific information on how the functional requirements of the Goal-based Ship Construction Standards for Bulk Carriers and Oil Tankers have been applied in the ship design and construction is to be provided upon delivery of a new ship, and kept on board the ship and/or ashore and updated as appropriate throughout the ship's service. The contents of the Ship Construction File are to conform to the requirements below.</p> <p>3.1.1 The following design specific information is to be included in the Ship Construction File(SCF): <same as present></p> <p>3.1.8 The SCF should be updated throughout the ship's life at any major event, including, but not limited to, substantial repair and conversion, or any modification to the ship structure.</p> <p><u>3.2 The SCF shall be reviewed³⁾, at the time of new building, in accordance with the requirements of paragraphs 3.1.1 and 3.1.2 and the normal storage location shall be distinguished.</u></p> <p><u>3.2.1 For the SCF stored on board ship, the surveyor is to verify that the information is placed on board the ship, upon completion of ship construction.</u></p> <p><u>3.2.2 For the SCF stored on shore archive, the surveyor is to verify that the information is stored on shore archive by examining the list of information included on shore archive, upon completion of ship construction.</u></p> <p><hereafter, same as present></p>

Present	Amendments
<p>(NOTES)</p> <p>1) Tier II items means the functional requirements included in the International Goal-based Ship Construction Standards for Bulk Carriers and Oil Tankers(GBS), adopted by IMO Res.MSC.287(87)</p> <p>2) Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers, adopted by IMO Res. MSC.215(82), as amended and Performance standard for protective coatings for cargo oil tanks of crude oil tankers, adopted by IMO Res.MSC.288(87), as amended</p> <p><newly added></p> <p><hereafter, omitted></p>	<p>(NOTES)</p> <p>1) Tier II items means the functional requirements included in the International Goal-based Ship Construction Standards for Bulk Carriers and Oil Tankers(GBS), adopted by IMO Res.MSC.287(87)</p> <p>2) Performance standard for protective coatings for dedicated seawater ballast tanks in all types of ships and double-side skin spaces of bulk carriers, adopted by IMO Res. MSC.215(82), as amended and Performance standard for protective coatings for cargo oil tanks of crude oil tankers, adopted by IMO Res.MSC.288(87), as amended</p> <p>3) <u>“Review” means the examination of the SCF that is carried out by the surveyor, at the end of the newbuilding process, in order to confirm that:</u></p> <ul style="list-style-type: none"> - <u>drawings and documents required under the paragraph 3. “Ship Construction File(SCF)” of the appendix 1-12-2 plus</u> - <u>the possible additional drawings/documents provided by the shipyard, as per the Ship Constructional File(SCF) list of drawings/documents</u> <p><u>are present in the copies of the SCF stored on board and in the ashore archive.</u></p> <p><u>The “review” is not to be intended as an assessment of the drawings/documents in order to verify their compliances with the applicable Rules/Regulations. (2018)</u></p> <p><hereafter, same as present></p>

Present	Amendments
<p data-bbox="304 244 584 268">Rule Part 3 Section 2</p> <p data-bbox="293 336 1104 392">209. Procedures for Testing Tanks and Tight Boundaries [See Guidance]</p> <p data-bbox="356 408 1104 496">In the Classification Survey during construction, structural testing, leak testing and hose testing are to be carried out in accordance with the following:</p>	<p data-bbox="1189 244 1895 320"><u>Annex 1-16 Procedures for Testing Tanks and Tight Boundaries (2018)</u></p> <p data-bbox="1196 349 1944 437"><u>In the Classification Survey during construction, structural testing, leak testing and hose testing are to be carried out in accordance with the following:</u></p> <p data-bbox="1176 453 1308 480"><u>1. General</u></p> <p data-bbox="1196 496 1944 644">(1) <u>The testing procedures of watertight compartments are to be carried out in accordance with ANNEX 1-16, the “Procedures for Testing Tanks and Tight Boundaries”. The requirements of ANNEX 1-16 are divided into two parts, PART A and PART B as follows:</u></p> <ul data-bbox="1238 651 1895 738" style="list-style-type: none"> <u>• PART A - SOLAS Ships (including CSR BC & OT)</u> <u>• PART B - Non-SOLAS Ships and SOLAS Exempt /Equivalent Ships</u> <p data-bbox="1196 745 1944 833">(2) <u>Testing procedures of watertight compartments for SOLAS Ships (including CSR BC & OT) are to be carried out in accordance with PART A, unless:</u></p> <p data-bbox="1238 839 1944 1018">(A) <u>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 PART B is equivalent to SOLAS Chapter II-1, Regulation 11; and</u></p> <p data-bbox="1238 1024 1944 1080">(B) <u>the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.</u></p> <p data-bbox="1196 1086 1944 1201">(3) <u>Testing procedures of watertight compartments are to be carried out in accordance with PART B for non-SOLAS ships and those SOLAS ships (including CSR BC & OT) for which:</u></p> <p data-bbox="1238 1208 1944 1388">(A) <u>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 PART B is equivalent to SOLAS Chapter II-1, Regulation 11; and</u></p> <p data-bbox="1238 1394 1944 1450">(B) <u>the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.</u></p>

Present	Amendments
<p>1. General</p> <p>(1) These test procedures are to confirm the watertightness of tanks and watertight boundaries and the structural adequacy of tanks which consist of <u>the watertight subdivisions of ships</u>. 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 during new construction and those relevant to major conversions or <u>major repairs(affecting structural integrity)</u> is to be confirmed by these test procedures prior to the delivery of the ship.</p> <p>2. Application</p> <p>(1) All gravity tanks(gravity tank means a tank that is subject to vapour pressure not greater than 70 kPa.) and other boundaries required to be watertight or weathertight are to be tested in accordance with this pocedure and proven to be tight and structurally adequate as follows:</p> <ul style="list-style-type: none"> · Gravity Tanks for their tightness and structural adequacy, · Watertight boundaries other than tank boundaries for their watertightness, and · Weathertight boundaries for their weathertightness. 	<p style="text-align: center;"><u>PART A - SOLAS Ships</u></p> <p>1 GENERAL</p> <p>(1) These test procedures are to confirm the watertightness of tanks and watertight boundaries and the structural adequacy of tanks which consist of <u>the watertight subdivisions(Watertight subdivision means the transverse and longitudinal subdivisions of the ship required to satisfy the subdivision requirements of SOLAS Chapter II-1.) of ships</u>. 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 during new construction and those relevant to major conversions or <u>major repairs(Major repair means a repair affecting structural integrity)</u> is to be confirmed by these test procedures prior to the delivery of the ship.</p> <p>(2) <u>Testing procedures of watertight compartments for SOLAS Ships (including CSR BC & OT) are to be carried out in accordance with PART A, unless:</u></p> <ul style="list-style-type: none"> (A) <u>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 PART B is equivalent to SOLAS Chapter II-1, Regulation 11; and</u> (B) <u>the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.</u> <p>2 APPLICATION</p> <p>(1) All gravity tanks(gravity tank means a tank that is subject to vapour pressure not greater than 70 kPa.) 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:</p> <ul style="list-style-type: none"> (A) Gravity Tanks for their tightness and structural adequacy, (B) Watertight Boundaries Other Than Tank Boundaries for their watertightness, and (C) Weathertight Boundaries for their weathertightness.

Present	Amendments
<p>(2) The testing of the cargo containment systems of liquefied gas carriers is to be <u>in accordance with standards</u> deemed appropriate by the our Society.</p> <p>(3) The testing of structures not listed in Table 3.1.1 or 3.1.2 is to be specially considered.</p> <p style="text-align: center;"><omitted></p> <p>3. Tests Types and Definition <omitted></p> <p>4. Test Procedures</p> <p>(1) General <omitted></p> <p>(2) Structural test procedures</p> <p>(A) Type and time of test</p> <p>(a) Where a structural test is specified in Table 3.1.1 or Table 3.1.2, a hydrostatic test in accordance with (4) (A) 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 (4) (B) may be accepted instead.</p> <p>(b) A hydrostatic test or hydropneumatic test for the confirmation of structural adequacy may be carried out while the vessel is afloat, provided the results of a leak test are confirmed to be satisfactory before the vessel is afloat.</p> <p>(B) Testing Schedule for New Construction or Major Structural Conversion</p> <p>(a) 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.</p>	<p>(2) The testing of cargo containment systems of liquefied gas carriers is to be <u>in accordance with the testing requirements in 4.20 to 4.26 of Pt 7 Ch 5 of the Rules</u> deemed appropriate by the Classification Society.</p> <p>(3) The testing of structures not listed in Table 3.1.1 or 3.1.2 is to be specially</p> <p><same as present></p> <p>3. Tests Types and Definition <same as present></p> <p>4. TEST PROCEDURES</p> <p>(1) General <same as present></p> <p>(2) Structural test procedures</p> <p>(A) Type and time of test</p> <p>(a) Where a structural test is specified in Table 3.1.1 or Table 3.1.2, a hydrostatic test in accordance with 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 4.4.2 may be accepted instead.</p> <p>(b) hydrostatic test or hydropneumatic test for the confirmation of structural adequacy may be carried out while the vessel is afloat, provided the results of a leak test are confirmed to be satisfactory before the vessel is afloat.</p> <p>(c) <u>Where the cofferdam is waived in accordance with Pt 13, Sub Pt 1, Ch 2, Sec 3, 1.2.4 of the Rules, the structural test is carried out with a test pressure increased by 1 mm in accordance with Pt 13, Sub Pt 1, Ch 2, Sec 3, 1.2.4 of the Rules.</u></p>

Present	Amendments
<p>(B) Testing Schedule for New Construction or Major Structural Conversion</p> <p>(a) 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.</p> <p>(b) 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.</p> <p>(c) Additional tanks may require structural testing if found necessary after the structural testing of the first tank.</p>	<p>(B) Testing Schedule for New Construction or Major Structural Conversion</p> <p>(a) <u>Tanks which are intended to hold liquids, and which form part of the watertight subdivision of the ship, shall be tested for tightness and structural strength as indicated in Table 3.1.1 or Table 3.1.2.</u></p> <p>(b) 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.</p>

Present	Amendments
<p>(d) <u>Where the structural adequacy of the tanks of a vessel were verified by the structural testing required in Table 3.1.1, 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:</u></p> <p>(i) <u>Water-tightness of boundaries of all tanks is verified by leak tests and thorough inspections are carried out.</u></p> <p>(ii) <u>Structural testing is carried out for at least one tank of each type among all tanks of each sister vessel.</u></p> <p>(iii) <u>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.</u></p> <p><u>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 paragraph (b) shall apply in lieu of paragraph (ii).</u></p> <p>(e) <u>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 (d) at the discretion of the Classification Society, provided that:</u></p> <p>(i) <u>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 Classification Society) and:</u></p> <p>(ii) <u>an enhanced NDT programme is implemented for the tanks not subject to structural tests.</u></p>	

Present	Amendments
<p>(f) <u>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 (a) to (e) shall apply, for ballast holds, chain lockers and a representative cargo hold if intended for in-port ballasting.</u></p>	<p>(c) <u>The watertight boundaries of spaces other than tanks for 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 exempted and the requirements for structural testing of tanks in (a) to (b) shall apply, for ballast holds, chain lockers and a representative cargo hold if intended for in-port ballasting.</u></p> <p>(d) <u>Tanks which do not form part of the watertight subdivision of the ship, may be exempted from structural testing provided that the water-tightness of boundaries of exempted spaces is verified by leak tests and inspections.</u></p>

Present	Amendments
<p>(3) Leak test procedures</p> <p>(A) For the leak tests specified in Table 3.1.1, tank air tests, compressed air fillet weld tests, vacuum box test in accordance with (4) (D) through (4) (F), or their combination, will be acceptable. Hydrostatic or hydro-pneumatic tests may also be accepted as leak tests provided that (5), (6) and (7) are complied with. Hose tests will also be acceptable for such locations as specified in Table 3.1.1, note *3, in accordance with (4) (C).</p> <p>(B) Air test 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 (5) (A) for the application of final coatings and (6) for the safe access to joints and the summary in Table 3.1.2-2.</p> <p>(4) Test Methods</p> <p>(A) Hydrostatic test</p> <p>(a) 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 3.1.1 or Table 3.1.2.</p> <p>(b) In cases where <u>a tank for higher density cargoes is to be tested with fresh water or sea water, the testing pressure height is to be specially considered.</u></p> <p>(c) All external surfaces of the tested space are to be examined for structural distortion, bulging and buckling, other related damage and leaks.</p>	<p>(3) Leak test procedures</p> <p>(A) For the leak tests specified in Table 3.1.1, tank air tests, compressed air fillet weld tests, vacuum box test in accordance with (4) (D) through (4) (F), or their combination, will be acceptable. Hydrostatic or hydro-pneumatic tests may also be accepted as leak tests provided that (5), (6) and (7) are complied with. Hose tests will also be acceptable for such locations as specified in Table 3.1.1, note *3, in accordance with (4) (C). <u>The application of the leak test for each type of welded joint is specified in Table 3.1.2-1.</u></p> <p>(B) 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 4.5.1 for the application of final coatings and 4.6 for the safe access to joints and the summary in Table 3.1.2-2.</p> <p>(4) Test Methods</p> <p>(A) Hydrostatic test</p> <p>(a) 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 <u>specified in Table 3.1.1 or Table 3.1.2.</u> <u>Also refer to 4. (7) "Hydrostatic or hydropneumatic tightness test.</u></p> <p>(b) In cases where <u>a tank is designed for cargo densities greater than sea water and testing is higher density cargoes is to be tested</u> with fresh water or sea water, the testing pressure height <u>is to simulate the actual loading for those greater cargo densities as far as practicable to be specially considered.</u></p> <p>(c) All external surfaces of the tested space are to be examined for structural distortion, bulging and buckling, other related damage and leaks.</p>

Present	Amendments
<p>(B) Hydropneumatic test</p> <p>(a) 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 (D) will also apply to hydro-pneumatic tests.</p> <p>(b) All external surfaces of the tested space are to be examined for structural distortion, bulging and buckling, other related damage and leaks.</p> <p><omitted></p> <p>(D) Tank air test</p> <p>(a) All boundary welds, erection joints and penetrations including pipe connections, are to be examined in accordance with the approved procedure and under a stabilized pressure differential above atmospheric pressure not less than $0.15 \cdot 10^5$ Pa, with a leak indicating solution such as soapy water/detergent or a proprietary brand applied.</p> <p>(b) 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. <u>Instead of using a U-tube, two calibrated pressure gauges may be acceptable to verify required test pressure.</u></p> <p><hereafter, omitted></p>	<p>(B) Hydropneumatic test</p> <p>(a) 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 (D) will also apply to hydro-pneumatic tests. Also refer to 4. (7) "Hydrostatic or hydropneumatic tightness test.</p> <p>(b) All external surfaces of the tested space are to be examined for structural distortion, bulging and buckling, other related damage and leaks.</p> <p><same as present></p> <p>(D) Tank air test</p> <p>(a) 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 $0.15 \cdot 10^5$ Pa, with a leak indicating solution such as soapy water/detergent or a proprietary brand applied.</p> <p>(b) 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 140, "Recommendation for Safe Precautions during Survey and Testing of Pressurized Systems".</p> <p><hereafter, same as present></p>

Present	Amendments
<p>(G) Ultrasonic test</p> <p>(a) 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.</p> <p>(H) Penetration test</p> <p>(a) 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.</p> <p>(I) Other test</p> <p>(a) Other methods of testing may be considered by each Classification Society upon submission of full particulars prior to the commencement of testing.</p> <p><hereafter, omitted></p>	<p>(G) Ultrasonic test</p> <p>(a) 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.</p> <p>(H) Penetration test</p> <p>(a) 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.</p> <p>(I) Other test</p> <p>(a) Liquid penetrant testing described in Annex 2-7, 2. (3) of Guidance Pt 2.</p> <p>(b) Other methods of testing may be considered by each Classification Society upon submission of full particulars prior to the commencement of testing.</p> <p><hereafter, same as present></p>

Present

Table 3.1.1 Test Requirements for Tanks and Boundaries [See Guidance]

	Tank or boundary to be tested	Test type	Test head or pressure	Remarks
				-
9	1. Fore peak voids spaces with equipment	Leak	See 4 (4) (C) through 4 (4) (F), as applicable	
	2. Fore peak voids	Leak and Structural(1),(9)	To bulkhead deck	-
	3. Aft peak spaces with equipment	Leak	See 4 (4) (C) through 4 (4) (F), as applicable	-
	4. Aft peak voids	Leak	See 4 (4) (D) through 4 (4) (F), as applicable	-
10	Cofferdams	Leak	See 4 (4) (D) through 4 (4) (F), as applicable	-
				-
19	L.O. sump. tanks and other similar tanks/spaces under main engines	Leak	See 4 (4) (C) through 4 (4) (F), as applicable	-

Note: ⁽¹⁾⁻⁽⁸⁾ <omitted>

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

Amendments

Table 3.1.1 Test Requirements for Tanks and Boundaries ~~[See Guidance]~~

	Tank or boundary to be tested	Test type	Test head or pressure	Remarks
				-
9	1. Fore peak spaces with equipment	Leak	See 4 (4) (C) through 4 (4) (F), as applicable	-
	2. Fore peak voids	Leak and Structural(1),(9)	<u>See 4 (4) (D) through 4 (4) (F), as applicable</u> To bulkhead deck	-
	3. Aft peak spaces with equipment	Leak	See 4 (4) (C) through 4 (4) (F), as applicable	-
	4. Aft peak voids	Leak	See 4 (4) (D) through 4 (4) (F), as applicable	-
	10	Cofferdams	Leak	See 4 (4) (D) through 4 (4) (F), as applicable
				-
19	L.O. sump. tanks and other similar tanks/spaces under main engines	Leak ⁽⁹⁾	See 4 (4) (C) through 4 (4) (F), as applicable	-

Note: ⁽¹⁾⁻⁽⁸⁾ <same as present>

⁽⁹⁾ Where L.O. sump tanks and other similar spaces under main engines intended to hold liquid form part of the watertight subdivision 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. Structural test may be waived where demonstrated to be impracticable to the satisfaction of the Classification Society.

Present

Table 3.1.2 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 Hull structure supporting membrane or semi-membrane tanks Independent tanks type A Independent tanks type B Independent tanks type C	Leak and structural	See Pt 7 Ch 5 Sec. 4 421. to 426.	-
2	Edible liquid tanks	Independent tanks	<u>Leak and structural</u>	The greater of - top of the overflow, or - to 0.9m above top of tank (1)	-
3	Chemical carriers	Integral or independent cargo tanks	Leak and structural	The greater of - to 2.4m above top of tank (1), or - to top of tank (1) 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

Note: (1) Top of tank is deck forming the top of the tank excluding any hatchways.

Amendments

Table 3.1.2 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 Hull structure supporting membrane or semi-membrane tanks Independent tanks type A Independent tanks type B Independent tanks type C	Leak and structural	See Pt 7 Ch 5 Sec. 4 421. to 426.	-
2	Edible liquid tanks	Independent tanks	Leak and structural ⁽¹⁾	The greater of - top of the overflow, or - to 0.9m above top of tank ⁽²⁾⁽¹⁾	-
3	Chemical carriers	Integral or independent cargo tanks	Leak and structural ⁽¹⁾	The greater of - to 2.4m above top of tank ⁽²⁾⁽¹⁾ , or - to top of tank ⁽²⁾⁽¹⁾ 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 ⁽³⁾

Note: ⁽¹⁾ Refer to 4 (2) (B)
⁽²⁾⁽¹⁾ Top of tank is deck forming the top of the tank excluding any hatchways.
⁽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.
 - to be continued -

Present	Amendments
	<div data-bbox="1137 304 1946 673" style="border: 1px solid black; padding: 10px;">$\frac{H}{2}(\gamma-1)+2.4 \text{ (m)}$<p>H : Vertical distance measured from the lower edge of the bulkhead plate of the tank top of the tank (m)</p><p>γ : Density of cargoes loaded in the tank</p><p>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.</p></div>

Present	Amendments
<p><u>Newly added</u></p>	<p style="text-align: center;"><u>PART B - Non-SOLAS Ships and SOLAS Exemption/Equivalent Ships</u></p> <p style="text-align: center;">—</p> <p><u>1. GENERAL</u></p> <p>(1) <u>These test procedures are to confirm the watertightness of tanks and watertight boundaries and the structural adequacy of tanks which consist of the watertight subdivisions¹ 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 during new construction and those relevant to major conversions or major repairs² is to be confirmed by these test procedures prior to the delivery of the ship.</u></p> <p>(2) <u>Testing procedures of watertight compartments are to be carried out in accordance with PART B for non-SOLAS ships and those SOLAS ships (including CSR BC & OT) for which:</u></p> <p>(A) <u>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 PART B is equivalent to SOLAS Chapter II-1, Regulation 11; and</u></p> <p>(B) <u>the above-mentioned exemption/equivalency has been granted by the responsible Flag Administration.</u></p> <p><u>2. APPLICATION</u></p> <p>(1) <u>Testing procedures are to be carried out in accordance with the requirements of PART A in association with the following alternative procedures for 4. (2) (B) of PART A "Testing Schedule for New Construction or Major Structural Conversion" and alternative test requirements for PART A Table 3.1.1.</u></p> <p>(2) <u>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.</u></p>

Present	Amendments
<p><u>Newly added</u></p>	<p>(3) <u>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.</u></p> <p>(4) <u>Additional tanks may require structural testing if found necessary after the structural testing of the first tank.</u></p> <p>(5) <u>Where the structural adequacy of the tanks of a vessel were verified by the structural testing required in PART A, Table 3.1.1, 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:</u></p> <p><u>(A) water-tightness of boundaries of all tanks is verified by leak tests and thorough inspections are carried out.</u></p> <p><u>(B) structural testing is carried out for at least one tank of each type among all tanks of each sister vessel.</u></p> <p><u>(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.</u></p> <p><u>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 paragraph PART B 2. (3) shall apply in lieu of paragraph PART B 2. (5). (B).</u></p> <p>(6) <u>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 PART B 2. (5) at the discretion of the Classification Society, provided that:</u></p>

Present	Amendments
Newly added	<p>(A) <u>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 Classification Society); and</u></p> <p>(B) <u>an NDT plan is implemented and evaluated by the Classification 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 47, “Shipbuilding and Repair Quality Standard”, or a recognised fabrication standard which has been accepted by the Classification 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 Classification Society.</u></p>

Annex 7-10 Guideline for Direct Strength Assessment for Ore Carriers

1. Direct strength calculation

The direct strength calculation of the ore carrier is in accordance with the Pt 3, Annex 3-2 Guidance for Direct Strength Assessment and following 1. to 9. and proceeds according to the structural analysis flow chart in Fig. 1.

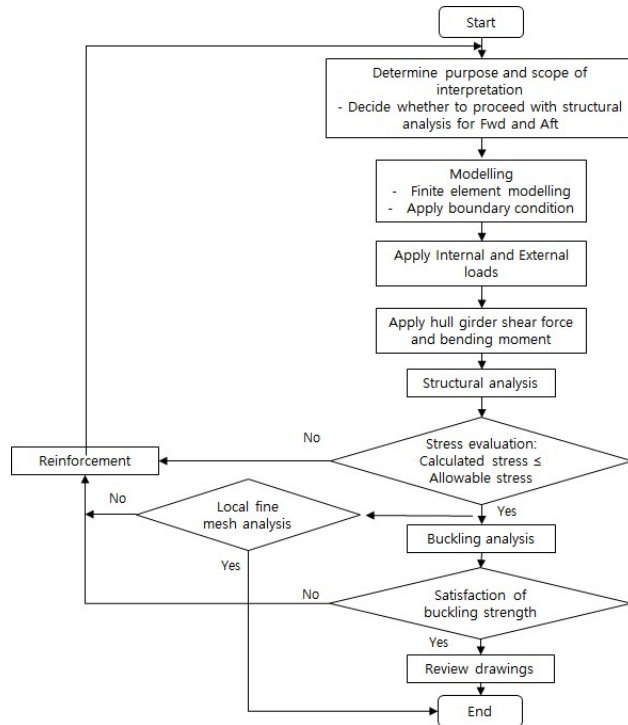


Fig. 1 Structural analysis flow of cargo hold and fore/aft structure

(1) Structural members to be calculated

The members that can determine the scantling by direct strength calculation are as follows.
Bottom transverse, deck transverse, side transverse, longitudinal bulkhead transverse, cross-tie, floor, inner bottom, bottom shell, side shell, cross deck and girder

(2) Modelling, Loads, boundary conditions, and supporting conditions

Assumed loads, structural models, boundary conditions and supporting condition for the calculation are to be as follows:

(A) The procedure of structural modelling for mid cargo hold(or tank)is to be as follows:

(a) Range of analysis (refer to Fig. 2)

(i) The analysis of the mid-cargo hold structure should be carried out to reflect the structural strength assessment from the No. 2 cargo hold to the No. n-1 cargo hold. In addition, the bow structure analysis should be carried out to reflect the structural strength evaluation of No.1 cargo hold, and the stern structure analysis should be

- carried out to reflect the structural strength evaluation of the No. n cargo hold.
- (ii) The longitudinal extent of the finite element model of the mid-hold is to include three cargo holds and four transverse bulkheads as shown in Fig. 3. The transverse bulkheads at both ends of the model range should be included with the connected stool. Both ends of the model shall form a vertical plane and, if applicable, shall include all transverse web frames on the plane. The model should be made in both port and starboard.
 - (iii) The Fwd and Aft models should extend to the fore peak for the Fwd part and after end transverse bulkhead for Aft part including the full length of the cargo hold, as shown in Fig. 4 and Fig. 5. The range of analysis should be determined taking into consideration the cargo/ the ballast conditions and the longitudinal/lateral symmetry of the bulkhead/the girders attached to the bulkheads. In the Fwd model, from the center of the collision bulkhead and fore peak to the fore peak, the forward hull form and cross section can be modeled with a simplified geometry. In the Aft model, from middle of machinery space to the after end transverse bulkhead can be modelled with a simplified geometry.

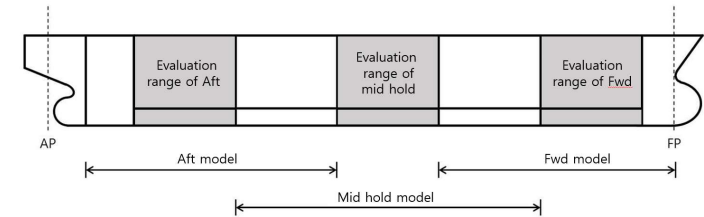


Fig. 2 Model and evaluation range

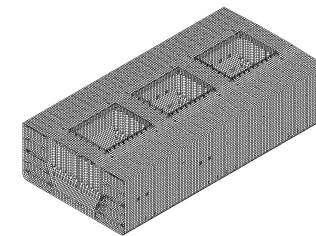


Fig. 3 Example of structural modelling

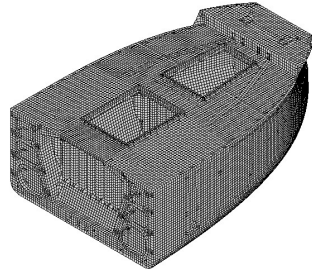


Fig. 4 Example of Fwd modelling

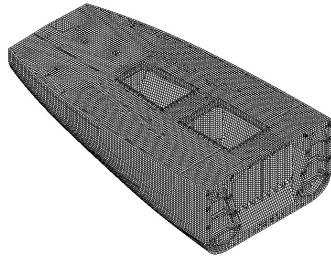


Fig. 5 Example of Aft model

(b) Structural modelling

The following (i) to (vi) apply to element meshing of structural model.

- (i) In meshing, proper sizes of meshes are to be selected by predicting the stress distribution in the model, and the aspect ratio should not exceed 3.
- (ii) Girders and similar members having stress gradients along their depth are to be so meshed as to enable their discrimination.
- (iii) The length of the short side of each mesh is to be restricted to longitudinal spacing or thereabouts.
- (iv) All stiffeners are to be modeled as beam elements with axial, torsional, shear, bending stiffness. Also, an offset beam considering the eccentricity of the stiffener should be used.
- (v) The flanges of primary support members and brackets are to be modeled using rods or beam elements.
- (vi) The coordinate system of the model is used as shown in **Table 1**.
- (vii) The method of indicating openings in the web of primary supporting members is to be in accordance with **Table 2**. If the openings are not modeled, the shear stresses near the openings shall be modified in accordance with the reduction of the shear area along the actual openings. And the modified shear stress should be used to calculate the equivalent stress of the element for verification of the yield criterion.

Table 1 Co-ordinate system

	Direction	Direction Remark
X	Longitudinal	Positive forward
Y	Transverse	Positive to port
Z	Vertical	Positive upwards from the baseline

Table 2 Representation of openings in web of primary support member

$h_0/h < 0.5$ and $g_0 < 2.0$	No need to model the openings
$h_0/h \geq 0.5$ and $g_0 \geq 2.0$	Need to model the openings

Where :

$$g_0 = \left(1 + \frac{l_0^2}{2.6(h-h_0)^2}\right)$$

l_0 : The length of the opening parallel to the longitudinal direction of the primary support member web. (m, see **Fig. 6**) For continuous openings where the distance d_0 between openings is less than $0.25h$, the length l_0 should be the length across the opening as shown in **Fig. 7**

h_0 : Height of opening parallel to the depth direction of the web (m, see **Fig. 6** and **Fig. 7**)

h : Height of primary support member web where opening is located (m, see **Fig. 6** and **Fig. 7**)

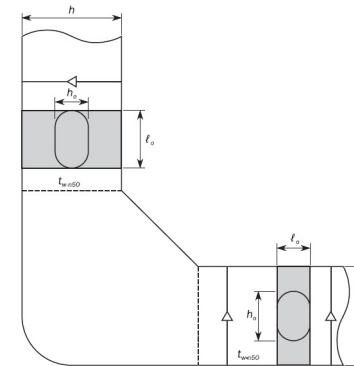


Fig. 6 Opening in the web

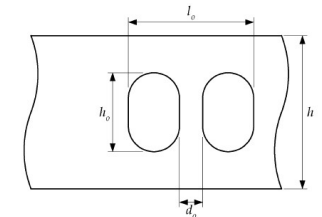


Fig. 7 Opening in the web

(B) Applied loads

(a) Internal loads

- (i) Loads due to ore cargo, grain cargo, etc. are as follows;

- ① The height and surface of the cargo are to be determined in accordance with below (see **Fig. 8** and **9**)
 - The shape of cargo surface is assumed to be horizontal longitudinally and transversely and sloped down straight to the ship's sides with the half angle of repose(ψ). (If the hold is not uniformed in longitudinally and transversely by hopper sloped angle, it is assumed that the middle section of the cargo hold is uniformed in longitudinally.)

- The width of the horizontal part b_{iB} is assumed to be equal to 1/4 of the breadth of the hold.
- The loading height h_c is determined in accordance with the mass, angle of repose and density of the cargo to be loaded. The shape of cargo surface may be assumed to be unchanged for the whole breadth above.
- The density and loading angle of cargo should be considered as follows

	Density of cargo γ (ton/m ³)	Repose angle ψ (°)
Low density cargo	M' / V_H (≥ 1.0)	35
High density cargo	3.0	35

M' : Cargo weight of the cargo hold. The following formula is applied.

$$M' = M + \frac{1}{n} Mfn(3000, 0.1M) \quad (t)$$

M : Maximum permissible bulk cargo weight of the cargo hold (t)

n : Minimum number of loading in one cargo hold

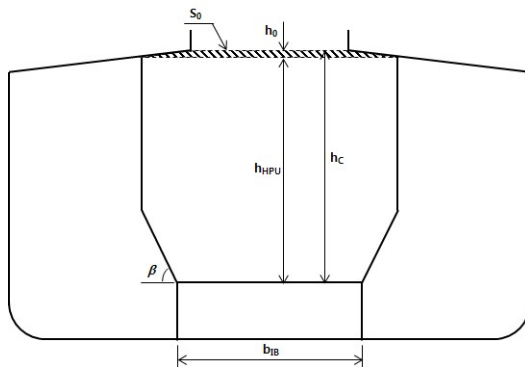


Fig. 8 Assumed cargo surface (low density)

- ② The loads on the vertical walls of the hold are to be determined by the following formula.

$$w = 9.81 \gamma h K_C \quad (N/mm^2)$$

γ : Density of cargo(kg/m³)

h : Vertical distance from the panel in consideration to the surface of the cargo right above the panel (m)

$$K_C : \cos^2 \beta + (1 - \sin \psi) \sin^2 \beta$$

β : Angle between slant plating of the bilge hopper and inner bottom plating(see Fig. 8)

ψ : Repose angle (see Fig. 9)

- The load of low density cargo on the inner wall of the cargo hold is given by the following formula.

$$h_c = h_{HPU} + h_0$$

where,

$$h_0 = \frac{S_A}{B_H}$$

$$S_A = S_o + \frac{V_{HC}}{l_H}$$

h_{HPU} : Vertical distance(m) between inner bottom and lower intersection of top side tank and side shell or inner side

S_o : Shaded area(m²) above the lower intersection of top side tank and side shell or inner side and up to the upper deck level

V_{HC} : Volume(m³) enclosed by the hatch coaming

- The load of high density cargo on the inner wall of the cargo hold is given by the following formula.

if $h_1 \geq 0$ (see Fig. 9)

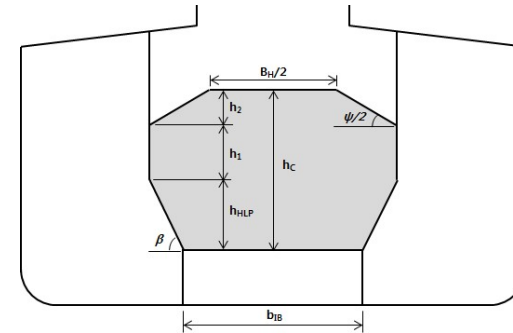


Fig. 9 Assumed cargo surface(high density $h_1 \geq 0$)

$$h_c = h_{HPL} + h_1 + h_2$$

Where,

h_{HPL} : Vertical distance between inner bottom plate and top intersection of hopper tank and inner plate(m)

h_1 : Vertical distance(m) is as follows

$$h_1 = \frac{M}{\rho B_H l_H} - \frac{B_H + b_{iB}}{2 B_H} h_{HPL} - \frac{3}{16} B_H \tan \frac{\psi}{2} + \frac{V_{FS}}{B_H l_H}$$

M' : cargo weight of the cargo hold. The following formula is applied.

$$M' = M + \frac{1}{n} Mfn(3000, 0.1M) \quad (t)$$

- M : Maximum permissible bulk cargo weight of the cargo hold (t)
 n : Minimum number of loading in one cargo hold
 B_H : Breadth of cargo hold(m)
 l_H : Length of cargo hold(m)
 b_{IB} : Breadth of double bottom(m)
 V_{TS} : The total volume(m³) of the transverse stool at the bottom of the transverse bulkhead within the cargo hold length, l_H considered. In this volume, the volume of the portion of the hopper tank passing through the transverse bulkhead is excluded.
 h_2 : The height(m) of the upper surface of the bulk cargo along the width, as follows:

$$h_2 = \frac{B_H}{4} \tan \frac{\psi}{2}, \quad \text{if } 0 \leq |y| \leq \frac{B_H}{4}$$

$$h_2 = \left(\frac{B_H}{2} - |y| \right) \tan \frac{\psi}{2}, \quad \text{if } \frac{B_H}{4} \leq |y| \leq \frac{B_H}{2}$$

if $h_1 < 0$ (see Fig. 10)

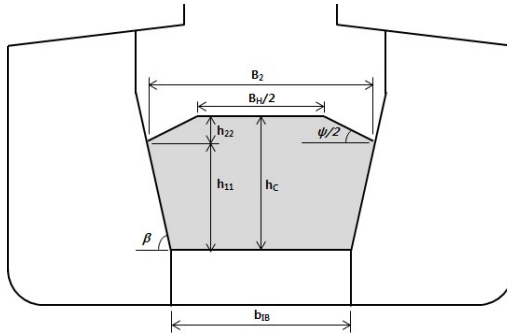


Fig. 10 Assumed cargo surface(high density, $h_1 < 0$)

$$h_C = h_{11} + h_{22}$$

Where,

h_{11} : Vertical distance(m) is as follows

$$h_{11} = h_{HPL} \left(\frac{B_2 - b_{IB}}{B_H - b_{IB}} \right)$$

h_{22} : Vertical distance(m) is as follows

$$h_{22} = \left(\frac{B_2}{2} - \frac{B_H}{4} \right) \tan \frac{\psi}{2}$$

$$B_2 = \sqrt{\frac{\frac{1}{l_H} \left(\frac{M}{\rho_c} + V_{TS} \right) + \frac{1}{2} \left(\frac{h_{HPL} \cdot b_{IB}^2}{B_H - b_{IB}} \right) + \frac{B_H^2}{16} \tan \frac{\psi}{2}}{\frac{1}{2} \left[\left(\frac{h_{HPL}}{B_H - b_{IB}} \right) + \frac{1}{2} \tan \frac{\psi}{2} \right]}}$$

M' : Cargo weight of cargo hold is as follows

$$M' = M + \frac{1}{n} Mfn(3000, 0.1M) \quad (t)$$

- M : Maximum allowable bulk cargo weight of the cargo hold (t)
 n : Minimum number of loading in one cargo hold

- In order to evaluate the total force in the vertical direction, shear loads acting on the slope plate of the bilge hopper tank and lower stool by bulk dry bulk cargo are to be taken into account. The shear load acting on the sloped members by the bulk cargo in the still water is given by the following formula.

$$h_S = \frac{(1 - K_C)(h_C + h_{DB} - z)}{\tan \beta}$$

z : vertical distance from inner bottom plate to considered point

(ii) Loads due to ballast water

The water head of the each location in ballast hold is to be determined by the following formula.

$$h_W = \text{Max}(0.85(h + \Delta h), h) \quad (m)$$

h : Vertical distance measured from the position under consideration to 1/2 of overflow pipes(m)

Δh : The value is to be obtained from following formula

$$\Delta h = 16/L(l_t - 10) + 0.25(b_t - 10)$$

l_t : tank length (m). however, where it is less than 10 (m), it is to be taken as 10.

b_t : tank breadth (m). however, where it is less than 10 (m), it is to be taken as 10.

(iii) Load under hydrostatic test

The water head of the tank to be subjected to the hydrostatic test should be the tank top + 2.4 m

(b) Hydrostatic pressure

The hydrostatic pressure is to be in accordance with **Guidance Pt. 3 Appendix 3-2 1 (8)**.

(c) Wave loads

The wave loads are to be in accordance with **Guidance Pt. 3 Appendix 3-2 1 (9)**.

(d) Hull weight

Consider the self weight of the hull considering gravitational acceleration.

(e) Load due to upper structure

If the upper structure is included in structural model, the load considered with acceleration of gravity are to be considered. If the upper structure is not included in structural model, loads on upper structure are to be distributed on relevant deck nodes.

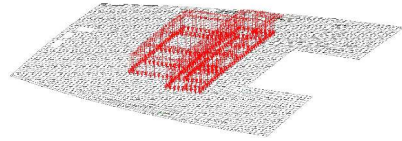


Fig. 11 Loads due to upper structure

(f) Load due to the main engine

The loads due to the main engine are to be distributed on relevant nodes of M/E foundation.



Fig. 12 Loads due to main engine

(C) Boundary condition and supporting condition of structural modelling

(a) The boundary conditions and supporting conditions of the structural model should be able to reasonably implement the behavior of the structural model according to the range of the model. Both ends of the model are simply supported in accordance with **Table 3, 4, 5 and 6**. The joints on the longitudinal strength members at both ends should be rigidly connected to the independent joints on the neutral axis on the ship's centerline as shown in **Table 3 and 5**. The independent nodes at both ends should be fixed as shown in **Table 4 and 6**.

Table 3 Rigid connections at both ends of the model except for Fwd cargo hold

Rigid - connection	Displacement			Rotation		
	U_x	U_y	U_z	θ_x	θ_y	θ_z
Longitudinal strength member nodes of front end of model	-	RL	RL	RL	-	-
Longitudinal strength member nodes of after end of model	-	RL	RL	RL	-	-

RL means that the related degrees of freedom of independent nodes are rigidly connected.

Table 4 Support conditions at model independent nodes except for Fws cargo hold

Location of independent nodes	Displacement			Rotation		
	U_x	U_y	U_z	θ_x	θ_y	θ_z
Independent nodes of front end of model	-	Fix	Fix	Fix	-	-
Independent nodes of after end of model	-	Fix	Fix	Fix	-	-
Intersection of centerline and inner bottom plate	Fix					

Table 5 Rigid connections at both ends of Fwd cargo hold

Rigid - connection	Displacement			Rotation		
	U_x	U_y	U_z	θ_x	θ_y	θ_z
Longitudinal strength member nodes of front end of model	-	RL	RL	RL	-	-
Longitudinal strength member nodes of after end of model	-	RL	RL	RL	-	-

RL means that the related degrees of freedom of independent nodes are rigidly connected.

Table 6 Support conditions at model independent nodes of Fwd cargo hold

Location of independent nodes	Displacement			Rotation		
	U_x	U_y	U_z	θ_x	θ_y	θ_z
Independent nodes of front end of model	-	Fix	Fix	Fix	-	-
Independent nodes of after end of model	-	Fix	Fix	Fix	-	-
Intersection of centerline and inner bottom plate	Fix					

(3) Consideration of hull girder shear force

(A) The hull girder shear force is to be calculated at the position of the transverse bulkhead of the mid hold, and the target value is determined as follows. In addition, the sign in each transverse bulkhead is applied in the same way as the loading conditions in **Tables 9, 10 and 11**.

$$Q_{arg} = F_s + F_w$$

where:

F_s : shear force in still water (kN)

F_w : wave shear force according to **Pt 3, Ch. 3 301. of the Rules**(kN)

(B) For mid hold, shear force is to comply with **Pt 12, Annex B 2.5 of the Rles**. For Fwd and Aft hold, shear force is to comply with **Pt 13, Ch. 7 Sec. 2 of the Rles**.

(C) The direct calculation of the shear flow is to comply with **Pt 13, Ch. 5 Annex 1 of the Rules**.

(4) Considering of hull girder bending moment

(A) The hull girder bending moment is adjusted after adjusting the shear force.

(B) In the analysis of the vertical bending moment, the target hull girder bending moment is the maximum vertical bending moment that can occur at the center of the mid hold in the finite element model. The target value of the hull girder bending moment is obtained as follows.

$$M_{v-arg} = M_s + M_w$$

where

M_s : vertical bending moment in still water (kNm)

M_w : wave bending moment according to **Pt 3, Ch. 3 Table 3.3.1 of the Guidance** (kN)

(C) The distribution of hull girder bending moments caused by local loads applied to the model is calculated using simple beam theory in accordance with **Pt. 13-1 Ch. 7 Sec. 2**.

(D) If the target vertical bending moment has to be reached, an additional vertical bending mo-

ment should be applied to both ends of the hold model to generate this target value in the center hold of the model. These end vertical bending moments are as follows.

$$M_{Y-aft} = M_{v-targ} - M_{V-FEM}(x_{v-max})$$

$$M_{Y-fwd} = -M_{Y-aft}$$

where

x_{v-max} : Longitudinal position where maximum bending moment occurs due to local load in mid hold(m)

M_{Y-fwd} : additional vertical bending moments applied to the forward end of the finite element model (kNm)

M_{Y-aft} : additional vertical bending moments applied to the after end of the finite element model (kNm)

M_{Y-peak} : maximum or minimum bending moments in the mid hold by local load and shear force adjustment (kNm)

(E) The bending moment adjustment procedure for the fore and aft part structural analysis is to comply with the requirements in **Pt. 13 Ch.7 Sec. 2. and 4.4.9 of the Rules.**

(5) Load case

The loading conditions to be considered are based on loading (high / low density), ballast loading, multi port loading and port loading. If special load cases are to be expected, such loading conditions are also included in the calculation. The load case for mid hold, aft hold and fwd hold are shown in **Table 7, 8 and 9.** Load cases may be changed according to loading manual, loading sequence and compartment layout, so it should be determined in consultation with the Society in advance.

Table 7 Load case of Mid hold

Condition	No	Description	Draft	Wave load	Internal load	Loading pattern	Target bending moment and shear force			
							% of Ms	% of Mw	% of Fs	% of Fw
at sea	1	Full load (1)	Ts	Trough	High/Low density		100% (Sag)	100% (Sag)	-	-
at sea	2	Full load (2)	Ts	Crest	High/Low density		0% ⁽¹¹⁾	100% (Hog)	-	-
at sea	3	Ballast (Normal)	Tbal	Crest	-		100% (Hog)	100% (Hog)	-	-
at sea	4	Ballast (Heavy)	Tbar-H	Crest	-		100% (Hog)	100% (Hog)	-	-
at sea	5	Multi port (1)	Tmulti-min ⁽¹⁾	Trough	High/Low density		100% (Sag)	100% (Sag)	-	-
at sea	6	Multi port (2)	Tmulti-min ⁽¹⁾	Crest	High/Low density		0% ⁽¹¹⁾	100% (Hog)	-	-
at sea	7	Multi port (3)	Tmulti-max ⁽²⁾	Trough	High/Low density		0% ⁽¹¹⁾	100% (Sag)	-	-
at sea	8	Multi port (4)	Tmulti-max ⁽²⁾	Crest	High/Low density		100% (Hog)	100% (Hog)	-	-
at sea	9	Multi port (5) ⁽⁷⁾	Tmulti-min ⁽¹⁾	Trough	High/Low density		100% (Sag)	100% (Sag)	Fore ⁽⁵⁾ : +100% Aft ⁽⁶⁾ : -100%	Fore ⁽⁵⁾ : +100% Aft ⁽⁶⁾ : -100%
at sea	10	Multi port (6) ⁽⁸⁾	Tmulti-max ⁽²⁾	Crest	High/Low density		100% (Hog)	100% (Hog)	Fore ⁽⁵⁾ : -100% Aft ⁽⁶⁾ : +100%	Fore ⁽⁵⁾ : -100% Aft ⁽⁶⁾ : +100%

(Note)

The load case can be changed according to the loading manual.

1) $T_{multi-min}$: meet the maximum allowable cargo mass (see(9))

2) $T_{multi-max}$: meet the minimum required cargo mass (see(9))

3) $T_{harbour-min}$: meet the maximum allowable cargo mass (see(9))

4) $T_{harbour-max}$: meet the minimum allowable cargo mass (see(9))

5) Fore : The sign of the target shear force of forward transverse bulkhead of the center hold

6) Aft : The sign of the target shear force of aftward transverse bulkhead of the center hold

7) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Multi port (1) condition.

8) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Multi port (4) condition.

9) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Port (1) condition.

10) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Port (2) condition.

11) 0%* : Refer to loading manual

Condition	No	Description	Draft	Wave load	Internal load	Loading pattern	Target bending moment and shear force			
							% of Ms	% of Mw	% of Fs	% of Fw
port	11	Port (1)	Tharbour -min ³⁾	Hydrostatic pressure	High/Low density		100% (Sag)	-	-	-
port	12	Port (2)	Tharbour -max ⁴⁾	Hydrostatic pressure	High/Low density		100% (Hog)	-	-	-
port	13	Port (3) ⁹⁾	Tharbour -min ³⁾	Hydrostatic pressure	High/Low density		100% (Sag)	-	Fore ⁵⁾ :	-
									+100%	-
port	14	Port (4) ¹⁰⁾	Tharbour -max ⁴⁾	Hydrostatic pressure	High/Low density		100% (Hog)	-	Aft ⁶⁾ :	-
									-100%	-
port	15	Port (5)	Tharbour -min ³⁾	Hydrostatic pressure	High/Low density		100% (Sag)	-	Fore ⁵⁾ :	-
									+100%	-
port	16	Port (6)	Tharbour -min ³⁾	Hydrostatic pressure	High/Low density		100% (Sag)	-	Aft ⁶⁾ :	-
									-100%	-
port	17	Port (7)	Tharbour -max ⁴⁾	Hydrostatic pressure	High/Low density		100% (Hog)	-	-	-
port	18	Port (8)	Tharbour -max ⁴⁾	Hydrostatic pressure	High/Low density		100% (Hog)	-	-	-
tank	19	Tank test (1)	Tsc/3	Hydrostatic pressure	-		-	-	-	-
tank	20	Tank test (2)	Tsc/3	Hydrostatic pressure	-		-	-	-	-

(Note)

The load case can be changed according to the loading manual.

- 1) $T_{multi-min}$: meet the maximum allowable cargo mass (see(9))
- 2) $T_{multi-max}$: meet the minimum required cargo mass (see(9))
- 3) $T_{harbour-min}$: meet the maximum allowable cargo mass (see(9))
- 4) $T_{harbour-max}$: meet the minimum allowable cargo mass (see(9))
- 5) Fore : The sign of the target shear force of forward transverse bulkhead of the center hold
- 6) Aft : The sign of the target shear force of aftward transverse bulkhead of the center hold
- 7) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Multi port (1) condition.
- 8) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Multi port (4) condition.
- 9) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Port (1) condition.
- 10) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Port (2) condition.
- 11) 0%* : Refer to loading manual.

Table 8 Load case of Aft hold

Condition	No	Description	Draft	Wave load	Internal load	Loading pattern	Target bending moment and shear force			
							% of Ms	% of Mw	% of Fs	% of Fw
at sea	1	Full load (1)	Ts	Trough	High/Low density		100% (Sag)	100% (Sag)	-	-
at sea	2	Full load (2)	Ts	Crest	High/Low density		0% ⁹⁾	100% (Hog)	-	-
at sea	3	Ballast (Normal)	Tbal	Crest	-		100% (Hog)	100% (Hog)	-	-
at sea	4	Ballast (Heavy)	Tbal-H	Crest	-		100% (Hog)	100% (Hog)	-	-
at sea	5	Multi port (1)	Tmulti-min ¹⁾	Trough	High/Low density		100% (Sag)	100% (Sag)	-	-
at sea	6	Multi port (2)	Tmulti-min ¹⁾	Crest	High/Low density		0% ⁹⁾	100% (Hog)	-	-
at sea	7	Multi port (3)	Tmulti-max ²⁾	Trough	High/Low density		0% ⁹⁾	100% (Sag)	-	-
at sea	8	Multi port (4)	Tmulti-max ²⁾	Crest	High/Low density		100% (Hog)	100% (Hog)	-	-
at sea	9	Multi port (5) ⁷⁾	Tmulti-min ¹⁾	Crest	High/Low density		100% (Sag)	100% (Sag)	Fore ⁵⁾ : +100%	Fore ⁵⁾ : +100%
at sea	10	Multi port (6)	Tmulti-max ²⁾	Crest	High/Low density		100% (Hog)	100% (Hog)	Aft ⁶⁾ :	-
									-100%	-

(Note)

The load case can be changed according to the loading manual.

- 1) $T_{multi-min}$: meet the maximum allowable cargo mass (see(9))
- 2) $T_{multi-max}$: meet the minimum required cargo mass (see(9))
- 3) $T_{harbour-min}$: meet the maximum allowable cargo mass (see(9))
- 4) $T_{harbour-max}$: meet the minimum allowable cargo mass (see(9))
- 5) Fore : The sign of the target shear force of forward transverse bulkhead of the center hold
- 6) Aft : The sign of the target shear force of aftward transverse bulkhead of the center hold
- 7) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Multi port (1) condition.
- 8) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Port (1) condition.
- 9) 0%* : Refer to loading manual.

Condition	No	Description	Draft	Wave load	Internal load	Loading pattern	Target bending moment and shear force			
							% of Ms	% of Mw	% of Fs	% of Fw
port	11	Port (1)	Tharbour-min ³⁾	Hydrostatic pressure	High/Low density		100% (Sag)	-	-	-
port	12	Port (2)	Tharbour-max ⁴⁾	Hydrostatic pressure	High/Low density		100% (Hog)	-	-	-
port	13	Port (3) ⁸⁾	Tharbour-min ³⁾	Hydrostatic pressure	High/Low density		100% (Sag)	-	Fore ⁵⁾ : +100%	-
									Aft ⁶⁾ : -100%	-
port	14	Port (4)	Tharbour-max ⁴⁾	Hydrostatic pressure	High/Low density		100% (Hog)	-	-	-
tank	15	Tank test (1)	Tsc/3	Hydrostatic pressure	-		-	-	-	-
tank	16	Tank test (2)	Tsc/3	Hydrostatic pressure	-		-	-	-	-

(Note)
The load case can be changed according to the loading manual.
1) $T_{multi-min}$: meet the maximum allowable cargo mass (see(9))
2) $T_{multi-max}$: meet the minimum required cargo mass (see(9))
3) $T_{harbour-min}$: meet the maximum allowable cargo mass (see(9))
4) $T_{harbour-max}$: meet the minimum allowable cargo mass (see(9))
5) Fore : The sign of the target shear force of forward transverse bulkhead of the center hold
6) Aft : The sign of the target shear force of aftward transverse bulkhead of the center hold
7) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Multi port (1) condition.
8) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Port (1) condition.
9) 0%* : Refer to loading manual.

Table 9 Load case of Fwd hold

Condition	No	Description	Draft	Wave load	Internal load	Loading pattern	Target bending moment and shear force			
							% of Ms	% of Mw	% of Fs	% of Fw
at sea	1	Full load (1)	Ts	Trough	High/Low density		100% (Sag)	100% (Sag)	-	-
at sea	2	Full load (2)	Ts	Crest	High/Low density		0% ⁹⁾	100% (Hog)	-	-
at sea	3	Ballast (Normal)	Tbal	Crest	-		100% (Hog)	100% (Hog)	-	-
at sea	4	Ballast (Heavy)	Tbal-H	Crest	-		100% (Hog)	100% (Hog)	-	-
at sea	5	Multi port (1)	Tmulti-min ¹⁾	Trough	High/Low density		100% (Sag)	100% (Sag)	-	-
at sea	6	Multi port (2)	Tmulti-min ¹⁾	Crest	High/Low density		0% ⁹⁾	100% (Hog)	-	-
at sea	7	Multi port (3)	Tmulti-max ²⁾	Trough	High/Low density		0% ⁹⁾	100% (Sag)	-	-
at sea	8	Multi port (4)	Tmulti-max ²⁾	Crest	High/Low density		100% (Hog)	100% (Hog)	-	-
at sea	9	Multi port (5)7)	Tmulti-min ¹⁾	Trough	High/Low density		100% (Sag)	-	Fore ³⁾ : +100%	-
									Aft ⁶⁾ : -100%	-
at sea	10	Multi port (6)	Tmulti-max ¹⁾	Crest	High/Low density		100% (Hog)	-	-	-

(Note)
The load case can be changed according to the loading manual.
1) $T_{multi-min}$: meet the maximum allowable cargo mass (see(9))
2) $T_{multi-max}$: meet the minimum required cargo mass (see(9))
3) $T_{harbour-min}$: meet the maximum allowable cargo mass (see(9))
4) $T_{harbour-max}$: meet the minimum allowable cargo mass (see(9))
5) Fore : The sign of the target shear force of forward transverse bulkhead of the center hold
6) Aft : The sign of the target shear force of aftward transverse bulkhead of the center hold
7) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Multi port (1) condition.
8) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Port (1) condition.
9) 0%* : Refer to loading manual.

Condition	No	Description	Draft	Wave load	Internal load	Loading pattern	Target bending moment and shear force			
							% of Ms	% of Mw	% of Fs	% of Fw
port	11	Port (1)	Tharbour-min ³⁾	Hydrostatic pressure	High/Low density		100% (Sag)	-	-	-
port	12	Port (2)	Tharbour-max ⁴⁾	Hydrostatic pressure	High/Low density		100% (Hog)	-	-	-
port	13	Port (3) ⁸⁾	Tharbour-min ³⁾	Hydrostatic pressure	High/Low density		100% (Sag)	-	Fore ⁵⁾ : +100%	-
port	14	Port (4)	Tharbour-max ⁴⁾	Hydrostatic pressure	High/Low density		100% (Hog)	-	Aft ⁶⁾ : -100%	-
tank	15	Tank test (1)	Tsc/3	Hydrostatic pressure	-		-	-	-	-
tank	16	Tank test (2)	Tsc/3	Hydrostatic pressure	-		-	-	-	-

(Note)
The load case can be changed according to the loading manual.
1) $T_{multi-min}$: meet the maximum allowable cargo mass (see(9))
2) $T_{multi-max}$: meet the minimum required cargo mass (see(9))
3) $T_{harbour-min}$: meet the maximum allowable cargo mass (see(9))
4) $T_{harbour-max}$: meet the minimum allowable cargo mass (see(9))
5) Fore : The sign of the target shear force of forward transverse bulkhead of the center hold
6) Aft : The sign of the target shear force of aftward transverse bulkhead of the center hold
7) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Multi port (1) condition.
8) If this loading condition is not taken into account, it should be evaluated in the loading condition of the Port (1) condition.
9) 0%* : Refer to loading manual.

(6) Allowable stresses

The stress calculated by the direct strength analysis using the dimension including the corrosion margin should meet the following criteria, and the evaluation range is shown in Fig. 13.

$$\sigma_{act} < \sigma_{allow}$$

$$\sigma_{act} = \sqrt{\sigma_x^2 + \sigma_y^2 - \sigma_x \sigma_y + 3\tau^2}$$

$$\sigma_{allow} = \eta \sigma_{yield}$$

$$\sigma_{yield} = 235 / K (\text{N/mm}^2)$$

where

- η : Yield strength correction factor
- $\eta=0.9$, longitudinal strength member at port and navigation condition

$\eta=0.72$, transverse strength member at port and navigation condition

K : Material factor (see Table 10)

σ_x : Normal stress in x-direction of element coordinate system

σ_y : Normal stress in y-direction of element coordinate system

τ : Shear stress on the face in x-y direction of element coordinate system

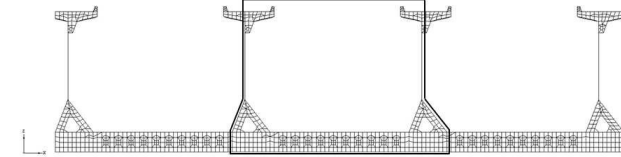


Fig 13 Evaluation range

(7) Buckling

The detailed calculation of buckling strength is to be in accordance with Pt. 11 Ch. 6 Annex 1 of the Rules and the corrosion addition and judgments of buckling strength for buckling evaluation are as follows;

Table 11 Corrosion addition

Location	Corrosion addition
When both sides are in contact with seawater	2.5 mm
When one side is in contact with seawater	2.0 mm
When both sides are not in contact with seawater	1.5 mm

Table 12 Judgement of buckling strength

Member	Buckling factor
Cross Deck, Hatch End Beam and Upper Stool	0.8
Others	1.0

(8) Local fine mesh analysis

(A) The list of structural details of the fine mesh analysis are as follows.

- (a) hopper knuckle
 - (b) openings
 - (c) connection between transverse bulkhead and longitudinal stiffener of deck and double bottom
 - (d) connection of corrugated bulkhead and the adjacent structure
 - (e) hatch corner
- (B) For other high stress areas in which the stress (σ_{act}) calculated by direct strength analysis is greater than 95% of the allowable stress (σ_{allow}), additional analysis should be performed at the discretion of the Society.
- (C) The range of the local fine mesh analysis should be at least 10 elements in all directions from the area under consideration.
- (D) All plates and stiffeners within the local fine mesh analysis range should be represented by shell elements.

- (E) For element corners, crooked elements less than 45 degrees or greater than 135 degrees should be avoided.
- (F) The aspect ratio of the element should be kept as close as possible to 1, and should be less than 3.
- (G) Mesh size of local fine mesh analysis should be such that it is capable of expressing the structure well and is less than the longitudinal spacing.
- (H) When performing local fine mesh analysis for openings, the elements of the first two layers of the perimeter elements of the opening should be modeled to a size of 50 x 50 mm or less. End stiffeners directly welded to the opening end should be modeled as shell elements. The web stiffener near the opening is located at least 50 mm from the end of the opening and can be modeled using a rod or beam element.
- (I) Allowable stresses for local fine mesh analysis should meet the following criteria.

$$\sigma_{act,l} < \sigma_{allow,l}$$

$$\sigma_{act,l} = \sqrt{\sigma_{x,l}^2 + \sigma_{y,l}^2 - \sigma_{x,l}\sigma_{y,l} + 3\tau_l^2}$$

$$\sigma_{allow,l} = \eta\eta_{local}\sigma_{yield,l}$$

$$\sigma_{yield,l} = 235/K \quad (\text{N/mm}^2)$$

where

η : Yield strength correction factor

$\eta = 0.9$, longitudinal strength member of port condition and sea going condition

$\eta = 0.72$, transverse strength member of port condition and sea going condition

η_{allow} : Local fine mesh analysis correction factor

$\eta_{allow} = 1.00$, element size \leq longitudinal spacing (mm)

$\eta_{allow} = 1.15$, element size $\leq 200 \times 200$ (mm)

$\eta_{allow} = 1.25$, element size $\leq 100 \times 100$ (mm)

$\eta_{allow} = 1.50$, element size $\leq 50 \times 50$ (mm)

$\sigma_{x,l}$: Normal stress in x-direction of element coordinate system (N/mm²)

$\sigma_{y,l}$: Normal stress in y-direction of element coordinate system (N/mm²)

τ_l : Shear stress on the face in x-y direction of element coordinate system (N/mm²)

- (J) When evaluating the corner of the opening, the average stress can be evaluated as follows.

$$\sigma_{act} < \sigma_{allow}$$

$$\sigma_{act} = \frac{\sum_1^n A_i \sigma_i}{\sum_1^n A_i}$$

where

σ_{allow} : Allowable stresses in direct strength analysis (N/mm²)

σ_{act} : Mean stress in the considered range (N/mm²)

σ_i : Each element stress in the considered range (N/mm²)

A_i : Each element area in the considered range (mm²)

n : Number of elements in the considered range

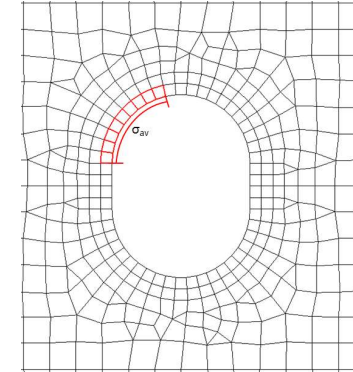


Fig. 16 Opening

- (9) Cargo Mass Curves

- (A) The maximum and minimum drafts which are satisfied with maximum allowable cargo mass and the minimum required cargo mass for the each cargo hold are to be given by the following equations. In finite element analysis of middle cargo hold, holds No. 2 to n-1 are to be satisfied. The draft of fore end part is to be satisfied with maximum allowable cargo mass and the minimum required cargo mass of No. 1 cargo hold and the draft of aft end part is to be satisfied with maximum allowable cargo mass and the minimum required cargo mass of No. n cargo hold. (see Fig. 17)

Maximum allowable cargo mass

Curve 1 : $W_{MAX,SEA}(T_{LC}) = M - 1.025LB(T_{LC} - T_{MIN,SEA}) (\leq M)$ (ton)

Curve 2 : $W_{MAX,HAR}(T_{LC}) = M - 1.025LB(T_{LC} - T_{MIN,HAR}) (\leq M)$ (ton)

Minimum required cargo mass

Curve 3 : $W_{MIN}(T_{LC}) = M - 1.025LB(T_{LC} - T_{multi-mar})$ (ton)

Curve 4 : $W_{MIN,HAR}(T_{LC}) = 1.025LB(T_{LC} - T_{MAX,HAR}) (\geq 0)$ (ton)

$W_{MAX,SEA}(T_{LC})$: Maximum allowable mass with draft, T_{LC} at sea going condition (ton)

$W_{MAX,HAR}(T_{LC})$: Maximum allowable mass with draft, T_{LC} at harbour (ton)

$W_{MIN,SEA}(T_{LC})$: Minimum required mass with draft, T_{LC} at sea going condition (ton)

$W_{MIN,HAR}(T_{LC})$: Minimum required mass with draft, T_{LC} at harbour (ton)

M : Maximum allowable mass of considered cargo hold (ton)

$T_{MIN,SEA}$: Minimum draft (m) at sea going condition which the maximum allowable cargo weight of the cargo hold is applied. But minimum draft at multi port condition subtracting 0.2m (considering the trim)

$T_{MAX,SEA}$: Maximum draft (m) at sea going condition which the minimum allowable cargo weight of the cargo hold is applied. But maximum draft at multi port condition including 0.2m (considering the trim)

$T_{MIN,HAR}$: Minimum draft (m) at the port state to which the maximum allow-

able cargo weight(M) of the cargo hold is applied. If the minimum draft in the port condition is not ascertained, an evaluation of the strength should be made by the following formula

$$T_{MIN,HAR} = T_{MIN,SEA} - (1.15M - W_{MAX,SEA}(T_{LC})) / (1.025LB)$$

L : length of the considered cargo hold (m)

B : mean breadth of the considered cargo hold (m)

$T_{MAX,HAR}$: Maximum draft (m) at port condition to which the minimum allowable cargo weight (M_{AD}) of cargo holds is applied

(B) The maximum and minimum drafts which are satisfied with maximum allowable cargo mass and the minimum required cargo mass for adjacent 2 cargo hold are to be given by the following equations. In finite element analysis of middle cargo hold, holds No. 2 and 3 to n-2 and n-1 are to be satisfied. The draft of fore end part is to be satisfied with maximum allowable cargo mass and the minimum required cargo mass of No. 1 and 2 cargo holds and the draft of aft end part are to be satisfied with maximum allowable cargo mass and the minimum required cargo mass of No. n-2 and n-1 cargo holds. (see Fig. 17)

Maximum allowable cargo mass

Curve 1 : $W_{MAX,SEA,AD}(T_{LC}) = M_{AD} - 1.025L_{AD}B_{AD}(T_{LC} - T_{MIN,SEA,AD}) (\leq M_{AD})$ (ton)

Curve 2 : $W_{MAX,HAR,AD}(T_{LC}) = M_{AD} - 1.025L_{AD}B_{AD}(T_{LC} - T_{MIN,HAR,AD}) (\leq M_{AD})$ (ton)

Minimum required cargo mass

Curve 3 : $W_{MIN,SEA,AD}(T_{LC}) = 1.025L_{AD}B_{AD}(T_{LC} - T_{MAX,SEA,AD}) (\geq 0)$ (ton)

Curve 4 : $W_{MIN,HAR,AD}(T_{LC}) = 1.025L_{AD}B_{AD}(T_{LC} - T_{MAX,HAR,AD}) (\geq 0)$ (ton)

$W_{MAX,SEA,AD}(T_{LC})$: Maximum allowable mass of adjacent 2 cargo holds with draft, T_{LC} at sea going condition (ton)

$W_{MAX,HAR,AD}(T_{LC})$: Maximum allowable mass of adjacent 2 cargo holds with draft, T_{LC} at port (ton)

$W_{MIN,SEA,AD}(T_{LC})$: Required cargo mass of adjacent 2 cargo holds with draft, T_{LC} at sea going condition (ton)

$W_{MIN,HAR,AD}(T_{LC})$: Required cargo mass of adjacent 2 cargo holds with draft, T_{LC} at port (ton)

$T_{MIN,SEA,AD}$: Minimum draft (m) in the sea going condition to which the maximum allowable cargo weight (M_{AD}) of adjacent 2 cargo holds is applied

$T_{MAX,SEA,AD}$: Maximum draft (m) in the sea going condition to which the minimum allowable cargo weight (M_{AD}) of adjacent 2 cargo holds is applied

$T_{MIN,HAR,AD}$: Minimum draft (m) at the port state to which the maximum allowable cargo weight(M_{AD}) of the cargo hold is applied. If the minimum draft in the port condition is not ascertained, an evaluation of the strength should be made by the following formula.

$$T_{MIN,HAR,AD} = T_{MIN,SEA,AD} - (1.15M_{AD} - W_{MAX,SEA,AD}(T_{LC})) / (1.025L_{AD}B_{AD})$$

M_{AD} : Maximum allowable mass of adjacent 2 cargo holds (ton)

L_{AD} : length of the considered cargo holds (m)

B_{AD} : mean breadth of the considered cargo holds (m)

$T_{MAX,HAR,AD}$: Maximum draft (m) at port condition to which the minimum allowable cargo weight (M_{AD}) of adjacent 2 cargo holds is applied

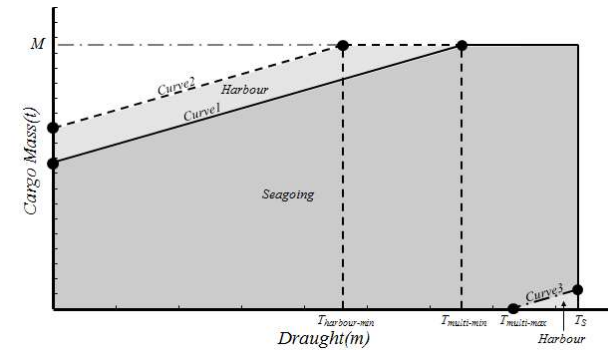


Fig. 17 Cargo mass curves

Amended Guidance Relating to the Rules for the Classification of Steel Ships

Part 1 Classification and Surveys
(Annex 1-1 Character of Classification)



Present

Amendment

Annex 1-1 Character of Classification

Annex 1-1 Character of Classification

1. Class Notation

1. Class Notation

1.1 Ship Type and Special Feature Notations

1.1 Ship Type and Special Feature Notations

Ship Types	Special Feature Notations	Remarks
1.~31	〈same as the present Rules〉	

Ship Types	Special Feature Notations		Remarks
1.~31	〈same as the present Rules〉		
32. WIG Ship	<u>A (Type)⁽³³⁾</u>	<u>B (Purpose)</u>	⁽³³⁾ : See Ch. 1, 104, in Guidance for WIG Ships (Wing-in-ground effect ships) ⁽³⁴⁾ : This notation shall be assigned a noncommercial (including training purpose) WIG ship and a WIG ship which carries cargo.
	<u>A-type</u> <u>B-type</u>	<u>Passenger</u> <u>General⁽³⁴⁾</u>	

Amended Guidance Relating to the Rules for the Classification of Steel Ships

Guidance for WIG Ships(wing-in-ground effect ships)
(Ch. 1 and Ch. 2)

Present	Amendment
<p style="text-align: center;">CHAPTER 1 GENERAL</p> <p>102. Equivalence 1.~2. <same as the present Rules></p> <p style="text-align: center;"><hereinafter same as the present Rules to Chapter end></p> <p style="text-align: center;">CHAPTER 2 CLASSIFICATION AND SURVEYS</p> <p>101.~102. <same as the present Rules> 103. Class notation The class notations assigned to the WIG ships classed with the Society are to be in accordance with the requirements specified in Pt 1, Ch 1, 201. of Rules for the Classification of Steel Ships. However, the notation "Passenger WIG-A" or "General WIG-A" for WIG ship of type A, "Passenger WIG-B" or "General WIG-B" for WIG ship of type B specified in Ch 1, 104. shall be assigned for Passenger WIG Ships or General WIG Ships, as an additional special feature notation.</p> <p style="text-align: center;"><hereinafter same as the present Rules></p>	<p style="text-align: center;">CHAPTER 1 GENERAL</p> <p>102. Equivalence 1.~2. <same as the present Rules> 3. Despite of para 1 and 2, the small WIG ships applied to the Ships Safety Law of Korea may be in accordance with the relevant requirements specified by this Law.</p> <p style="text-align: center;"><hereinafter same as the present Rules to Chapter end></p> <p style="text-align: center;">CHAPTER 2 CLASSIFICATION AND SURVEYS</p> <p>101.~102. <same as the present Rules> 103. Class notation The class notations assigned to the WIG ships classed with the Society are to be in accordance with the requirements specified in Pt 1, Annex 1-1 of Rules for the Classification of Steel Ships.</p> <p style="text-align: center;"><hereinafter same as the present Rules ></p>