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HULL SURVEYS OF GENERAL DRY CARGO SHIPS

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Publications P (Additional Rule Requirements) issued by Polski Rejestr Statków complete or extend the Rules and are mandatory where applicable.



GDAŃSK

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1 GENERAL

1.1 Application

1.1.1 The requirements apply to all self-propelled general dry cargo ships of 500 GT and above performing solid cargoes other than:

- ships subject to *Publication No. 39/P* or *Publication No. 64/P*;
- dedicated container carriers;
- ro-ro cargo ships;
- refrigerated cargo ships;
- dedicated wood chip carriers;
- dedicated cement carriers;
- livestock carriers;
- deck cargo ships (designed to perform cargo exclusively above deck without any access for cargo below deck);
- general dry cargo ships of double side-skin construction, with double side-skin extending for the entire length of the cargo area, and for the entire height of the cargo hold to the upper deck.

1.1.2 The requirements apply to surveys of hull structure and piping systems in way of the cargo holds, cofferdams, pipe tunnels, void spaces and fuel oil tanks within the cargo area and all ballast tanks. The requirements are additional to the classification requirements applicable to the remainder of the ship.

1.1.3 The requirements contain the minimum extent of examination, thickness measurement and tank testing. The survey shall be extended when substantial corrosion and/or structural defects are found and include additional close-up survey when necessary.

1.2 Definitions

A ballast tank – a tank which is being used primarily for salt water ballast.

Spaces – separate compartments including holds and tanks.

An overall survey – a survey intended to report on the overall condition of the hull structure and to determine the extent of additional close-up surveys.

A close-up survey – a survey where the details of structural components are within the close visual inspection range of the Surveyor, i.e. normally within the reach of hand.

A transverse section – includes all longitudinal members such as plating, longitudinals and girders at the deck, side, bottom, inner bottom and hopper side plating, longitudinal bulkhead and bottom plating in top wing tanks.

For ships with transverse girder system, transverse section contains adjacent frames with their ends attachment in way of transverse bulkheads.

Representative spaces – those spaces which are expected to reflect the condition of other spaces of similar type and service and with similar corrosion prevention systems. When selecting representative spaces account shall be taken of the service and repair history on board and identifiable critical structural areas and/or suspect areas.

Critical structural areas – locations which have been identified from calculations to require monitoring or from the service history of the subject ship or from similar ships or sister ships, if any, to be sensitive to cracking, buckling or corrosion which would impair the structural integrity of the ship.

Suspect areas – locations showing substantial corrosion and/or considered by the Surveyor to be prone to wastage and/or substantial corrosion.

Substantial corrosion – an extent of corrosion such that assessment of corrosion pattern indicates a wastage in excess of 75% of the allowable margins, but within the acceptable limits.

Corrosion prevention system – normally considered a full hard protective coating. Hard protective coating is usually to be epoxy coating or equivalent. Other coating systems, which are neither

soft nor semi-hard coatings, may be considered applicable as alternatives provided that they are applied in compliance with the manufacturer's specifications.

Coating condition is defined as follows:

GOOD – condition with only minor spot rusting,

FAIR – condition with local breakdown at edges of stiffeners and weld connections and/or light rusting over 20% or more of areas under consideration, but less than as defined for POOR condition,

POOR – condition with general breakdown of coating over 20% or more of areas or hard scale at 10% or more of areas under consideration.

Cargo length area – that part of the ship which contains all cargo holds and adjacent areas including fuel tanks, cofferdams, ballast tanks and void spaces.

Special consideration or specially considered (in connection with close-up surveys and thickness measurements) – means that sufficient close-up inspection and thickness measurements are taken to confirm the actual average condition of the structure under the coating.

Prompt and thorough repair – permanent repair completed at the time of survey to the satisfaction of the Surveyor, therein removing the need for the imposition of any associated condition of classification.

1.3 Repairs

1.3.1 Any damage in association with wastage over the allowable limits (including buckling, grooving, detachment or fracture), or extensive areas of wastage over the allowable limits which affects or, in the opinion of the Surveyor, will affect the ship's structural, watertight and weathertight integrity, shall be promptly and thoroughly repaired. Areas to be considered include:

- side shell frames, their end attachments and adjacent shell plating;
- deck structure and deck plating;
- bottom structure and bottom plating;
- watertight bulkheads;
- hatch covers and hatch coamings;
- weld connections between air pipes and deck plating;
- air pipe heads installed on the exposed decks;
- ventilators, including closing devices, if any.

For locations where adequately repair facilities are not available, consideration may be given to allow the ship to proceed directly to a repair facility. This may require discharging the cargo and/or temporary repairs for the intended voyage.

1.3.2 Additionally, when a survey results in the identification of structural defects or corrosion, either of which, in the opinion of the Surveyor, will impair the vessel's fitness for continued service, remedial measures shall be implemented before the ship continues in service.

1.3.3 Where the damage found on structure mentioned in 1.3.1 is isolated and of a localized nature which does not affect the ship's structural integrity, consideration may be given by the surveyor to allow an appropriate temporary repair to restore watertight or weathertight integrity and impose a Recommendation with a specific time limit.

1.4 Thickness measurements and close-up surveys

In any kind of survey, i.e. class renewal, intermediate, annual or other surveys having the scope of the foregoing ones, thickness measurements, **when required by Table II**, of structures in areas where close-up surveys are required, shall be performed simultaneously with close-up surveys.

2 ANNUAL SURVEY

2.1 Schedule

2.1.1 Annual Surveys shall be held within 3 months before or after anniversary date from the date of the initial classification survey or of the date credited for the last Class Renewal Survey.

2.2 Scope

2.2.1 General

2.2.1.1 The survey shall 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.

2.2.2 Examination of the Hull

2.2.2.1 Examination of the hull plating and its closing appliances as far as can be seen.

2.2.2.2 Examination of watertight penetrations as far as practicable.

2.2.3 Examination of Weather Decks, Hatch Covers and Coamings

2.2.3.1 Confirmation shall be obtained that no unapproved changes have been made to the hatch covers, hatch coamings and their securing and sealing devices since the last survey.

2.2.3.2 Where mechanically operated steel covers are fitted, checking the satisfactory condition of:

- hatch covers, including close-up survey of hatch cover plating,
- tightness devices of longitudinal, transverse and intermediate cross junctions (gaskets, gasket lips, compression bars, drainage channels),
- clamping devices, retaining bars, cleating,
- chain or rope pulleys,
- guides,
- guide rails and track wheels,
- stoppers, etc.,
- wires, chains, gypsies, tensioning devices,
- hydraulic system essential to closing and securing,
- safety locks and retaining devices.

Where portable covers, wooden or steel pontoons are fitted, checking the satisfactory condition where applicable of:

- wooden covers and portable beams, carriers or sockets for the portable beam and their securing devices,
- steel pontoons,
- tarpaulins,
- cleats, battens and wedges,
- hatch securing bars and their securing devices,
- loading pads/bars and the side plate edge,
- guide plates and chocks,
- compression bars, drainage channels and drain pipes (if any).

2.2.3.3 Checking the satisfactory condition of hatch coamings plating and their stiffeners including close-up survey.

2.2.3.4 Random checking of the satisfactory operation of mechanically operated hatch covers shall be made, including:

- stowage and securing in open condition,
- proper fit and efficiency of sealing in closed condition,
- operational testing of hydraulic and power components, wires, chains, and link drives.

2.2.4 Suspect Areas identified at previous surveys shall be examined. Thickness measurements shall be taken of the areas of substantial corrosion and the extent of thickness measurements shall be increased to determine the extent of areas of substantial corrosion. Table III may be used as guidance for these additional thickness measurements. These extended thickness measurements shall be performed before the annual survey is credited as completed.

2.2.5 Examination of Cargo Holds

2.2.5.1 For ships 10 to 15 years of age, the following shall apply:

- a) Overall survey of one forward and one after cargo hold and their associated tween deck spaces.
- b) When considered necessary by the Surveyor, or where extensive corrosion exists, thickness measurement shall be performed. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements shall be increased to determine the extent of areas of substantial corrosion. Table III may be used as guidance for these additional measurements. These extended thickness measurements shall be performed before the annual survey is credited as completed.

2.2.5.2 For ships over 15 years of age, the following applies:

- a) Overall survey of all cargo holds and tween deck spaces.
- b) Close-up examination of sufficient extent, minimum 25% of frames, to establish the condition of the lower region of the shell frames including approx. lower one third length of side frame at side shell and side frame end attachment and the adjacent shell plating in the forward lower cargo hold and one other selected lower cargo hold. Where this level of survey reveals the need for remedial measures, the survey shall be extended to include a close-up survey of all of the shell frames and adjacent shell plating of those cargo holds and associated tween deck spaces (as applicable), as well as a close-up survey of sufficient extent of all remaining cargo holds and tween deck spaces (as applicable).
- c) When considered necessary by the Surveyor, or where extensive corrosion exists, thickness measurement shall be performed. If the results of these thickness measurements indicate that substantial corrosion is found then the extent of thickness measurements shall be increased to determine the extent of areas of substantial corrosion. Table III may be used as guidance for these additional measures. These extended thickness measurements shall be performed before the annual survey is credited as completed.
- d) Where a protective coating is found in GOOD condition, the extent of close-up surveys and thickness measurements may be specially considered.
- e) All piping and their penetrations in cargo holds, including overboard piping, shall be examined.

2.2.6 Examination of Ballast Tanks

2.2.6.1 Examination of ballast tanks when required as a consequence of the results of the Class Renewal Survey and Intermediate Survey shall be performed. When considered necessary by the Surveyor, or where extensive corrosion exists, thickness measurement shall be performed. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements shall be increased to determine the extent of areas of substantial corrosion. Table III may be used as guidance for those additional measures. These extended thickness measurements shall be performed before the annual survey is credited as completed.

2.3 Additional Requirements for Single Hold Cargo Ships after Determining Compliance with SOLAS II-1/23-3 and II-1/25

2.3.1 For ships complying with the requirements of SOLAS II-1/23-3 and II-1/25 for hold water level detectors, the annual survey shall include an examination and a test, at random, of the water ingress system and of their alarms.

3 INTERMEDIATE SURVEY

3.1 Schedule

3.1.1 Intermediate Survey shall be held at or between either the 2nd or 3rd Annual Survey.

3.1.2 Those items which are additional to the requirements of the Annual Survey may be surveyed either at or between the 2nd and 3rd Annual Survey.

3.1.3 A survey planning meeting shall be held prior to the commencement of the survey.

3.1.4 Surveys and thickness measurements of spaces, once credited towards Class Renewal Survey can not be credited towards Intermediate Survey.

3.2 Scope

3.2.1 General

3.2.1.1 The survey extent is dependent on the age of the vessel as specified in 3.2.2 to 3.2.4.

3.2.2 Ships 5-10 Years of Age

The following applies:

3.2.2.1 Ballast Tanks

- a) For tanks used for water ballast, an overall survey of representative tanks selected by the Surveyor shall be performed. If such overall survey reveals no visible structural defects, the examination may be limited to a verification that the corrosion prevention system remains efficient.
- b) Where POOR coating condition, soft or semi-hard coating, corrosion or other defects are found in water ballast tanks or where a hard protective coating was not applied from the time of construction, the examination shall be extended to other ballast tanks of the same type.
- c) In water ballast tanks other than double bottom tanks, where a hard protective coating is found in POOR condition and it is not renewed, where soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question shall be examined with thickness measurements performed as considered necessary at annual intervals. When such breakdown of hard protective coating is found in water ballast double bottom tanks, where a soft or semi-hard coating has been applied, or where a hard protective coating has not been applied, the tanks in question may be examined at annual intervals. When considered necessary by the Surveyor, or where extensive corrosion exists, thickness measurements shall be performed.
- d) In addition to the above requirements, areas found suspect at the previous Class Renewal Survey shall be surveyed in accordance with the provisions indicated in 2.2.4.

3.2.2.2 Cargo Holds

- a) An overall survey of one forward and one after cargo hold and their associated tween deck spaces shall be performed.
- b) Areas found suspect at previous surveys shall be surveyed in accordance with the provisions indicated in 2.2.4.

3.2.3 Ships 10 – 15 Years of Age

The following applies:

3.2.3.1 Ballast Tanks

- a) For tanks used for water ballast, an overall survey of all tanks shall be performed. If such overall survey reveals no visible structural defects, the examination may be limited to a verification that the corrosion prevention system remains efficient.
- b) The requirements of 3.2.2.1 c) and d) also apply.

3.2.3.2 Cargo Holds

- a) An overall survey of all cargo holds and tween deck spaces shall be performed.
- b) Areas found suspect at the previous surveys shall be surveyed in accordance with the provisions indicated in 2.2.4.
- c) When considered necessary by the Surveyor, or where extensive corrosion exists, thickness measurements shall be performed. If the results of these thickness measurements indicate that substantial corrosion is found, then the extent of thickness measurements shall be increased to determine the extent of areas of substantial corrosion. Table III may be used as guidance for these additional measurements. These extended thickness measurements shall be performed before the annual survey is credited as completed.

3.2.4 Ships over 15 Years of Age

The following applies:

3.2.4.1 The requirements of the Intermediate survey shall be to the same extent as the previous class renewal survey as required in 4, except for item 2c) in column 4 of Table II. However, tank testing specified in 4.5, survey of automatic air pipe heads and internal examination of fuel oil, lube oil and fresh water tanks (see 4.3.1), are not required unless deemed necessary by the attending Surveyor.

3.2.4.2 In application of 3.2.4.1, the Intermediate Survey may be commenced at the second annual survey and be progressed during the succeeding year with a view to completion at the third annual survey in lieu of the application of 4.1.4.

3.2.4.3 In lieu of the requirements of 4.2.2, an under water survey may be considered as equivalent.

4 CLASS RENEWAL SURVEY

4.1 Schedule

4.1.1 Class Renewal Surveys shall be performed at 5 years intervals to renew the Certificate of Class.

4.1.2 The first Class Renewal Survey shall be completed within 5 years from the date of the initial classification survey and thereafter 5 years from the credited date of the previous Class Renewal Survey. However, an extension of class of 3 months maximum beyond the 5th year can be granted in exceptional circumstances. In this case, the next period of class will start from the expiry date of the Class Renewal Survey before the extension was granted.

4.1.3 For surveys completed within 3 months before the expiry date of the Class Renewal Survey, the next period of class will start from the expiry date of the Class Renewal Survey. For surveys completed more than 3 months before the expiry date of the Class Renewal Survey, the period of class will start from the survey completion date.

In cases where the ship has been laid up or has been out of service for a considerable period because of a major repair or modification and the Owner elects to only perform the overdue surveys, the next period of class will start class renewal survey. If the Owner elects to perform the next due class renewal survey, the period of class will start from the survey completion date.

4.1.4 Class Renewal Survey may be commenced at the 4th Annual Survey and be progressed with a view to completion by the 5th anniversary date. When the Class Renewal Survey is commenced prior to the 4th Annual Survey, the entire survey shall be completed within 15 months if such work is to be credited to the Class Renewal Survey.

4.1.5 A survey planning meeting shall be held prior to the commencement of the survey.

4.1.6 Surveys and thickness measurements of spaces, once credited towards Intermediate Survey can not be credited towards Class Renewal Survey.

4.2 Scope

4.2.1 General

4.2.1.1 Class Renewal Survey shall include, in addition to the requirements of the Annual Survey, examination, tests and checks of sufficient extent to ensure that the hull and related piping, as required in 4.2.1.3, are in a satisfactory condition and are fit for the intended purpose for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and to periodical surveys being performed at the due dates.

4.2.1.2 All cargo holds, water ballast tanks, including double bottom tanks, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull shall be examined, and this examination shall be supplemented by thickness measurement and testing as required in 4.4 and 4.5, to ensure that the structural integrity remains effective.

The aim of examination shall discover substantial corrosion, significant deformation, fractures, damages and other structural deterioration, that may be presented.

4.2.1.3 All piping systems within the above spaces shall be examined and operationally tested to working pressure to attending Surveyor's satisfaction, to ensure that tightness and condition remain satisfactory.

4.2.1.4 The survey extent of ballast tanks converted to void spaces shall be specially considered in relation to the requirements for ballast tanks.

4.2.2 Dry Dock Survey

4.2.2.1 A survey in dry dock shall be a part of the Class Renewal Survey. The overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the cargo holds and water ballast tanks shall be performed in accordance with the applicable requirements for Class Renewal Survey, if not already performed (lower portions of the cargo holds and ballast tanks are considered to be the parts below light ballast water line).

4.2.3 Tank Protection

4.2.3.1 Where provided, the condition of coating or corrosion prevention of ballast tanks shall be examined. For tanks used for water ballast, excluding double bottom tanks, where a hard protective coating is found in poor condition and it is not renewed, where soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question shall be examined at annual internals. Thickness measurements shall be performed as deemed necessary by the surveyor.

When such breakdown of hard protective coating is found in water ballast double bottom tanks, and it is not renewed, where a soft or semi-hard coating has been applied, or where a hard protective coating was not applied from the time of construction, the tanks in question may be examined at annual intervals. When considered necessary by the surveyor, or where extensive corrosion exists, thickness measurements shall be performed.

4.2.3.2 Where the hard protective coating in spaces is found to be in GOOD condition, the extent of close-up surveys and thickness measurements may be specially considered.

4.2.4 Hatch Covers and Coamings

The hatch covers and coamings shall be surveyed as follows:

4.2.4.1 A thorough inspection of the items listed in 2.2.3 shall be performed.

4.2.4.2 Checking the satisfactory operation of all mechanically operated hatch covers shall be made, including:

- stowage and securing in open condition,
- proper fit and efficiency of sealing in closed condition,

– operational testing of hydraulic and power components, wires, chains and link drives.

4.2.4.3 Checking the effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent shall be performed.

4.2.4.4 Close-up survey and thickness measurement¹ of the hatch cover and coaming plating and stiffeners shall be performed as given in Table I and Table II.

4.3 Extent of Overall and Close-up Survey

4.3.1 An overall survey of all tanks and spaces, excluding fuel oil, lubricating oil and fresh water tanks (for fuel oil, lube oil and fresh water tanks refer to *Rules for the Classification and Construction of Seagoing Ships, Part I – Rules for Classification*), shall be performed at each Class Renewal Survey.

4.3.2 The minimum requirements for close-up surveys at Class Renewal Survey are given in Table I.

4.3.3 Surveyor may extend the close-up survey as deemed necessary taking into account the maintenance of the spaces under survey, the condition of the corrosion prevention system and where spaces have structural arrangements or details which have suffered defects in similar spaces or in similar ships according to available information.

4.3.4 For areas in spaces where hard protective coatings are found in a GOOD condition, the extent of close-up surveys according to Table I may be specially considered.

4.4 Extent of Thickness Measurement

4.4.1 The minimum requirements for thickness measurements at Class Renewal Survey are given in Table II.

4.4.2 Representative thickness measurement to determine both general and local levels of corrosion in the shell frames and their end attachments in all cargo holds and water ballast tanks shall be performed. Thickness measurement is also to be performed to determine the corrosion levels on the transverse bulkhead plating.

The thickness measurements may be dispensed with provided the surveyor is satisfied by the close-up examination that there is no structural diminution and the hard protective coating, where applied, remains efficient.

4.4.3 Surveyor may extend the thickness measurements as deemed necessary. When thickness measurements indicate substantial corrosion, the extent of thickness measurements shall be increased to determine the extent of areas of substantial corrosion. Table III may be used as guidance for these additional thickness measurements.

4.4.4 For areas in spaces where hard protective coatings are found in a GOOD condition, the extent of thickness measurements surveys according to Table II may be specially considered.

4.4.5 Transverse sections should be chosen where the largest reductions are suspected to occur or are revealed from deck plating measurements.

4.5 Extent of Tank Testing

4.5.1 All boundaries of water ballast tanks, deep tanks and cargo holds used for water ballast within the cargo length area shall be pressure-tested. For fuel oil tanks, the representative tanks shall be pressure-tested.

4.5.2 Surveyor may extend the tank testing as deemed necessary.

¹ Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey/thickness measurement shall be done of accessible parts of hatch covers structures.

4.5.3 Tank testing of fuel oil tanks shall be performed with a head of liquid to the highest point that liquid will rise under service conditions. Tank testing of fuel oil tanks may be specially considered based on satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been performed according to the requirements with satisfactory results.

4.6 Additional Requirements for Single Hold Cargo Ships after Determining Compliance with SOLAS II-1/23-3 and II-1/25

4.6.1 For ships complying with the requirements of SOLAS II-1/23-3 and II-1/25 for hold water level detectors, the class renewal survey shall include an examination and a test of the water ingress system and of their alarms.

5 PREPARATION FOR SURVEY

5.1 Conditions for Survey

5.1.1 The Owner shall provide the necessary facilities for a safe execution of the survey.

5.1.2 Tanks and spaces shall be safe for access, i.e. gas freed, ventilated and illuminated.

5.1.3 In preparation for survey and thickness measurements and to allow for a thorough examination, all spaces shall be cleaned including removal from surfaces of all loose accumulated corrosion scale. Spaces shall be sufficiently clean and free from water, scale, dirt, oil residues etc. to reveal corrosion, deformation, fractures, damages, or other structural deterioration. However, those areas of structure whose renewal has already been decided by the Owner need only be cleaned and descaled to the extent necessary to determine the limits of the areas to be renewed.

5.1.4 Sufficient illumination shall be provided to reveal corrosion, deformation, fractures, damages or other structural deterioration.

5.1.5 Where soft or semi-hard coatings have been applied, safe access shall be provided for the surveyor to verify the effectiveness of the coating and to perform an assessment of the conditions of internal structures which may include spot removal of the coating. When safe access cannot be provided, the soft or semi hard coating shall be removed.

5.2 Access to Structures

5.2.1 For overall survey, means shall be provided to enable the Surveyor to examine the hull structure in a safe and practical way.

5.2.2 For close-up surveys, one or more of the following means for access, acceptable to the Surveyor, shall be provided:

- permanent staging and passages through structures,
- temporary staging, e.g. ladders, and passages through structures,
- hydraulic arm vehicles such as conventional cherry pickers, lifts and movable platforms,
- boats or rafts,
- other equivalent means.

5.3 Equipment for Survey

5.3.1 Thickness measurement is normally to be performed by means of ultrasonic test equipment. The accuracy of the equipment shall be proven to the Surveyor as required.

5.3.2 One or more of the following fracture detection procedures may be required if deemed necessary by the Surveyor:

- radiographic equipment,
- ultrasonic equipment,
- magnetic particle equipment,

– dye penetrant.

5.4 Survey at Sea or at Anchorage

5.4.1 Survey at sea or at anchorage may be accepted provided the Surveyor is given the necessary assistance from the personnel on board. Necessary precautions and procedures for performing the survey shall be in accordance with 5.1, 5.2, and 5.3.

5.4.2 A communication system shall be arranged between the survey party in the tank and the responsible officer on deck. This system must also include the personnel in charge of ballast pump handling if boats or rafts are used

5.4.3 When boats or rafts are used, appropriate life jackets shall be available to all participants. Boats or rafts shall have satisfactory residual buoyancy and stability even if one chamber is ruptured. A safety checklist shall be provided.

5.4.4 Surveys of tanks by means of boats or rafts may only be undertaken at the sole discretion of the surveyor, who shall take into account the safety arrangements provided, including weather forecast and ship response in reasonable sea conditions. See *Publication No. 72/P – Guidelines for Approval / Acceptance of Alternative Means of Access*.

6 PROCEDURES FOR THICKNESS MEASUREMENTS

6.1 General

6.1.1 The required thickness measurements, if not performed by PRS itself, shall be witnessed by a PRS surveyor. Surveyor shall be on board to the extent necessary to control the process.

6.1.2 The thickness measurement company shall be part of the survey planning meeting to be held prior to commencing the survey.

6.1.3 Thickness measurements of structures in areas where close-up surveys are required shall be performed simultaneously with close-up surveys.

6.2 Certification of Thickness Measurement Company

6.2.1 The thickness measurement shall be performed by a company certified by PRS according to the principles stated in Table IV.

6.3 Reporting

6.3.1 A thickness measurement report shall be prepared and submitted to PRS. The report shall give the location of measurements, the thickness measured, as well as corresponding original thickness. Furthermore, the report shall give the date when the measurements were performed, type of measuring equipment, names of personnel and their qualifications and has to be signed by the operator.

6.3.2 Surveyor shall review the final thickness measurement report and countersign the cover page.

Table I
MINIMUM REQUIREMENTS FOR CLOSE-UP SURVEYS
AT CLASS RENEWAL SURVEYS OF GENERAL DRY CARGO SHIPS

I class renewal Age ≤ 5 years	II class renewal 5 < Age ≤ 10 years	III class renewal 10 < Age ≤ 15 years	IV and subsequent class renewals Age > 15 years
(A) Selected shell frames in one forward and one aft cargo hold and associated tween deck spaces.	(A) selected shell frames in all cargo holds and tween deck spaces	(A) All shell frames in the forward lower cargo hold and 25% of frames in each of the remaining cargo holds and tween deck spaces, including upper and lower end attachments and adjacent shell plating.	(A) All shell frames in all cargo holds and tween deck spaces, including upper and lower end attachments and adjacent shell plating.
(B) One selected cargo hold transverse bulkhead.	(B) One transverse bulkhead in each cargo hold. (B) Forward and aft transverse bulkhead in one side ballast tank, including stiffening system. (C) One transverse web with associated plating and framing in two representative water ballast tanks of each type (i.e. topside, hopper side, side tank or double bottom tank).	(B) All cargo hold transverse bulkheads. (B) All transverse bulkheads in ballast tanks, including stiffening system. (C) All transverse webs with associated plating and framing in each water ballast tank.	Areas (B) – (F) as for Class Renewal Survey No. 3.
(D) All cargo hold hatch covers and coamings (plating and stiffeners).	(D) All cargo hold hatch covers and coamings (plating and stiffeners). (E) Selected areas of deck plating and underdeck structure inside line of hatch openings between cargo hold hatches. (F) Selected areas of inner bottom plating.	(D) All cargo hold hatch covers and coamings (plating and stiffeners). (E) All deck plating and underdeck structure inside line of hatch openings between cargo hold hatches. (F) All areas of inner bottom plating.	

- (A) – Cargo hold transverse frames
(B) – Cargo hold transverse bulkheads plating, stiffeners and girders
(C) – Transverse web frame or watertight transverse bulkhead in water ballast tanks
(D) – Cargo hold hatch covers and coamings. **Subject to cargo hold hatch covers of approved design which structurally have no access to the internals, close-up survey/thickness measurement shall be done of accessible parts of hatch covers structures.**
(E) – Deck plating and underdeck structure inside line of hatch openings between cargo hold hatches
(F) – Inner bottom plating

See sketches 1 and 2 for the areas corresponding to (A), (B), (C), (D), (E) and (F).

Note: Close-up survey of transverse bulkheads to be performed at the below levels:

Level (a) Immediately above the inner bottom and immediately above the tween decks, as applicable.

Level (b) About mid-height of the bulkheads for holds without tween decks.

Level (c) Immediately below the main deck plating and tween deck plating.

Table II
MINIMUM REQUIREMENTS FOR THE THICKNESS MEASUREMENTS
AT CLASS RENEWAL SURVEYS OF GENERAL DRY CARGO SHIPS

I class renewal Age ≤ 5 years	II class renewal 5 < Age ≤ 10 years	III class renewal 10 < Age ≤ 15 years	IV and subsequent class renewals Age > 15 years
1. Suspect areas	1. Suspect areas 2. One transverse section of deck plating in way of a cargo space within the amidships 0.5L. 3. Measurement, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Table I.	1. Suspect areas 2. Two transverse sections within the amidships 0.5L in way of two different cargo spaces. 3. Measurement, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Table I. 4. Within the cargo length area, each deck plate outside line of cargo hatch openings. 5. All wind and water strakes within the cargo length area. 6. Selected wind and water strakes outside the cargo length area.	1. Suspect areas 2. Within the cargo length area: a) a minimum of three transverse sections within the amidships 0.5L. b) each deck plate outside line of cargo hatch openings. c) each bottom plate, including lower turn of bilge. d) duct keel or pipe tunnel plating and internals. 3. Measurement for general assessment and recording of corrosion pattern of those structural members subject to close-up survey according to Table I. 4. All wind and water strakes full length.

Notes:

1. Thickness measurements locations should be selected to provide the best representative sampling of areas likely to be most exposed to corrosion, considering cargo and ballast history and arrangement and condition of protective coatings.
2. For ships less than 100 meters in length, the number of transverse sections required at class renewal survey No. III may be reduced to one and the number of transverse sections at class renewal survey No. IV and subsequent surveys may be reduced to two.

Table III
GUIDANCE FOR ADDITIONAL THICKNESS MEASUREMENTS
IN WAY OF SUBSTANTIAL CORROSION

Structural Member	Extent of Measurement	Pattern of Measurement
Plating	Suspect area and adjacent plates	5 point pattern over 1 square meter
Stiffeners	Suspect area	3 measurements each in line across web and flange.

Table IV
PROCEDURES FOR CERTIFICATION OF FIRMS
ENGAGED IN THICKNESS MEASUREMENTS OF HULL STRUCTURES

1 Application

This guidance applies for certification of the firms which intend to engage in the thickness measurement of hull structures of the vessels.

2 Procedure for Certification

2.1 Submission of Documents

The following documents shall be submitted to PRS HO for approval:

- .1** Outline of firm, e.g. organisation and management structure.
- .2** Experience of the firm on thickness measurement, inter alia of hull structures of the vessels.
- .3** Technicians careers, i.e. experiences of technicians as thickness measurement operators, technical knowledge of hull structure, etc. Operators should be qualified according to a recognised industrial NDT Standard.
- .4** Equipment used for thickness measurement such as ultrasonic testing machines and its maintenance/calibration procedures.
- .5** A guide for thickness measurement operators.
- .6** Training programmes of technicians for thickness measurement.

2.2 Auditing of the Firms

Upon reviewing the documents submitted with satisfactory results, the firm is audited in order to ascertain that it is duly organised and managed in accordance with the documents submitted, and eventually is capable of conducting thickness measurements of the hull construction of the ships.

2.3 Demonstration

Certification is conditional on an onboard demonstration of thickness measurements, as well as satisfactory reporting.

3 Certification

3.1 Upon satisfactory results of both the audit of the firm in 2.2 and the demonstration tests in 2.3 above, PRS will issue a Certificate of Approval, as well as notice to the effect that the thickness measurement operation system of the firm has been certified by PRS.

Note: Details concerning approval of firms engaged in thickness measurement of hull structures are included in *Publication No. 51/P – Procedural Requirements for Service Suppliers*.

3.2 Renewal/endorsement of the Certificate shall be made at intervals not exceeding 3 years by verification that original conditions are maintained.

4 Information of any Alteration to the Certified Thickness Measurement Operation System

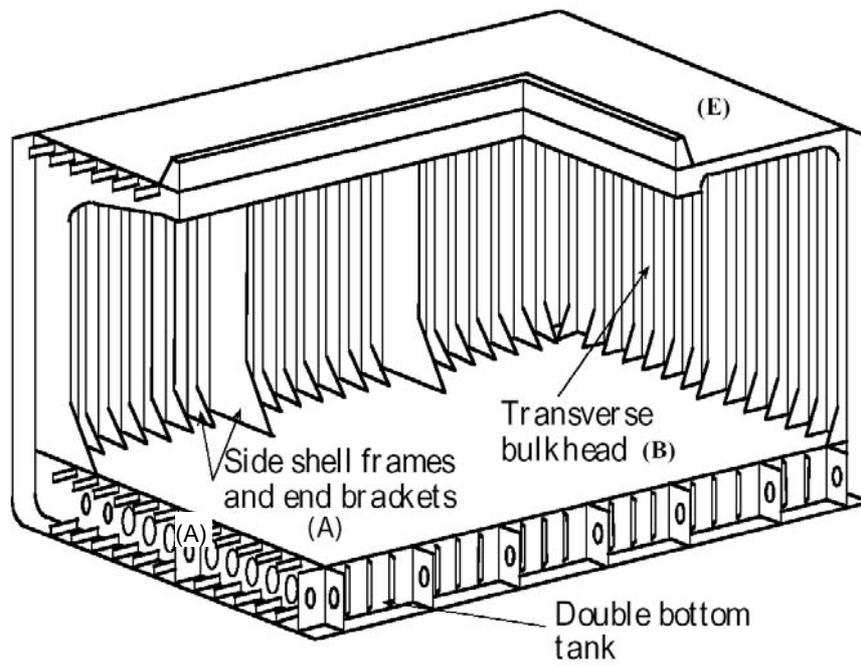
In case where any alteration to the certified thickness measurement operation system of the firm is made, such an alteration shall be immediately reported to PRS. Re-audit is made where deemed necessary by PRS.

5 Cancellation of Approval

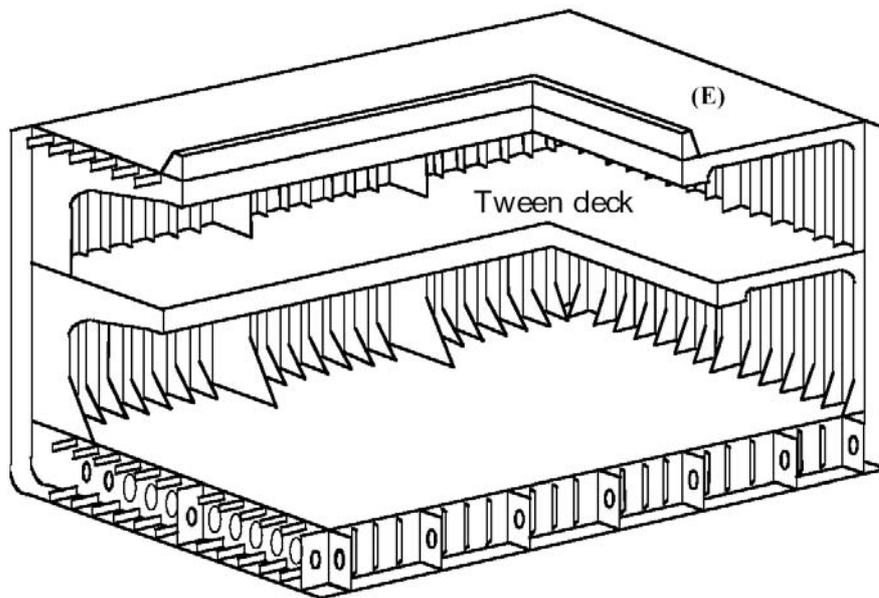
Approval may be cancelled in the following cases:

- .1** Where the measurements were improperly performed or the results were improperly reported.
- .2** Where the PRS Surveyor found any deficiencies in the approved thickness measurement operation system of the firm.

.3 Where the firm failed to inform of any alteration in 4 above to PRS.



(a) Single Deck Ship



(b) Tween Deck Ship

Figure 1. Areas for Close-up Survey of General Dry Cargo Ships

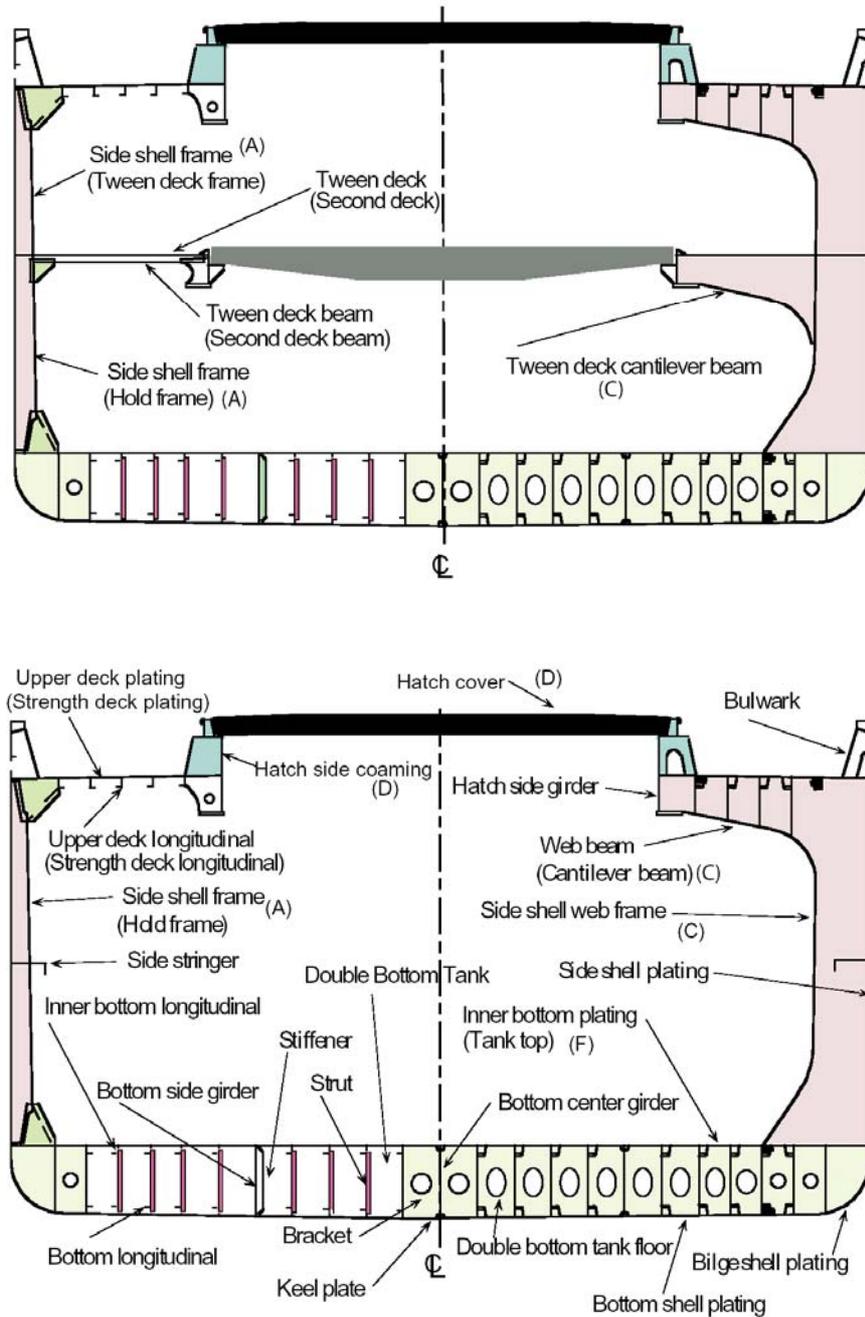


Figure 2. Areas for Close-up Survey of General Dry Cargo Ships

List of amendments effective as of 1 July 2016

<i>Item</i>	<i>Title/Subject</i>	<i>Source</i>
1.4	Thickness measurements and close-up surveys	IACS UR Z7.1 Rev.11
4.2.4.4	Hatch covers and coamings	IACS UR Z7.1 Rev.11
Table I	Minimum requirements for close up surveys	IACS UR Z7.1 Rev.11