

Section 4

Surveys - Special Ship Types

A. Oil Tankers

1. General Requirements

1.1 Application

1.1.1 The following instructions refer to oil tankers and product carriers as defined by the GL Rules for [Hull Structures \(I-1-1\), Section 24](#), i. e., also to ships intended for the alternative carriage of dry cargo or oil, and to double hull oil tankers.

1.1.2 The following requirements apply to surveys of hull structure and piping systems in way of cargo tanks, pump rooms, cofferdams, pipe tunnels, void spaces within the cargo area, and for all ballast tanks on ships with the class notation **ESP** additionally to the arrangements in [Section 3](#).

Unless otherwise stated in the following, the arrangements in [Section 3](#) apply.

1.2 Extent of surveys

1.2.1 The surveys are to cover all installations, outfit and equipment related to the carriage and handling of oil cargo. They also cover the surveys required by the **SOLAS 74** regulations¹ for oil tankers. The protective equipment and the safety equipment required by the **SOLAS 74** regulations for protection of the personnel as well as other equipment and outfit, which are no class requirement items, are not covered by the present Rules for Classification and Surveys. These items will, however, be included in the surveys, if compliance with the requirements of an Administration has to be certified.

1.2.2 Hull

The following requirements under [2](#). to [4](#). define the minimum extent of examinations. The surveys are to be extended where substantial corrosion and/or structural defects are found, and will include an additional close-up survey (close visual inspection range, preferably within reach of hand) where deemed necessary by the Surveyor.

1.2.3 Repairs

Necessary repairs, see [Section 2, B.2.4](#).

1.3 Documents to be carried on board

1.3.1 The owner is to supply and maintain on board documentation as specified under [1.3.2](#) and [1.3.3](#) which is to be readily available for the Surveyor. The documentation is to be kept on board for the life time of the ship.

1.3.2 Survey Report File

A Survey Report File is to be part of the documentation on board:

- reports on structural surveys
- Executive Hull Summary²
- thickness measurements reports²

The Survey Report File is to be available also in the Owners management office.

1.3.3 Supporting documents

- main structural plan of cargo and ballast tanks
- previous damage and repair history
- cargo and ballast history²
- extent of use of inert gas plant and tank² cleaning procedures
- inspections by ship's personnel with reference to²
 - structural deterioration in general
 - leakage in bulkheads and piping
 - condition of protective coating or corrosion prevention
- Survey Programme as required under [1.6](#)² till the completion of the next Class Renewal Survey
- Description and history corrosion prevention systems, if any
- Information regarding conversion or modification of cargo and ballast tanks
- any other information that will help to identify Suspect Areas requiring inspection

1.4 Access to Structures

1.4.1 Regarding accessibility to spaces, absence of gases, removal of residual cargo and rust, and in respect of lighting, the ship is to be prepared such as to enable it to be duly examined without any risk.

¹ "International Convention for the Safety of Life at Sea" (1974) and Amendments

² Applicable in conjunction with Class Notation "ESP", see [Section 2, C.3.1.6](#)

Where soft³ or semi-hard coating has been applied, safe access is to be provided for the surveyor to verify the effectiveness of coating and to assess the internal structure. When safe access cannot be provided, it may be necessary to remove this soft or semi-hard coating, at least partially.

1.4.2 For close-up surveys in cargo and ballast tanks, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

- permanent or temporary staging
- passages through structures
- lifts and moveable platforms
- boats or rafts
- other equivalent means

1.5 Survey at Sea

Upon prior agreement with the owner, GL may carry out surveys at sea or at anchorage, provided the Surveyor is given the necessary assistance, including safety equipment, by the personnel on board. See also [Section 3, A.1.4](#).

1.6 Survey programme²

For each Class renewal as well as for intermediate surveys for oil tankers over 10 years of age, a survey programme / planning document has to be worked out in advance. This planning document is prepared by GL Head Office and adjusted to the actual situation found on board by the owner in cooperation with the surveyor during the intermediate survey. The completed planning document is then reviewed by GL Head Office.

2. Annual Surveys

2.1 General

2.1.1 In addition to the surveys as stipulated in [Section 3, C.1.1](#) the following installations, structural elements, items of equipment and outfit, including facilities for handling and carriage of the oil cargo as stated below in 2.2 to 2.8, are to be surveyed in order to ensure that they are maintained in satisfactory condition.

Prior to inspection, the Surveyor shall examine the documentation required to be kept on board for this type of vessel, as a basis for the survey, see [1.3](#).

2.1.2 The annual survey is to ensure that the cargo handling installations and pertinent safety equipment are in good working order. The surveys are preferably to be carried out during loading or discharging operations.

For the aforementioned surveys normally access to cargo holds or other spaces within the cargo area necessitating gas-freeing is not required, unless checking of the equipment for correct functioning is not possible otherwise.

³ "Soft coating" means: Solvent-free coating on base of wool grease, grease, mineral oils and/or wax that remains soft so that it wears off when touched.

2.2 Installations on the weather deck

2.2.1 On the weather deck the following equipment, if fitted, will have to be surveyed and/or checked:

- cargo tank hatches, including seals and covers
- cargo tank pressure/vacuum relief valves and flame arresters
- air pipe heads/flame arresters of all bunker tanks and the like
- cargo, crude oil washing, bunkering, ballast and cargo tank vent line systems, including remotely controlled valves and safety equipment
- cargo tank gauging systems
- for electrical equipment, see [2.4](#)
- for fire-extinguishing equipment, see [2.5](#).
- emergency towing appliances for oil tankers exceeding to 20.000 tdw
- safe access to tanker bow

2.2.2 The cargo handling installations (including spool pieces of the loading and unloading system, spray shields and drip trays, cargo hoses, etc.) arranged on the weather deck, possibly in the fore or aft area, are to be visually examined.

2.3 Pump rooms and pipe tunnels

Equipment in pump rooms and other enclosed spaces serving cargo handling operations, including pipe tunnels if fitted, is to be checked, in particular as to leakages and potential sources of danger (explosion protection), e. g.:

- condition of bulkheads and bulkhead penetrations (cracks, leakages)
- all piping systems including pressure gauges
- cargo, stripping, bilge and ballast pumps for leakages, as far as practicable
- electrical and mechanical remote control and emergency stopping equipment, see also [2.4](#)
- ventilation systems
- fire extinguishing systems, see also [2.5](#)

2.4 Electrical installations

In gas-dangerous spaces and zones the electrical equipment, including cables and their supports is to be visually examined, particularly regarding explosion protection.

2.5 Fire-extinguishing systems

The survey of the fire-extinguishing systems covers

- external inspection of all systems for the cargo tank area, including the pump room
- checking of the foam fire extinguishing and/or water spraying system on deck, see [Section 3, C.1.1.4](#).

2.6 Inert gas systems

A survey of the inert gas system covers:

- external checking of important system components for wear and corrosion
- external checking of piping, fittings and safety equipment, including operational test of the blowers
- checking of the soot blowers as to interlocking
- checking of the alarm, recording and safety equipment

2.7 Ballast tanks

Ballast tanks shall be surveyed, within annual surveys, as a consequence of findings on the occasion of an intermediate or Class Renewal Survey, see 3.3 and Section 3, C.1.2.2.

Ballast tanks are to be examined at annual intervals where:

- a hard protected coating has not been applied from the time of construction, or
- a soft or semi-hard coating has been applied, or
- substantial corrosion⁴ is found within the tank, or
- the hard protective coating is found in less than good condition⁵ and the hard protective coating is not repaired to the satisfaction of Surveyor, or
- additionally on ships exceeding 15 years of age: the tank has a common plane boundary with a cargo tank with any means of heating. Such tanks, where the protective coating was found to be in good condition at the previous intermediate or renewal surveys, may be specially considered by the Surveyor.

Regarding the renewal of protective coating see Section 3, C.1.2.2.5.

If considered necessary by the Surveyor, thickness measurements are to be carried out, which are to be extended if substantial corrosion is found.

2.8 Miscellaneous

On the occasion of the annual survey also the following items are to be checked:

- special arrangements related to damage control, e. g. sliding bulkhead doors in accordance with the approved damage control plan
- cargo sample stowage spaces
- gas detection instruments
- cargo information, safety instructions, etc., see 1.3.

⁴ Substantial corrosion is an extent of corrosion such that assessment of corrosion pattern indicate a wastage in excess of 75 % of allowable margins, but within acceptable limits. For vessels built under the IACS Common Structural Rules, substantial corrosion is an extent of corrosion such that the assessment of the corrosion pattern indicates a gauged (or measured) thickness between $t_{net} + 0,5$ mm and t_{net} .

⁵ Good condition: Condition with only minor spot rusting

3. Intermediate Surveys

3.1 General

3.1.1 In addition to the surveys and checks listed in item 2 above, on the occasion of the second or the third annual survey the checks mentioned below will be carried out. If deemed necessary by the Surveyor, functional test, pressure tests or thickness measurements are to be carried out in addition to the survey.

3.1.2 For oil tankers exceeding 15 years of age the intermediate survey is to be carried out in dry-dock. For oil tankers of 15 years of age or less, GL may agree to a bottom in-water survey according to Section 3, C.1.7.

3.1.3 In case of ships exceeding 10 years of age the intermediate survey is to be enhanced to the scope of previous Class Renewal Survey according to 1.6 and 4. Pressure testing of ballast and cargo tanks and the requirements for longitudinal strength evaluation of hull girder according to 4.2.3.4 are not required unless deemed necessary by the attending Surveyor.

3.1.4 Concurrent crediting for surveys and thickness measurements to both Intermediate and Class Renewal Survey is not acceptable.

3.2 Installations in the cargo area

3.2.1 Irrespective of the vessel's age the condition of the cargo, tank cleaning, bunkering, ballast, steam and venting systems, as well as of the vent masts and headers is to be checked. In cases of any doubt on whose condition pressure tests and/or wall thickness measurements may be demanded.

Cargo tank high velocity vent and pressure/vacuum valves are to be function tested, and if deemed necessary by the Surveyor, to be opened up and re-adjusted.

3.2.2 Beyond this, the following is to be checked:

- drainage of cargo tank vent lines
- bonding devices of all piping systems and cargo tanks built-in independent from the hull
- cargo hoses (repeat test, if needed)

3.3 Ballast tanks

3.3.1 Vessels over 5 and up to 10 years of age

All ballast tanks are to be examined. When considered necessary by the Surveyor, thickness measurement and testing are to be carried out to ensure that the structural integrity remains effective.

A ballast tank is to be examined at subsequent annual intervals where:

- a hard protective coating has not been applied from the time of construction, or
- a soft or semi-hard coating has been applied, or
- substantial corrosion⁴ is found within the tank, or

- the hard protective coating is found to be in less than good condition⁵ and the hard protective coating is not repaired to the satisfaction of the Surveyor.

In addition to the requirements above, suspect areas⁶ identified at previous surveys are to be examined.

Regarding the renewal of protective coating, see also [Section 3, C.1.2.2.5](#).

Semi-hard coatings in ballast tanks, if already applied, will not be accepted from the next special or intermediate commenced on or after 1 July 2010, whichever comes first, with respect to waiving the annual internal examination of ballast tanks as required in [2.7](#).

3.3.2 Vessels more than 10 years of age

For the intermediate survey of ships exceeding 10 years of age, see [3.1.3](#).

3.3.3 For double hull oil tankers, see [Table 4.1](#).

3.4 Thickness measurements

Thickness measurements are to be carried out in areas found to be suspect during the previous Class Renewal Survey. In case of ships exceeding 10 years of age please refer also to [3.1.3](#).

Where substantial corrosion is found, the extent of the thickness measurements is to be increased.

Authorization for thickness measurements see [Section 3, C.2.2](#).

3.4.1 For double hull oil tankers, see [Table 4.1](#).

3.5 Electrical installations

3.5.1 Irrespective of the vessel's age, electrical equipment and cables in gas-dangerous spaces, such as pump rooms and spaces adjacent to cargo tanks, are to be inspected. Insulation measurements are to be carried out (only in gas-free or inerted condition). Any measurement protocols kept on board may be considered.

3.5.2 Beyond this, in gas-dangerous areas the following checks are to be made:

- protective earthing of system components (spot checks)
- integrity of certified safe-type equipment
- damages to outer sheet of cables
- function testing of pressurized equipment and of associated alarms

3.6 Inert gas systems

The survey is to be carried out according to GL survey-programmes, see [Section 3, B.1.5.7](#).

4. Class Renewal Surveys

4.1 General requirements

4.1.1 In addition to the Class Renewal Surveys of the ship's hull, the machinery plant and electrical installation, according [Section 3, C.1.3](#), the structural elements, equipment and outfit including the cargo system and pertinent safety devices listed in [3.2](#) for intermediate survey, are to be subjected to thorough examination and testing for proper functioning at the Surveyor's discretion.

It is to be verified that the relevant instructions, documentation and information material, such as cargo handling plans, cargo tank loading limit information etc. are kept on board, see [1.3](#).

4.1.2 The Class Renewal Survey of cargo handling installations and related control, alarm and safety devices cannot normally be carried out during loading or discharging operations and is preferably to be carried out with the ship in gas-free condition.

4.1.3 Spaces and areas serving cargo handling operations (e. g. cargo control rooms and pump rooms), are to be examined with respect to their general condition and possible sources of danger. All accessible gas tight bulkhead penetrations including gastight shaft seals are to be visually examined.

4.1.4 Regarding planning/survey programme, see [1.6](#).

Table 4.1 Intermediate Survey (Hull) of Double Hull Oil Tankers. Minimum Requirements for Overall and Close-up Survey and Thickness Measurement

Ship's age [years]		
5 < age ≤ 10	10 < age ≤ 15	age > 15
Overall survey of representative water ballast tanks, selected by the attending surveyor (the selection is to include fore and aft peak tanks and three other tanks)	As for the previous Class Renewal Survey, see also 3.1.3	As for the previous Class Renewal Survey, see also 3.1.3
Thickness measurements of those areas found to be suspect areas at the previous Class Renewal Survey		

⁶ Suspect Areas: Locations showing substantial corrosion and/or considered by the Surveyor to be prone to rapid wastage.

4.1.5 For Class Renewal Surveys of oil tankers (hull), the "Continuous Class Renewal" procedure described in [Section 3, B.1.3.6](#) is excluded.

4.1.6 The Class Renewal Survey is to be held when the ship is in dry-dock or on a slipway, unless a dry-docking survey has been carried out within the admissible period, see [Section 3, B.1.6.7](#). The ship is to be placed on blocks of sufficient height so that the keel, the bottom plating and the rudder can be examined.

4.1.7 Concurrent crediting for surveys and thickness measurements to both Intermediate and Class Renewal Survey is not acceptable.

4.2 Hull in the cargo area

4.2.1 General requirements

4.2.1.1 All cargo tanks, ballast tanks including double bottom tanks, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined. This examination is to be supplemented by thickness measurements and tank testing as deemed necessary to ensure that the structural integrity continues to be given.

The examination is to be sufficiently thorough for revealing substantial corrosion, significant deformations, fractures, damages or other structural deteriorations affecting vessel's class. Special attention is to be drawn to the structure and the coating in ballast tanks for necessity of annual inspections, see [2.7](#).

Regarding anticipated thickness measurements, see also [Section 3, C.2.3.5](#).

4.2.1.2 Cargo piping on deck, including crude oil washing piping, and cargo and ballast piping within the above spaces are to be examined and tested to working conditions to ensure their continued satisfactory condition.

Special attention is to be given to ballast piping in cargo tanks and cargo piping in ballast tanks and void spaces.

4.2.1.3 The survey extent of combined ballast/cargo holds is to be determined based on the records of ballast history, the corrosion prevention system provided, and the extent of corrosion found, see [1.3](#).

4.2.2 Surveys

4.2.2.1 Overall Survey

An overall survey of all cargo and ballast tanks and spaces is to be carried out, see also [3.3.1](#).

For fuel oil, lubricating oil and fresh water tanks, the necessity for the overall survey is to be determined based on the ship's age, see [Section 3, Table 3.1](#).

4.2.2.2 Close-up Surveys

Close-up Surveys are to be carried out at least acc. to the requirements shown in [Table 4.2](#) or, for double hull oil tankers, [Table 4.3](#), depending on the age of the vessel.

The Surveyor may extend the close-up survey as deemed necessary taking into account the maintenance of the tanks under survey and the condition of the corrosion

prevention system, and also in the following cases:

- in particular, tanks having structural arrangements or details which have suffered defects in similar tanks or on similar ships according to available information
- tanks which have structures approved with reduced scantlings due to an approved corrosion control system

For areas in tanks where the protective coating is found to be in a good condition, the extent of close-up surveys according to [Tables 4.2](#) and [4.3](#) may be specially considered by the Surveyor.

4.2.2.3 Tank corrosion prevention

Where provided, the condition and/or function of protective coating or corrosion prevention of cargo and ballast tanks is/are to be examined. Detail procedure (possible change to annual surveys) as under [3.3.1](#), regardless of the ship's age.

Semi-hard coatings in ballast tanks, if already applied, will not be accepted from the next special or intermediate survey commenced on or after 1 July 2010, whichever comes first, with respect to waiving the annual internal examination of ballast tanks as required in [2.7](#).

4.2.3 Thickness measurements

4.2.3.1 The minimum requirements for thickness measurements on the occasion of Class Renewal Surveys are stated in [Table 4.4](#). Extended measurements may be required by the Surveyor, e. g. for areas with substantial corrosion and/or as specified in the survey programme, see [1.6](#). Thickness measurements shall be witnessed by the Surveyor to the necessary extent.

4.2.3.2 For areas in tanks where the protective coating is found to be in a good condition⁵, the extent of thickness measurements according to [Table 4.4](#) may be specially considered by the Surveyor. That means sufficient measurements are to be taken to confirm the actual average condition of the structure under the coating.

4.2.3.3 Transverse sections are to be chosen where largest corrosion rates are suspected to occur or are revealed by deck plating measurements. At least one of these transverse sections is to include a ballast tank within 0, 5 L amidships.

4.2.3.4 Regarding thickness measurements see also [Section 3, C.2](#). For oil tankers, exceeding 10 years of age and 130 m in length L, the longitudinal strength is to be evaluated using the actual thickness measurements. The maximal allowable diminution of midship section modulus should be calculated using specific criteria.

4.2.4 Tank testing

4.2.4.1 The minimum requirements for tank testing are given in [Table 4.5](#). The Surveyor may require tank testing to be extended as deemed necessary.

4.2.4.2 Regarding pressure heads and testing with air pressure, see [Section 3, C.1.3.2.1.4](#).

**Table 4.2 Class Renewal Surveys (Hull) of Oil Tankers, Ore/Oil Ships etc.
Minimum Requirements for Close-up Surveys**

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
<p>One complete transverse web frame ring including adjacent structural members in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast.</p> <p>One deck transverse including adjacent deck structural members in a cargo tank.</p>	<p>All complete transverse web frame rings including adjacent structural members in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast.</p> <p>One deck transverse including adjacent deck structural members in each of the remaining ballast tanks, if any.</p> <p>One deck transverse including adjacent deck structure in a cargo wing tank and in two cargo centre tanks.</p>	<p>All complete transverse web frame rings including adjacent structural members in all ballast tanks and in a cargo wing tank.</p> <p>A minimum of 30 % of all complete transverse web frame rings including adjacent structural members in each remaining cargo wing tank ¹</p> <p>A minimum of 30 % of deck and bottom transverses including adjacent structural members in each cargo centre tank ¹</p> <p>Additional complete transverse web frame rings as considered necessary by the Surveyor.</p>	<p>As for class renewal survey No. III</p> <p>Additional transverse frames as deemed necessary by the Surveyor.</p>
<p>Lower part of one transverse bulkhead - including girder system and adjacent structural members - in one ballast tank, one cargo wing tank and one cargo centre tank.</p>	<p>Both transverse bulkheads complete - including girder system and adjacent members - in a ballast wing tank, if any, or a cargo wing tank used primarily for water ballast.</p> <p>One transverse bulkhead lower part - including girder system and adjacent structural members - in each of the remaining ballast tanks, one cargo wing tank and two cargo centre tanks.</p>	<p>All transverse bulkheads complete - including girder system and adjacent members - in all cargo and ballast tanks.</p>	<p>Bulkheads: As for class renewal survey No. III.</p>

¹ The 30 % value is to be rounded up to the next whole integer.

4.3 Cargo area equipment

4.3.1 Cargo and ballast piping systems, including valves and fittings, are to be internally inspected for corrosion as deemed necessary by the Surveyor. Subsequently, a pressure test is to be carried out.

4.3.2 Cargo, stripping and ballast pumps are to be examined and checked. Pressure relief valves of pumps are to be function tested.

4.3.3 Cargo tank high velocity vent and pressure/vacuum valves are to be overhauled, adjusted by makers/ recognized firm and tested under supervision of a Surveyor.

4.3.4 Tank venting systems are to be examined; flame arresters are to be opened as far as necessary, and cleaned.

4.3.5 Cargo tank heating systems are to be examined and pressure-tested to 1,5 times the operating pressure, see [Section 3, C.1.5.4.4](#).

4.3.6 The bilge systems of pump rooms and cofferdams are to be inspected and tested.

4.3.7 All ventilation systems in the cargo area including portable fans are to be examined and function-tested.

4.3.8 The following equipment is to be function-tested:

- level indicators of cargo tanks
- liquid level alarms
- overflow controls
- pressure and temperature alarms
- remote-control systems of cargo pumps
- sampling arrangements of cargo tanks, if fitted
- for inert gas systems see [3.6](#).

4.4 Electrical installations

In addition to the inspection and tests as per [3.5](#) the protection devices of electric motors are to be tested.

**Table 4.3 Class Renewal Surveys (Hull) of Double Hull Oil Tankers
 Minimum Requirements for Close-Up Surveys**

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age >15
One web frame ¹ (means a vertical web in side tank, hopper web in hopper tank, floor in double bottom tank and deck transverse in double deck tank, where fitted, including adjacent structural members). In fore and aft peak tanks means a complete trans-verse web frame ring including adjacent structural members) in a ballast tank ²	All web frames as defined in I. The knuckle area ⁴ and the upper part (5 metres approximately) of one web frame in each remaining ballast tank including adjacent structural members.	All web frames ¹ as defined in I. but in all ballast tanks.	As for Class Renewal Survey No. III. Additional transverse areas as deemed necessary by the Society Surveyor.
One deck transverse ¹ , (including adjacent deck structural members, or external structure on deck in way of the tank, where applicable) in a cargo oil tank.	One deck transverse ¹ as defined in I. but in two cargo oil tanks.	All web frames ¹ (including deck transverses, longitudinal bulk-head vertical girder and cross ties, where fitted, including adjacent structural members), including deck transverse and cross ties, if fitted, in a cargo oil tank. One web frame ¹ (including etc., as above) including deck trans-verses and cross ties, if fitted, in each remaining cargo oil tank.	
One transverse bulkhead ¹ (in ballast tanks, including adjacent structural members, such as longitudinal bulkheads, girders in double bottom tanks, inner bottom plating, hopper side, connecting brackets) in a complete ballast tank. ² .	One transverse bulkhead ¹ as defined in I. but in each ballast tank ²	All transverse bulkheads, in all cargo oil tanks ¹ (complete in cargo tanks, including girder system, adjacent structural members, such as longitudinal bulkheads, and internal structure of lower and upper stools, where fitted) and ballast tanks (complete in ballast tanks including girder system and adjacent structural members, such as longitudinal bulkheads, girders in double bottom tanks, inner bottom plating, hopper side, connecting brackets).	
One transverse bulkhead ¹ (lower part in cargo tank, including girder system, adjacent structural members, such as longitudinal bulkheads, and internal structure of lower stool, where fitted) in a cargo oil centre tank and in a cargo oil wing tank ³ .	One transverse bulkhead ¹ as defined in I. but in two cargo oil centre tanks and in a cargo oil wing tank ³ .		
<p>¹ These areas are to be subjected to close-up surveys and thickness measurements.</p> <p>² Complete ballast tank means double bottom tank plus double side tank plus double deck tank, even if these tanks are separate.</p> <p>³ Where no centre cargo tanks are fitted, transverse bulkheads in wing tanks are to be surveyed.</p> <p>⁴ Knuckle area is the area of the web frame around the connections of the slope hopper plating to the inner hull bulkhead and the inner bottom plating, up to 2 metres from the corners both on the bulkhead and the double bottom.</p>			

Table 4.4 Class Renewal Surveys (Hull) of Single and Double Hull Oil Tankers, Ore/Oil Ships etc. Minimum Requirements for Thickness Measurements

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
One section of deck plating for the full beam of the ship within the cargo area (in way of side, hopper, double bottom ballast tank, if any, or a cargo tank used primarily for water ballast)	Within the cargo area: – each deck plate – one transverse section ¹	Within the cargo area: – each deck plate – two transverse sections ¹	Within the cargo area: – each deck plate – three transverse sections ¹ – each bottom plate
Measurements of structural members subject to close-up survey according to Table 4.2 or 4.3, for general assessment and recording of corrosion pattern			
Suspect areas			
	Selected wind and water strakes outside the cargo area		All wind and water strakes full length
	All wind and water strakes within the cargo area		
¹ At least one section is to include a ballast tank within 0,5 L amidships.			

Table 4.5 Class Renewal Surveys (Hull) of Oil Tankers, Ore/Oil Ships, Double Hull Oil Tankers etc. Minimum Requirements for Tank Testing

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
All ballast tank boundaries			
Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels, pump rooms or cofferdams	All cargo tank bulkheads		

B. Oil Recovery Vessels

1. General Requirements

1.1 Application

1.1.1 The following instructions refer to oil recovery vessels as defined by the GL Rules for [Oil Recovery Vessels \(I-1-9\)](#).

1.1.2 Unless otherwise stated in the following, the arrangements as per [Section 3](#) and [A](#) apply.

1.2 Extent of surveys

1.2.1 The surveys are to cover installations, outfit and equipment for:

- operation in oil covered waters
- recovering oil floating on the water
- the carriage and handling of oil cargo

They also cover the surveys required by the SOLAS regulations ¹ for oil tankers.

The protective equipment and the safety equipment required by the SOLAS regulations for protection of the personnel as well as other equipment and outfit, which are no class requirement items, are not covered by the present Rules for Classification and Surveys. These items will, however, be included in the surveys, if compliance with the requirements of an Administration has to be certified.

1.2.2 Hull

The following requirements under [2.](#) to [4.](#) define the minimum extent of examinations. The surveys are to be extended where substantial corrosion and/or structural defects are found, and will include an additional close-up survey (close visual inspection range, preferably within reach of hand) where deemed necessary by the Surveyor.

1.3 Documents to be carried on board

In addition to the documents specified in [A.1.3](#) the following information is to be readily available for the Surveyor's use in connection with the survey:

- operation- and equipment manual
- maintenance records for the gas detection and alarm system

and any information that will help to identify suspect areas requiring inspection.

1.4 Access to Structures

1.4.1 Regarding accessibility to spaces, absence of gases, removal of residual cargo and rust, and in respect of lighting, the ship is to be prepared such as to enable it to be duly examined without any risk.

1.4.2 For close-up surveys in cargo and ballast tanks, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

- permanent or temporary staging
- passages through structures
- lifts and moveable platforms
- boats or rafts
- other equivalent means

1.5 Survey at Sea

Upon prior agreement with the owner, GL may carry out surveys at sea or at anchorage, provided the Surveyor is given the necessary assistance, including safety equipment, by the personnel on board, see also [Section 3, A.1.4](#).

2. Annual Surveys

2.1 General

2.1.1 In addition to the surveys as stipulated in [Section 3, C.1.1](#) the following installations, structural elements, items of equipment and outfit, including facilities for handling and carriage of the oil cargo, are to be surveyed in order to ensure that they are maintained in satisfactory condition.

Prior to inspection, the Surveyor shall examine the documentation required to be kept on board for this type of vessel, as a basis for the survey, see [1.3](#).

2.1.2 The annual survey is to ensure that the equipment for operation in oil-covered waters and for oil recovery as well as the cargo handling installations and pertinent safety equipment are in good working order.

For the aforementioned surveys normally access to cargo holds or other spaces within the cargo area necessitating gas-freeing is not required, unless checking of the equipment for correct functioning is not possible otherwise.

2.2 Installations on the weather deck

On the weather deck the oil recovery equipment will have to be surveyed and/or checked in addition to the items specified in [A.2.2](#).

2.3 Pump rooms

Equipment in pump rooms and other enclosed spaces used during oil recovery and cargo handling operations is to be checked, in particular as to leakages and potential sources of danger (explosion protection), e.g.:

- equipment according [A.2.3](#)
- equipment for the recovery of oil (separation plants) and the associated pumping and piping arrangements

2.4 Electrical installations

In gas-dangerous spaces and zones the electrical equipment, including cables and their supports is to be visually examined, particularly regarding explosion protection.

2.5 Fire-extinguishing systems

The scope of survey of the fire-extinguishing systems is as specified in [A.2.5](#).

2.6 Equipment for operation in oil-covered Waters

The following equipment for operation in oil-covered waters is to be visually examined and to be checked:

- air locks
- arrangements for effecting the closures necessary for explosion protection
- ventilation system for pressurizing accommodation, workshops and machinery spaces (test operation)
- vapour detection and alarm systems and portable gas detection equipment

2.7 Ballast tanks

In the case of ballast tanks the procedure as outlined in [A.2.7](#) shall be followed, if applicable.

2.8 Miscellaneous

See [A.2.8](#).

3. Intermediate Surveys

3.1 General

In addition to the surveys and checks listed in item 2 above, on the occasion of the second or the third annual survey the checks mentioned below will be carried out. If deemed necessary by the Surveyor, apart from the survey a functional test will be performed.

3.2 Installations in the cargo area

3.2.1 Irrespective of the vessel's age the condition of the cargo, oil recovery, tank cleaning, bunkering, ballast, steam and venting systems, as well as of the ventilation and ventilator heads is to be checked. In cases of doubt pressure tests and/or wall thickness measurements may be demanded.

Cargo tank high velocity vent valves and pressure/vacuum valves are to be function tested, and if deemed necessary by the Surveyor, to be opened up and re-adjusted.

3.2.2 In the case of oil recovery vessels, beyond this, the following are to be checked:

- drainage of cargo tank vent lines
- bonding devices of all piping systems and independent cargo tanks
- cargo hoses (repeat test, if needed)
- sea inlet discharge valves
- for appliances with pressurized enclosures, see [3.5](#).

3.3 Ballast and cargo tanks

For the scope of the surveys refer to [A.3.3](#).

3.4 Thickness measurements

Thickness measurements are to be carried out in sections found to be suspect on occasion of the previous Class Renewal Survey.

In case of substantial corrosion the extent of the thickness measurements is to be increased.

3.5 Electrical installations

For the scope of the surveys refer to [A.3.5](#).

4. Class Renewal Surveys

4.1 General requirements

4.1.1 In addition to the Class Renewal Surveys of the ship's hull, the machinery plant and electrical installation, the cargo system, the oil recovery system, and the pertinent safety devices listed in [3.2](#) for intermediate survey are to be subjected to thorough examination and testing for proper functioning at the Surveyor's discretion.

It is to be verified that the relevant instructions, documentation and information material, such as cargo handling plans, cargo tank loading limit information etc. are kept on board, see [1.3](#).

4.1.2 The Class Renewal Survey of cargo handling installations and related control, alarm and safety devices cannot normally be carried out during loading or discharging operations and is preferably to be carried out with the ship in gas-free condition.

4.1.3 Spaces and areas used in connection with cargo handling (e. g. cargo control rooms and pump rooms), are to be examined with respect to their general condition and possible sources of danger. All accessible gas tight bulkhead penetrations including gastight shaft seals are to be visually examined.

4.1.4 Dry-docking, see [Section 3, C.1.3.1.3](#) and [A.4.1.6](#).

4.1.5 The equipment for operation of the vessel in oil-covered waters has to be subjected to thorough surveys and operational tests.

4.2 Hull

4.2.1 General requirements

4.2.1.1 All cargo tanks, ballast tanks including double bottom tanks, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined. This examination is to be supplemented by thickness measurements and tank testing as deemed necessary to ensure that the structural integrity continues to be given.

The examination is to be sufficiently thorough for revealing substantial corrosion, significant deformations, fractures, damages or other structural deteriorations.

Regarding anticipated thickness measurements, see also [Section 3, C.2.3.5](#).

4.2.1.2 All piping systems within the above spaces are to be examined and tested under working conditions to ensure their continued satisfactory condition.

Special attention is to be given to ballast piping in cargo tanks and cargo piping in ballast tanks and void spaces.

4.2.1.3 The survey extent of combined ballast/cargo holds is to be evaluated based on the records of ballast history, see [1.3](#).

4.2.2 Surveys

4.2.2.1 An overall survey of all tanks and spaces is to be carried out.

4.2.2.2 The scope of close-up surveys is to be established based on the requirements shown in [Table 4.2](#) or, for double hull vessels, [Table 4.3](#), depending on the age of the vessel and the operational profile of the vessel during the last period of class.

The Surveyor may extend the close-up survey as deemed necessary taking into account the maintenance of the tanks under survey and the condition of the corrosion protection system, and also in the following cases:

- in particular, tanks having structural arrangements or details which have suffered defects in similar tanks or on similar ships according to available information
- tanks which have structures approved with reduced scantlings due to an approved corrosion control system

4.2.2.3 Tank corrosion prevention

Where provided, the condition and/or function of protective coating or corrosion prevention of ballast tanks is to be examined. Detail procedure (possible change to annual intervals) as under [Section 3, C.1.2.2](#) and [A.3.3.1](#) (2nd paragraph).

4.2.3 Thickness measurements

4.2.3.1 The scope of thickness measurements is to be established based on the requirements shown in [Table 4.4](#) depending on following items:

- age of the vessel
- operation of the vessel during the last period of class
- results of the close-up surveys acc. to [4.2.2.2](#).

4.2.3.2 Transverse sections are to be chosen where largest corrosion rates are suspected to occur or are revealed by deck plating measurements.

In cases where three sections are to be measured, at least one is to include a ballast tank within 0,5 L.

4.2.3.3 Regarding thickness measurements, see also [Section 3, C.2](#).

4.2.4 Tank testing

4.2.4.1 The scope of tank testing shall be established based on the requirements shown in [Table 4.5](#) depending on following items:

- age of the vessel
- operation of the vessel during the last period of class
- results of the close-up surveys according to [4.2.2.2](#)
- results of the thickness measurements according to [4.2.3](#).

4.2.4.2 Regarding pressure heads and testing with air pressure, see [Section 3, C.1.3.2.1.4](#).

4.3 Cargo area equipment

4.3.1 Cargo, oil recovery and ballast piping systems, including valves and fittings, are to be internally inspected for corrosion as deemed necessary by the Surveyor. Subsequently, a pressure test is to be carried out.

4.3.2 Cargo, stripping, oil recovery, and ballast pumps are to be examined and checked. Pressure relief valves of pumps are to be function tested.

4.3.3 Cargo tank high velocity vent and pressure/vacuum valves are to be overhauled, adjusted by makers/recognized firms and tested under supervision of a Surveyor.

4.3.4 Tank venting systems are to be examined; flame arresters are to be opened as far as necessary, and cleaned.

4.3.5 Cargo tank heating systems are to be examined and pressure-tested to 1,5 times the operating pressure, see [Section 3, C.1.5.4.4](#).

4.3.6 The bilge systems of pump rooms are to be inspected and tested.

4.3.7 All ventilation systems in the cargo area including portable fans are to be examined and function-tested.

4.3.8 The following equipment is to be function-tested:

- level indicators of cargo tanks
- liquid level alarms
- overflow controls
- pressure and temperature alarms
- remote-control systems of cargo pumps
- sampling arrangements of cargo tanks, if fitted

4.4 Equipment for operation in oil-covered waters

The equipment for operation in oil-covered waters and the pertinent safety equipment have to be subject to thorough surveys and operational tests.

4.5 Electrical installations

In addition to the inspection and tests as per [3.5](#) the protection devices of electric motors are to be tested.

C. Chemical Tankers

1. General requirements

1.1 Range of application

1.1.1 The following arrangements relate to chemical tankers as defined in the GL Rules for [Chemical Tankers \(I-1-7\)](#).

1.1.2 Unless otherwise stipulated in the following, the requirements of [Section 3](#) apply.

1.1.3 In the case of chemical tankers also qualified as oil or product carriers additionally [A](#). is to be observed.

1.2 Scope of surveys

1.2.1 The surveys are to cover all installations, outfit and equipment related to the carriage and handling of chemicals. They also cover the surveys required by the IMO Codes for Chemical Tankers.⁷

The protective equipment and the safety equipment required by the Codes for protection of the personnel as well as other equipment and outfit which are no class re-

⁷ "Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk" (BCH Code) for ships the keels of which were laid on or after 12.4.1972, and with some limitations, also for ships built before that date;

"International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk" (IBC Code) for ships, the keels of which were laid on or after 1.7.1986.

The IBC Code is also part of the MARPOL Convention (Annex II), and of the SOLAS Convention 1974 (Chapter VII).

requirement items are not covered by the present Rules for Classification and Surveys. These items will, however, be included in the surveys, if compliance with the requirements of an Administration has to be certified, see the GL Rules for [Chemical Tankers \(I-1-7\)](#), Section 1.

Reference should be made to the procedures stated in the IBC Code regarding the authorization of recognized institutions, surveys and issuance, validity and extension of certificates. The "Certificate of Fitness" required for chemical tankers is issued either by the Administration of the vessel's flag state on the basis of GL certificates or, if GL is authorized by the respective flag state, by GL itself.

1.2.2 Hull

The following defines the minimum extent of examinations. The surveys shall be extended where substantial corrosion and/or structural defects are found, and will include an additional close-up survey (close visual inspection range, preferably within reach of hand) where deemed necessary by the Surveyor.

1.2.3 Repairs

Necessary repairs, see [Section 2, B.2.4](#).

1.3 Documents to be carried on board

1.3.1 The owner is to supply and maintain on board documentation as specified under 1.3.2 and 1.3.3 which should be readily available for the Surveyor. The documentation is to be kept on board for the life time of the ship.

1.3.2 Survey Report File

A Survey Report File is to be part of the documentation on board:

- reports on structural surveys
- Executive Hull Summary ²
- thickness measurements reports ²

The Survey Report File shall be available also in the Owners management office.

1.3.3 Supporting Documents

- main structural plan of cargo and ballast tanks
- list of substances permitted to be carried (Annex I to "Certificate of Fitness")
- previous repair history
- cargo and ballast history ²
- extent of use of inert gas plant and tank ² cleaning procedures
- inspections by ship's personnel with reference to ²
 - structural deterioration in general
 - leakage in bulkheads and piping
 - condition of protective coating or corrosion prevention

- survey Programme as required under 1.6 ² until the completion of the next Class Renewal Survey
- any other information that will help the Surveyor to identify Suspect Areas requiring inspection

1.4 Access to structures

1.4.1 The ship's spaces are to be made accessible, adequately lighted, freed from gas and cleaned, so that they may be properly examined without risk.

Where soft ³ or semi-hard coating has been applied, safe access is to be provided for the surveyor to verify the effectiveness of coating and to assess the internal structure. When safe access cannot be provided, it may be necessary to remove this soft or semi-hard coating, at least partially.

1.4.2 For close-up surveys in cargo and ballast tanks, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

- permanent or temporary staging
- passages through structures
- lifts and moveable platforms
- boats or rafts
- other equivalent means

1.5 Survey at sea

Upon prior agreement with the owner, GL may carry out surveys at sea or at anchorage, provided the Surveyor is given the necessary assistance, including safety equipment, by the personnel on board, see also [Section 3, A.1.4](#).

1.6 Survey programme ²

For each Class renewal as well as for intermediate surveys to chemical tankers over 10 years of age, a survey programme / planning document have to be worked out in advance. This planning document is prepared by GL Head Office and adjusted to the actual situation found on board by the owner in cooperation with the surveyor during the intermediate survey. The completed planning document is then reviewed by GL Head Office.

2. Annual surveys

2.1 General

2.1.1 In addition to the surveys as stipulated in [Section 3, C.1.1](#), the following installations, items of equipment and outfit as listed in 2.2 to 2.10 below are to be checked as to their perfect maintenance condition.

2.1.2 The annual survey is to ensure that the cargo handling installations and pertinent safety equipment are in good working order.

2.1.3 The surveys are preferably to be carried out during loading or discharging operations.

2.1.4 Access to cargo tanks or other spaces within the cargo area, necessitating gas-freeing will normally not be required unless necessary for checking items of equipment and installations for correct functioning.

2.2 Installations on the weather deck

2.2.1 On the weather deck the following equipment, if fitted, is to be surveyed and/or examined:

- cargo tank hatches, including seals, covers, coamings and flame screens
- tank gauging devices, level alarms and overflow controls with automatic closing valves
- cargo, washing, bunkering, ballast and cargo tank vent line systems, including vent masts and headers, remotely controlled valves and safety equipment
- pressure/vacuum relief valves and flame arresters of the cargo tank venting arrangements as well as devices for measuring the cargo tank vapour pressure
- flame arresters on vents to all bunker, oily ballast and oily slop tanks
- sampling devices of cargo cooling or heating installations as well as temperature measuring devices and temperature alarm systems
- pump discharge pressure gauges and the distinctive marking of pumps, valves and cargo piping.
- wheelhouse doors and wheelhouse windows, deckhouse and superstructure windows facing the cargo area (closing condition).
- electrical installations, see [2.4](#)
- for fire-extinguishing systems, see [2.5](#).
- emergency towing appliances for chemical tankers exceeding 20.000 tdw
- safe access to tanker bow

2.2.2 The cargo handling installations (including spool pieces of the loading and unloading system, spray shields and drip trays, cargo hoses, etc.) arranged on the weather deck, possibly in the fore or aft area, are to be visually examined.

2.3 Pump rooms and pipe tunnels

Equipment in pump rooms and other enclosed spaces serving cargo handling operations, including pipe tunnels if fitted, is to be checked, in particular as to leakages and potential sources of danger (explosion protection), e. g.:

- condition of bulkheads and bulkhead penetrations (cracks, leakages)
- all piping systems including pressure gauges
- cargo, stripping, bilge and ballast pumps for leakages, as far as practicable
- electrical and mechanical remote control and emergency stopping equipment, see also [2.4](#)

- ventilation systems
- rescue arrangements
- for fire-extinguishing systems, see [2.5](#).

2.4 Electrical installations

In gas-dangerous spaces and zones, the electrical equipment, including cables and their supports, is to be visually examined, particularly regarding explosion protection.

2.5 Fire extinguishing systems

The survey of the fire-extinguishing systems covers:

- external inspection of all systems for the cargo tank area
- checking of the foam fire-extinguishing and/ or water-spraying system on deck, see also [Section 3, C.1.1.4](#).

2.6 Inert gas systems

The arrangements for the inert of cargo tanks and spaces surrounding cargo tanks and for padding of cargo tanks by filling with inert gas or dry air are to be examined as to their operability.

2.7 Ballast tanks

Ballast tanks shall be surveyed, within annual surveys, as a consequence of findings on the occasion of an intermediate or Class Renewal Survey, see [A.3.3.1](#) and [Section 3, C.1.2.2](#).

Regarding the renewal of protective coating, see [Section 3, C. 1.2.2.5](#).

If considered necessary by the Surveyor, thickness measurements are to be carried out, which are to be extended if substantial corrosion is found.

2.8 Miscellaneous

On the occasion of the annual survey also the following items, if fitted, are to be checked:

- special arrangements related to damage control (e. g. sliding bulkhead doors) in accordance with the approved damage control plan (also for tankers of less than 100 m in length).
- cargo sample stowage space
- gas detection instruments
- cargo information, safety instructions, etc., see [1.3](#)

2.9 Offshore supply vessels

Onboard supply vessels equipped for the carriage of dangerous or corrosive substances (class notation **EQUIPPED FOR CARRIAGE OF CHEMICALS IN BULK**), the equipment employed for cargo handling and monitoring (piping, pumps, valves, safety equipment) is to be surveyed. As far as accessible, spaces employed for storage are to be subjected to a general condition survey.

3. Intermediate surveys

3.1 General

3.1.1 In addition to the surveys and checks listed in 2. above, on the occasion of the second or third annual survey the checks listed below are to be performed. If deemed necessary by the Surveyor, functional test, pressure tests or thickness measurements are to be carried out in addition to the survey.

3.1.2 For chemical tankers exceeding 15 years of age the intermediate survey is to be carried out in dry-dock. For chemical tankers of 15 years of age or less, GL may agree to a bottom in-water survey according to [Section 3, C.1.7](#).

3.1.3 In case of ships exceeding 10 years of age the intermediate survey is to be enhanced to the scope of the preceding Class Renewal Survey according to [1.6](#) and [4](#). Pressure testing of ballast and cargo tanks is not required unless deemed necessary by the attending Surveyor.

3.1.4 Concurrent crediting for surveys and thickness measurements to both Intermediate and Class Renewal Survey is not acceptable.

3.2 Installations in the cargo area

Irrespective of the vessel's age, all important piping systems in the cargo area are to be examined, e. g.:

- cargo, tank-cleaning, bunkering, ballast and steam piping (if considered necessary by the Surveyor, pressure testing or thickness measurements may be required)
- provisions for drainage of cargo tank vent lines
- cargo tank high velocity vent and pressure/vacuum valves are to be function tested, and if deemed necessary by the Surveyor, to be opened up and re-adjusted
- bonding devices of all piping systems and cargo tanks built-in independent from the hull
- cargo hoses (repeat test, if needed)
- cargo cooling systems
- tank heating systems
- spare parts for mechanical ventilation systems

3.3 Ballast tanks

3.3.1 Vessels over 5 and up to 10 years of age

For tanks used for water ballast, an overall survey of representative tanks selected by the Surveyor is to be carried out. If such inspections reveal no visible structural defects, the examination may be limited to a verification that the hard protective coating remains in good condition⁵.

A ballast tank is to be examined at subsequent annual intervals where:

- a hard protective coating has not been applied from the time of construction, or
- a soft or semi-hard coating has been applied, or
- substantial corrosion⁴ is found within the tank, or
- the hard protective coating is found to be in less than good condition and the hard protective coating is not repaired to the satisfaction of the Surveyor.

In addition to the requirements above, suspect areas identified at previous surveys are to be examined.

Regarding the renewal of protective coating see also [Section 3, C.1.2.2.5](#).

Semi-hard coatings in ballast tanks, if already applied, will not be accepted from the next special or intermediate commenced on or after 1 July 2010, whichever comes first, with respect to waiving the annual internal examination of ballast tanks as required in [2.7](#).

3.3.2 Vessels over 10 and up to 15 years of age

For the intermediate survey of ships exceeding 10 years of age, see [3.1.3](#).

3.3.3 Vessels more than 15 years of age

For the intermediate survey of ships exceeding 15 years of age, see [3.1.3](#).

The overall and close-up surveys and thickness measurements, as applicable, of the lower portions of the cargo and water ballast tanks (below light ballast water line) are to be carried out in accordance to the applicable requirements for intermediate surveys, if not already performed.

3.4 Thickness measurements

Thickness measurements shall be carried out in areas found to be suspect during the previous Class Renewal Survey. In case of ships exceeding 10 years of age please refer also to [3.1.3](#).

Where substantial corrosion is found, the extent of the thickness measurements should be increased.

Authorization for thickness measurements, see [Section 3, C.2.2](#).

3.5 Electrical installations

Irrespective of the vessel's age, the electrical equipment in gas-dangerous spaces and zones is to be examined with respect to the following:

- protective earthing (spot checks)
- integrity of certified safe-type equipment
- damages to outer sheet of cables
- function testing of pressurized equipment, and of associated alarms
- Isolation resistance of circuits (only in gas-free or inert condition). If proper test reports are available on board, the readings made by the crew may be accepted.

3.6 Inert gas systems

For ships with the class notation **INERT**, a survey according to GL survey programmes is to be carried out.

3.7 Offshore supply vessels

Onboard supply vessels equipped for the carriage of dangerous or corrosive substances, all tanks employed for the storage of such substances, including piping and fittings, have to be thoroughly examined for corrosion and possible damages to their protective coatings, where provided. The thickness measurements in these areas are to be conducted analogously to those of chemical tankers.

4. Class Renewal Surveys

4.1 General requirements

4.1.1 In addition to the Class Renewal Surveys of the ship's hull, the machinery plant and electrical installation according to [Section 3, C.1.3](#) to 1.6, the structural elements, equipment and outfit including the cargo system and pertinent safety devices listed in [3.2](#). for intermediate survey are to be subjected to thorough examination and testing for proper functioning, at the Surveyor's discretion.

It is to be ensured that the relevant instructions and information material, such as cargo handling plans, cargo tank loading limit information, etc. are kept on board, see [1.3](#).

4.1.2 The Class Renewal Survey of cargo handling installations and pertinent control, alarm and safety devices cannot normally be carried out during loading or discharging operations and is preferably to be carried out with the ship in gas-free condition.

4.1.3 Spaces and areas serving cargo handling operations (e.g. cargo control rooms and pump rooms) are to be examined with respect to their general condition and possible sources of danger. All accessible gas-tight bulkhead penetrations, including gas-tight shaft seals, are to be visually examined.

4.1.4 Surveys for general condition, close-up surveys, tank pressure tests and thickness measurements of the hull are to be carried out in accordance with [4.2](#). Regarding the preparation of a survey programme, see [1.6](#).

4.1.5 The Class Renewal Survey is to be held when the ship is in dry-dock or on a slipway, unless a dry-docking survey has been carried out within the admissible period, see [Section 3, B.1.6.7](#). The ship is to be placed on blocks of sufficient height so that the keel, the bottom plating and the rudder can be examined.

4.1.6 For Class Renewal Surveys of chemical tankers (hull), the "Continuous Class Renewal" procedure described in [Section 3, B.1.3.6](#) is excluded.

4.1.7 Concurrent crediting for surveys and thickness measurements to both Intermediate and Class Renewal Survey is not acceptable.

4.2 Hull

4.2.1 General requirements

4.2.1.1 All cargo tanks, ballast tanks including double bottom tanks, pumprooms, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined.

The examination is to be sufficiently thorough for revealing substantial corrosion, significant deformations, fractures, damages or other structural deteriorations. Special attention is to be drawn to the structure and the coating in ballast tanks for necessity of annual inspections, see [A.2.7](#).

The examination is to be supplemented by thickness measurements and tank testing as deemed necessary to ensure that the structural integrity continues to be given. Regarding anticipated thickness measurements, see also [Section 3, C.2.3.5](#).

4.2.1.2 All piping systems on deck and within the above spaces are to be examined and tested under working conditions to ensure their continued satisfactory condition.

Special attention is to be given to ballast piping in cargo tanks and cargo piping in ballast tanks and void spaces. Surveyors are to be advised on all occasions when these piping including fittings are open during repair periods for internally examination.

4.2.1.3 The survey extent of combined ballast/cargo holds is to be evaluated based on the records of ballast history, the corrosion prevention system provided, and the extent of corrosion found, see [1.3](#).

4.2.2 Surveys

4.2.2.1 Overall surveys

An overall survey of all cargo and ballast tanks and spaces is to be carried out, see also [3.3.1](#).

The survey of stainless steel tanks is to be carried out as an overall survey and can be supplemented by a close-up survey as deemed necessary by the Surveyor. For fuel oil, lubricating oil and fresh water tanks the necessity for an overall survey is to be determined based on the ship's age, see also [Table 3.1](#).

4.2.2.2 Close-up surveys

Depending on the design and age of the ship, in general, close-up surveys shall be carried out at least according to the requirements shown in [Table 4.6](#).

The Surveyor may extend the close-up survey as deemed necessary taking into account the maintenance of the tanks under surveys and the condition of the corrosion prevention system, and also in the following cases:

- in particular, tanks having structural arrangements or details which have suffered defects in similar tanks or on similar ships acc. to available information
- tanks which have structures approved with reduced scantlings due to an approved corrosion control system

**Table 4.6 Class Renewal Surveys (Hull) of Chemical Tankers
Minimum Requirements for Close-up Surveys**

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
<p>One complete transverse web frame ring including adjacent structural members in a ballast wing tank (SH) or a ballast double hull tank (DH; including side and double bottom tank, even though these tanks are separate)</p> <p>One deck transverse including adjacent deck structural members in a cargo tank or on deck</p>	<p>All complete transverse web frame rings including adjacent structural members in a ballast wing tank or a ballast double hull tank (including side and double bottom tank, even though these tanks are separate)</p> <p>One deck transverse including adjacent deck structural members</p> <ul style="list-style-type: none"> – in each remaining ballast tank or on deck (SH) and – in one cargo wing tank or on deck (SH) <p>One deck transverse including adjacent deck structural members</p> <ul style="list-style-type: none"> – in two cargo centre tanks or on deck (SH) and – two cargo tanks (DH) <p>The knuckle area and the upper part (approx. 3 metres) including adjacent structural members of one web frame in each remaining ballast tank (DH)</p>	<p>All complete transverse web frame rings including adjacent structural members in all ballast tanks and a cargo wing tank</p> <p>One complete transverse web frame ring including adjacent structural members in each remaining cargo tank</p>	As per Class Renewal III
<p>One complete transverse bulkhead including girder system and adjacent structural members</p> <ul style="list-style-type: none"> – in a ballast tank (lower part for SH, complete for DH), – in a cargo wing tank – in a cargo centre tank ¹ 	<p>Both complete transverse bulkheads including girder system and adjacent structural members in a ballast wing tank (SH)</p> <p>One complete transverse bulkhead including girder system and adjacent structural members in each ballast tank (DH, including side and double bottom tank, even though these tanks are separate)</p> <p>One transverse bulkhead lower part including girder system and adjacent structural members</p> <ul style="list-style-type: none"> – in each remaining ballast tank (SH) – in a cargo wing tank (SH) in two cargo centre tanks ¹ 	All complete transverse bulkheads including girder system and adjacent structural members in all cargo and ballast tanks	Additional transverse areas as deemed necessary by the Surveyor
<p>Note: SH - Single hull chemical tanker DH - Double hull chemical tanker</p> <p>Note: Lower part - considered to be the parts below light ballast water line</p> <p>¹ Where no cargo centre tanks are fitted (as in the case of centre longitudinal bulkhead), transverse bulkheads in wing tanks are to be surveyed.</p>			

- stainless steel tanks, see 4.2.2.1
- pipes see 4.2.3.5.

For areas in tanks where the protective coating and/or lining are found to be in a good condition, or where the tanks are made of stainless steel, the extent of close-up surveys according to Table 4.6 may be specially considered by the Surveyor.

4.2.2.3 Tank corrosion prevention

Protective coating and/or corrosion prevention equipment, if fitted, are to be examined for their general condition and functioning. Detailed procedure (possible change to annual surveys), see 3.3.1.

Semi-hard coatings in ballast tanks, if already applied, will not be accepted from the next special or interme-

diate commenced on or after 1 July 2010, whichever comes first, with respect to waiving the annual internal examination of ballast tanks as required in A.2.7.

4.2.3 Thickness measurements

4.2.3.1 The minimum requirements for thickness measurements on the occasion of Class Renewal Surveys are stated in Table 4.7, depending on the ship's age.

Extended measurements may be required, e. g. for areas with substantial corrosion, and/or according to the statements in the survey programme, see 1.6. The thickness measurements should be witnessed by the Surveyor to the necessary extent.

4.2.3.2 For areas in spaces where protective coating and/or lining are found to be in good condition⁵, or where the cargo tanks are made of stainless steel (except for clad steel plating), the extent of thickness measurements according to Table 4.7 may be specially considered by the Surveyor. That means sufficient measurements are to be taken to confirm the actual average condition of the structure under the coating.

4.2.3.3 The selected transverse sections should include all continuous longitudinal structural elements.

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

4.2.3.4 At least one of these transverse sections is to include a ballast tank within 0,5 L.

4.2.3.5 For chemical tankers exceeding 10 years of age, selected cargo pipes outside cargo tanks and ballast pipes passing through tanks are to be subjected to random thickness measurements, and selected pipe lengths opened for inspection if deemed necessary.

4.2.3.6 Regarding thickness measurements see also Section 3, C.2. For chemical tankers, which are also qualified as oil or product tankers, see also A.4.2.3.4.

4.2.4 Pressure tests

4.2.4.1 In general, pressure tests are to be carried out in line with Table 4.8. Depending on the design and use of the tanks, the Surveyor may accept deviations (e. g. correctly documented recent pressure tests of cargo tanks carried out by the crew) or require additional tests to be carried out.

4.2.4.2 For the pressure heads, see Section 3, C.1.3.2.1.4.

**Table 4.7 Class Renewal Surveys (Hull) of Chemical Tankers
Minimum Requirements for Thickness Measurements**

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
One section of deck plating for the full beam of the ship within the cargo area (preferably in way of a ballast tank, if any, or a cargo tank used primarily for water ballast)	Within the cargo area: – each deck plate – one transverse section ¹	Within the cargo area: – each deck plate – two transverse sections ¹	Within the cargo area: – each deck plate – three transverse sections ¹ – each bottom plate
Measurements of structural members subject to close-up survey according to Table 4.6, for general assessment and recording of corrosion pattern			
Suspect areas			
	Selected wind and water strakes, outside the cargo area		All wind and water strakes full length
	All wind and water strakes within the cargo area		
¹ At least one section is to include a ballast tank within 0,5 L amidships.			

**Table 4.8 Class Renewal Surveys (Hull) of Chemical Tankers
Minimum Requirements for Tank Testing**

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
All ballast tank boundaries			
Cargo tank boundaries facing ballast tanks, void spaces, pipe tunnels, pump rooms or cofferdams	All cargo tank bulkheads		

4.2.4.3 For chemical tankers exceeding 10 years of age, selected cargo pipes outside cargo tanks and ballast pipes passing through cargo tanks are to be pressure tested to the maximum working pressure.

4.2.4.4 The testing of tanks and spaces not designed for carriage of liquid may be omitted provided as satisfactory internal examination together with an examination of the tank top is carried out.

4.3 Cargo area equipment

4.3.1 Cargo and ballast piping systems, including valves and fittings, are to be internally inspected for corrosion, as deemed necessary by the Surveyor. Subsequently, a pressure test is to be carried out.

4.3.2 Cargo, stripping and ballast pumps are to be examined and checked. Pressure-relief valves of pumps are to be function-tested.

4.3.3 Cargo tank high velocity vent and pressure/vacuum valves are to be overhauled, adjusted by makers/recognized firm and tested under supervision of a Surveyor.

4.3.4 Tank venting systems are to be examined; flame arresters are to be opened as far as necessary, and cleaned.

4.3.5 Cargo tank heating systems are to be examined and pressure-tested to 1,5 times the operating pressure, see [Section 3, C.1.5.4.4](#).

4.3.6 All ventilation systems in the cargo area, including portable fans, are to be examined and function-tested.

4.3.7 The following equipment is to be function-tested:

- level indicators of cargo tanks
- liquid level alarms
- overflow controls
- pressure and temperature alarms
- remote-control systems of cargo pumps
- bilge systems of pump rooms and cofferdams
- sampling arrangements of cargo tanks, if fitted
- inert gas systems, if the survey is due, see [3.6](#)

4.4 Electrical installations

In addition to the inspections and tests according to [3.5](#), the protection devices of electric motors are to be tested.

D. Liquefied Gas Carriers

1. General requirements

1.1 The following arrangements relate to liquefied gas carriers as defined in the GL Rules for [Liquefied Gas Carriers \(I-1-6\)](#).

1.2 Unless otherwise stipulated in the following, the requirements in [Section 3](#) apply.

1.3 The surveys are to cover all installations, outfit and equipment related to the carriage and handling of liquefied gases. They also cover the surveys required by the IMO Codes for Liquefied Gas Carriers⁸. The fire protection equipment and the safety equipment required by the Codes for protection of the personnel as well as other equipment and outfit which are no class requirement items are not covered by the present Rules for Classification and Surveys. These items will, however, be included in the surveys, if compliance with the requirements of an Administration has to be certified, see also the GL Rules for [Liquefied Gas Carriers \(I-1-6\)](#), [Section 1](#).

Reference should be made to the procedures stated in the IGC Code regarding the authorization of recognized institutions, surveys and issuance, validity and extension of Certificates. The "Certificate of Fitness" required for liquefied gas carriers is issued either by the Administration of the vessel's flag state on the basis of GL Certificates or, if GL is authorized by the respective flag state, by GL itself.

1.4 The ship's spaces and tanks are to be made accessible, adequately lighted, freed from gas and cleaned, so that they may be properly examined without risk.

Where soft³ or semi-hard coating has been applied, safe access is to be provided for the Surveyor to verify the effectiveness of coating and to assess the internal structure. When safe access cannot be provided, it may be necessary to remove this soft or semi-hard coating, at least partially.

1.5 For ships of special design, the survey intervals and procedures will be specially considered.

⁸ "Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk" (GC Code) for ships ordered after 31.10.1976, but before 1.7.1986;

"Code for Existing Ships Carrying Liquefied Gases in Bulk" for ships ordered before 31.10.1976;

"International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk" (IGC Code) for ships the keel of which is laid on or after 1.7.1986.

The IGC-Code is part of the SOLAS Convention 1974 (Chapter VII).

2. Annual surveys

2.1 General

2.1.1 In addition to the surveys as per [Section 3, C.1.1](#), the components, equipment and outfit as listed below in [2.2](#) to [2.9](#) are to be examined as to whether they are in unobjectionable maintenance condition.

2.1.2 The annual survey is to ensure that the cargo handling installations and pertinent safety equipment are in good working order. The annual survey is preferably to be carried out during a loading or discharging operation. Access to cargo tanks or inert cargo holds, necessitating gas-freeing/venting will normally not be required unless deemed necessary by the Surveyor in specific cases.

2.1.3 The second annual survey during each period of class, or the third at the latest will be carried out in the form of an intermediate survey in accordance with a programme covering a wider scope, see [3](#).

2.1.4 Spaces and areas used in connection with cargo handling (e. g. cargo control rooms, air-locks, compressor rooms), are to be examined with respect to their general condition and maintenance. All accessible gas-tight bulkhead penetrations, including gas-tight shaft seals, are to be visually examined.

2.2 Cargo handling systems

2.2.1 The cargo and process piping, expansion joints, cargo hoses and machinery, such as heat exchangers, vaporizers pumps, and compressors are to be visually examined.

2.2.2 The availability of the required spool pieces for piping separation is to be verified.

2.2.3 The log books are to be examined with regard to correct functioning of the cargo containment and cargo handling systems. The running hours per day of the reliquification plant or the boil-off rate and the inert gas consumption are to be considered.

2.2.4 It is to be ensured that the relevant instructions and information material, such as cargo handling plans, cargo tank loading limit information, cooling-down procedures, etc. are on board.

2.3 Cargo containment venting systems

2.3.1 Venting systems for the cargo tanks, inter barrier spaces (in case of Type A tanks, cargo holds) are to be visually examined. It is to be verified that the cargo tank relief valves are sealed and that the certificate containing details on opening/closing pressures of the relief valves is on board.

2.3.2 Protection screens and flame arresters, if fitted, are to be examined for corrosion and cleanliness.

2.4 Instrumentation and safety systems

2.4.1 The monitoring and control equipment for pressure, temperature and liquid levels is to be verified as to its good working order, by one or several of the following methods:

- visual external examination
- comparison of read-outs of different indicators
- comparison of read-outs with the data of the cargo actually handled
- examination of repair and maintenance records with reference to the cargo plant repair and maintenance manual
- verification of calibration status of the measuring instruments

2.4.2 Emergency shut-down valves at shore connections and tanks are to be tested without flow in the pipe lines. It is to be verified that operation of the emergency shut-down system will cause the cargo pumps and compressors to stop.

2.4.3 The fixed and portable gas detection equipment, including indicators and alarms, is to be tested for correct functioning.

2.5 Electrical installations

In gas-dangerous spaces and zones the electrical equipment, including the cables and their supports, is to be visually examined, particularly regarding explosion protection.

2.6 Ventilation systems

Ventilation systems for all spaces in the cargo area, including cargo pump rooms, cargo compressor rooms, electric motor rooms, cargo control rooms and other spaces used for cargo handling operations are to be examined as to their satisfactory operating condition.

2.7 Inert gas and dry air systems

Inert gas/dry air systems, including the means for prevention of back-flow of cargo vapour to gas-safe spaces are to be checked as to their satisfactory operating condition.

2.8 Fire-fighting systems

All systems in the cargo tank area, including the compressor room, are to be checked visually, see also [Section 3, C.1.1.4](#).

2.9 Miscellaneous

The following items of equipment are to be inspected for their condition and correct functioning:

- means for ensuring gas-tightness of the wheelhouse windows and doors, windows in end bulkheads of superstructures and deckhouses

facing the cargo area or stern loading/unloading arrangements, and closing devices of all air intakes and openings into accommodations, service and control stations

- sealing arrangements for tanks or tank domes penetrating decks or tank covers
- drip trays or insulation for deck protection against cargo leakage
- arrangements for heating of hull structural elements, if any. Access to heated cofferdams, etc. is normally not required
- electric bonding of cargo piping systems
- arrangements for the use of boil-off gas as fuel, including alarm and safety systems
- emergency towing appliances for liquefied gas carriers exceeding 20.000 tdw
- safe access to tanker bow

3. Intermediate surveys

3.1 General

3.1.1 In addition to the surveys and checks as stipulated in 2. and in Section 3, C.1.2 irrespective of the vessel's age, unless expressly stated otherwise, the checks mentioned below are to be carried out on the occasion of the second or third annual survey.

The intermediate survey supplements the preceding annual survey by testing of the cargo handling installations, with pertinent automatic controls, alarm and safety systems, for their correct functioning.

3.1.2 For some of the surveys and checks to be carried out within the scope of the intermediate survey, the ship is required to be in gas-free condition. They may be carried out on the occasion of dry-docking.

3.2 Cargo systems, tanks

3.2.1 Bonding of tanks and pipes is to be controlled.

3.2.2 It is to be checked whether the ship's cargo hoses are of approved type and in satisfactory condition. At intervals not exceeding 2.5 years, the cargo hoses are to be subjected to pressure and conductivity tests.

3.2.3 Weather deck

The piping systems essential for operation of the ship, e. g. cargo transfer, bunker and ballast lines, are to be examined, see C.3.3.

3.3 Cargo containment venting systems

3.3.1 The drainage arrangements of the venting systems are to be examined.

3.3.2 If the cargo tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, such membranes are to be replaced by new ones and the valves are to be adjusted, function-tested, and sealed.

These measures need not be taken simultaneously with the intermediate survey, provided that the non-metallic membranes are renewed at intervals not exceeding 3 years.

3.4 Instrumentation and safety systems

3.4.1 The alarm, control and safety systems of the cargo installation are to be visually examined and tested by varying pressure, temperature and liquid level, as far as practicable, and comparisons are to be drawn, using test instruments. Simulated testing may be accepted for sensors which are not accessible or for sensors located within cargo tanks or inert cargo holds. This test is to include testing of alarm and safety functions.

3.4.2 The gas detection equipment, including indicators and alarms, is to be tested for correct functioning. The piping of the gas detection system is to be visually inspected for corrosion and damages. The tightness and integrity of the suction lines between suction points and analysing units is to be verified as far as possible.

Gas detectors are to be calibrated or verified with sample gases.

3.4.3 On ships having arrangements for the use of boil-off gases as fuel, the safety, control, alarm and shut-down systems are to be checked. The extent of the checks will be determined from case to case.

3.4.4 The emergency shutdown system is to be tested without flow in the pipelines, to verify that the system will cause the cargo pumps and compressors to stop.

3.5 Electrical installations

Electrical equipment in gas-dangerous spaces and zones is to be examined in respect of the following:

- protective earthing (spot checks)
- integrity of certified safe-type equipment
- damage to outer sheath of cables
- function-testing of pressurized equipment and associated alarms
- testing of systems for de-energizing non-certified safe electrical equipment located in spaces protected by air-locks, such as electric motor rooms, cargo control rooms, etc.

- checking of insulation resistance of circuits. Relevant measurements are only to be made when the ship is in gas-free or inert condition. If proper test reports are available on board, readings made by the crew may be accepted.
- when the ship is in gas-free condition, it is to be verified that the cargo tanks are electrically bonded to the hull

3.6 Inert gas system

The inert gas installation is to be tested in accordance with GL survey programmes.

4. Class Renewal Surveys

4.1 General requirements

In addition to the surveys and inspections referred to in 3 and in Section 3, C.1.3, the examinations and tests as mentioned in 4.2 to 4.9 below are to be performed.

4.2 Hull in the cargo area

4.2.1 Extent of overall and close-up survey

4.2.1.1 An overall survey of all tanks and spaces, excluding fuel oil, lube oil and fresh water tanks, is to be carried out at each renewal survey.

Note

For fuel oil, lube oil and fresh water tanks, reference is to be made to Section 3, Table 3.1.

4.2.1.2 The minimum requirements for close-up surveys at renewal survey are given in Table 4.9.

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

4.2.1.4 For areas in tanks where hard protective coatings are found to be in a good condition (see Section 3, C.3.3), the extent of close-up surveys according to Table 4.9 may be specially considered.

Note

For examination of automatic air pipe heads reference is made to Section 3, C.1.3.2.1.6.

4.2.2 Extent of thickness measurement

4.2.2.1 The minimum requirements for thickness measurements at renewal survey are given in Table 4.10.

4.2.2.2 The Surveyor may extend the thickness measurements as deemed necessary. When thickness measurements indicate substantial corrosion (see Section 3, C.1.1.2.6), the extent of thickness measurements is to be increased to determine the extent of areas of substantial corrosion.

4.2.2.3 For areas in tanks where hard protective coatings are found to be in a good condition, the extent of thickness measurement according to Table 4.10 may be specially considered.

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

4.3 Cargo containment system

4.3.1 Surveys

4.3.1.1 All cargo tanks are to be inspected internally. Where applicable, inspections performed between the class renewals may be recognized.

4.3.1.2 As far as practicable, the outer surface of non-insulated cargo tanks or the outer surface of cargo tank insulations, including vapour or protective cover if any, is to be examined, as are areas in way of supports, keys and anti-flotation chocks. Partial removal of insulation may be required in order to verify the condition of the tank or the insulation itself, if found necessary by the Surveyor. Where, e. g. in the case of membrane-type cargo tanks, the insulation arrangement is such, that it cannot be examined, the surrounding structures of wing tanks, double bottom tanks and cofferdams are to be examined for cold spots when the cargo tanks are in cold condition. This examination may be dispensed with if the log book, together with the monitoring instruments, gives sufficient evidence of the integrity of the insulation system.

4.3.2 Non-destructive tests

4.3.2.1 Thickness measurements of the cargo tanks may be required, if deemed necessary by the Surveyor.

4.3.2.2 Non-destructive testing of the main structural members, tank shell and highly stressed parts, including welded connections is to supplement cargo tank inspection as far as deemed necessary by the Surveyor. The following items are inter alia considered as highly stressed parts:

- cargo tank supports and longitudinal and transverse securing devices
- y-connections between tank shell and longitudinal bulkhead of bilobe tanks
- web frames or stiffening rings
- swash bulkheads and their fixations
- dome and sump connections to tank shell
- foundations for pumps, towers, ladders, etc.
- pipe connections

**Table 4.9 Class Renewal Surveys (Hull) of Liquefied Gas Carriers
Minimum Requirements for Close-up Surveys**

Class Renewal Survey [No.] and ship's age [years]		
I. age ≤ 5	II. 5 < age ≤ 10	III. and subsequent, age > 10
One web frame in a representative ballast tank of the topside, hopper side and double hull side type ¹ One transverse bulkhead in a ballast tank ³	All web frames in a ballast tank, which is to be a double hull side tank or a top-side tank. If such tanks are not fitted, another ballast tank is to be selected ¹ One web frame in each remaining ballast tank ¹ One transverse bulkhead in each ballast tank ²	All web frames in all ballast tanks ¹ All transverse bulkheads in all ballast tanks ²
¹ Complete transverse web frame including adjacent structural members. ² Transverse bulkhead complete, including girder system and adjacent members, and adjacent longitudinal bulkhead structure. ³ Transverse bulkhead lower part including girder system and adjacent structural members.		
Notes 1. Ballast tanks include topside, double hull side, double bottom, hopper side, or any combined arrangement of the aforementioned, and peak tanks where fitted. 2. For areas in tanks where coatings are found to be in good condition, the extent of close-up surveys may be specially considered by GL. 3. For ships having independent tanks of type C, with a midship section similar to that of a general cargo ship, the extent of close-up surveys may be specially considered by GL. 4. The Surveyor may extend the close-up survey as deemed necessary, taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and also in the following cases: <ul style="list-style-type: none"> – in particular, in tanks having structural arrangements or details which have suffered defects in similar tanks, or on similar ships according to available information; – in tanks having structures approved with reduced scantlings. 		

**Table 4.10 Class Renewal Surveys (Hull) of Liquefied Gas Carriers
Minimum Requirements for Thickness Measurements**

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
One section of deck plating for the full beam of the ship within 0,5 L amidships in way of a ballast tank, if any	Within the cargo area: – each deck plate – one transverse section within 0,5 L amidships in way of a ballast tank, if any	Within the cargo area: – each deck plate – two transverse sections ¹ – all wind and water strakes	Within the cargo area: – each deck plate – three transverse sections ¹ – each bottom plate – duct keel plating and internals
	Selected wind and water strakes outside the cargo area		All wind and water strakes, full length
Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Table 4.9			
Suspect areas			
¹ At least one section is to include a ballast tank within 0,5 L amidships, if any.			
Notes 1. For ships having independent tanks of type C, with a midship section similar to that of a general cargo ship, the extent of thickness measurements may be increased to include the tank top plating at the discretion of the Surveyor. 2. For areas in spaces where coatings are found to be in good condition, the extent of thickness measurements may be specially considered by GL. 3. The Surveyor may extend the thickness measurements as deemed necessary. Where substantial corrosion is found, the extent of thickness measurements is to be increased to the satisfaction of the Surveyor.			

**Table 4.11 Intermediate Surveys (Hull) of Liquefied Gas Carriers
Minimum Requirements for Close-up Surveys**

10 < age ≤ 15	age > 15
Close-up survey of: <ul style="list-style-type: none"> – all web frames and both transverse bulkheads in a representative ballast tank ^{1, 2} – the upper part of one web frame in another representative ballast tank – one transverse bulkhead in another representative ballast tank ² 	Close-up survey of: <ul style="list-style-type: none"> – all web frames and both transverse bulkheads in two representative ballast tanks ^{1, 2}
¹ Complete transverse web frame including adjacent structural members. ² Transverse bulkhead complete, including girder system and adjacent members, and adjacent longitudinal bulkhead structure.	
<p>Notes</p> <ol style="list-style-type: none"> 1. Ballast tanks include topside, double hull side, double bottom, hopper side, or any combined arrangement of the aforementioned, and peak tanks where fitted. 2. For areas in tanks where protective coating is found to be in good condition, the extent of close-up survey may be specially considered by GL. 3. For ships having independent tanks of type C, with a midship section similar to that of a general cargo ship, the extent of close-up surveys may be specially considered by GL. 4. The extent of close-up surveys may be extended by the Surveyor as deemed necessary, taking into account the maintenance of the tanks under survey, the condition of the corrosion prevention system and also in the following cases: <ul style="list-style-type: none"> – in particular, in tanks having structural arrangements or details which have suffered defects in similar tanks, or on similar ships according to available information; – in tanks having structures approved with reduced scantlings. 	

4.3.2.3 For independent Type B tanks, the extent of non-destructive testing is defined in a programme specially prepared for the particular cargo tank design.

4.3.3 Tightness tests

4.3.3.1 The tightness of all cargo tanks is to be verified by an appropriate procedure. Provided that the effectiveness of the ship's gas detection equipment has been confirmed, it will be acceptable to utilize this equipment for the tightness test of independent tanks below deck during the first process of filling of the cargo tanks subsequent to the Class Renewal Survey. Where applicable, inspections performed between the class renewals may be recognized.

4.3.3.2 Where the findings of checks according to 4.3.1 to 4.3.3.1 or an examination of the log book raise doubts as to the structural integrity of a cargo tank, a hydrostatic or hydro pneumatic test is to be carried out. For integral tanks and for independent Type A and B tanks, the test pressure at the top of tank is to correspond to the MARVS (maximum allowable relief valve setting) of the tank. For independent Type C tanks, the test pressure at the top of tank is not to be less than 1,25 times the MARVS.

4.3.4 Extended tests

At intervals of 10 years and on the occasion of Class Renewal Surveys Nos. II, IV, VI, etc., all independent Type C tanks are to be either

- hydrostatically or hydro pneumatically tested to a pressure at upper edge of tank of 1,25 times MARVS and thereafter, non-destructively, in accordance with 4.3.2.2 / 4.3.2.3

or

- subjected to a thorough, systematically planned non-destructive testing procedure. These tests are to be carried out in accordance with a programme specially prepared for the particular tank design.

If a special programme does not exist, the following applies with regard to non-destructive testing:

Testing shall be concentrated on the detection of surface cracks in welded connections in highly stressed areas, as listed in 4.3.2.2.

At least 10 % of the length of the welded connections in each of the above mentioned areas are to be tested. This testing is to be carried out internally and externally, as far as practicable.

Insulation is to be removed as necessary for the required non-destructive testing.

4.3.5 Tank supporting structures and insulation, secondary barrier

4.3.5.1 As far as practicable, all hold spaces and hull insulation (if provided), secondary barriers and tank supporting structures are to be visually examined. The secondary barrier of all tanks is to be checked

for its effectiveness by means of a pressure/vacuum test, a visual examination or some other acceptable method.

4.3.5.2 For membrane and semi-membrane tank systems inspection and testing as per 4.3.5.1 are to be carried out in accordance with programmes specially prepared in accordance with an approved method for the actual tank system. For further details regarding testing of membrane containment systems and their barriers see UR Z 16.

4.3.6 Pressure and vacuum relief valves

4.3.6.1 The pressure relief valves for the cargo tanks are to be opened for examination, adjusted, function-tested and sealed. The requirements of 3.3.2 regarding replacement of non-metallic membranes apply. The following tolerances apply regarding the set pressures of the cargo tank pressure relief valves:

Set pressure	Tolerance
0 bar to 1,5 bar	± 10 %
1,5 bar to 3,0 bar	± 6 %
≥ 3,0 bar	± 3 %

4.3.6.2 Pressure/vacuum relief valves, rupture discs and other pressure relief devices for inter-barrier spaces and hold spaces are to be examined, opened and tested if necessary, depending on their design.

4.3.7 Electric bonding

It is to be verified that the cargo tanks are electrically bonded to the hull.

4.4 Piping systems

4.4.1 The cargo, liquid nitrogen and process piping systems, including their valves and actuators, compensators etc., are to be opened for examination as deemed necessary by the Surveyor. Insulation is to be removed as deemed necessary to ascertain the external condition of the pipes. At the Surveyor's discretion welded seams at branches and bends are to be subjected to non-destructive random crack tests. If the visual examination raises doubts as to the integrity of the pipelines, the pipeline is to be pressure-tested to 1,25 times the MARVS. After reassembly the complete piping system is to be tested for leaks.

4.4.2 The pressure relief valves in the piping systems are to be function-tested. A random selection of valves is to be opened for examination and adjusted.

4.4.3 Cargo pumps, booster pumps and gas compressors, as well as hoses and spool pieces used for segregation of piping systems, inert gas and bilging are to be inspected and tested.

4.5 Reliquifaction installation

4.5.1 The parts of the compressors subject to wear, such as cylinders, pistons, connecting rods, glands, bearings, auxiliary machinery components, such as the shafts, rotors and diffusers of centrifugal pumps, etc., are to be examined.

4.5.2 The drives of the compressors, including those components which are required for operation of the drives, are to be inspected.

4.5.3 All covers of the heat exchangers are to be dismantled for inspection of the pipe plates and pipes. After renewal of pipes or pipe plates, if necessary, pressure and tightness tests are to be conducted. If only a few pipes have been exchanged, a tightness test may be sufficient.

4.5.4 The safety equipment (pressure relief valves, rupture discs) is to be checked.

4.6 Process pressure vessels

At Class Renewal Surveys Nos. II, IV, VI, etc. all process pressure vessels are to be tested pneumatically at a pressure equal to 1,1 times the working pressure, unless the result of the survey requires a hydraulic pressure test to 1,5 times the working pressure.

4.7 Equipment for the use as fuel of gases evaporated from the LNG cargo

4.7.1 The gas conditioning plant is to be inspected externally.

4.7.2 The pipe or duct enclosing the gas fuel line is to be inspected for leaks. The ventilation system of that pipe or duct as well as the inert equipment of a double-wall piping system are to be checked for their operability.

Heat exchangers are to be visually examined internally.

4.7.3 Safety devices

See 3.4.

4.8 Electrical installation

In addition to the visual examinations and tests as per 3.5, the protection devices of electric motors are to be tested.

4.9 Miscellaneous

4.9.1 Drainage systems for removal of water or cargo from inter-barrier spaces and hold spaces are to be examined and tested where necessary.

4.9.2 All gas-tight bulkheads are to be inspected. The effectiveness of gas-tight shaft seals is to be verified.

4.9.3 It is to be checked whether the spare parts stipulated are kept on board.

4.9.4 Any installations for heating of hull structures are to be examined for correct functioning.

E. Bulk Carriers

1. General Requirements

1.1 Application

1.1.1 The following requirements refer to the steel structure and related piping systems of all self-propelled single and double skin bulk carriers, in way of cargo holds, cofferdams, pipe tunnels, void spaces and fuel oil tanks within the cargo area, and to all ballast tanks.

1.1.2 Unless otherwise stated in the following, the arrangements as per [Section 3](#) apply.

1.1.3 For bulk carriers also designed for the carriage of crude oil [A](#). should be observed as well.

1.2 Extent of surveys

The following defines the minimum extent of examinations. The surveys are to be extended where substantial corrosion and/or structural defects are found, and will include an additional close-up survey (close visual inspection range, preferably within reach of hand) where deemed necessary by the Surveyor.

1.2.1 Repairs

Necessary repairs, see [Section 2, B.2.4](#).

1.3 Documents to be carried on board

1.3.1 The owner is to supply and maintain on board documentation as specified under 1.3.2 and 1.3.3 which is to be readily available for the Surveyor. The documentation is to be kept on board for the life time of the ship.

1.3.2 Survey Report File

A Survey Report is to be part of the documentation on board consisting of:

- reports on structural surveys
- Executive Hull Summary ²
- thickness measurements reports ²

The Survey Report File is to be available also in the Owners management office.

1.3.3 Supporting documents

- main structural plan of cargo holds and ballast tanks
- previous damage and repair history
- cargo and ballast history ²
- inspections by ship's personnel with reference to ²

- structural deterioration in general
- leakage in bulkheads and piping
- condition of protective coating or corrosion prevention

- Survey Programme as required under [1.6](#) ² until such time as the next Class Renewal Survey has been completed
- description and history corrosion prevention systems, if any
- information regarding conversion or modification of cargo and ballast tanks
- any other information that will help to identify Suspect Areas requiring inspection

1.4 Access to structures

1.4.1 Regarding accessibility to spaces, absence of gases, removal of residual cargo and rust, and in respect of lighting, the ship is to be prepared such as to enable it to be duly examined without any risk.

Where soft ³ or semi-hard coating has been applied, safe access is to be provided for the surveyor to verify the effectiveness of coating and to assess the internal structure. When safe access cannot be provided, it may be necessary to remove this soft or semi-hard coating, at least partially.

1.4.2 For close-up surveys in cargo holds and ballast tanks, one or more of the following means for access, acceptable to the Surveyor, is to be provided:

- permanent staging and passages through structures
- temporary staging, e. g. ladders and passages through structures
- lifts and movable platforms
- boats or rafts
- other equivalent means

1.5 Survey at sea

Upon prior agreement with the owner, GL may carry out surveys at sea or at anchorage, provided the Surveyor is given the necessary assistance by the personnel on board, see also [Section 3, A.1.4](#).

1.6 Survey programme ²

For each Class Renewal as well as for intermediate survey for bulk carriers over 10 years of age, a survey programme/planning document has to be worked out in advance. This planning document is prepared by GL Head Office and adjusted to the actual situation found on board by the owner in cooperation with the surveyor during the intermediate survey. The completed planning document is then reviewed by GL Head Office.

1.7 Additional Safety Measures

1.7.1 Strength evaluation of the foremost cargo hold

The strength of the transverse watertight corrugated bulkhead between cargo holds No. 1 and 2⁹ and the allowable hold loading¹⁰, i.e. the strength of the internal structure of the double bottom in hold No. 1 have to be evaluated for flooded condition of the foremost cargo hold.

This applies to existing bulk carriers of 150 m in length and above, intended to carry solid bulk cargoes having a density of 1,78 t/m³, or above, with single deck, topside tanks, hopper tanks and single side shell or double skin construction of less than 760 mm breadth.

In connection with this strength calculation additional thickness measurements have to be taken of the aforementioned structures. Renewal and strengthening required are to be approved by GL. Thickness measurements and strength calculations are to be performed at all subsequent Intermediate Surveys (for ships over 10 years) and Class Renewal Surveys.

1.7.2 Damage stability requirements

Bulk carriers of 150 m in length and above of single side skin construction have to comply with the damage stability requirements as specified in SOLAS Reg. XII/4.

For possible exemptions please refer to SOLAS Reg. XII/9.

1.7.3 Cargo hold hatch cover securing arrangements

Bulk carriers which were not built in accordance with the particular requirements¹¹ for evaluation of the scantlings of hatch covers and hatch coamings of cargo holds have to comply with the additional requirements¹² for cargo hatch cover securing arrangements.

1.7.4 Side shell frames and brackets

Single side bulk carriers which were not built in accordance with the particular requirements¹³ for side structures, as well as Oil/Bulk/Ore (OBO) carriers, have to be assessed for compliance with the respective renewal criteria for side shell frames and brackets¹⁴.

In connection with this, additional thickness measurements and strength calculations have to be performed for the aforementioned structures. Renewal and strengthening required are to be approved by GL. Thickness measurements and strength calculations have to be performed at all subsequent intermediate and Class Renewal Surveys.

1.7.5 Water ingress detection and dewatering system

All bulk carriers have to comply with the requirements¹⁵ concerning water level detectors in hold, ballast and dry spaces, as well as with the availability requirements¹⁶ of pumping systems for dewatering and pumping ballast tanks forward of the collision bulkhead and bilges of dry spaces forward of the foremost cargo hold.

Function tests are to be carried out at a random basis at all subsequent annual surveys and in full scope at Class Renewal Surveys.

1.7.6 Strength and securing of small hatches on exposed Fore Deck

All bulk carriers have to comply with the requirements¹⁷ concerning the strength and securing devices for small hatches fitted on the exposed fore deck.

Those hatches are designed for access to spaces below deck and are capable to be closed weather-tight or watertight, as applicable. Their opening is normally 2,5 square meters or less.

1.7.7 Strength of Fore Deck fittings and Equipment

All bulk carriers have to comply with the requirements¹⁸ concerning the strength of air pipes, ventilator pipes and their closing devices and windlasses.

1.7.8 Restriction from sailing with any hold empty

Bulk carriers of 150 m in length L and upwards of single-side skin construction carrying dry cargoes having a density of 1,780 kg/m³ and above, have to comply with the requirements¹⁹ concerning the loading of cargo holds in full load condition (at least 90% of ship's deadweight). Requirements are applicable after the vessel reaches 10 years of age and only if the vessel meets not the requirements for withstanding flooding of any one cargo hold.

2. Annual surveys

2.1 General

The survey is to ensure that the hull, weather decks, hatch covers, coamings and piping are maintained in satisfactory condition, see also [Section 3, C.1.1.2](#). Prior to inspection, the Surveyor shall examine the documentation required to be kept on board for this type of vessel, as a basis for the survey, see [1.3](#).

⁹ For requirements see UR S19 of IACS

¹⁰ For requirements see UR S22 and S23 of IACS

¹¹ For requirements see UR S21 of IACS

¹² For requirements see UR S30 of IACS

¹³ For requirements see UR S12 of IACS

¹⁴ For requirements see UR S31 of IACS

¹⁵ For requirements see SOLAS XII/12 and UI SC 180 of IACS

¹⁶ For requirements see SOLAS XII/13 and UI SC 179 of IACS

¹⁷ For requirements see UR S26 of IACS

¹⁸ For requirements see UR S27 of IACS

¹⁹ For requirements see SOLAS XII/14

2.2 Hull and weather decks

Examination of hull, its closing appliances and water-tight penetrations should be carried out as far as practicable.

Flame screens on vents to all bunker tanks as well as bunker and vent piping system including ventilators are to be examined.

2.3 Hatch covers, coamings

2.3.1 A thorough survey of cargo hatch covers and coamings is only possible by examination in the open as well as closed positions and should include verification of proper opening and closing operation. As a result, at least the hatch cover sets within the forward 25 % of the ships length and at least one additional set, such that all the sets on the ship are assessed at least once in every five-year period, should be surveyed open, closed and in operation to the full extent in each direction at each annual survey, including:

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

The closing of covers should include the fastening of all peripheral, and cross joint cleats or other securing devices. Particular attention should be paid to the condition of hatch covers in the forward 25 % of the ships length, where the sea loads are normally greatest.

2.3.2 If there are indications of difficulty in operation and securing hatch covers, additional sets above those required in 2.3.1, at the discretion of the surveyor, should be tested in operation.

2.3.3 Where the cargo hatch securing system does not function properly, repairs should be carried out under the supervision of the surveyor. Where hatch covers or coamings undergo substantial repairs, the strength of securing devices should be upgraded to comply with Annex 13 of IMO-Resolution A.744(18) as amended.

2.3.4 For each cargo hatch cover set, at each annual survey, the following items should be surveyed:

- cover panels, including side plates, and stiffener attachments that may be accessible in the open position by close-up survey (for corrosion, cracks, deformation);
- sealing arrangements of perimeter and cross joints (gaskets for condition and permanent deformation, flexible seals on combination carriers, gasket lips, compression bars, drainage channels and non-return valves);
- clamping devices, retaining bars, cleating (for wastage, adjustment, and condition of rubber components);

- closed cover locating devices (for distortion and attachment);
- chain or rope pulleys;
- guides;
- guide rails and track wheels;
- stoppers;
- wires, chains, tensioners and gypsies;
- hydraulic system, electrical safety devices and interlocks; and
- end and interpanel hinges, pins and stools where fitted.

2.3.5 At each hatchway, at each annual survey, the coamings, with plating, stiffeners and brackets should be checked for corrosion, cracks and deformation, especially of the coaming tops.

2.3.6 Where considered necessary, the effectiveness of sealing arrangements may be proved by hose or chalk testing supplemented by dimensional measurements of seal compressing components.

2.3.7 Where portable covers, wooden or steel pontoons are fitted, the satisfactory condition of the following should be confirmed:

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

2.3.8 The Surveyor shall check whether since the last survey any unapproved changes or repairs have been made to the hatch covers, hatch coamings and the securing and sealing devices.

2.4 Cargo holds

2.4.1 For single skin bulk carriers up to 10 years of age, an overall survey of a representative forward and aft cargo hold is to be carried out. Where this level of survey reveals the need for remedial measures, the survey is to be extended to all cargo holds (overall survey, general condition).

2.4.2 For single skin bulk carriers over 10 years up to 15 years of age the following is required:

- overall survey of all cargo holds

- close-up examination of sufficient extent (minimum 25 % of frames) to establish the condition of the lower one-third of the shell frames, adjacent shell plating and frame connections, in the forward cargo hold. Where this survey reveals the need for remedial measures, the survey is to be extended to include a close-up survey of all the shell frames and adjacent shell plating of that cargo hold as well as close-up survey of sufficient extent of all remaining cargo holds.
- thickness measurements, where considered necessary by the Surveyor. If the measurements indicate substantial corrosion, the extent of measurements is to be increased.
- Where protective coating in cargo holds found in good condition, the extent of close-up surveys and thickness measurements may be specially considered.

2.4.3 For single skin bulk carriers over 15 years of age, a close-up survey of one more selected cargo hold is to be carried out, in addition to the surveys indicated in 2.4.2 and with the same extent. All piping and penetrations in cargo holds including overboard piping are to be examined. Consequent measures in case of damages, and thickness measurements: See 2.4.2.

2.4.4 Additional annual survey requirements acc. to SOLAS Reg. XII/9.1

Single skin bulk carriers of 150 m in length and above which were exempted from the damage stability requirements specified in SOLAS Reg. XII/4.3 are subject to extended annual surveys in the foremost cargo hold according to SOLAS Reg. XII/9.1.

On those ships the scope of inspections in the foremost cargo hold has to be enhanced to the scope prescribed in the requirements²⁰.

2.4.5 For double skin bulk carriers 10 to 15 years of age the following is required:

- overall survey of two selected cargo holds
- thickness measurements before the survey is credited as complete, when considered necessary by the Surveyor, or when suspect areas respectively areas of substantial corrosion have been identified at previous surveys. If the results of these measurements indicate substantial corrosion, the extent of the survey and the measurements are to be increased to sufficient extent to the remaining cargo holds
- All piping and penetration in cargo holds, including overboard piping, are to be examined.

2.4.6 For double skin bulk carriers over 15 years of age, in addition to the requirements as indicated in 2.4.5, an overall survey of all cargo holds is to be carried out.

2.5 Ballast tanks

Ballast tanks shall be surveyed, within annual surveys, as a consequence of findings on the occasion of an intermediate or Class Renewal Survey, see Section 3, C.1.2.2.

When considered necessary by the Surveyor, thickness measurements are to be carried out. If these measurements indicate substantial corrosion⁴, the extent of thickness measurements is to be increased.

3. Intermediate Surveys

3.1 General

3.1.1 In addition to the surveys and checks listed in 2. above, on the occasion of the second or third annual survey the checks listed below are to be performed. If deemed necessary by the Surveyor, functional test, pressure tests or thickness measurements are to be carried out in addition to the survey.

For double skin bulk carriers the survey extent is dependent on the age of the vessel shown in Table 4.12.

3.1.2 For ships exceeding 15 years of age the intermediate survey is to be carried out in dry-dock. For ships of 15 years of age or less, GL may agree to a bottom in-water survey according to Section 3, C.1.7.

3.1.3 In case of ships exceeding 10 years of age the intermediate survey is to be enhanced to the scope of the preceding Class Renewal Survey according to 1.6 and 4. Pressure testing of ballast and cargo tanks is not required unless deemed necessary by the Surveyor.

3.1.4 Concurrent crediting for surveys and thickness measurements to both Intermediate and Class Renewal Survey is not acceptable.

3.2 Cargo holds

3.2.1 Vessels over 5 and up to 10 years of age

3.2.1.1 The survey is to include:

- an overall survey of all cargo holds of sufficient extent to establish the general condition of the structure
- close-up survey of a least 25 % of shell frames including their end attachments and adjacent shell plating over the entire height in the forward cargo hold and one other selected cargo hold
- close-up survey of the transverse bulkheads in the cargo holds mentioned above
- close-up survey of suspect areas⁶ identified by the previous Class Renewal Survey
- regarding protective coating see 2.3.4.

3.2.1.2 Where considered necessary by the Surveyor as a result of the overall and close-up survey as described in 3.2.1.1, the survey is to be extended to include a close-up survey of all of the shell frames and adjacent shell plating of that cargo hold, as well as a close-up survey of sufficient extent of all remaining cargo holds.

²⁰ For requirements see Annex IV of UR Z10.2 of IACS

3.2.2 Vessels more than 10 years of age

For the intermediate survey of ships exceeding 10 years of age, see 3.1.3.

3.2.3 For double skin bulk carriers, see also Table 4.12.

3.3 Ballast tanks

3.3.1 Vessels over 5 and up to 10 years of age

For tanks used for water ballast, an overall survey of representative spaces selected by the Surveyor is to be carried out. The selection has to include fore and aft peak tanks and a number of other tanks, taking into account the total number and type of ballast tanks. If such overall survey reveals no visible structural defects, the examination may be limited to verification that the corrosion prevention system remains efficient.

Where poor coating condition²¹, 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 is to be extended to other ballast tanks of the same type.

In ballast tanks other than double bottom tanks, where a hard protective coating is found in poor condition, and it is not renewed, or where soft or semi-hard coating has been applied, or where substantial corrosion is found or where a hard protective coating was not applied from the time of construction, the tanks in question are to be examined and thickness measurements carried out as considered necessary at annual intervals.

When such breakdown of hard protective coating is found in ballast double bottom tanks, or where a soft or semi-hard coating has been applied, or where substantial corrosion is found 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 are to be carried out.

In addition to the requirements above, suspect areas identified at previous surveys are to be examined.

Regarding the renewal of protective coating, see also Section 3, C.1.2.2.5.

Semi-hard coatings in ballast tanks, if already applied, will not be accepted from the next special or intermediate survey commenced on or after 1 July 2010, whichever comes first, with respect to waiving the annual internal examination of ballast tanks as required in A.2.7.

3.3.2 Vessels more than 10 years of age

For the intermediate survey of ships exceeding 10 years of age, see 3.1.3.

3.3.3 For double skin bulk carriers, see Table 4.12.

3.4 Extent of thickness measurements

3.4.1 Thickness measurements are to be carried out to an extent sufficient to determine both general and local corrosion levels in areas subject to close-up survey.

**Table 4.12 Intermediate Survey of Double Skin Bulk Carriers (Hull)
Minimum Requirements of Overall and Close-up Survey and Thickness Measurements**

Ship's age [years]		
5 < age ≤ 10	10 < age ≤ 15	age > 15
Overall survey of representative ballast tanks selected by the attending surveyor (the selection is to include fore and aft peak tanks) and a number of other tanks, taking into account the total number and type of ballast tanks	The requirements of the previous Class Renewal Survey	The requirements of the previous Class Renewal Survey
Overall and close-up survey of suspect areas identified at previous surveys		
Overall survey of all cargo holds		
Thickness measurements to an extent sufficient to determine both general and local corrosion levels at areas subject to close-up survey at suspect areas identified at previous surveys		

²¹ Poor: General breakdown of coating over 20 % or more of areas, or hard scale at 10 % or more of areas under consideration.

As a minimum requirement thickness measurements are to be carried out in suspect areas identified by the previous Class Renewal Survey. Where substantial corrosion is found, the extent of thickness measurements should be increased.

In case of ships exceeding 10 years of age, see also 3.1.3.

3.4.2 The thickness measurements may be specially considered provided the Surveyor is satisfied by the close-up survey that there is no structural diminution and that the protective coating remains effective where fitted.

3.4.3 For double skin bulk carriers, see [Table 4.12](#).

4. Class Renewal Surveys

4.1 General requirements, scope

4.1.1 In order to ensure that the hull and related piping are in satisfactory condition and fit for the new period of class, the following surveys are to be carried out, in addition to the annual and intermediate surveys outlined in 2. and 3., and the surveys prescribed in [Section 3, C.1.3 - 1.5](#) for all types of ships.

4.1.2 Regarding planning/survey programme, see [1.6](#). Regarding anticipated thickness measurements, see also [Section 3, C.2.3.5](#).

4.1.3 For Class Renewal Surveys of bulk carriers (hull), the "Continuous Class Renewal" procedure, as described in [Section 3, B.1.3.6](#) is excluded.

4.1.4 The Class Renewal Survey is to be held when the ship is in dry-dock or on a slipway, unless a dry-docking survey has been carried out within the admissible period, see [Section 3, B.1.6.7](#). The ship is to be placed on blocks of sufficient height so that the keel, the bottom plating and the rudder can be examined.

4.1.5 Concurrent crediting for surveys and thickness measurements to both Intermediate and Class Renewal Survey is not acceptable.

4.2 Hull, general

4.2.1 All cargo holds, ballast tanks including double bottom and double side tanks, pipe tunnels, cofferdams and void spaces bounding cargo holds, decks and outer hull are to be examined. This examination is to be supplemented by thickness measurements and tank testing to the necessary extent, in order to ensure that the structural integrity continues to be given.

A sufficiently thorough examination should be carried out for revealing substantial corrosion, significant deformations, fractures, damages or other structural deterioration affecting vessel's class. Special attention is to be drawn to the structure and the coating in ballast tanks for necessity of annual inspections, see [A.2.7](#).

Regarding protective coating see [2.3.4](#).

4.2.2 All piping systems within the above spaces are to be examined and tested under working conditions to ensure their continued satisfactory condition.

4.2.3 The survey extent of combined ballast/cargo holds is to be evaluated based on the records of ballast history, the kind and extent of the fitted corrosion prevention system and the extent of the revealed corrosion.

4.2.4 The survey extent of ballast tanks converted into void spaces will be specially considered in relation to the requirements for ballast tanks.

4.2.5 Regarding the extent of close-up surveys and thickness measurements, see [4.3](#), [4.4](#) and [4.5](#) below.

4.3 Hatch covers, coamings

The survey of hatch covers and coamings shall include the following :

- a thorough inspection of the items listed in [2.3](#)
- checking of the satisfactory operation of mechanically operated hatch covers, e.g.:
 - stowage and securing in open condition
 - condition of sealing, proper fit in closed condition
 - operational testing of hydraulic and power components (wires, chains, link drives, etc.)
- checking of the effectiveness of sealing arrangements of all hatch covers by hose testing or equivalent
- thickness measurements of the hatch cover and coamings plating and stiffeners as given in [Table 4.16](#).
- close-up survey of all hatch covers and hatch coamings (plating and stiffeners)

4.4 Cargo holds, ballast tanks

4.4.1 An overall survey of all cargo holds, ballast tanks and spaces is to be carried out. For fuel oil, lubricating oil and fresh water tanks the necessity for an overall survey is to be determined based on the ship's age, see also [Section 3, Table 3.1](#).

4.4.2 A close-up examination of sufficient extent should be included in the Class Renewal Survey, in order to establish the condition of the shell frames and their lower and upper end attachments in all cargo holds and of the stiffening structures in ballast tanks as indicated in [Table 4.13](#) or [4.14](#) or [4.15](#). The Surveyor may extend the close-up survey as deemed necessary taking into account the maintenance of spaces under survey, the condition of corrosion prevention system and structural arrangements which have suffered defects in similar spaces or ships.

4.4.3 Tank corrosion prevention

The condition of protective coating or corrosion prevention of ballast tanks is to be examined, where provided. The statements under 3.3.1 apply to Class Renewal Surveys of bulk carriers, regardless of age.

Semi-hard coatings in ballast tanks, if already applied, will not be accepted from the next special or intermediate survey commenced on or after 1 July 2010, whichever comes first, with respect to waiving the annual internal examination of ballast tanks as required in A.2.7.

For areas in tanks where the protective coating is found to be in a good condition, the extent of close-up surveys according to Tables 4.13 or 4.14 or 4.15 may be specially considered by the Surveyor.

4.5 Thickness measurements

4.5.1 The minimum requirements for thickness measurements on the occasion of Class Renewal Surveys are stated in Table 4.16, depending on the ship's age.

Representative thickness measurements to determine both general and local levels of corrosion in the shell frames and their end attachments in all cargo holds, of the stiffening structure in ballast tanks and on the transverse bulkhead plating are to be carried out.

4.5.2 The extent of thickness measurements may be reduced, in comparison with those stated in Table 4.16, provided during the close-up examination the Surveyor satisfies himself that there is no structural diminution, and the protective coating where applied continues to be effective and in good condition ⁵.

**Table 4.13 Class Renewal Surveys of Single Skin Bulk Carriers (Hull)
Minimum Requirements for Close-up Surveys**

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
25 % of shell frames in the forward cargo hold at representative positions. Selected frames in remaining cargo holds.	All shell frames in the forward cargo hold and 25 % of shell frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating. For bulk carriers 100,000 tdw and over, all shell frames in the forward cargo hold and 50 % of shell frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating.	All shell frames in the forward and one other selected cargo hold and 50 % of frames in each of the remaining cargo holds, including upper and lower end attachments and adjacent shell plating.	All shell frames in all cargo holds, including upper and lower end attachments and adjacent shell plating
One transverse web with associated plating and longitudinals in two representative water ballast tanks of each type	One transverse web with associated plating and longitudinals in each water ballast tank	All transverse webs with associated plating and longitudinals in each water ballast tank	Other items: As for Class Renewal Survey No. III
Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted. ¹	Forward and aft transverse bulkhead in one side ballast tank, including stiffening system.	All transverse bulkheads in ballast tanks, including stiffening system	
	All cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted. ¹		
All cargo hold hatch covers and	coamings (plating and stiffeners).		
	All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches.		
¹ For bulk carriers as per Section 4, E.1.7 one of these bulkheads has to be the aft transverse bulkhead of the foremost cargo hold.			

**Table 4.14 Class Renewal Survey of Double Skin Bulk Carriers (Hull), excluding Ore Carriers
Minimum Requirements for Close-up Surveys**

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
One transverse web with associated plating and longitudinalinals in two representative ballast tanks of each type (This is to include the foremost topside and double side ballast tanks on either side.) ¹	One transverse web with associated plating and longitudinalinals as applicable in each ballast tank ¹	All transverse webs with associated plating and longitudinalinals as applicable in each ballast tank ¹	
	Forward and aft transverse bulkheads including stiffening system in a transverse section including topside, hopper side and double side ballast tanks ¹	All transverse bulkheads including stiffening system in each ballast tank ¹	
	25 % of ordinary transverse web frames, in the foremost double side tanks ²	25 % of ordinary transverse web frames in all double side tanks ²	All ordinary transverse web frames in all double side tanks ²
Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted ³	One transverse bulkhead in each cargo hold, including internal structure of upper and lower stools, where fitted ³	All cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted ³	
All cargo hold hatch covers and coamings (platings and stiffeners) ⁴			
	All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches ⁵		
<p>¹⁻⁵ are areas to be subjected to close-up surveys and thickness measurements</p> <p>¹ Transverse web frame or watertight transverse bulkhead in topside, hopper side and double side and double bottom ballast tanks. In fore and aft peak tanks transverse web frame means a complete transverse web frame ring including adjacent structural members.</p> <p>² Ordinary transverse frame in double side tanks</p> <p>³ Cargo hold transverse bulkheads plating, stiffeners and girders</p> <p>⁴ Cargo hold hatch covers and coamings</p> <p>⁵ Deck plating inside line of hatch openings between cargo hold hatches</p> <p><i>Note</i> Close-up survey of transverse bulkheads to be carried out at four levels:</p> <ul style="list-style-type: none"> - immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool - immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates - about mid-height of the bulkhead - immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tanks 			

That means sufficient measurements are to be taken to confirm the actual average condition of the structure under the coating.

4.5.3 The Surveyor may extend the thickness measurements as deemed necessary. These apply especially to areas with substantial corrosion and to areas defined as suspect in the inspection programme, see 1.6. The thickness measurements should be witnessed by the Surveyor to the necessary extent. Extended thickness

measurements are to be carried out before the survey is credited as completed.

4.5.4 Transverse sections are to be chosen where largest corrosion rates are suspected to occur or are revealed by deck plating measurements.

4.5.5 Regarding thickness measurements, see also Section 3, C.2. For bulk carriers designed also for the carriage of crude oil, see also A.4.2.3.4.

4.6 Tank testing

4.6.1 All boundaries of ballast tanks and deep tanks within the cargo hold area, and of cargo holds used for ballast, are to be pressure-tested by filling with water.

4.6.2 Representative fuel oil, lubricating oil and fresh water tanks as selected by the Surveyor are to be tested. The tightness of fuel oil, lubricating oil and

fresh water tanks may be confirmed by filling with oil, water or air pressure test. The air pressure shall not exceed 0,2 bar gauge pressure.

4.6.3 The pressure should correspond to a water level to the top of hatches for ballast/cargo holds or to the top of air pipes for ballast tanks or fuel oil, lubricating oil or fresh water tanks, see A.4.2.2.1, whichever pressure is higher, see also Section 3, C. 1.3.2.1.4.

**Table 4.15 Class Renewal Survey of Double Skin Bulk Carriers (Hull), only Ore Carriers
Minimum Requirements for Close-up Surveys**

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
One web frame ring complete including adjacent structural members in a ballast wing tank. ¹	All web frame rings complete including adjacent structural members in a ballast wing tank ¹ One deck transverse including adjacent deck structural members in each remaining ballast tank ¹	All web frame rings complete including adjacent structural members in each ballast tank ¹ Additional web frame rings in void spaces as deemed necessary by Surveyor ¹	
	Forward and aft transverse bulkheads including girder system and adjacent structural members in a ballast wing tank ¹	One web frame ring complete including adjacent structural members in each wing void space. ¹	
One transverse bulkhead lower part including girder system and adjacent structural members in a ballast tank ¹	One transverse bulkhead lower part including girder system and adjacent structural members in each remaining ballast tank ¹	All transverse bulkheads including girder system and adjacent structural members in each ballast tank ¹	
Two selected cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted ³	One transverse bulkhead in each cargo hold, including internal structure of upper and lower stools, where fitted ³	All cargo hold transverse bulkheads, including internal structure of upper and lower stools, where fitted ³	
All cargo hold hatch covers and coamings (platings and stiffeners) ⁴			
	All deck plating and under deck structure inside line of hatch openings between all cargo hold hatches ⁵		
<p>¹⁻⁵ are areas to be subjected to close-up surveys and thickness measurements</p> <p>¹ Transverse web frame or watertight transverse bulkhead in ballast wing tanks and void spaces. In fore and aft peak tanks transverse web frame means a complete transverse web frame ring including adjacent structural members.</p> <p>³ Cargo hold transverse bulkheads plating, stiffeners and girders</p> <p>⁴ Cargo hold hatch covers and coamings</p> <p>⁵ Deck plating and under deck structure inside line of hatch openings between cargo hold hatches</p> <p><i>Note</i></p> <p><i>Close-up survey of transverse bulkheads to be carried out at four levels:</i></p> <ul style="list-style-type: none"> - immediately above the inner bottom and immediately above the line of gussets (if fitted) and shedders for ships without lower stool - immediately above and below the lower stool shelf plate (for those ships fitted with lower stools), and immediately above the line of the shedder plates - about mid-height of the bulkhead - immediately below the upper deck plating and immediately adjacent to the upper wing tank, and immediately below the upper stool shelf plate for those ships fitted with upper stools, or immediately below the topside tanks 			

**Table 4.16 Class Renewal Surveys of Single Skin and Double Skin Bulk Carriers (Hull)
Minimum Requirements for Thickness Measurements**

Class Renewal Survey [No.] and ship's age [years]			
I. age ≤ 5	II. 5 < age ≤ 10	III. 10 < age ≤ 15	IV. and subsequent, age > 15
Suspect Areas			
	Within the cargo length area: <ul style="list-style-type: none"> – two transverse sections of deck plating outside line of cargo hatch openings – one transverse section within the amidships 0.5L 	Within the cargo length area: <ul style="list-style-type: none"> – each deck plate outside line of cargo hatch openings – 2 transverse sections, one in amidship area, outside line of cargo hatch openings 	Within the cargo length area: <ul style="list-style-type: none"> – each deck plate outside line of cargo hatch openings – 3 transverse sections, one in amidship area, outside line of cargo hatch openings – each bottom plate
	Wind and water strakes in way of the transverse sections indicated above	All wind and water strakes within the cargo length area	All wind and water strakes full length
	Selected wind and water strakes outside the cargo length area		
	Measurement, for general assessment and recording of corrosion pattern, of the structural members subject to close-up survey according to Table 4.13 or 4.14 or 4.15		
	Selected cargo hold hatch covers and coamings (plating and stiffeners)	All cargo hold hatch covers and coamings (plating and stiffeners)	Other items: As for Class Renewal Survey No. III
	Selected areas of deck plating inside line of openings between cargo hold hatches	All deck plating inside line of openings between cargo hold hatches	
		Additional measurements of the aft bulkhead of cargo hold no. 1, for ships as per 1.7.1 and 1.7.2.	
	Additional measurements of side shell frames and brackets for ships as per 1.7.4		

F. Floating Docks

1. General

1.1 For floating docks subject to classification by GL, unless otherwise agreed, Class Renewal Surveys are to be conducted at intervals of 5 years.

1.2 Floating docks which are not classified may on request be subjected to a condition survey, e. g. prior to sale or conversion.

1.3 If classification is intended, the procedure to be followed regarding documents to be submitted and the scope of surveys for classification is analogous to that outlined in Section 2, E. Structural plans of the essential structural elements of the dock structure and particulars on their machinery and equipment are to be submitted for approval.

2. Class Renewal Surveys

2.1 Floating dock structure

2.1.1 For Class renewal, the dock structure should be immersed as little as possible; the structural elements above the waterline will be inspected both, internally and externally, and the watertight compartments internally, at the Surveyor's discretion. Particular attention is to be paid to the piping arranged inside the compartments, including their valves; these, as well as the inlet and outlet valves, are to be checked for tightness and operability.

2.1.2 The partition bulkheads of the watertight compartments are to be checked for tightness and tested by compressed air (max. 0,2 bar). The compartments to be tested will be selected by the Surveyor, depending on the age and general condition of the dock; however, at least every second compartment is to be tested.

2.1.3 If only every other compartment is pressure-tested, on the occasion of a trial docking also the tightness of the safety deck is to be tested.

2.1.4 Thickness measurements at parts of the dock structure are to be carried out on the occasion of every second class renewal, and/or the Surveyor may require them to be carried out, if he suspects an inadmissible degree of corrosion.

2.1.5 Dry-docking or bottom surveys with the floating dock in inclined position will be restricted to special cases (averages, leakages, etc.) upon agreement between owners/operators and GL.

2.2 Machinery equipment

The machinery equipment for operation of the dock, including the electrical equipment, is to be surveyed and checked analogously to the procedure outlined in [Sections 3, C.1.3.3 and C.1.5](#), as far as applicable.

2.3 Equipment

The equipment required for operation of the dock, e. g. bilge and keel blocks and - if fitted - their drives, warping capstans, cranes, bridge connections, shore connections and the dock mooring equipment are to be covered by the condition survey. Changes introduced since the last class renewal are to be documented.

G. Yachts and Small Watercraft

1. General remarks. Kinds of surveys.

1.1 Regarding the surveys necessary for maintenance of class, on principle, the requirements of [Section 3](#), and in particular, of [3, A](#), apply.

The following kinds of surveys are prescribed for watercraft as defined in [Section 2, F](#).

1.2 Intermediate surveys

For sporting craft with total engine outputs exceeding 300 kW, and for watercraft employed for commercial purposes and/or by authorities: Intermediate surveys of the hull, the machinery installation including the electrical installation, the rigging and the closures, according to [2.1](#).

The intermediate survey is due 2,5 years after assignment or renewal of class, with a time window of ± 6 months being allowed.

1.3 Class Renewal Surveys

For all types of watercraft: Class Renewal Surveys according to [2](#), 2,5 years after assignment of class or last class renewal. The time window is as for seagoing ships, see [B.1.3](#) (i. e. the survey may be started 15 months before, and shall be finished at the date of expiry of the class period).

1.4 Damage surveys

Damage surveys are required if the hull, machinery, electrical installation or rigging have suffered a damage, if a damage is suspected in consequence of some other event, or if deteriorations affecting the vessel's class have been ascertained.

1.5 Bottom surveys

For bottom surveys (dry-docking or placing onshore), see also [Section 3, B.1.6.7](#).

1.6 Other surveys

1.6.1 Upon special agreement, GL may undertake condition surveys and supervise repairs of watercraft constructed under the Society's supervision.

The surveys and findings will be certified informally.

1.6.2 Expertises are prepared only by order of a court and provided that GL's principle of impartiality is not affected.

1.6.3 Where surveys are required by official directives or similar provisions of an Administration, GL will perform these on request and/or on behalf of the authorities, in accordance with their instructions.

2. Performance and scope of surveys

2.1 Intermediate surveys

The survey is to be conducted on shore. To this effect, the vessel is to be stacked at a height enabling its keel and bottom to be thoroughly examined.

The surveys/inspections will have to cover:

- the hull structural areas, including the foundations
- watertight closures, such as hatches, skylights, air and sounding pipes, scuppers, discharge lines, doors, etc., including their seals and locking devices.
- rudder and steering gear, including measurement of bearing clearances
- main and auxiliary machinery with pertinent components
- electrical installation, including pertinent machinery, switchboards and cabling
- propeller, including fastening/securing devices
- external inspection of the entire propeller shaft system(s) in place, including measurement of bearing clearances
- sea valves and all inlet and outlet shell openings

2.2 Class Renewal Surveys

The Class Renewal Survey is to be carried out on shore. To this effect, the vessel is to be stacked at a height enabling its keel and bottom to be thoroughly examined.

In addition to the surveys required in 2.1 above, the surveys/inspections will have to include:

- internal inspection of fresh water, ballast and fuel tanks
- pressure tests of tanks carrying water
- hose testing of all watertight closures
- inspection of anchors, chain cables, hawses
- inspection of bilge and ballast lines, including pertinent pumps, with operational trials
- dismounting of sea valves depending of the findings obtained during external inspection, in accordance with the Surveyor's instructions
- drawing of propeller shaft in accordance with the Surveyor's instructions, if necessary depending of the findings obtained by external inspection
- dismounting of individual components of the machinery in accordance with the Surveyor's instructions, where required on account of his findings
- partial or complete disassembly of main engines (with a total output, exceeding 300 kW), in accordance with the Surveyor's instructions, taking into account provable service times between overhauls and maintenance work performed
- operational trials of the entire machinery and electrical installation, with the ship afloat

3. Thickness measurements and corrosion / Wear tolerances

3.1 In the case of aged steel ships thickness measurements are to be conducted at the hull structural elements in accordance with the Surveyor's instructions. The scope of measurements depends on the vessel's age and maintenance condition.

3.2 Parts damaged or worn to such an extent as to no longer comply with the requirements of GL are to be repaired or replaced.

3.3 Components with thickness of less than 90% of those stipulated are to be renewed.

3.4 Anchors are to be replaced, if their weights have been reduced by more than 10 % compared with the rule weight.

Chain-link cables are to be renewed, if the prescribed cross-section of the chain links has been reduced by more than 12 %, see also [Section 3, C.2.4.4](#).

H. Submersibles

1. Manned, non-military submersibles

Regarding the required surveys for admission to Class respectively for maintenance of the Class, see the GL Rules for [Manned Submersibles \(I-5-2\)](#), [Section 2](#) resp. [Section 1](#).

2. Unmanned submersibles

Regarding the required surveys for admission to Class respectively for maintenance of the Class, see the GL Rules for [Unmanned Submersibles \(ROV, AUV\) and Underwater Working Machines](#), [Section 2](#) resp. [Section 1](#).

3. Underwater working machines

Regarding the required survey for Certification, see the GL Rules for [Unmanned Submersibles \(ROV, AUV\) and Underwater Working Machines](#), [Section 5](#).