

# RULES FOR THE CLASSIFICATION OF OFFSHORE UNITS

**NR445 - JUNE 2025**

## **PART A** CLASSIFICATION AND SURVEYS



# BUREAU VERITAS RULES FOR THE CLASSIFICATION OF OFFSHORE UNITS

**NR445 - JUNE 2025**

This version of the document takes precedence over previous revision. Unless otherwise specified, these rules apply to ships for which contracts are signed on or after June 1st, 2025. The Society may refer to the contents hereof before June 1st, 2025, as and when deemed necessary or appropriate.

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**These rules are provided within the scope of the Bureau Veritas Marine & Offshore General Conditions, enclosed at the end of Part A of NR467, Rules for the Classification of Steel Ships. The latest version of these General Conditions is available on the Bureau Veritas Marine & Offshore website.**

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## PART A

### CLASSIFICATION AND SURVEYS

NR445 A DT R09 JUNE 2025

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## PART B

### STRUCTURAL SAFETY

NR445 B DT R07 JUNE 2025

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## PART C

### FACILITES

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## PART D

### SERVICE NOTATIONS

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NR445

# RULES FOR THE CLASSIFICATION OF OFFSHORE UNITS

## Part A Classification and Surveys

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Chapter 1      Classification

Chapter 2      Maintenance of Class

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# Part A

## Classification and Surveys

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### CHAPTER 1

### CLASSIFICATION

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- Section 1      General Principles of Classification
- Section 2      Classification Notations
- Section 3      Assignment of Class
- Section 4      Required Documentation
- Appendix 1      Former Classification Notations

## Section 1

# General Principles of Classification

## 1 Principles of classification

### 1.1 Purpose of the Rules

**1.1.1** The present Rules give the requirements for the assignment and the maintenance of classification for offshore units.

Note 1: The general conditions of classification are laid down in the Marine & Offshore Division General Conditions.

**1.1.2** The application criteria of the different parts of the present Rules are the following:

- Part A - Classification Surveys, which applies to all units
- Part B - Structural Safety, Part C - Facilities, Part D - Service Notations, which apply to offshore units of welded steel construction. Where necessary, the extent of application is more precisely defined in each chapter of these parts.

The classification of units other than those dealt with in the above-mentioned Part B, Part C and Part D is covered by specific Rules published by the Society.

### 1.2 General definitions

**1.2.1** The following general definitions are used in these Rules:

- Society means the Classification Society with which the unit is classed.
- Rules means the present Rules for the Classification of Offshore Units and documents issued by the Society serving the same purpose.
- Ship Rules means the NR467, Rules for the Classification of Steel Ships.
- Surveyor means the technical staff acting on behalf of the Society to perform tasks in relation to classification and survey duties.
- Survey means an intervention by the Surveyor for assignment or maintenance of class, or interventions by the Surveyor within the limits of the tasks delegated by the Administrations.
- Administration means the Government of the State whose flag the unit is entitled to fly or the State under whose authority the unit is operating in the specific case.
- Interested Party means a party, other than the Society, having responsibility for the classification of the unit, such as the Owners of a unit and his representatives, or the Shipbuilder, or the Engine Builder, or the Supplier of parts to be tested.
- Owner means the Registered Owner or the Disponent Owner or the Manager or any other party having the responsibility to keep the unit seaworthy, having particular regard to the provisions relating to the maintenance of class laid down in Part A, Chapter 2.
- Approval means the review by the Society of documents, procedures or other items related to classification, verifying solely their compliance with the relevant Rules requirements, or other referentials where requested.
- Type approval means an approval process for verifying compliance with the Rules of a product, a group of products or a system, and considered by the Society as representative of continuous production.
- Essential services mean services necessary for a unit to operate at site, be steered or manoeuvred, or undertake activities connected with its operation, and for the safety of life, as far as class is concerned.
- Gross tonnage (GT) is the measure of the overall size of a unit as determined in accordance with the provisions of the 1969 International Convention on Tonnage Measurement of Ships. It is expressed as a figure without units.

### 1.2.2 Date of "contract for construction"

The date of "contract for construction" of a unit is the date on which the contract to build the unit is signed between the Owner and the Shipbuilder. This date is normally to be declared to the Society by the Interested Party applying for the assignment of class to a new unit.

## 1.3 Meaning of classification, scope and limits

### 1.3.1 Classification process

The classification process consists of:

- the development of Rules, guidance notes and other documents relevant to the structure, material, equipment, machinery and other items covered by such documents
- the review of plans and calculations and the surveys, checks and tests intended to demonstrate that the unit meets the Rules (refer to Ch 1, Sec 3)
- the assignment of class (see Ch 1, Sec 2) and issue of a Certificate of Classification, where compliance with the above Rules is found
- the periodical, occasional and class renewal surveys performed to record that the unit in service meets the conditions for maintenance of class (see Part A, Chapter 2).

### 1.3.2 Other parties

The Rules, surveys performed, reports, certificates and other documents issued by the Society, are in no way intended to replace or alleviate the duties and responsibilities of other parties such as Administrations, Designers, Shipbuilders, Manufacturers, Repairers, Suppliers, Contractors or Sub-contractors, actual or prospective Owners or Operators, Charterers, Brokers, Cargo-owners and Underwriters.

The activities of such parties which fall outside the scope of the classification as set out in the Rules, such as design, engineering, manufacturing, operating alternatives, choice of type and power of machinery and equipment, number and qualification of crew or operating personnel, lines of the unit in case of a surface unit, trim, hull vibrations, spare parts including their number, location and fastening arrangements, life-saving appliances (except if **LSA** additional class notation, as defined in Ch 1, Sec 2, [8.3.5], is assigned), and maintenance equipment, remain therefore the responsibility of those parties, even if these matters may be given consideration for classification according to the type of unit or additional class notation assigned.

### 1.3.3 Certificate of classification

The class assigned to a unit by the Society following its interventions is embodied in a Certificate of Classification and noted in the appropriate Register.

At a certain date the class of a unit is maintained or regular when no surveys are overdue, when the conditions for suspension of class are not met and when the class is not withdrawn nor suspended. Otherwise the class is irregular. Attention is drawn on the fact that a unit holding a valid Certificate of Classification may be in an irregular class position.

### 1.3.4 Site conditions and related operating procedures

- It is incumbent to the Owners/Operators to perform the necessary investigations, including environmental and geotechnical surveys, prior to operating the unit at a given site.
- For permanent units, Owner/Operator is to provide supporting information to give evidence to the Society that the proposed design criteria are an adequate representations of the actual conditions on site, including both environmental and soil conditions.
- For other units, these investigations are to be conducted in order to ascertain that the actual conditions met at the contemplated operating site remain on the safe side when compared to design data and assumptions, particularly those listed in the Design Criteria Statement.

Such site assessment is however not part of classification, which also does not cover the assessment of sea bottom conditions and geotechnical investigations or the assessment of possible sea floor movement.

- The procedures to be used for the unit's positioning, anchors setting and retrieving, legs lowering and jacking, preloading, jetting and other related operations are not part of Classification. It is the responsibility of the Owner, or of the Operator if distinct from the Owner, to ascertain that the said procedures and their implementation satisfy the design criteria of the unit and the design of the related equipment.

For permanent units, above procedures are only considered in so far as they could affect the safety or integrity of completed installation on site.

- For other classification limits applicable to operating procedures, refer to Part B, Chapter 2.

### 1.3.5 Classification restrictions

When the design data and assumptions specified by the party applying for classification do not comply with the applicable Rule requirements, restrictions may be placed upon the unit's class.

When deemed necessary, restrictions may be placed on the duration of the operating life of the unit.

Class restrictions, if any, are to be endorsed as a Memorandum and are to be incorporated in the Operating Manual prescribed in [3.4].

## 1.4 Request for services

**1.4.1** Requests for interventions by the Society, such as surveys during construction, surveys of units in service, tests, etc., are in principle to be submitted in writing and signed by the Interested Party. Such request implies that the applicant will abide by all the relevant requirements of the Rules, including the Marine Division General Conditions.

The Society reserves the right to refuse or withdraw the class of any unit for which any applicable requirement of the Rules is not complied with.

## 1.5 Register

**1.5.1** A Register is published periodically by the Society. This publication, which is updated by the Society, contains the names of units which have received the Certificate of Classification, as well as particulars of the class assigned and information concerning each unit.

## 1.6 Design Criteria Statement

### 1.6.1 General

Classification is based upon the design data or assumptions specified by the party applying for classification.

A Design Criteria Statement is to list the service(s) performed by the unit and the design conditions and other assumptions on the basis of which class is assigned to the unit.

The Design Criteria Statement is issued by the Society, based on information provided by the party applying for classification.

The Design Criteria Statement is to be referred to in a Memorandum.

The Design Criteria Statement is to be incorporated in the Operating Manual as prescribed in [3.4].

### 1.6.2 Unit's activities

The Design Criteria Statement is to list the main services for which the unit is designed, the service notation and other notations assigned to the unit.

The nature of the unit's activity is to be duly accounted for in the application of the present Rules, as far as classification is concerned.

The Design Criteria Statement is to mention when the unit is, or is part of, a permanent unit, and will make reference to the applicable site data.

### 1.6.3 Structural design criteria

The Design Criteria Statement is to list the necessary data pertaining to the structural design of the unit for the different conditions of operation of the unit, according to provisions of Part B, Chapter 2.

Note 1: Transit of non self-propelled units is covered by classification as regards only the unit's structural overall and local strength as well as stability. All other aspects relating to towing are reviewed only on special request for a towage survey.

Note 2: As regards design of the foundations of equipment, classification is based upon the data submitted by the party applying for classification, under the format called for by the Rules.

### 1.6.4 Machinery, electrical and other system design conditions

The party applying for classification is to submit the necessary description, diagrammatic plans, design data of all systems, including those used solely for the service (drilling, pipe laying, lifting, etc.) performed by the unit and, where applicable, their cross connections with other systems. The submitted data are to incorporate all information necessary to the assessment of the unit for the purpose of the assignment of class or for the assignment of additional class notations.

In accordance with [1.6.1] the party applying for classification is to give an estimation of electric balance for the different conditions of operation of the unit. The specifications are to list all important equipment and apparatus, their rating and the power factors as applicable.

## 1.7 Design life

### 1.7.1 Definition

For classification, a "design life" for structural strength and integrity assessment of unit hull and mooring is to be specified by the Party applying for classification at the time of design and construction. The default and minimum value usually considered is 20 years from the date of build.

In particular, the "design life" should be taken into account in the predictions of corrosion protection and fatigue strength, in conjunction with appropriate safety factors.

### 1.7.2 Unit modification

Unit modification may be required during the unit life. In such a case, the Owner and/or the operator are/is to carry out an assessment of the impact of modifications on the existing unit. The assessment is to be submitted to the Society.

The review of the assessment may result in requirement for a more comprehensive re-assessment due to the extent and impact of the modification and taking into account the unit age and condition.

### **1.7.3 Unit re-assessment**

A complete re-assessment of the unit condition may be required in the following cases:

- if operating life is expected beyond "design life"
- deficiencies revealed during operation
- major modification.

The re-assessment is to address the actual situation (condition, modifications) of the unit and the current knowledge in site environmental conditions.

Classification requirements as result of the re-assessment, given in terms of required repair/renewal work, surveys, plan approval, possible limited class period, etc., will be evaluated on a case by case basis.

## **1.8 Non-permanently installed equipment**

### **1.8.1 General**

Non-permanent equipment means equipment not remaining on board during the operation of the offshore unit but installed periodically for the purpose of specific works.

### **1.8.2 Classed equipment**

The Owner is to inform the Society about any classed equipment or part of classed equipment which is returned onshore for storage, modifications, repair or maintenance.

As a rule, the classed equipment is to be tested onshore after modifications, repair or maintenance, in accordance with the rules applicable for the classification of the equipment.

A release statement (attestation) is to be issued upon satisfactory completion of tests and visual examination.

The release statement is to be maintained on board the unit for verification during classification surveys.

### **1.8.3 Non-classed equipment**

Unless otherwise specified, non-classed equipment which is not permanently installed and is used solely for operational activities is not covered by the rules.

## **1.9 Attachments of appurtenances**

**1.9.1** The attachments of appurtenances to the hull are within the scope of classification if the supported equipment is either within the scope of classification or essential for the safety of the unit.

Otherwise, the interface between classed and non-classed parts is to be defined on a case-by-case basis.

## **2 Rules**

### **2.1 Rule application**

**2.1.1** The requirements of the present Rules are applicable to all offshore units, as defined in [4], unless a specific statement to the contrary is made.

Requirements of the present Rules may be made applicable to other units, when deemed appropriate by the Society.

The designer is to contact the Society for information about any amendments to these Rules.

The present Rules are not applicable to bottom founded fixed platforms.

### **2.2 Effective date**

**2.2.1** The effective date of entry into force of any amendments to the Rules is indicated on the inside front page of the Rules or in the relevant Section.

**2.2.2** In principle, the applicable Rules for assignment of class to a new unit are those in force at the date of contract for construction.

**2.2.3** Special consideration may be given to applying new or modified rule requirements which entered into force subsequent to the date of contract for construction, at the discretion of the Society and in the following cases:

- when a justified written request is received from the party applying for classification
- when the keel is not yet laid and more than one year has elapsed since the contract for construction was signed
- where it is intended to use existing previously approved plans for a new contract.

**2.2.4** The above procedures for application of the Rules are, in principle, also applicable to existing units in the case of major conversions and, in the case of alterations, to the altered parts of the unit.

**2.2.5** The rule requirements related to assignment, maintenance and withdrawal of the class of units already in operation are applicable from the date of their entry into force.

### 2.3 Equivalence

**2.3.1** The Society may consider the acceptance of alternatives to these Rules, provided that they are deemed to be equivalent to the Rules to the satisfaction to the Society.

The Society may accept surveys and approval done by Administration or by a recognised organisation, concerning fire prevention, ventilation systems, means of escape in accommodation and service spaces. In such a case, supporting documents are to be transmitted to the Society.

**2.3.2** Risk Based Inspection (RBI) may be considered as an element in application of [2.3.1].

**2.3.3** On a case by case basis and upon request from the Owner, a specific in-service inspection programme may be approved by the Society, as an alternative to these Rules.

### 2.4 Novel features

**2.4.1** The Society may consider the classification of units based on or applying novel design principles or features, to which the Rules are not directly applicable, on the basis of experiments, calculations or other supporting information provided to the Society. Specific limitations may then be indicated on a memorandum.

### 2.5 Disagreement and appeal

**2.5.1** Any technical disagreement with the Surveyor in connection with the performance of his duties should be raised by the Interested Party as soon as possible.

The Interested Party may appeal in writing to the Society, which will subsequently consider the matter and announce its decision according to its established procedure.

### 2.6 Risk assessment and Rule application

**2.6.1** As an alternative to the full application of the present prescriptive rules, a hazard analysis approach may be used to justify deviations or modifications from Rule requirements.

**2.6.2** This alternative approach is authorised and encouraged as far as the class is concerned, under reserve of the agreement of the Owner when it leads to deviation from the Rules. Regarding the application to statutory requirements, attention is drawn upon the necessary agreement of the flag and/or coastal Authorities.

**2.6.3** The risk levels obtained by the arrangement resulting from the analysis are to be as low as reasonably practicable.

**2.6.4** It is to be noted that the use of prescriptive rules is not contradictory with the use in parallel of analytical methods, the rules deriving from collection and analysis of past experience.

**2.6.5** The analysis is to be documented and a complete file is to be submitted to the Society for agreement.

## 3 Duties of the Interested Parties

### 3.1 International and national regulations

**3.1.1** The classification of a unit does not relieve the Interested Party from compliance with any requirements issued by Administrations.

**3.1.2** Where requirements of International Conventions, such as SOLAS, ILLC, MARPOL, ILO or of IMO Assembly Resolutions, are quoted as excerpts, they are printed in italic type replacing the word "Administration" by "Society".

These requirements are quoted for ease of reference.

**3.1.3** When authorised by the Administration concerned, the Society will act on its behalf within the limits of such authorisation. In this respect, the Society will take into account the relevant national requirements, survey the unit, report and issue or contribute to the issue of the corresponding certificates.

The above surveys do not fall within the scope of the classification of units, even though their may overlap in part and may be carried out concurrently with surveys for assignment or maintenance of class.

**3.1.4** In the case of a discrepancy between the provisions of the applicable international and national regulations and those of the Rules, normally, the former take precedence. However, the Society reserves the right to call for the necessary adaptation to preserve the intention of the Rules or to apply the provisions of [1.4.1].

## 3.2 Surveyor's intervention

**3.2.1** Surveyors are to be given free access at all times to units which are classed or being classed, shipyards and works, to carry out their interventions within the scope of assignment or maintenance of class, or within the scope of interventions carried out on behalf of Administrations, when so delegated.

Free access is also to be given to auditors accompanying the Surveyors of the Society within the scope of the audits as required in pursuance of the Society's internal Quality System or as required by external organizations.

**3.2.2** Interested Parties are to take the necessary measures for the Surveyors' inspections and testing to be carried out safely. Interested Parties - irrespective of the nature of the service provided by the Surveyors of the Society or others acting on its behalf - assume with respect to such Surveyors all the responsibility of an employer for his workforce such as to meet the provisions of applicable legislation. As a rule, the Surveyor is to be constantly accompanied during surveys by personnel of the Interested Party.

Interested Parties are to inform promptly the Surveyor of defects or problems in relation to class.

Refer also to the Ship Rules, Pt A, Ch 2, Sec 2, [2.5] to Pt A, Ch 2, Sec 2, [2.8].

**3.2.3** The Certificate of Classification and/or other documents issued by the Society remain the property of the Society. All certificates and documents necessary to the Surveyor's interventions are to be made available by the Interested Party to the Surveyor on request.

**3.2.4** During the phases of unit design and construction, due consideration should be given to rule requirements in respect of all necessary arrangements for access to spaces and structures with a view to carrying out class surveys. Arrangements of a special nature are to be brought to the attention of the Society.

## 3.3 Operation and maintenance of units

**3.3.1** The classification of a unit is based on the understanding that the unit is loaded and operated in a proper manner by competent and qualified crew or operating personnel according to the environmental, loading, operating and other criteria on which classification is based.

In particular, it will be assumed that the draught of the unit in operating conditions will not exceed that corresponding to the freeboard assigned or the maximum approved for the classification, that the unit will be properly loaded taking into account both its stability and the stresses imposed on its structures and that cargoes will be properly stowed and suitably secured and that the speed and course of the unit are adapted to the prevailing sea and weather conditions, according to the normal prudent seamanship.

In the same way, it will be assumed that the draught of the unit in operating conditions will not be lower than the minimum draught approved for the classification.

**3.3.2** Units are to be maintained at all times, at the diligence of the Owners, in proper condition complying with international safety and pollution prevention regulations.

**3.3.3** Any document issued by the Society in relation to its interventions reflects the condition of the unit as found at the time and within the scope of the survey. It is the Interested Party's responsibility to ensure proper maintenance of the unit until the next survey required by the Rules. It is the duty of the Interested Party to inform the Surveyor when he boards the unit of any events or circumstances affecting the class.

## 3.4 Operating Manual

**3.4.1** An Operating Manual, which includes instructions regarding the safe operation of the unit and of the systems and equipment fitted on the unit, is to be placed onboard the unit.

The Operating Manual is to incorporate a dedicated section containing all information relating to classification, particularly environmental, loading and other design criteria as well as classification restrictions. The Operating Manual is to be, at all times, placed on board the unit and made available to all concerned. A copy of the Operating Manual is to be retained ashore by the Owners of the unit or their representatives.

It is the responsibility of the Interested Party to prepare the contents of the Operating Manual.

**3.4.2** The Operating Manual is to be submitted for review to the Society, this review being limited to checking that the classification related material contained in the dedicated section mentioned in [3.4.1] is consistent with data given in the Design Criteria Statement (see [1.6] and Part B, Chapter 2).

**3.4.3** When a construction portfolio is not required according to Ch 1, Sec 3, [2.4], the Operating Manual is to contain all reviewed drawings relative to structural strength, stability, fire and explosion safety.

### 3.5 Flag and Port State Control inspections

**3.5.1** Where defects are found further to an inspection by an Administration in pursuance of Port State Control or similar programmes, Owners are to:

- immediately report the outcome of this inspection to the Society, and
- ask the Society to perform an occasional survey in order to verify that the deficiencies, when related to the class of the unit or to the statutory certificates issued by the Society on behalf of the flag Administration, are rectified and/or the necessary repair work is carried out within the due time.

### 3.6 Use of measuring equipment and of service suppliers

#### 3.6.1 General

Firms providing services on behalf of the Interested Party, such as measurements, tests and servicing of safety systems and equipment, the results of which may form the basis for the Surveyor's decisions, are subject to the acceptance of the Society, as deemed necessary.

The equipment used during tests and inspections in workshops, shipyards and on board units, the results of which may form the basis for the Surveyor's decisions, is to be customary for the checks to be performed. Firms are to individually identify and calibrate to a national or international standard each piece of such equipment.

#### 3.6.2 Simple measuring equipment

The Surveyor may accept simple measuring equipment (e.g. rulers, tape measures, weld gauges, micrometers) without individual identification or confirmation of calibration, provided it is of standard commercial design, properly maintained and periodically compared with other similar equipment or test pieces.

#### 3.6.3 Onboard measuring equipment

The Surveyor may accept measuring equipment fitted on board a unit (e.g. pressure, temperature or rpm gauges and meters) and used in examination of onboard machinery and/or equipment based either on calibration records or comparison of readings with multiple instruments.

### 3.7 Spare parts

**3.7.1** It is the Owner's responsibility to decide whether and which spare parts are to be carried on board.

**3.7.2** As spare parts are outside the scope of classification, the Surveyor will not check that they are kept on board, maintained in a satisfactory condition, or suitably protected and lashed.

However, in the case of repairs or replacement, the spare parts used are to meet the requirements of the Rules as far as practicable.

## 4 Definitions

### 4.1 Offshore units

**4.1.1** For the purpose of the application of the present Rules, an offshore unit is defined as a unit fulfilling simultaneously the following conditions:

- to be designed for use in connection with offshore recovery of subsea resources including but not limited to hydrocarbons
- to be of a normally floating type, or to be so designed as to be capable of being moved from one operating site to another in a floating mode.

Other units, not fulfilling the above, may be also considered as offshore units, where deemed appropriate by the Society.

The present Rules are not applicable to bottom founded fixed platforms.

### 4.2 Propulsion

#### 4.2.1 Self-propelled units

A self-propelled unit is a unit capable of unassisted transit between different geographic locations.

Note 1: Units capable of short moves from one operating location to another close one are not considered as self-propelled units.

#### 4.2.2 National and international regulations

The Owners' attention is drawn to different national or international regulations applicable to self-propelled units.

### 4.3 Units' structural types

#### 4.3.1 Surface units

Surface units, for the application of the present Rules, are floating units designed with a displacement-type hull or hulls.

A ship is a self-propelled surface unit.

A barge is a non propelled surface unit.

Note 1: This structural type generally excludes the self-elevating units.

#### 4.3.2 Submersible units

A submersible unit is a unit capable of being designed to rest on the sea bed under working condition and capable, when deballasted to be kept afloat in a semi-submerged position.

#### 4.3.3 Column stabilized units

Column stabilized units are designed with their main deck, which supports most of the equipment, connected to underwater hulls or footings by columns. Bracings may be provided between the lower hulls or footings, the columns and the deck structure.

#### 4.3.4 Self-elevating units

Self-elevating or jack-up units are designed with legs capable of being lowered to the sea bed and of raising the unit hull, which supports the equipment, above the sea surface.

The unit's legs may be of a shell (cylindrical) or truss (tubular or structural sections) type. The legs may be equipped with a lower mat or with footings designed to penetrate the sea bed.

The unit's legs may be vertical or slanted.

#### 4.3.5 SPAR

A SPAR is a floating structure consisting of a large diameter single vertical cylinder supporting fixed platform topside.

#### 4.3.6 Tension Leg Platform (TLP)

Tension leg platforms (TLP) are buoyant structures vertically moored, wherein the excess buoyancy of the platform maintains tension in the mooring system (tether, tendon).

#### 4.3.7 Buoys

A buoy is a floating body, not normally manned, generally of a cylindrical shape, and fitted with mooring equipment as necessary to perform the mooring of a vessel and ensuring fluid transfer between production and/or storage unit or onshore installation and the moored vessel.

It is composed of the following main parts:

- a hull providing buoyancy and stability
- a rotating part to which the vessel is moored and that allows weathervaning
- a fixed part to which the mooring lines and underbuoy pipes are connected.

Note 1: The hull may be either the rotating part or the fixed part.

#### 4.3.8 Other structural types

Units of other structural types will be given special consideration.

#### 4.3.9 Structural type notations

The structural type notations corresponding to the structural types described in [4.3] are defined in Ch 1, Sec 2, [4].

### 4.4 Units' services

#### 4.4.1 Drilling and drilling assistance

For the purpose of the present Rules, drilling includes drilling activities for the exploration of the seabed and/or exploitation of subsea resources including but not limited to hydrocarbons.

For the purpose of the present Rules, drilling assistance includes activities related to drilling without involving the use of a drilling derrick, such as mud treatment, tendering, well remedial or other servicing activities, etc.

The following types of drilling units are considered:

- Surface type drilling units
  - Ship type drilling units are seagoing ship-shaped units having a displacement-type hull or hulls, which have been designed or converted for drilling operations in the floating condition. Such types have propulsion machinery.
  - Barge type drilling units are seagoing units having a displacement type hull or hulls, which have been designed or converted for drilling operations in the floating condition. These units have no propulsion machinery.
- Column stabilized drilling units

Column stabilized drilling units depend upon the buoyancy of widely spaced columns for flotation and stability for all afloat modes of operation or in the raising or lowering of the unit, as may be applicable. The columns are connected at their top to an upper structure supporting the drilling equipment. Lower hulls or footings may be provided at the bottom of the columns for

additional buoyancy or to provide sufficient area to support the unit on the sea bed. Bracing members of tubular or structural sections may be used to connect the columns, lower hulls or footings and to support the upper structure. Drilling operations may be carried out in the floating condition, in which condition the unit is described as a semi-submersible, or when the unit is supported by the sea bed, in which condition the unit is described as a submersible. A semi-submersible unit may be designed to operate either floating or supported by the sea bed, provided each type of operation has been found to be satisfactory.

- **Self-elevating drilling units**

Self-elevating drilling units have hulls with sufficient buoyancy to safely transport the unit to the desired location, after which the hull is raised to a predetermined elevation above the sea surface on its legs, which are supported on the sea bed. Drilling equipment and supplies may be transported on the unit, or may be added to the unit in its elevated position. The legs of such units may penetrate the sea bed, may be fitted with enlarged sections or footings to reduce penetration, or may be attached to a bottom pad or mat.

- **Other types of drilling units**

Units which are designed as mobile offshore drilling units and which do not fall into the above mentioned categories will be treated on an individual basis and be assigned an appropriate classification designation.

#### **4.4.2 Oil and gas production and related services**

For the purpose of the present Rules:

- production means processing of oil/gas well effluents prior to exporting or storage
- storage means storage (in significant quantities) of hydrocarbons (oil, gas), or other subsea resources, prior to exporting
- offloading means facilities to transfer stored hydrocarbons to shuttle ships or to pipelines.

#### **4.4.3 Other services**

Other services are purposes other than drilling, production and related activities, i.e.:

- construction, maintenance and support activities: lifting, pipe laying, accommodation and jacket launching
- other services which may be defined by the party applying for classification.

#### **4.4.4 Service notations**

The service notations corresponding to the services described in [4.4] are defined in Ch 1, Sec 2, [4].

### **4.5 Units' operation**

#### **4.5.1 Nature of the unit**

- a) **Permanent unit**

A permanent unit is a unit performing its service for a duration of not less than 5 years on a single site. A permanent unit is to be assigned with a site notation.

- b) **Disconnectable permanent unit**

A disconnectable permanent unit is a permanent unit able of disengaging from its mooring and riser systems in extreme environmental or emergency conditions.

- c) **Mobile unit**

A mobile unit is a unit which does not correspond to definitions of items a) and b).

#### **4.5.2 Conditions of operations**

- a) **Working conditions**

Working conditions are conditions wherein a unit is on location and performs its service(s), as defined by its service notation, operational and environmental loads remaining within design limits corresponding to this (these) service(s). The unit may be floating or supported by the sea-bed, as applicable.

- b) **Severe storm conditions**

Severe storm conditions are the most severe environmental conditions which the unit is designed to withstand, this unit being floating or supported by the sea-bed, as applicable. These conditions may discontinue the activities of the unit (for drilling units, the riser may be disconnected; for pipe laying units, the pipe may be disconnected and the stinger raised; for crane barges, the boom may be laid down in its cradle, etc.).

- c) **Transit conditions**

Transit condition is condition wherein a unit is moving from one location to another.

Transit includes short duration field moves, between locations in close proximity, and ocean transit, for which a specific preparation of the unit is generally needed.

The unit may be self-floating or supported by a transportation barge or vessel, as applicable. Some design limits to environmental loads may be specified.

The initial transportation to site of a permanent unit is also considered as a transit condition.

## **4.6 Temporary mooring and position anchoring**

### **4.6.1 Temporary mooring**

Surface units may be provided with classical temporary mooring equipment.

The Owners' attention is drawn to applicable national regulations regarding mooring of surface units, particularly self-propelled units.

### **4.6.2 Station keeping**

Station keeping herein means deep sea or location mooring and/or dynamic positioning.

The purpose of positioning equipment and machinery is to maintain the unit on location, within station keeping requirements, in view of its designed functions.

Station keeping may be either passive, by means of catenary equipment (position anchoring) or active (dynamic positioning) or may involve a combination of these.

Additional class notations and service features corresponding to position anchoring and to dynamic positioning are dealt with in Ch 1, Sec 2, [6.2] and Ch 1, Sec 2, [8.4] respectively.

## **4.7 Dimensions and characteristics**

### **4.7.1 Water depth**

The nominal water depth is the vertical distance from the sea bed to a reference sea surface level (such as the Chart Datum).

The design maximum water depth is the vertical distance from the sea bed to the highest still water surface, including astronomical tide and storm (wind and pressure differential) tide.

### **4.7.2 Dimensions**

Except for surface units, all dimensions such as length, breadth, depth relate to overall dimensions, measured without taking into account locally protruding elements (for instance stinger foundations, anchor racks, fenders, etc.).

For surface units, definitions of breadth, moulded depth and block coefficient given in the Ship Rules are applicable.

### **4.7.3 Draughts**

The moulded draughts are the vertical distances between the moulded base line and the water lines in different afloat conditions.

Certain components of a unit's structure, machinery or equipment may extend below the moulded base line.

### **4.7.4 Lightweight**

Lightweight is defined as the weight of the complete unit with all its permanently installed machinery, equipment and outfit, including permanent ballast, spare parts normally retained on board and liquids in machinery and piping to their normal working level, but does not include liquids in storage or reserve supply tanks, items of consumable or variable loads, stores or crew and their effects.

### **4.7.5 Moulded base line**

The moulded base line is a horizontal line extending through the upper surface of the bottom plating.

## **4.8 Other definitions**

### **4.8.1 International instruments**

- SOLAS means the 1974 International Convention for the Safety Of Life At Sea, as amended
- ILLC means the 1966 International Convention on Load Lines, as amended
- MODU Code means the IMO Code for the Construction and Equipment of Mobile Offshore Drilling Units, as amended
- MARPOL means the 1973 International Convention for Prevention of Pollution from Ships and its 1978 Protocol, as amended
- COLREG means the 1972 Convention on the International Regulations for Preventing Collisions at Sea, as amended.

## Section 2

# Classification Notations

## 1 General

### 1.1 Purpose of the classification notations

**1.1.1** The classification notations give the scope according to which the class of the unit has been based and refer to the specific rule requirements which are to be complied with for their assignment. In particular, the classification notations are assigned according to the type, service and navigation of the unit and other criteria which have been+ provided by the Interested Party, when applying for classification.

The Society may change the classification notations at any time, when the information available shows that the requested or already assigned notations are not suitable for the intended service, navigation and any other criteria taken into account for classification.

Note 1: Reference should be made to Ch 1, Sec 1, [1.3] on the limits of classification and its meaning.

**1.1.2** The classification notations assigned to a unit are indicated on the Certificate of Classification, as well as in the Register published by the Society.

**1.1.3** The classification notations applicable to existing units conform to the Rules of the Society in force at the date of assignment of class, as indicated in Ch 1, Sec 3. However, the classification notations of existing units may be updated according to the current Rules, as far as applicable.

## 1.2 Types of notations assigned

**1.2.1** The types of classification notations assigned to a unit are the following:

- class symbol
- construction marks
- structural type notations with additional service features, as applicable
- service notations with additional service features, as applicable
- site notation
- transit notation
- navigation notations
- additional class notations.

The different classification notations and their conditions of assignment are listed in Articles [2] to [9], according to their types.

**1.2.2** As an example, the classification notations assigned to a unit may be as follow (the kind of notation shown in brackets does not form part of the classification notation indicated in the Register and on the Certificate of Classification):

**I ✕ HULL ✕ MACH**

(class symbol, construction marks)

**offshore barge**

(structural type notation)

**oil production unit/oil storage**

(service notations)

**Dalissol field - unrestricted navigation**

(site notation/navigation notation)

**transit - unrestricted navigation**

(transit notation/navigation notation)

**PERMANENT ✕ POSA**

(additional service features)

**✖ AUTO ✕ VeriSTAR-HULL ✕ ALM**

(additional class notation)

## 2 Class symbol

### 2.1 General

**2.1.1** The class symbol expresses the degree of compliance of the unit with the rule requirements as regards its construction and maintenance. There is one class symbol, which is compulsory for every classed unit.

**2.1.2** The class symbol **I** is assigned to units built in accordance with the requirements of the Rules or other rules recognised as equivalent, and maintained in a condition considered satisfactory by the Society.

The period of class (or interval between class renewal surveys) assigned to class symbol **I** units is maximum 5 years.

Note 1: The class symbol **I** is to be understood as being the highest class granted by the Society.

**2.1.3** The class symbol **II** is assigned to units which do not meet all requirements for class symbol **I**, but are deemed acceptable to be entered into the Register.

The period of class assigned to class symbol **II** units is maximum 3 years.

**2.1.4** Except for special cases, class is assigned to a unit only when the hull, propulsion and auxiliary machinery installations, and equipment providing essential services have all been reviewed in relation to the requirements of the Rules.

## 3 Construction marks

### 3.1 General

**3.1.1** The construction mark identifies the procedure under which the unit and its main equipment or arrangements have been surveyed for initial assignment of the class. The procedures under which the unit is assigned one of the construction marks are detailed in Ch 1, Sec 3.

**3.1.2** One of the construction marks defined below is assigned separately to the hull of the unit and its appendages, to the machinery installation, and to some installations for which an additional classification notation is assigned.

The construction mark is placed before the symbol **HULL** for the hull, before the symbol **MACH** for the machinery installations, and before the additional class notation granted, when such a notation is eligible for a construction mark.

If the unit has no machinery installations covered by classification, the symbol **MACH** is not granted and the construction mark is to be only placed before the symbol **HULL**.

**3.1.3** The construction marks refer to the original condition of the unit. However, the Society may change the construction mark where the unit is subjected to repairs, conversion or alterations.

### 3.2 List of construction marks

**3.2.1** The mark **☒** is assigned to the relevant part of the ship, when it has been surveyed by the Society during its construction in compliance with the new building procedure detailed in Ch 1, Sec 3, or when it is changing class from an IACS Society at ship's delivery or when class is being added to an IACS Society's class at ship's delivery in accordance with specific procedures.

**3.2.2** The mark **☒** is assigned to the relevant part of the unit, when the latter is classed after construction and is changing class from an IACS Society at the time of the admission to class.

**3.2.3** The mark **•** is assigned to the relevant part of the unit, where the procedure for the assignment of classification is other than those detailed in [3.2.1] and [3.2.2], but however deemed acceptable.

## 4 Structural type notations and associated additional service features

### 4.1 General

**4.1.1** The structural type notation of a unit identifies its structural type, as defined in Ch 1, Sec 1, [4.3] to which it belongs. Only one structural type notation listed in Tab 1 is to be assigned to every classed unit.

**4.1.2** A structural type notation may be completed by one or more additional service features, giving further precision regarding the type of the unit for which specific rule requirements are applied.

Table 1 : List of structural type notations and associated additional service features

Structural type notation [ref. in Part A] Additional service feature	Reference Reference	Remarks
<b>offshore ship</b> [4.1.3]  MOBILE or PERMANENT [6.1] POSA, POSA-HR or POSA JETTY [6.2.1] (1) POSA MU [6.2.2] (1)	NR493 NR493	mandatory for permanent units
<b>offshore barge</b> [4.1.4]  MOBILE or PERMANENT [6.1] POSA, POSA-HR or POSA JETTY [6.2.1] (1) POSA MU [6.2.2] (1)	NR493 NR493	mandatory for permanent units
<b>offshore submersible unit</b> [4.1.5]  MOBILE or PERMANENT [6.1]		
<b>column stabilized unit</b> [4.1.6]  MOBILE or PERMANENT [6.1] POSA, POSA-HR or POSA JETTY [6.2.1] (1) POSA MU [6.2.2] (1)	NR571 NR493 NR493	mandatory for permanent units
<b>self-elevating unit</b> [4.1.7]  MOBILE or PERMANENT [6.1]	NR534	
<b>offshore SPAR</b> [4.1.8]  MOBILE or PERMANENT [6.1] POSA or POSA-HR [6.2.1] (1)	NR493	mandatory
<b>offshore TLP</b> [4.1.9]  MOBILE or PERMANENT [6.1] TLS or TLS PLUS [4.1.9]	NR578 NR578	mandatory
<b>offshore buoy</b> [4.1.10]  MOBILE or PERMANENT [6.1] POSA or POSA-HR [6.2.1] (1)	NR494 NR493	mandatory
<b>offshore special type unit ( )</b> [4.1.11]  MOBILE or PERMANENT [6.1] POSA, POSA-HR or POSA JETTY [6.2.1] (1) POSA MU [6.2.2] (1)	NR493 NR493	mandatory for permanent units

(1) A construction mark is added to the additional service feature.

#### 4.1.3 Offshore ship

The structural type notation **offshore ship** is assigned to self-propelled surface units defined in Ch 1, Sec 1, [4.3.1].

One of the additional service features **MOBILE** or **PERMANENT** is to be assigned in accordance with [6.1].

For permanent units, one of the additional service features **POSA**, **POSA-HR** or **POSA JETTY** is to be assigned in accordance with [6.2].

Mobile units may be assigned the additional service feature **POSA MU** as defined in [6.2].

#### 4.1.4 Offshore barge

The structural type notation **offshore barge** is assigned to non-propelled surface units defined in Ch 1, Sec 1, [4.3.1].

One of the additional service features **MOBILE** or **PERMANENT** is to be assigned in accordance with [6.1].

For permanent units, one of the additional service features **POSA**, **POSA-HR** or **POSA JETTY** is to be assigned in accordance with [6.2].

Mobile units may be assigned the additional service feature **POSA MU** as defined in [6.2].

#### 4.1.5 Offshore submersible unit

The structural type notation **offshore submersible unit** is assigned to units defined in Ch 1, Sec 1, [4.3.2].

One of the additional service features **MOBILE** or **PERMANENT** is to be assigned in accordance with [6.1].

#### 4.1.6 Column stabilized unit

The structural type notation **column stabilized unit** is assigned to units defined in Ch 1, Sec 1, [4.3.3].

One of the additional service features **MOBILE** or **PERMANENT** is to be assigned in accordance with [6.1].

For permanent units, one of the additional service features **POSA**, **POSA-HR** or **POSA JETTY** is to be assigned in accordance with [6.2].

Mobile units may be assigned the additional service feature **POSA MU** as defined in [6.2].

#### 4.1.7 Self-elevating unit

The structural type notation **self-elevating unit** is assigned to units defined in Ch 1, Sec 1, [4.3.4].

One of the additional service features **MOBILE** or **PERMANENT** is to be assigned in accordance with [6.1].

#### 4.1.8 Offshore SPAR

The structural type notation **offshore SPAR** is assigned to units defined in Ch 1, Sec 1, [4.3.5].

One of the additional service features **MOBILE** or **PERMANENT** is to be assigned in accordance with [6.1].

The notation is to be completed by one of the additional service features **POSA** or **POSA-HR** as defined in [6.2].

#### 4.1.9 Offshore TLP

The structural type notation **offshore TLP** is assigned to units defined in Ch 1, Sec 1, [4.3.6].

One of the additional service features **MOBILE** or **PERMANENT** is to be assigned in accordance with [6.1].

The structural type notation **offshore TLP** is to be completed by one of the following additional service features, as defined in NR578 Rules for the Classification of Tension Leg Platforms (TLP):

- **TLS**, Tension Leg System

In principle, the additional service feature **TLS** adopts the same level of safety as API RP 2T recommendations.

- **TLS PLUS**, Tension Leg System PLUS

In addition to the requirements applicable for **TLS**, the additional service feature **TLS PLUS** requires the verification of tendon legs system under some additional loading conditions for higher redundancy.

Note 1: The scope of **TLS** notation can be extended to tandem connection with a specific second unit.

#### 4.1.10 Offshore buoy

The structural type notation **offshore buoy** may be assigned to units defined in Ch 1, Sec 1, [4.3.7].

One of the additional service features **MOBILE** or **PERMANENT** is to be assigned in accordance with [6.1].

The notation is to be completed by one of the additional service features **POSA** or **POSA-HR** as defined in [6.2].

The specific service notations to be assigned to **offshore buoy** are defined in [5.5].

#### 4.1.11 Offshore special type unit ( )

The structural type notation **offshore special type unit ( )** may be assigned to units not belonging to any of the other structural types.

The mention between brackets is to be completed according to the specific type of the unit, in agreement with the Society.

One of the additional service features **MOBILE** or **PERMANENT** is to be assigned in accordance with [6.1].

For permanent units, one of the additional service features **POSA**, **POSA-HR** or **POSA JETTY** is to be assigned in accordance with [6.2].

Mobile units may be assigned the additional service feature **POSA MU** as defined in [6.2].

### 5 Service notations and associated additional service features

#### 5.1 General

**5.1.1** The service notations define the service of the unit which have been considered for its classification, according to the request for classification signed by the Interested Party. At least one service notation is to be assigned to every classed unit.

Note 1: The service notations applicable to existing units conform to the Rules of the Society in force at the date of assignment of class. However, the service notations of existing units may be updated according to the current Rules, as far as applicable, at the request of the Interested Party.

**5.1.2** The assignment of any service notation to a new unit is subject to compliance with general rule requirements laid down in Part B and Part C of the Rules and in NR216 Rules on Materials and Welding for the Classification of Marine Units and, for some service notations, with the additional requirements laid down in Part D or in separate Rule Notes.

**5.1.3** A unit may be assigned several different service notations. In such case, the specific rule requirements applicable to each service notation are to be complied with. However, if there is any conflict in the application of the requirements applicable to different service notations, the Society reserves the right to apply the most appropriate requirements or to refuse the assignment of one of the requested service notations.

**5.1.4** A service notation may be completed by one or more additional service features, giving further precision regarding the type of service of the unit, for which specific rule requirements are applied.

**5.1.5** The different service notations which may be assigned to a unit are listed in [5.2] to [5.7], according to the category to which they belong. These service notations are also listed in Tab 2.

Several service notations may be assigned, e.g.:

**pipelaying / lifting**

**Table 2 : List of service notations and associated additional service features**

Service notation [ref. in Part A] Additional service feature	Reference Reference	Remarks
<b>accommodation</b> [5.4.3]		
<b>drilling</b> [5.3.1]	NR569	The type of drilling service may be indicated between brackets. Eg: <b>drilling (geotechnical), drilling (workover)</b>
<b>POSA MU (1)</b> [6.2.2]	NR493	Mandatory for units fitted with passive station keeping system
<b>drilling assistance</b> [5.3.2]	NR569	
<b>FSRU</b> [5.2.6]	NR645	
<b>REGAS</b>	Part D, Chapter 1	
<b>FSU-LNG</b> [5.2.6]	NR645	
<b>gas liquefaction unit</b> [5.2.4]	NR542	
<b>gas production unit</b> [5.2.5]	NR542	
<b>INERTGAS</b> [6.3.1]	Part D, Chapter 1	
<b>jacket launching</b> [5.4.4]		
<b>lifting</b> [5.4.1]	Ship Rules, Part E Chapter 8 (2) (3)	The lifting appliance is to be certified and at least one of the following additional class notations is to be assigned: <b>ALM</b> or <b>OHS</b>
<b>liquefied gas storage</b> [5.2.3]	NR542	
<b>SLOSHING</b> [5.2.3]	NI554	Mandatory for units using membrane tanks for cargo containment
<b>INERTGAS</b> [6.3.1]	Part D, Chapter 1	
<b>oil production unit</b> [5.2.2]	Part D, Chapter 1	
<b>INERTGAS</b> [6.3.1]	Part D, Chapter 1	Mandatory for units having integrated process tanks or with tanks cleaning procedure using crude oil washing
<b>oil loading</b> [5.5.1]	NR494	Applicable to offshore buoys
<b>oil offloading</b> [5.5.1]		
<b>oil storage</b> [5.2.1]	Part D, Chapter 1	
<b>INERTGAS</b> [6.3.1]	Part D, Chapter 1	Mandatory for storage > 8000 t
<b>gas/condensate loading</b> [5.5.1]	NR494	Applicable to offshore buoys
<b>gas/condensate offloading</b> [5.5.1]		
<b>pipelaying</b> [5.4.2]		
<b>FOWT</b> [5.6.1]	NR572	Floating Offshore Wind Turbine
<b>special service ( )</b> [5.7]		An additional service feature may be added to identify the particular service in which the unit is intended to operate
<b>OTHER ADDITIONAL SERVICE FEATURES</b>		
<b>CYBER RESILIENT</b> [6.4.1]	NR659	
<b>CBM or [CBM] or CBM-P or [CBM-P]</b> [6.5.1]	–	
(1)	A construction mark is added to the additional service feature	
(2)	As applicable	
(3)	Specific stability criteria for units assigned with the structural type notation <b>column stabilized unit</b> are given in Pt B, Ch 1, Sec 1, [6]	

## 5.2 Oil and gas production and related services

### 5.2.1 Oil storage unit

The service notation **oil storage** may be assigned to units engaged in the storage of oil products (in significant quantities). The requirements of Part D, Chapter 1 are applicable to these units.

The additional service feature **INERTGAS** as defined in [6.3] is to be assigned to units having the service notation **oil storage**.

### 5.2.2 Oil production unit

The service notation **oil production unit** may be assigned to units equipped for oil production and related activities, as defined in Ch 1, Sec 1, [4.4].

The requirements of Part D, Chapter 1 are applicable to these units. Production equipment is not included in the scope of classification except when the additional class notation **PROC** as defined in [8.3.3], is assigned to the unit.

The additional service feature **INERTGAS**, as defined in [6.3], is to be assigned to units assigned with the service notation **oil production unit** and fitted with integrated process tanks or with tanks cleaning procedure using crude oil washing.

### 5.2.3 Liquefied gas storage unit

The service notation **liquefied gas storage** may be assigned to units designed and equipped for the storage of liquefied gases (in significant quantities). The requirements of NR542 Rules for the Classification of Floating Gas Units are applicable to these units.

The additional service feature **INERTGAS**, as defined in [6.3] may be assigned to units granted with the service notation **liquefied gas storage**, when they are equipped with an inert gas plant for condensate storage tanks complying with the corresponding provisions of Part D, Chapter 1. This additional service feature applies also to gas blanketing systems.

The additional service feature **SLOSHING** is to be assigned to units granted with the service notation **liquefied gas storage**, when they are equipped with membrane tanks for cargo containment.

Note 1: **SLOSHING** may also be requested by the Society on a case-by-case basis for containment systems other than membrane type, if deemed necessary considering the specific design of the containment system.

The requirements for the assignment of the additional service feature **SLOSHING** are given in NI554 Sloshing Assessment.

### 5.2.4 Gas liquefaction unit

The service notation **gas liquefaction unit** may be assigned to units designed and equipped for gas liquefaction and complying with the requirements of NR542 Rules for the Classification of Floating Gas Units.

The service notation **gas liquefaction unit** is mandatory for units granted with the service notation **liquefied gas storage** when the liquefaction plant is necessary for compliance with the requirements of IGC Code, Chapter 7.

Liquefaction equipment is not included in the scope of classification except when the additional class notation **PROC-GL**, as defined in [8.3.3], is assigned.

### 5.2.5 Gas production unit

The service notation **gas production unit** may be assigned to units designed and equipped to receive gas and to process it.

Relevant requirements of NR542 Rules for the Classification of Floating Gas Units are applicable to these units.

Production equipment is not included in the scope of classification except when the additional class notation **PROC**, as defined in [8] is assigned.

Production equipment is not included in the scope of classification except when the additional class notation **PROC-GP**, as defined in [8.3.3] is assigned.

### 5.2.6 Floating storage regasification unit (FSRU) and floating storage unit (FSU)

The service notations **FSRU** and **FSU-LNG** may be assigned to floating storage regasification units (FSRUs) and floating storage units (FSUs) respectively, designed to operate as a regasification and/or storage unit permanently moored without trading LNG.

The requirements of NR645 Rules for the Classification of Floating Storage Regasification Units and Floating Storage Units are applicable to these units. Typical notations to be assigned to complete the service notations **FSRU** and **FSU-LNG** are described in NR645.

## 5.3 Drilling and drilling assistance units

**5.3.1** The service notation **drilling** may be assigned to units engaged in drilling activities as defined in Ch 1, Sec 1, [4.4].

Drilling equipment is not included in the scope of classification, except when the additional class notation **DRILL**, as defined in [8], is granted.

This service notation may be completed by an indication between brackets of the type of drilling service the unit is engaged in, such as the following examples:

**drilling (geotechnical)**

**drilling (workover)**

The additional service feature **POSA MU**, as defined in [6.2], is mandatory for drilling units fitted with passive mooring systems.

**5.3.2** The service notation **drilling assistance** may be assigned to units engaged in drilling assistance, as defined in Ch 1, Sec 1, [4.4].

Specific equipment used for drilling assistance is not included in the scope of classification

The additional service feature **POSA-MU** defined in [6.2] may be assigned to these units.

## 5.4 Offshore service vessels

**5.4.1** The service notation **lifting** may be assigned to units having lifting equipment installed on-board and performing lifting operations at sea.

The requirements for the assignment of this notation are given in:

- Ship Rules, Pt E, Ch 8, Sec 2 to Pt E, Ch 8, Sec 6, as applicable
- Part B and Part C of the present Rules
- for units having the structural type notation **column stabilized unit**, specific stability criteria given in Pt B, Ch 1, Sec 1, [6].

References and list of documents to be submitted are defined in Ship Rules, Pt E, Ch 8, Sec 1, [3] and Pt E, Ch 8, Sec 1, [4] respectively.

The requirements for the maintenance of the notation **lifting** are given in Ch 2, Sec 9, [10].

Note 1: Note 1: The service notation **lifting** can only be granted to the offshore unit if the corresponding lifting appliance is covered by at least one of the additional class notations **ALM** or **OHS** to be assigned to the offshore unit.

**5.4.2** The service notation **pipelaying** may be assigned to units having specific equipment for pipe laying activities fitted on-board.

The pipe laying equipment is not included in the scope of classification except when the additional class notation **OHS** is granted.

**5.4.3** The service notation **accommodation** may be assigned to units specially intended for accommodation of personnel engaged in offshore activities.

**5.4.4** The service notation **jacket launching** may be assigned to units having specific equipment for jacket launching activities fitted on board.

## 5.5 Offshore buoys

**5.5.1** The service notations listed below may be granted only to offshore floating buoys complying with the requirements stipulated in NR494 Rules for the Classification of Offshore Loading and Offloading Buoys:

- **oil loading**
- **oil offloading**
- **gas/condensate loading**
- **gas/condensate offloading**

## 5.6 Marine Renewable Energy Converters

**5.6.1** The service notation **FOWT** may be assigned to Floating Offshore Wind Turbine.

The requirements of NR572 Classification and certification of floating offshore wind turbines are applicable to these units.

## 5.7 Special service ( )

**5.7.1** The service notation **special service ( )** may be assigned to units which, due to the peculiar characteristics of their activity, are not covered by any of the above mentioned notations. The classification requirements of such units are considered by the Society on a case by case basis. An additional service feature may be specified after the notation to identify the particular service in which the unit is intended to operate. The scope and criteria of classification of such units are indicated in a memorandum.

# 6 Additional service features applicable to several structural type or service notations

## 6.1 Mobile and permanent units (MOBILE / PERMANENT)

### 6.1.1 PERMANENT

The additional service feature **PERMANENT** is assigned to units permanently moored for a period equal to or greater than 5 years at a single location with no drydock.

### 6.1.2 MOBILE

The additional service feature **MOBILE** is assigned to seagoing units or stationary units moored for period less than indicated in [6.1.1].

## 6.2 Station keeping (POSA)

### 6.2.1 Permanent units

The additional service feature **POSA** is assigned to units equipped with position anchoring equipment complying with the applicable requirements of NR493 Classification of Mooring Systems for Permanent and Mobile Offshore Units.

The additional service feature **POSA-HR** (Higher Redundancy) may be assigned in substitution to the notation **POSA**, based on the provisions of NR493.

For units moored to a jetty with a permanent position mooring equipment complying with the applicable requirements of NR493 the additional service feature **POSA JETTY** is to be assigned in substitution to **POSA**.

A construction mark is to be added to these additional service features.

The requirements for the maintenance of these notations are given in Ch 2, Sec 9.

Note 1: The scope of **POSA** notation can be extended to tandem connection with a specific second unit.

### 6.2.2 Mobile units

The additional service feature **POSA MU** (Mobile Units) may be assigned to mobile units with station keeping system complying with the applicable requirements of NR493.

A construction mark is to be added to these additional service features.

The requirements for the maintenance of these notations are given in Ch 2, Sec 9.

## 6.3 Inert gas systems (INERTGAS)

**6.3.1** The additional service feature **INERTGAS** may be assigned to units fitted with an inerting system capable of preventing the combustion of flammable materials in cargo tanks, according to the conditions of assignation defined for the service notation in [5.2].

This notation is mandatory for oil storage units with a deadweight greater than 8000 tonnes.

The technical requirements for inert gas systems are provided in Part D, Chapter 1.

## 6.4 Cybersecurity

**6.4.1** Self-propelled units of 500GT and upwards, assigned the additional service feature **MOBILE**, and equipped with computer-based systems, are to comply with the requirements of NR659, Chapter 3 and, as applicable with the requirements of NR659, Chapter 5.

These units are to be assigned the additional service feature **CYBER RESILIENT**.

The requirements for the assignment of this additional service feature are given in NR659 Rules on Cyber Security for the Classification of Marine Units.

The requirements for the maintenance of this notation are given in Pt A, Ch 5, Sec 17 of the Ship Rules.

Note 1: Units complying with the requirements of NR659, Chapter 4 may be assigned the additional class notation **CYBER SECURE**, as defined in [6.21.1], in addition to the additional service feature **CYBER RESILIENT**.

## 6.5 Condition based maintenance

**6.5.1** The additional service features **CBM** and **[CBM]** are assigned to units where a planned maintenance survey system for machinery (PMS) is implemented and on which at least one machinery item is to be surveyed under a Condition Based Maintenance scheme, according to the requirements of Pt A, Ch 2, Sec 2, [4.4] and Pt A, Ch 2, App 4 of the Ship Rules.

The additional service features **CBM-P** and **[CBM-P]** are assigned in lieu of the notations **CBM** and **[CBM]** when the **CBM** scheme relies on at least one predictive condition monitoring system as defined in NI684.

The additional service features **[CBM]** and **[CBM-P]** are assigned to ships after the Owner's application for the **CBM** scheme has been received by the Society.

The additional service features **[CBM]** and **[CBM-P]** are replaced by respectively **CBM** or **CBM-P** when the installation survey and the implementation survey are carried out and found satisfactory in accordance with Pt A, Ch 2, App 4, [3.1] and Pt A, Ch 2, App 4, [3.2] of the Ship Rules.

Consideration may be given by the Society, on a case by case basis, to withdraw **[CBM]** or **[CBM-P]** in case of significant delay for the Owner's request for the installation survey.

The requirements for the assignment and maintenance of these additional service features are given in Pt A, Ch 2, App 4 of the Ship Rules.

Note 1: See NI684 Guideline for Condition Based Maintenance for further details on requirements and class workflow.

## 7 Site, transit and navigation notations

### 7.1 Site notation

**7.1.1** Units covered by the present Rules are to be granted with a site notation, consisting in the name of field and/or geographical area and/or the most unfavourable sea conditions where the unit is intended to operate.

**7.1.2** For surface units, as defined in Ch 1, Sec 1, [4.3.1], the site notation may be completed by one of the navigation notations given in [7.4]. This navigation notation is to cover only the site condition of the unit. In addition, the requirements of [7.3], are also to be complied with.

Example: **USANFLOR Offshore Angola - tropical zone**

**7.1.3** In both cases, with or without navigation notation for site condition, the data, limitations and assumptions used for the assessment of the unit on site are stated in the Design Criteria Statement, which is referred to on a memorandum.

### 7.2 Transit notation

**7.2.1** Units involved in towing or sailing by means of own propulsion system between construction shipyard and the intended site, or between different operation sites, are to be granted with the notation **transit**.

Note 1: Dry towing of offshore units is not covered by the notation **transit**.

**7.2.2** The notation **transit**, as defined in [7.2.1], is to be completed as follows:

- **transit - specific criteria**, applicable for all types of unit, when the criteria for the assessment in towing/transit phase are based on data and assumptions specified by the party applying for classification. These criteria are to be stated in the Design Criteria Statement, which is referred to on a memorandum.
- For surface units, as defined in Ch 1, Sec 1, [4.3.1], the notation **transit** may be completed by one of the navigation notation given in [7.4]. In this case, the requirements of [7.3] are to be complied with.

Example: **transit - unrestricted navigation**

### 7.3 Navigation notations

**7.3.1** Navigation notations listed in [7.4] may complete the site notation and/or transit notation of the unit, as required in [7.1.2] and [7.2.2].

**7.3.2** When surface units covered by Part D are intended to be granted a navigation notation, requirements of Pt D, Ch 1, Sec 5 are to be complied with.

**7.3.3** The assignment of a navigation notation, including the reduction of scantlings or specific arrangements for restricted navigation notations, is subject to compliance with the requirements laid down in Part B, Part C and Part D of the Rules.

**7.3.4** The assignment of a navigation notation does not absolve the Interested Party from compliance with any international and national regulations established by the Administrations for a unit operating in national waters, or a specific area, or a navigation zone. Neither does it waive the requirements in Ch 1, Sec 1, [3.3.1].

### 7.4 List of navigation notations

**7.4.1** The navigation notation **unrestricted navigation** is assigned to units intended to operate in any area and any period of the year.

**7.4.2** The navigation notation **summer zone** is assigned to units intended to operate only within the geographical limits as defined in ILLC 1966 for the Summer zones.

**7.4.3** The navigation notation **tropical zone** is assigned to units intended to operate only within the geographical limits as defined in ILLC 1966 for the Tropical zones.

**7.4.4** The navigation notation **coastal area** is assigned to units intended to operate only within 20 nautical miles from the shore and with a maximum sailing time of six hours from a port of refuge or safe sheltered anchorage.

**7.4.5** The navigation notation **sheltered area** is assigned to units intended to operate in sheltered waters, i.e. harbours, estuaries, roadsteads, bays, lagoons and generally calm stretches of water and when the wind force does not exceed 6 Beaufort scale.

## 8 Additional class notations

### 8.1 General

**8.1.1** An additional class notation expresses the classification of additional equipment or specific arrangement, which has been requested by the Interested Party. Some additional class notations may also be mandatory for certain unit types and services when specified in the present Rules.

**8.1.2** The assignment of an additional class notation is subject to the compliance with the associated additional rule requirements.

**8.1.3** Some additional class notations are assigned a construction mark, according to the principles given in [3.1.2]. This is indicated in the definition of the relevant additional class notations.

**8.1.4** The different additional class notations which may be assigned to a unit are listed in [8.2] [8.4] and are summarized in Tab 3.

Table 3 : List of additional class notations

Additional class notation	Defined in	Reference for assignment	Remarks
<b>ALM</b> ( <b>ALM</b> ) <b>ALM-EN</b> ( <b>ALM-SUBSEA</b> ) <b>ALP</b> ( <b>ALP</b> )	(1) (1) (1) (1) (1)	[8.3.1]	NR526 <b>ALP, ALM, ALM-EN and ALM-SUBSEA</b> may be completed by <b>-MR</b>
<b>AUTO</b>	(1)	[8.3.14]	Part C, Chapter 3 mandatory for offshore units having offshore barge or offshore ship structural type notation with at least one of the following service notations: <b>oil storage, oil production unit, liquefied gas storage, gas production unit or gas liquefaction unit</b>
<b>COMF HEALTH-NOISE-g</b> <b>COMF HEALTH-VIB-g</b>		[8.4.3]	NR636 <b>g</b> is equal to <b>1</b> (best level) or <b>2</b> <b>COMF</b> notations may be completed by <b>-SIS</b>
<b>CSR Hull Type</b>		[8.4.3]	NR606 for oil storage unit verified at design with the requirement of NR606
<b>CYBER MANAGED</b> <b>CYBER RESILIENT</b> <b>CYBER CECURE</b>		[8.4.14]	NR659
<b>DRILL</b>		[8.3.9]	NR570 for floating units with service notation <b>drilling</b>
<b>DYNAPOS AM</b> <b>DYNAPOS AT</b> <b>DYNAPOS AM/AT</b>	(1) (1) (1)	[8.3.2]	Pt F, Ch 11, Sec 5 of the Ship Rules <b>DYNAPOS AM, DYNAPOS AT and DYNAPOS AM/AT</b> may be completed by either: <b>R</b> or <b>RS</b> , and <b>ESKI (xx ; xx)</b> and <b>-HWIL</b> . <b>ESKI</b> is completed between bracket by the two number vector for the Environmental Station Keeping Index. <b>R</b> and <b>RS</b> may be completed by <b>-EI</b> and <b>-DDPS</b>
<b>DYNAPOS SAM</b>	(1)	[8.3.2]	Pt F, Ch 11, Sec 5 of the Ship Rules <b>DYNAPOS</b> notations may be completed by <b>-HWIL</b>
<b>ERS-H or [ERS-H]</b> <b>ERS-M or [ERS-M]</b> <b>ERS-S or [ERS-S]</b>		[8.3.15]	NR556
<b>ETA</b>		[8.3.6]	Pt B, Ch 12, Sec 4 of the Ship Rules
<b>GREEN PASSPORT</b> <b>GREEN PASSPORT EU</b>		[8.4.12]	NR528
<b>HEL</b>	(1)	[8.3.7]	Pt B, Ch 3, Sec 4, [4]
<b>HIPS</b>		[8.4.6]	NI524
<b>ICE</b>		[8.4.1]	Pt F, Ch 8, Sec 1, Pt F, Ch 8, Sec 2 and Pt F, Ch 8, Sec 3 of the Ship Rules
<b>ICE CLASS IA SUPER</b> <b>ICE CLASS IA</b> <b>ICE CLASS IB</b> <b>ICE CLASS IC</b> <b>ICE CLASS ID</b>		[8.4.1]	
<b>INTERNAL CONNECTIVITY</b>		[8.4.11]	NR688
<b>INWATERSURVEY</b>		[8.4.9]	Pt F, Ch 15, Sec 3 of the Ship Rules mandatory for permanent units
<b>IVBS-xxx</b>		[8.4.7]	NI567 <b>xxx</b> is the reference of the concerned regulation, standard or Owner specification. Ex: <b>IVBS-UK, IVBS-BRA, IVBS-AUS</b>
<b>liquefied gas transfer</b>		[8.3.8]	NR542 for side-by-side transfer arms, tandem transfer arms or transfer systems based on flexible hoses
<b>LSA</b>		[8.3.5]	Pt C, Ch 4, Sec 12

(1) A construction mark is added to the additional class notation.

(2) For units contracted before 1 July 2016 the notation **DFL xx years** may have been assigned in lieu of **FAT xx years**.

Additional class notation	Defined in	Reference for assignment	Remarks
<b>MON-SHAFT</b>	[8.3.16]	Pt F, Ch 5, Sec 2 of the Ship Rules	
<b>OAS (1)</b>	[8.3.12]	NI629	
<b>OHS (1)</b>	[8.3.11]	NR595	
<b>oil offloading (transfer arms)</b>	[8.3.10]	NR588	for side-by-side or tandem transfer arms
<b>PROC</b>	[8.3.3]	NR459	for permanent units with service notation <b>oil production unit</b>
<b>PROC-GL</b>	[8.3.3]	NR542	for permanent units with service notation <b>gas liquefaction unit</b>
<b>PROC-GP</b>	[8.3.3]	NR542	for permanent units with service notation <b>gas production unit</b>
<b>RBA</b> <b>RBA ( )</b>	[8.4.8]	NR568	when the risk based approach concerns a part of the unit only, this part is to be indicated between brackets. Ex: <b>RBA (offloading system)</b>
<b>RBVS-xxx</b>	[8.4.5]	NI567	xxx is the reference of the concerned regulation, standard or Owner specification
<b>REGAS</b>	[8.3.13]	NR645	
<b>Spectral Fatigue ( )</b>	[8.4.4]	NI611	the information between brackets is a short description of routes and/or areas considered for the spectral fatigue analysis
<b>STAR-CARGO</b>	[8.2.5]	Pt F, Ch 1, Sec 4 of the Ship Rules	
<b>STAR-MACH</b> <b>STAR-MACH SIS</b>	[8.2.4]	Pt F, Ch 1, Sec 2 of the Ship Rules	
<b>STAR-REGAS</b>	[8.2.6]	Pt F, Ch 1, Sec 3 of the Ship Rules	
<b>STI</b>	[8.4.2]	Pt D, Ch 1, Sec 3, [5]	
<b>SUR2SUB</b>	[8.3.4]	Pt D, Ch 1, Sec 21	only for permanent units fitted with risers, umbilicals and/or power cables
<b>SUSTAINABILITY-1</b> <b>SUSTAINABILITY-2</b>	[8.4.13]	Part C, Chapter 5	
<b>VeriSTAR-Hull (1)</b>	[8.2.2]	Pt D, Ch 1, Sec 9 NR542	these notations may be complemented by <b>FAT</b> or <b>FAT xx years</b> , with $\leq 25 \leq 40$ (2) or by <b>FAT [YY, YEAR]</b> with $YY \geq 5$ mandatory for offshore units having offshore barge or offshore ship structural type notation with at least one of the following service notations: <b>oil storage</b> , and/or <b>oil production unit</b> , <b>liquefied gas storage</b> , <b>gas production unit</b> or <b>gas liquefaction unit</b>
<b>VeriSTAR-Hull FLM</b>	[8.2.3]	NR551	for surface units only
<p>(1) A construction mark is added to the additional class notation.  (2) For units contracted before 1 July 2016 the notation <b>DFL xx years</b> may have been assigned in lieu of <b>FAT xx years</b>.</p>			

## 8.2 VeriSTAR and STAR notations

### 8.2.1 General

VeriSTAR and STAR notations integrate rational analysis at design stage or after construction and possibly with data and records from unit-in-service concerning planned inspection and maintenance.

### 8.2.2 VeriSTAR-Hull

The additional class notation **VeriSTAR-Hull** is mandatory and is to be assigned to surface units, when the structural assessment of the unit (the hull structure and its interfaces with offshore structures) is performed through partial 3D finite element model, complying with the requirements of Pt D, Ch 1, Sec 9 or equivalent.

This notation is assigned a construction mark.

The additional class notation **VeriSTAR-Hull** may be completed by **FAT [XX]**, with XX having values between 25 and 40, when the fatigue assessment carried out according to Pt D, Ch 1, Sec 10 shows that the evaluated design fatigue life of selected structural details is not less than xx years.

For conversion, redeployment or life extension the additional class notation **VeriSTAR-Hull** will be completed by **FAT [YY, YEAR]** with YY having value equal or greater than 5, when the fatigue assessment carried out according to Pt D, Ch 1, Sec 10 shows that the evaluated design fatigue life of selected structural details is not less than YY years and YEAR being the year of conversion or redeployment, or life extension. Fatigue analysis will include all previous phases of the unit as applicable.

Note 1: In case of conversion of a surface unit, when no structural assessment is performed through partial 3D finite element model as allowed by NI593, the notation **VeriSTAR-Hull** is not to be assigned.

Note 2: By default, the design fatigue life is considered 20 years from the date of build.

Note 3: For converted units with existing documented structural assessment, exemptions from structural assessment may be allowed according to NI593 and by default the design life is considered 20 years from the date of build unless otherwise documented.

### 8.2.3 Full length finite element model (VeriSTAR-Hull FLM)

The additional class notation **VeriSTAR-Hull FLM** may be assigned only to surface units, as defined in Ch 1, Sec 1, [4.3.1], when the structural assessment of the unit is performed through full length 3D finite element models, complying with the requirements of NR551 Structural Analysis of Offshore Surface Units through Full Length Finite Element Models.

### 8.2.4 STAR-MACH and STAR-MACH SIS

The additional class notations **STAR-MACH** and **STAR-MACH SIS** may be assigned to units for which a risk analysis has been performed for propulsion and steering installations (if any) and marine auxiliary systems (machinery, electrical) in order to support and validate the Maintenance Plan in the operating context.

They may be granted to units complying with the relevant requirements of Pt F, Ch 1, Sec 2 of the Ship Rules, as follows:

- **STAR-MACH SIS**, for units on which a Planned Maintenance Survey System (PMS), as defined in Ch 2, Sec 1, [4.4], is implemented.
- **STAR-MACH**, for the other units.

The requirements for the maintenance of the notation **STAR-MACH SIS** are given in Pt A, Ch 5, Sec 2 of the Ship Rules.

### 8.2.5 STAR-CARGO

The additional class notation **STAR-CARGO** may be assigned to units for which a risk analysis has been performed for the cargo handling installation and its associated marine systems, in order to support and validate the maintenance plan in the operating context.

The requirements for the assignment of this notation are given in Pt F, Ch 1, Sec 4 of the Ship Rules.

### 8.2.6 STAR-REGAS

The additional class notation **STAR-REGAS** may be assigned to units having the additional class notation **REGAS** and for which a risk analysis has been performed for the regasification installation and its associated systems, in order to support and validate the maintenance plan in the operating context.

The requirements for the assignment of this notation are given in Pt F, Ch 1, Sec 3 of the Ship Rules.

## 8.3 Equipment and facilities

### 8.3.1 Lifting appliances

Offshore units fitted with lifting appliances meeting the requirements of the NR526 Rules for the Certification of Lifting Appliances onboard Ships and Offshore Units may be assigned the following additional class notations:

- a) **ALP** for appliances intended to be used in harbour or in similar conditions
- b) **ALM** for appliances intended to be used in offshore conditions for various lifting operations exclusive of the appliances mentioned in item a).

The additional class notations **(ALP)** or **(ALM)** may be assigned by the Society in lieu of the notations **ALP** or **ALM** respectively, when the corresponding lifting appliances meet the requirements of specific National Regulations under the conditions defined in NR526.

The additional class notation **ALM** may be completed by:

- **-EN**, when lifting appliances are in compliance with additional specific safety requirements as defined in NR526
- **-SUBSEA**, when lifting appliances are intended to be used for lifting of subsea equipment in compliance with specific requirements as defined in NR526.

The additional class notations **ALP**, **ALM**, **ALM-EN** and **ALM-SUBSEA** may be completed by **-MR** when, in addition, lifting appliances are intended to be used for lifting of personnel and comply with the specific requirements of NR526.

The additional class notations **ALP**, **ALM**, **(ALP)**, **(ALM)**, **ALM-EN** or **ALM-SUBSEA** are optional. However, the Society may require the compliance of lifting appliances with the assigning conditions of one of the above mentioned additional class notations for the classification of offshore units, when one or several lifting appliances are of a primary importance for their

operation, or when such appliances significantly influence their structure. As a rule, such is the case for crane vessels fitted with lifting appliances with special high capacities.

In compliance with [8.1.3], these notations are assigned a construction mark as defined in [3].

The requirements for assignment and maintenance of these notations are given in NR526.

### 8.3.2 Dynamic positioning (DYNAPOS)

The additional class notation **DYNAPOS** may be assigned to units equipped with a dynamic positioning system.

In accordance with [8.1.3], this notation is assigned a construction mark, as defined in [3].

The scope of the additional class notation **DYNAPOS**, including the additional notations for the description of capability of the installation (**SAM**, **AM**, **AT**, **AM/AT**), and the requirements for the assignment of this notation are given in Pt F, Ch 11, Sec 5 of the Ship Rules.

The requirements for the maintenance of this notation are given in Pt A, Ch 5, Sec 12 of the Ship Rules.

The additional class notations **DYNAPOS** may be completed by **-HWIL** when the DP control system and the power management system have been verified according to the requirements of NR632, Hardware-in-the-loop Testing.

The additional class notations **DYNAPOS AM**, **DYNAPOS AT** and **DYNAPOS AM/AT** may be completed by:

- **ESKI (xx ; xx)**: corresponding to the two number vector for the Environmental Station Keeping Index

and either:

- **R**: when the dynamic positioning system is provided with redundancy achieved by using two or more systems or alternative means of performing a function, or
- **RS**: when in addition to symbol **R**, the redundancy is achieved by using two systems or alternative means of performing a function physically separated.

The additional class notations **R** and **RS** may be completed by:

- **-EI** when the unit is fitted with enhanced dynamic positioning control system and complying with the requirements of Pt F, Ch 11, Sec 5, [10] of the Ship Rules. This notation allows improving the reliability, availability and operability of a DP vessel, and
- **-DDPS** when the unit is fitted with a system which enables the unit to undertake digital surveys in compliance with Ship Rules, Pt F, Ch 11, Sec 5, [11].

The notation **-DDPS** allows the unit's crew to conduct tests, proving the ability of a DP unit to keep position after single failures associated with the assigned equipment class and to validate the FMEA and operation manual, as a part of annual survey as laid down in Ship Rules, Pt A, Ch 5, Sec 12, [4.1.2] and only for this part, according to their own schedule within the window of the Annual Survey, with the results witnessed by the Society digitally.

Any test from the approved FMEA test programme not completed by unit's crew at the time of Surveyor's attendance for annual survey has to be carried out before completion of the survey.

A confirmatory survey, to be carried out by a Surveyor of the Society, is to be requested, when the unit is within the window for annual survey of its classed DP system.

The Surveyor carries out the annual survey as laid down in Pt A, Ch 5, Sec 12, [4.1] of the Ship Rules and satisfies himself with the validation of the FMEA and operations manual, based on the reports/records provided by the unit's crew. If doubts arise, the Surveyor extend the tests as deemed necessary.

Example: **DYNAPOS AM/AT RS ESKI (99 ; 95) -EI -HWIL**

### 8.3.3 Process (PROC)

The additional class notation **PROC**, **PROC-GP** or **PROC-GL** may be assigned to units fitted with, respectively, oil production, gas production or gas liquefaction installations meeting the corresponding requirements of the Rule Note NR459 Process Systems on board Offshore Units and Installations (**PROC**) and of the Rule Note NR542 Classification of Floating Gas Units (**PROC-GP** and **PROC-GL**).

Note 1: The additional class notations **PROC**, **PROC-GP** and **PROC-GL** are strongly recommended for permanent units fitted with oil production, gas production or gas liquefaction installations, so as to allow a global approach of unit's safety.

### 8.3.4 Risers, umbilicals and power cables (SUR2SUB)

Permanent units supporting lines such as riser, umbilical or power cable systems connecting the permanent unit and the seabed, and complying with the requirements of Pt D, Ch 1, Sec 21 may be assigned the additional class notation **SUR2SUB** completed between bracket by indication of:

- **xxx** denotes the sea water depth, in m
- **yy** denotes the unit design life in years

Example:

**SUR2SUB (1500 m, 25 years)**

The lines covered by the additional class notation **SUR2SUB** are to be listed in a memorandum appended to the certificate of classification.

### 8.3.5 Life saving appliances (LSA)

The additional class notation **LSA** may be assigned to units the life-saving equipment of which complies with the applicable provisions of Pt C, Ch 4, Sec 12.

Note 1: It is reminded that, except if **LSA** additional class notation is to be granted, life-saving appliances are out of the scope of classification.

### 8.3.6 Emergency towing arrangement (ETA)

The additional class notation **ETA** may be assigned to units fitted with an emergency towing arrangement.

The requirements for the assignment of this notation are given in Pt B, Ch 12, Sec 4 of the Ship Rules.

### 8.3.7 Helideck (HEL)

The additional class notation **HEL** may be assigned to units complying with chapter 13 of MODU Code and Civil Aviation Publication (CAP) 437 when they are fitted with helicopter facilities subject to design review and construction and installation survey by the Society.

This notation is assigned a construction mark.

The requirements for the assignment and maintenance of this notation are given respectively in Pt B, Ch 3, Sec 4, [4] and. Ch 2, Sec 9, [10]

### 8.3.8 Liquefied gas transfer

The additional class notation **liquefied gas transfer** may be assigned to units having a liquefied gas transfer system fitted on-board, complying with the requirements of NR542 Rules for the Classification of Floating Gas Units. This additional class notation covers the following types of transfer systems:

- side-by-side transfer arms
- tandem transfer arms
- transfer systems based on flexible hoses.

### 8.3.9 Drilling systems (DRILL)

The additional class notation **DRILL** may be assigned to floating offshore units fitted with drilling systems and associated equipment.

The requirements for the assignment of these notations are given in NR570 Classification of Drilling Equipment.

Note 1: The additional class notation **DRILL** although optional is strongly recommended for all types of offshore rig, so as to allow a global approach of unit's safety.

### 8.3.10 Oil offloading (transfer arms)

The additional class notation **oil offloading (transfer arms)** may be assigned to units having a transfer system for oil products, using transfer arms, and complying with the requirements of NR588 Offshore Oil Offloading - Transfer Arms.

This additional class notations covers the following types of transfer systems:

- side-by-side transfer arms
- tandem transfer arms.

### 8.3.11 Offshore handling systems (OHS)

The additional class notation **OHS** may be assigned to units having offshore handling systems such as winches, strand jacks, chain jacks, sheaves and their foundations used for lifting/pulling of loads.

This notation is assigned a construction mark.

The requirements for the assignment and maintenance of this notation are given in, respectively, NR595 Classification of Offshore Handling Systems and Ch 2, Sec 9.

### 8.3.12 Offshore access system (OAS)

The additional class notation **OAS** may be assigned to units having an Offshore Access System such as a motion compensated gangway used for personnel transfer from a mobile unit to an offshore facility or to an other mobile unit.

This notation is assigned a construction mark.

The requirements for the assignment and maintenance of this notation are given in, respectively, NI629 Offshore Access Systems and Ch 2, Sec 9.

### 8.3.13 Regasification installations (REGAS)

The additional class notation **REGAS** may be assigned to units fitted with regasification plant and complying with the relevant requirements of NR645 Rules for the Classification of Floating Storage Regasification Units and Floating Storage Units

### 8.3.14 Automation systems (AUTO)

The additional class notation **AUTO** may be assigned to units the control and safety systems of which comply with the applicable requirements of Part C, Chapter 3.

This notation is assigned a construction mark.

### 8.3.15 Emergency response service {ERS-S (Strength), ERS-H (Hydrodynamic), ERS-M (Mooring), [ERS-S] (Strength-partial), [ERS-H] (Hydrodynamic-partial) and [ERS-M] (Mooring-partial) services}

The additional class notations dealt with under this requirement may be assigned to units where there is a provision of technical assistance in case of a maritime accident at sea by providing information on their remain in strength and stability in the resulting damaged condition.

The requirements for the assignment and maintenance of these notations are given in NR556, Emergency Response Service.

**ERS-S** corresponds to damage longitudinal strength and damage stability analyses. It aims at providing information on the remaining hull strength and stability after the accident.

**ERS-H** aims at providing limits of navigation, based on direct calculations of vertical wave bending moment and vertical wave shear force for the accidental site sea-states, instead of empirical rule formulae. It is only applied in complement to ERS-S. It aims at providing maximum environmental conditions (Hs), heading restriction, or speed limit. These limits of navigation are given for hull girder strength only.

**ERS-M** corresponds to damaged mooring analyses for permanently moored units. It aims at providing information on the remaining capacities of the mooring system after the failure of one or several mooring lines and the potential failure of an additional mooring line.

**[ERS-S], [ERS-H] and [ERS-M]** are assigned to units until the respective ERS service becomes fully effective. The Society will provide service in case of damage as far as possible depending on the available information.

Note 1: The notations **[ERS-S]**, **[ERS-H]** and **[ERS-M]** are replaced respectively by **ERS-S**, **ERS-H** and **ERS-M** when all necessary information has been made available to the Society allowing the service to become fully effective.

### 8.3.16 Propeller shaft monitoring system (MON-SHAFT)

The additional class notation MON-SHAFT is assigned to offshore units fitted with oil or water lubricated systems for propeller shaft bearings.

The assignment of this notation allows the offshore units to be granted a reduced scope for complete propeller surveys, see Pt A, Ch 2, Sec 2, [5.5.3] of the Ship Rules and Pt A, Ch 5, Sec 6, [3] of the Ship Rules.

The requirements for the assignment and maintenance of this notation are given respectively in Pt F, Ch 5, Sec 2 of the Ship Rules and in Pt A, Ch 5, Sec 6 of the Ship Rules.

Note 1: The propeller shaft is named tailshaft in the Ship Rules.

## 8.4 Other additional class notations

### 8.4.1 Operation in ice (ICE)

- The additional class notations **ICE CLASS IA SUPER**, **ICE CLASS IA**, **ICE CLASS IB**, **ICE CLASS IC** and **ICE CLASS ID** may be assigned to units that comply with the specific requirements detailed in Pt F, Ch 8, Sec 1, Sec 2 and Sec 3 of the Ship Rules.
- The additional class notation **ICE** may be assigned to units whose reinforcements for navigation in ice are similar but not equivalent to those required for the assignment of one of the notation defined above, when this has been specially considered by the Society.

The survey requirements are given in Pt A, Ch 5, Sec 10 of the Ship Rules.

### 8.4.2 Specific thickness increment (STI)

The additional class notation **STI** may be assigned to units with thickness increments determined in accordance with the Interested Party.

The requirements for the assignment of this notation are given in Pt D, Ch 1, Sec 3, [5].

### 8.4.3 Comfort and health on board (COMF)

The notations dealt with under this heading are relevant to the assessment of comfort on board floating units with regard to:

- the level of noise - **COMF HEALTH-NOISE- g**
- the level of vibration - **COMF HEALTH-VIB- g**

with g = **1** or **2**, **1** corresponding to the best level.

The parameters which are taken into consideration for the evaluation of the comfort and health such as the level of noise, and the level of vibration are to be indicated in the relevant memorandum.

As an initial approach, the requirements in NR636 are to be considered for the floating unit. The Society is to take into consideration criteria upon the final evaluation of the unit – and based on Owner requirements.

For offshore units intended with in-service assessment, the notations **COMF** are followed by notation **-SIS**. The requirements for the maintenance of these notations are given in Ch 2, Sec 9, [6].

#### 8.4.4 Spectral fatigue

The Guidance Note NI611 Guidelines for Fatigue Assessment of Steel Ships and Offshore Units is to be used.

The information between brackets is a short description of routes and areas considered for this spectral fatigue analysis.

Example:

##### Spectral Fatigue (North Atlantic)

The guidance note NI611 Guidelines for Fatigue Assessment of Steel Ships and Offshore Units is applicable.

Other methodology may be used subject to approval by the Society.

#### 8.4.5 Risk based verification services (RBVS-xxx)

The additional class notation **RBVS-xxx** may be assigned to units for which the Society provides risk based verification services.

The requirements for the assignment of these notations are given in NI567 Risk Based Verification of Offshore Units.

#### 8.4.6 High integrity protection system (HIPS)

The additional class notation **HIPS** may be assigned to units equipped with a high integrity protection system based on the provisions of NI524 High Integrity Protection System.

#### 8.4.7 Independent verification services (IVBS-xxx)

The additional class notation **IVBS-xxx** may be assigned to units for which the Society provides independent verification services, acting as Independent Verification Body (IVB).

**xxx** is the reference of the concerned regulation, standard or Owner specification.

Example: **IVBS-UK, IVBS-BRA, IVBS-AUS, IVBS-EN**

The requirements for the assignment of these notations are given in NI 567 Risk Based Verification of Offshore Units.

#### 8.4.8 Risk based approach (RBA)

The additional class notation **RBA** may be assigned to Units for which the classification process is carried out through a risk analysis approach.

The requirements for the assignment of these notations are given in NR568 Classification of Offshore Units - Risk Based Approach.

Note 1: When the classification based on risk analysis approach covers only a part of the offshore units, the additional class notation **RBA** is to be completed with a feature describing the concerned part of the unit, installation or equipment, between brackets.

Example: **RBA (offloading system)**

#### 8.4.9 In-water survey (INWATERSURVEY)

The additional class notation **INWATERSURVEY** may be assigned to units provided with suitable arrangements to facilitate the in-water surveys.

The requirements for the assignment and maintenance of this notation are given respectively in Pt F, Ch 15, Sec 3 of the Ship Rules and in Ch 2, Sec 8.

#### 8.4.10 Common structural rules designed offshore unit (CSR Hull type)

The additional class notation **CSR Hull type** may be assigned to oil storage units arranged with double hull and double bottom and for which the hull has been designed taking into account the requirements of NR606 Common Structural Rules for Bulk Carriers and Oil Tankers, as far as practicable.

#### 8.4.11 INTERNAL CONNECTIVITY

The additional class notation **INTERNAL CONNECTIVITY** may be assigned to offshore units for which the on-board network infrastructure enables an internal connectivity using a VSAT subscription.

The requirements for the assignment and the maintenance of this notation are given in the Rule Note NR688 Internal Connectivity.

The scope of additional class notation **INTERNAL CONNECTIVITY** is limited to the list of Internal Connectivity Areas (ICAs) specified by the applicant.

This list of Internal Connectivity Areas (ICAs), along with Class items covered, if applicable, is to be referred to in a memorandum on a Classification Certificate.

#### 8.4.12 Green passport

The additional class notations **GREEN PASSPORT** or **GREEN PASSPORT EU** may be assigned to units for which requirements intended to facilitate ship recycling have been applied, encompassing the identification, quantification and localization of materials which may cause harm to the environment and people when the fittings or equipment containing such materials are removed, or when the unit is recycled, as detailed hereafter.

**GREEN PASSPORT** may be assigned to units for which such requirements have been applied in accordance with:

- the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009, and
- the European Regulation Reg (EU) N°1257/2013 on Ship Recycling, as amended, as applicable to ships flying the Flag of a non-EU member State.

**GREEN PASSPORT EU** may be assigned to units for which such requirements have been applied in accordance with:

- the Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships, 2009, and
- the European Regulation Reg (EU) N°1257/2013 on Ship Recycling as applicable to units flying the Flag of an EU member State.

The requirements for the assignment and maintenance of this notation are given in NR528 Green Passport.

#### 8.4.13 Sustainability

The additional class notations **SUSTAINABILITY-1** or **SUSTAINABILITY-2** may be assigned to units that are designed, built and equipped according to the requirements of Part C, Chapter 5, focusing on the following sustainability aspects:

- prevention of sea and air pollution
- protection of the marine environment
- reduction of greenhouse gases emissions
- preparation for unit recycling
- enhancement of people well-being on board.

The requirements for the assignment of the additional class notations **SUSTAINABILITY-1** and **SUSTAINABILITY-2** are given in Part C, Chapter 5.

The requirements for the maintenance of these additional class notations are given in Ch 2, Sec 9, [12].

#### 8.4.14 Cybersecurity

The additional class notations **CYBER MANAGED**, **CYBER RESILIENT** and **CYBER SECURE** may be assigned to units equipped with computer based systems and equipment which comply with the requirements of NR659 Rules on Cyber Security for the Classification of Marine Units.

- The additional class notation **CYBER MANAGED** covers cyber security controls which are based in particular on the management of administration, and the operator actions subject to procedures and policies.
- The additional class notation **CYBER RESILIENT** covers cyber security controls which are based in particular on the management of administration, and engineering specifications subject to the requirements for procedures, software and hardware secure design.
- The additional class notation **CYBER SECURE** covers cyber security controls which are based in particular on the engineering specifications, and hardening of software and hardware.

a) The additional class notation **CYBER MANAGED** may be assigned to units complying with the set of requirements for critical equipment management, crew training, remote access and change management defined in NR659, Chapter 2.

The requirements for the maintenance of the notation **CYBER MANAGED** are given in Pt A, Ch 5, Sec 17 of the Ship Rules.

b) The additional class notation **CYBER RESILIENT** may be assigned to units other than those defined in [6.4.1] and complying with the minimum requirements regarding units resilience defined in NR659, Chapter 3.

In compliance with [8.1.3], the additional class notation **CYBER RESILIENT** is assigned a construction mark, as defined in Article [3].

The requirements for the maintenance of the notation **CYBER RESILIENT** are given in Pt A, Ch 5, Sec 17 of the Ship Rules.

c) The additional class notation **CYBER SECURE** may be assigned to ships complying with the set of requirements for cyber management, equipment hardening and overall design of the systems to guarantee a defence in depth as defined in NR659, Chapter 4.

In compliance with [8.1.3], the additional class notation **CYBER SECURE** is assigned a construction mark, as defined in Article [3].

The requirements for the maintenance of the notation **CYBER SECURE** are given in Pt A, Ch 5, Sec 17 of the Ship Rules.

Note 1: Units assigned the additional class notation **CYBER SECURE** comply with the requirements of the notation **CYBER RESILIENT** and additional requirements which are made to cover a higher level of cyber security.

### 9 Other class notations

#### 9.1 General

**9.1.1** On request of the Interested Party, the Society may assign, in addition to those mentioned in the present Section, additional class notations as defined in Part A of the Ship Rules when the unit meets the requirements of these Rules or of Guidance Notes to which it is referred.

**9.1.2** The Society may also define other notations by means of provisional requirements and guidelines, which may then be published in the form of tentative rules.

## Section 3

## Assignment of Class

### 1 General

#### 1.1

**1.1.1** Class is assigned to a unit upon a survey, with the associated operations, which is held in order to verify whether it is eligible to be classed on the basis of the Rules of the Society (see Ch 1, Sec 1, [1.3.2]). This may be achieved through:

- the completion of the new building, during which a survey has been performed
- a survey carried out according to the agreement developed by the IACS Member Societies when units change class between members, or
- a specific admission to class survey, in cases where a unit is classed with a non-IACS Society or is not classed at all.

### 2 New building procedure

#### 2.1 Units surveyed by the Society during construction

**2.1.1** When a unit is surveyed by the Society during construction, it is to comply with those requirements of the Rules which are in force and applicable depending on the class of the ship, taking into account the provisions of Ch 1, Sec 1, [2.2] and Ch 1, Sec 1, [2.3].

**2.1.2** The Society:

- approves the plans and documentation submitted as required by the Rules
- proceeds, if required, with the appraisal of the design of materials and equipment used in the construction of the unit and their inspection at works
- carries out surveys or obtains appropriate evidence to satisfy itself that the scantlings and construction meet the rule requirements in relation to the approved drawings
- attends tests and trials provided for in the Rules
- assigns the construction mark {; refer to Ch 1, Sec 2, [3.1.2].}

**2.1.3** The Society defines in specific Rules which materials and equipment used for the construction of units built under survey are, as a rule, subject to appraisal of their design and to inspection at works, and according to which particulars.

**2.1.4** As part of his interventions during the ship's construction, the Surveyor will:

- conduct an overall examination of the parts of the unit covered by the Rules
- examine the construction methods and procedures when required by the Rules
- check selected items covered by the rule requirements
- attend tests and trials where applicable and deemed necessary.

Note 1: The Society's surveys cannot be considered as a substitute for the construction control which remains the responsibility of the Builder, nor for the unit's acceptance which remains the responsibility of the Owner.

#### 2.1.5 Use of materials, machinery, appliances and items

As a general rule, all materials, machinery, boilers, auxiliary installations, equipment, items etc. (generally referred to as "products") which are covered by the class and used or fitted on board units surveyed by the Society during construction are to be new and, where intended for essential services as defined in Ch 1, Sec 1, [1.2.1], tested by the Society.

Second hand materials, machinery, appliances and items may be used subject to the specific agreement of the Society and the Owner.

The requirements for the selection of materials to be used in the construction of the various parts of a unit, the characteristics of products to be used for such parts and the checks required for their acceptance are to be as stated in Part C and in NR216, as applicable, or in other Parts of the Rules or as specified on approved plans. In particular, the testing of products manufactured according to quality assurance procedures approved by the Society and the approval of such procedures are governed by the requirements of NR216.

## 2.1.6 Defects or deficiencies and their repair

The Society may, at any time, reject items found to be defective or contrary to rule requirements or require supplementary inspections and tests and/or modifications, notwithstanding any previous certificates issued.

All repairs are subject to the preliminary agreement of the Society. When the limits of tolerance for defects are specified in the Rules concerned or by the Manufacturer, they are to be taken into account for repairs.

It is incumbent upon the Interested Party to notify the Society of any defects noted during the construction of the unit and/or of any item not complying with the applicable requirements or in any case unsatisfactory. Proposals regarding remedial actions intended to be adopted to eliminate such defects or unsatisfactory items are to be submitted to the Society and, if accepted, carried out to the Surveyor's satisfaction.

## 2.1.7 Equivalence of Rule testing under certain conditions

Notwithstanding the provisions of [2.1.5], the Society may, at its discretion and subject to conditions and checks deemed appropriate, accept certain materials, appliances or machinery which have not been subjected to rule testing.

## 2.2 Other cases

**2.2.1** When the procedure adopted does not comply with that detailed in [2.1] but the Society deems that it is acceptable for the assignment of class, the construction mark  $\mu$  is assigned in accordance with Ch 1, Sec 2, [3.2.3].

## 2.3 Documentation

**2.3.1** Documentation relevant to the Class applied for is to be submitted for the approval of the Society.

**2.3.2** The minimum required documentation to be submitted for new built units is listed in Ch 1, Sec 4, [2].

**2.3.3** The documentation submitted to the Society is examined in relation to the class applied for in the request for classification.

Note 1: Should the Interested Party subsequently wish to have the class, in particular the service notation or design data contained in the design criteria statement modified, plans and drawings are generally to be re-examined.

**2.3.4** A copy of the submitted plans will be returned duly stamped, with remarks related to the compliance with the rule requirements should the need arise.

**2.3.5** As a rule, modifications of the approved plans regarding items covered by classification are to be submitted.

**2.3.6** Design data to be submitted to the Society are to incorporate all information necessary for the assessment of the design of the unit for the purpose of assignment of class. It is the responsibility of the Interested Party to ascertain that the design data are correct, complete and compatible with the use of the unit.

**2.3.7** Design calculations are to be provided, when called for, as supporting documents to the submitted plans.

**2.3.8** Design data and calculations are to be adequately referenced. It is the duty of the Interested Party to ascertain that the references used are correct, complete and applicable to the design of the unit.

**2.3.9** The submitted plans are to contain all necessary information for checking the compliance with the requirements of the Rules.

**2.3.10** In the case of conflicting information, submitted documentation will be considered in the following order of precedence: design data, plans, design calculations.

**2.3.11** It is the responsibility of the Interested Party to ascertain that drawings used for the procurement, construction and other works are in accordance with the approved plans.

**2.3.12** Upon specific agreement between the Society and the Interested Parties, tri-dimensional models may be submitted in place of two-dimensional plans. In this case, the Society may require that additional documentation containing information that cannot be specified in tri-dimensional models be submitted.

## 2.4 Construction portfolio

**2.4.1** For units built in compliance with the construction mark { requirements, a construction portfolio, including items listed in [2.4.2], is to be prepared and a copy placed on board the unit.

For units not built in compliance with the construction mark { requirements, it is recommended that a construction portfolio, as complete as possible, be prepared and a copy placed on board the unit.

**2.4.2** The portfolio is to include the following items:

- quality control plans
- reviewed drawings relating to the structure of the unit showing the location and extent of application of different grades and strengths of materials (material list)
- fabrication procedures and qualifications (welding, forming, heat treatment, etc.)

- testing procedures (NDT, pressure testing, functional testing, etc.)
- personnel qualifications (welders, NDT operators)
- material certificates
- test certificates
- as-built drawings.

**2.4.3** Restrictions or prohibitions, as applicable, regarding alterations or repairs in connection with [2.4.2] are to be included in the portfolio.

**2.4.4** The construction portfolio is to be submitted to the review of the Surveyor attending the construction of the unit for review of the items specified in [2.4.2].

## **3 Units classed after construction**

### **3.1 General**

**3.1.1** When an Owner applies to the Society for an unit already in service to be admitted to class, the application will be processed differently depending on whether the unit is:

- classed with an IACS Society
- not classed with an IACS Society.

### **3.2 Surveys and documentation**

#### **3.2.1 Surveys**

A programme of surveys, appropriate to the age and condition of the unit, is determined by the Society, on the basis of the requirements of Ship Rules, Pt A, Ch 2, Sec 1, [3].

Note 1: Reference is made to Ch 2, Sec 1, [4.1.7]

#### **3.2.2 Documentation**

The minimum required documentation to be submitted for units classed after construction is listed in Ch 1, Sec 4, [3].

## **4 Date of initial classification**

### **4.1 Definitions**

#### **4.1.1 Date of build**

For a new building the date of build is the year and month at which the new construction survey process is completed. Where there is a substantial delay between the completion of the construction survey process and the unit commencing active service, the date of commissioning may be also specified.

If modifications are carried out, the date of build remains assigned to the unit. Where a complete replacement or addition of a major portion of the unit (e.g. forward section, after section, main cargo section) is involved, the following applies:

- the date of build associated with each major portion of the unit is indicated on the Classification Certificate
- survey requirements are based on the date of build associated with each major portion of the unit.

#### **4.1.2 Date of initial classification for new buildings**

As a general rule, for new buildings the date of initial classification coincides with the date of build.

#### **4.1.3 Date of initial classification for existing units**

In principle, for existing units the date of initial classification is the date of completion of the admission to class survey.

## **5 Reassignment of class**

### **5.1**

**5.1.1** At the request of the Owner, a unit which was previously classed with the Society, subsequently withdrawn from class and has not been classed since may have the class reassigned subject to an admission to class survey. If applicable and appropriate, account may be taken of any periodical surveys held in the former period of class with the Society.

# Section 4 Required Documentation

## 1 General

### 1.1 Principle

**1.1.1** The documentation listed in the present Section is to be considered as a minimum, to be completed in compliance with the particular requirements of the other chapters, accounting for the unit's service(s), structural type and contemplated additional class notations.

**1.1.2** The lists of requested plans, documents and other items related to Classification are not exhaustive and are intended as guidance for specifying the set of information to be submitted, rather than lists of actual titles.

The Society may require that additional information be submitted if deemed necessary for the verification of rule requirements, especially in the case of non-conventional design.

### 1.2 Time of submission

**1.2.1** The required plans, drawings and documentation are to be submitted to the Society by the party applying for classification, as early as possible, unless otherwise agreed upon.

### 1.3 Contents of documentation

**1.3.1** The submitted plans and drawings are to clearly show all essential features, arrangements and scantlings of the structure, machinery, boilers, auxiliaries and other equipment covered by the classification.

In addition to the above, drawings and documents may also be required for assigning the requested additional class notations or special notations.

## 2 New built units

### 2.1 Design data

#### 2.1.1 Structural data

The following design data are to be submitted for information and plan review purposes:

- Environmental including:
  - metocean data, applicable to each mode of operation
  - soil conditions
  - minimum atmospheric and sea water temperatures and ice formation if applicable.
- For permanent units, background data to the above, such as metocean investigation reports, soil investigation reports, and other relevant documentation, are to be also provided.
- Distributions of fixed and variable loads for each mode of operation.
- Maximum loading for all decks areas.
- Necessary data relevant to corrosion protection.
- Results of model basin tests, when performed.
- Results of wind tunnel tests, when performed.
- For helidecks, data of the heaviest helicopter intended to be used (see Pt B, Ch 2, Sec 3, [2.4]).
- For equipment liable to induce, when in use, significant loads within the structure of the unit, all information on these loads (refer to Part B, Chapter 2), such as:
  - drilling loads
  - crane loads on pedestal and on boom and hook rests (lifting)
  - stinger and tensioner loads (pipe laying)
  - other loads from lifting and handling equipment.

#### 2.1.2 Power consumers

The list of essential and emergency power consumers of all types is to be submitted together with the complete indications of the required power supplies associated to different operational configurations.

## 2.2 Design calculations

### 2.2.1 Structural calculations

The following design calculations are to be provided as supporting documents to the submitted plans and drawings:

- calculations of environmental loadings to include forces and moments from wind, waves, currents, ice, snow, earthquakes as applicable
- calculations of the unit's resistance against overturning while resting on the sea bed, if applicable
- calculations of unit motions, where applicable
- calculations of loads induced by equipment (refer to [2.1.1])
- overall strength calculations
- local strength calculations
- jacking systems calculations, where applicable
- mooring and anchoring calculations, as applicable
- calculations of cathodic protection system.

### 2.2.2 Stability calculations

The following design calculations are to be provided as supporting documents to the submitted plans and drawings:

- cross curves of stability or equivalent
- wind heeling moment curves or equivalent data
- ice accretion effects, when relevant
- stability calculations for the intact and damaged conditions.

### 2.2.3 Piping calculations

The following design calculations are to be provided as supporting documents to the submitted plans and drawings:

- piping and pressure vessels strength calculations, in particular for calculation of steam pipes and other pressure piping
- fire water demand and fire pump capacity calculations.

### 2.2.4 Electrical calculations

Electrical design calculations are to be provided as supporting documents to the submitted plans and drawings, including:

- electrical balance, estimated for the different conditions of operation of unit (refer to Ch 1, Sec 1, [1.6.4])
- justification of sizes of conductors (temperature rises and voltage drops)
- for installations where the total rated current of generators arranged to run in parallel is above 1000 A, estimation of the prospective short-circuit currents
- where the main bus-bar maximum symmetrical short-circuit current is expected to exceed 50 kA, justification of the bus-bar and bracket strength related to the induced electromagnetic forces.

### 2.2.5 Additional class notations

Additional calculations as may be called for concerning the assignment of additional class notations are to be also provided.

## 2.3 Plans and drawings

### 2.3.1 General drawings

The following general drawings are to be submitted:

- general arrangement plan
- lines drawings (body plan) and offset table of frames, together with plotting of fore and aft axial longitudinal curves
- capacity plan indicating the volumes, overflows and the positions of the centres of gravity of the various compartments together with their locations
- tank sounding tables
- distribution, actual or estimated, of the unit's lightweight
- deck loading plans.

### 2.3.2 Structural drawings

The following structural plans are to be submitted:

- Main structural drawings showing structural arrangements, scantlings, grades of steel, welded connections. These drawings are to include, as applicable: transverse and longitudinal sections, decks including helicopter deck; shell plating and framing; bulkheads and flats; legs; columns, bracings and floaters; hull, footings and mats; superstructures and deck houses.
- Detailed structural drawings in the areas of connections between main structural members (for instance, connections between bracings, bracing and column, column and floater, column and deck in column stabilized units), in way of foundations of jacking systems for self-elevating units, drilling derrick, anchoring equipment, crane foundations and of all other parts liable to be subject to high local loadings or stress concentrations.

- Test plan of compartments intended for liquids.
- Arrangements and details of watertight doors and other closing appliances; arrangement and details of all openings and means of closure including locations of overflow and air pipes.
- Drawings showing corrosion control arrangements.

### **2.3.3 Machinery and piping systems**

The following machinery and piping drawings are to be submitted:

- a) General:
  - general arrangement showing particularly location of essential machinery and equipment
  - bilge and ballast pipings, outside and inside machinery spaces
  - sea inlets, scuppers and discharges
  - air vents, overflow and sounding piping systems and/or devices
  - remote level indicating systems and draught measurements systems
  - boiler feed system
  - sea water distillation system
  - fuel oil and lubricating oil systems, including pipings and tanks not forming part of the unit's structure
  - live steam piping
  - reduced pressure steam, draining, and exhaust piping
  - machinery circulation and cooling piping
  - compressed air systems for remote control, instrumentation, engine starting and bulk handling, including compressed air vessels and pipings
  - accessories such as heaters, coolers, waste heat recovery units, etc.
  - exhaust ducts of engines and boilers
  - location and arrangement of drip-trays and gutterways
  - jacking systems, for self-elevating units
  - propulsion and power generating systems.
- b) Thermal oil heating installation:
  - piping and pumping systems
  - general arrangement of the installation
  - boilers including their major components
  - protections against oil leakage
  - monitoring and alarm systems
  - nature and characteristics of the thermal oil: viscosity, flash point, fire point, decomposition temperature, auto-ignition temperature, etc.
  - operation and maintenance instructions.
- c) Hydraulic installations:
  - piping and pumping systems
  - arrangement of the installations
  - protections against leakage
  - description of the main components
  - protection against overpressure
  - monitoring and alarm systems
  - nature and characteristics of the hydraulic medium (flash point and auto-ignition in particular)
  - operation and maintenance instructions.
- d) Incinerators:
  - general arrangement of the installation
  - incinerators
  - piping and pumping systems
  - monitoring and alarm systems
  - programme of type tests and tests after completion
  - operation and maintenance instructions.
- e) Helicopter refuelling system:
  - general arrangement of the installation
  - storage vessels, piping and pumping system
  - protection against leakage
  - protection against overpressure

- jettisoning or emergency draining
- helideck drainage system
- emergency shutdown system.

The drawings are to be diagrammatic and are to refer to a single system, in order to facilitate their examination. They are to include:

- service pressures and temperatures, in order to determine their classes
- size and nature of materials for pipes and accessories
- capacity, prime mover and, if needed, location of the pumps
- arrangements proposed when remote control, remote monitoring or automation, are foreseen for the installations concerned
- generally, all information allowing the verification of the requirements of the Rules
- specification of systems
- fabrication specification
- welding procedure specification
- operation control procedures.

### **2.3.4 Electrical drawings**

The following electrical plans and diagrams are to be submitted:

- General arrangement of:
  - main switchboard
  - other distribution boards
  - emergency switchboard
  - generators
  - electric propulsion plant, if any
  - motors and equipment serving the essential services,
  - batteries
  - cable trays.
- Single line diagrams of the main and emergency distribution networks, including single line diagrams of intrinsically safe circuits, indicating:
  - make, type, cross section area, of the conductors with mention of the intensity carried under full load
  - make, type and rating of switch-gears, fuses and circuit-breakers.
- For main, sub and emergency switchboards:
  - assembly drawing showing the various sections and the arrangement of the equipment and instrumentation
  - bus-bar arrangement with mention of their cross section areas.
- For offshore units where hazardous area(s) is(are) existing:
  - a general diagram showing the location of the electrical equipment within the hazardous area(s) and their safety type (e.g. Ex "d" II BT3)
  - an evidence of the safety character of the above equipment
  - the list of explosion protected equipment.
- Impressed current cathodic protection systems if applicable.

### **2.3.5 Safety plans**

The following safety plans and documents are to be submitted:

- general arrangement of the installation
- the dedicated sections of the Operating Manual related to classification as specified in Ch 1, Sec 1, [3.4]
- the dedicated sections of the construction portfolio as specified in Ch 1, Sec 3, [2.4.2]
- hazardous areas classification drawing, including information about all openings located in these hazardous areas
- mechanical and natural ventilation systems including location of air intakes and exhausts, air renewal rate per hour, location of fan controls
- air intakes and exhaust outlets of internal combustion engines and boilers
- fire structural protection drawings
- fire detection and extinguishing system description and drawings, including fire-fighting water piping and pumping systems, with flow calculations
- alarm and internal communication systems description and drawings
- emergency shutdown systems description, procedures and drawings
- escape way and life saving appliances description and drawings.

### **2.3.6 Stability file**

A stability file is to be submitted by the Owner or its representative. The stability file has to include:

- lines plan
- capacity plan
- lightweight characteristics and justification, results of the inclining experiment results
- booklet of typical loading conditions including allowable ice accretion, wind speed, lifting appliances motions, etc.
- intact trim and stability booklet
- damage stability booklet
- damage control plan and booklet
- allowable vertical centre of gravity (KG max) curves based on intact and damage stability criteria.

When an inclining test is conducted, the Owner has to submit:

- inclining test protocol (prior to being carried out)
- lightweight survey report
- report of water density and wind measurements
- inclining test report and centre of gravity calculations.

## **2.4 Operating manual**

### **2.4.1 General**

An Operating Manual or equivalent is to be placed on board each unit. The manual should include the following information, as applicable to the particular unit, so as to provide suitable guidance to the operating personnel with regard to safe operation of the unit.

The operating manual is to be submitted for review to the Society.

Note 1: When an IMO MODU certificate is granted to the unit, the operating manual is to comply with IMO MODU Code Chapter 14 in addition to the present Article.

### **2.4.2 Content**

As a minimum, the operating manual is to include the following informations, where applicable:

- general description and principal particulars of the unit
- pertinent data for each approved mode of operation, including design and variable loading, environmental conditions, sea bed conditions, etc.
- minimum anticipated sea and atmospheric temperatures
- general arrangement plan showing watertight compartments, closures, vents, intakes and discharges, down flooding points, fixed and variable deck loads, and the location of draught gauges and draught marks.  
If permanent ballast is to be used, the weight, location and substance used are to be clearly indicated.
- hydrostatic curves or equivalent data
- capacity plan showing the capacity, centre of gravity and free surface correction for each tank
- instructions for operation, including precautions to be taken in adverse weather, changing mode of operations, any inherent limitations of operations, etc.
- plans and description of the ballast system and instructions for ballasting
- hazardous areas drawings
- light ship data based on the results of an inclining experiment, etc
- stability information in the form of maximum KG-draught curve, or other suitable parameters based upon compliance with the required intact and damaged stability criteria
- representative examples of loading conditions for each approved mode of operation, together with means for evaluation of other loading conditions
- details of emergency shutdown procedures for electrical equipment
- identification of helicopter uses for the design of the helicopter deck
- any relevant data regarding stability including amount of snow, ice allowable on deck and wind speed
- amount of allowable marine growth
- towing arrangements and limiting conditions of operations
- temporary mooring and position anchoring arrangements
- description of the dynamic positioning systems and limiting conditions of operation
- ballast control system drawings including piping diagram showing remote and manual control devices
- bilge system
- fire bulkhead arrangement drawing
- fire and gas drawings showing types and locations of detection and extinguishing equipment
- schematic diagrams of main emergency power supplies and electrical installations

- operational procedures for onboard cranes and winches
- plan identifying the location of all watertight and weathertight closures and all non-protected openings and identifying the position open/closed of all non-automatic closing devices
- instructions for internal and external openings to be used or to be kept closed during operating conditions and transit
- access manual, as defined in Pt B, Ch 3, Sec 1, [4]
- corrosion protection system including:
  - in case of impressed current system, operating manual and detail of maintenance operations
  - in case of sacrificial anodes: detail of maintenance/retrofit operations
- list of key as-built drawings incorporated in the Operating Manual or in the construction portfolio
- design Criteria Statement issued by the Society, including classification restrictions, if any
- design data sheets referred to in the Design Criteria Statement
- Classification Certificates, continuous survey lists and other certificates issued by the Society.

## **2.5 Construction portfolio**

**2.5.1** A set of plans showing the exact location and extent of application of different grades and strengths of structural materials, together with a description of the material and welding procedures employed, is to be placed aboard the unit. Any other relevant construction information is to be included in the booklet, including restrictions or prohibitions regarding repairs or modifications.

# **3 Units classed after construction**

## **3.1 General**

**3.1.1** The following documentation will be required for the classification of units classed after construction.

## **3.2 Operating manual**

**3.2.1** Refer to [2.4].

## **3.3 Structure**

**3.3.1** The following documentation is to be submitted:

- general arrangement
- midship section or representative sections, as applicable
- profile and deck plan
- watertight bulkheads
- rudderspan and rudderstock, if any
- shell expansion
- hatch covers, if any
- capacity plan
- loading conditions, calculation of still water bending moment and overall stresses as applicable, relevant documents, particulars of loading calculator and instruction booklet as per Society's requirements, according to the case
- stability documents.

## **3.4 Machinery and equipment**

**3.4.1** The following documentation is to be submitted:

- engine room general arrangement
- diagrammatics of fuel (transfer, service), bilge, ballast, lubricating oil, cooling, steam and feed, general service and starting compressed air piping
- drawings of boilers and air receivers
- drawings of shaft line, reduction gear and propeller, if any
- drawings of steering gear, if any
- torsional vibration calculations as per conditions laid down in the Ship Rules; such documents are required only for units less than 2 years old and for older units the propelling system of which has been modified during the two years preceding the classification.

### **3.5 Electrical systems**

**3.5.1** The following documentation is to be submitted:

- master plan of power distribution, lighting and emergency power circuits
- single line diagram of networks and switchboards
- location and arrangement of electrical equipment in hazardous areas.

### **3.6 Safety**

**3.6.1** The following documentation is to be submitted:

- safety plan
- location and rating of passive fire protection
- diagrammatics of fire-fighting systems
- fire and gas detection and fire protection causes and effects matrix.

### **3.7 Drilling equipment (if any)**

**3.7.1** The following documentation is to be submitted:

- diagrams of drilling mud process
- diagrams of pneumatic systems for dry storage.

### **3.8 Oil and gas production equipment (if any)**

**3.8.1** The following documentation is to be submitted:

- diagrams of process, venting and flaring lines
- diagrams of process pressure vessels
- ESD system causes and effects matrix.

### **3.9 Additional class notation AUTO**

**3.9.1** The following documentation is to be submitted:

- instrument and alarm list
- fire alarm system
- list of automatic safety functions (eg: slowdowns, shutdown, etc)
- function testing plan.

### **3.10 Other additional class notations**

**3.10.1** For installation or equipment covered by an additional class notation, the Society will determine the documentation to be submitted.

# Appendix 1      Former Classification Notations

## 1 General

### 1.1 Correspondence between former and current class notations

**1.1.1** Some class notations assigned in accordance with a previous edition of the present Rules have been modified or cancelled. The present Appendix gives correspondence between former and current notations.

- Tab 1 gives correspondence between former structural type notations and current ones
- Tab 2 gives correspondence between former service notations and current ones
- Tab 3 gives correspondence between former additional service features and current ones
- Tab 4 gives correspondence between former additional service features and current ones.

At the request of the owner, the new classification notation could be used at the renewal period.

**Table 1 : Structural type notation**

Former notation	Current notation	Remarks
Offshore semi-submersible unit	<b>column stabilized unit</b>	Edition December 2016
Offshore self-elevating unit	<b>self-elevating unit</b>	Edition December 2016

**Table 2 : Service notation**

Former notation	Current notation	Remarks
diving support-integrated		
diving support-capable	None (1)	Edition February 2019
diving support-portable		
gas liquefaction	<b>gas liquefaction unit</b>	Edition February 2019
gas production	<b>gas production unit</b>	Edition February 2019
production	<b>oil production unit</b>	Edition February 2019
transportation	None (2)	Edition December 2016

(1) See Ship Rules, Part E, Chapter 7  
(2) Unless a new service notation corresponds to the specified service.

**Table 3 : Additional service features**

Former notation	Current notation	Remarks
AUTO	Changed into additional class notation	Edition December 2016
DD	None (1)	Edition February 2019
HEL	Changed into additional class notation	Edition June 2015
IG	<b>INERTGAS</b>	Edition December 2016
SD	None (1)	Edition February 2019
VeriSTAR-HULL	Changed into additional class notation	Edition December 2016

(1) See Ship Rules, Part E, Chapter 7.

**Table 4 : Additional class notations**

Former notation	Current notation	Remarks
ALS	<b>ALM-SUBSEA</b>	Edition February 2019
liquefied gas offloading	<b>liquefied gas transfer</b>	Edition February 2019
RIPRO	None (1)	Edition April 2025

(1) Replaced by **SUR2SUB** with not exactly the same scope.

# Part A

## Classification and Surveys

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## CHAPTER 2

### MAINTENANCE OF CLASS

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Section 1	General Provisions Concerning Surveys
Section 2	Annual Survey
Section 3	Intermediate Survey
Section 4	Class Renewal Survey
Section 5	Scope of Surveys for Offshore Drilling Units
Section 6	Additionnal Surveys Related to Storage Area of Oil Storage Units
Section 7	Additional Surveys Related to Storage Area of Gas Storage Units
Section 8	Survey of Underwater Parts and Temporary Mooring Equipment
Section 9	Other Surveys
Section 10	Suspension and Withdrawal of Class
Appendix 1	Thickness Measurements: Extent, Determination of Locations, Acceptance Criteria

## Section 1

# General Provisions Concerning Surveys

## 1 General principles of surveys

### 1.1 Survey types

**1.1.1** Classed units are submitted to surveys for the maintenance of class. These surveys include the class renewal survey, intermediate and annual survey, bottom survey (either survey in dry condition or in-water survey), propeller shaft survey, boiler survey, and surveys for the maintenance of additional class notations, where applicable. Such surveys are carried out at the intervals and under the conditions laid down in this Section. In addition to the above periodical surveys, units are to be submitted to occasional surveys whenever the circumstances so require; refer to Article [6].

Note 1: For the terminology related to surveys, refer to Pt A, Ch 2, Sec 2, [2.2] of the Ship Rules.

**1.1.2** For the requirements related to the extent, determination of locations and acceptance criteria of thickness measurements, reference is made to Ch 2, App 1.

**1.1.3** Where there are no specific survey requirements for additional class notations assigned to a unit, equipment and/or arrangements related to these additional class notations are to be examined, as applicable, to the Surveyor's satisfaction at each class renewal survey for the class.

The surveys are to be carried out in accordance with the relevant requirements in order to confirm that the hull, machinery, equipment and appliances comply with the applicable Rules and will remain in satisfactory condition based on the understanding and assumptions mentioned in Ch 1, Sec 1, [3.3].

Where the conditions for the maintenance of the class, service notations and additional class notations are not complied with, the class and/or the service notation and/or the additional class notations as appropriate will be suspended and/or withdrawn in accordance with the applicable Rules given in Ch 2, Sec 3.

Note 1: It is understood that requirements for surveys apply to those items that are required according to the Rules or, even if not required, are fitted on board.

**1.1.4** Unless otherwise specified, any periodical survey other than bottom survey and propeller shaft survey may be effected by carrying out partial surveys at different times to be agreed upon with the Society, provided that each partial survey is adequately extensive. The splitting of a survey into partial surveys is to be such as not to impair its effectiveness.

### 1.2 Change of periodicity, postponement or advance of surveys

**1.2.1** The Society reserves the right, after due consideration, to change the periodicity, postpone or advance surveys, taking into account particular circumstances.

**1.2.2** When a survey becomes overdue during a voyage, the following applies:

a) In the case of a class renewal survey, the Society may grant an extension to allow for completion of this survey provided there is documented agreement to such an extension prior to the expiry date of the Certificate of Classification, adequate arrangements have been made for the attendance of the Surveyor at the first port of call and the Society is satisfied that there is technical justification for such an extension. Such an extension will be granted only until arrival at the first port of call after the expiry date of the Certificate of Classification.

However, if owing to "exceptional circumstances", the class renewal survey cannot be completed at the first port of call, the Society may grant an extension, but the total period of extension shall in no case be longer than three months after the original limit date of the class renewal survey.

b) In the case of annual and intermediate surveys, no postponement is granted. Such surveys are to be completed within their prescribed windows.

c) In the case of all other periodical surveys and recommendations, extension of class may be granted until the arrival of the unit at the port of destination.

### 1.3 Extension of scope of survey

**1.3.1** The Society and/or its Surveyors may extend the scope of the provisions in the present Chapter, which set forth the technical requirements for surveys, whenever and so far as considered necessary, or modify them in the case of special units or systems.

**1.3.2** The extent of any survey also depends upon the condition of the unit and its equipment. Should the Surveyor have any doubt as to the maintenance or condition of the unit or its equipment, or be advised of any deficiency or damage which may affect the class, then further examination and testing may be conducted as considered necessary.

## 1.4 General procedure of survey

**1.4.1** The general procedure of survey consists in:

- an overall examination of the parts of the unit covered by the rule requirements
- checking selected items covered by the rule requirements
- attending tests and trials where applicable and deemed necessary by the Surveyor.

**1.4.2** When a survey results in the identification of significant corrosion, structural defects or damage to hull, machinery and/or any piece of its equipment which, in the opinion of the Surveyor, affect the unit's class, remedial measures are to be implemented before the unit continues in service (see also Pt A, Ch 2, Sec 2, [2.10] of the Ship Rules).

Note 1: The Society's survey requirements cannot be considered as a substitute for specification and acceptance of repairs and maintenance, which remain the responsibility of the Owner.

Note 2: In accordance with the provisions of Ch 1, Sec 1, [3.1.4], the Society will, at the request of the Owner, apply the regulations of Administrations concerning the scope and periodicity of surveys when they differ from those laid down in Article [4] and Article [5].

Note 3: During the surveys, the Surveyor does not check that the spare parts are kept on board, maintained in working order and suitably protected and lashed.

## 1.5 Appointment of another Surveyor

**1.5.1** In compliance with the provisions of Ch 1, Sec 1, [2.5], should a disagreement arise between the Owner and the Surveyor during a survey, the Society may, at the request of the Owner, designate another Surveyor.

## 1.6 Access for surveys

**1.6.1** The Rule requirements for class maintenance surveys are to be given due consideration during the unit's design and construction phases as regards all necessary arrangements for access. Arrangements of a special nature are to be brought to the attention of the Society.

**1.6.2** For small volume void space without primary structure inside, the Society may accept that no access is provided for inspection. When necessary, the Society may call then for additional requirements.

## 1.7 Remote inspection techniques (RIT)

**1.7.1** The remote inspection techniques (RIT) are to provide the information normally obtained from a close-up survey.

RIT surveys are to be carried out in accordance with the requirements given in the present Article and in NR533 Approval of Service Suppliers.

The proposals for use of a RIT shall be submitted by the Owner in advance of the survey and approved by the Society.

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

**1.7.3** When using RIT as alternative to close-up survey, it shall be conducted by an approved service supplier according to NR533 and it shall be witnessed by an attending Surveyor.

**1.7.4** The structure to be surveyed using the RIT is to be clean to permit meaningful examination. Visibility is to be sufficient to allow meaningful examination. The Society is to be satisfied with the methods and the orientation on the structure.

**1.7.5** The attending Surveyor is to be satisfied with the method of live data presentation including pictorial representation. A good two-way communication between the Surveyor and the RIT operator shall be provided.

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

## 1.8 Remote surveys

**1.8.1** On a case-by-case basis and subject to special agreement with the Society, remote surveys may be accepted when requirements given in Pt A of the Ship Rules are complied with.

## 1.9 Alterations or additions to approved systems

**1.9.1** When an alteration or addition to an approved system is proposed, documentation is to be submitted and approved by the Society before the work of alteration or addition is commenced.

**1.9.2** Where the modifications may affect compliance with the rules, they are to be carried out under survey and the installation and testing are to be to the Surveyor's satisfaction.

## 2 Definitions and procedures related to surveys

### 2.1 General

#### 2.1.1 Period of class

Period of class means the period starting either from the date of the initial classification, or from the credited date of the last class renewal survey, and expiring at the limit date assigned for the next class renewal survey.

#### 2.1.2 Anniversary date

Anniversary date means the day of the month of each year in the period of class which corresponds to the expiry date of the period of class.

#### 2.1.3 Survey time window

Survey time window, or more simply window, mean the fixed period during which annual and intermediate surveys are to be carried out.

#### 2.1.4 Overdue surveys

Each periodical survey is assigned a limit date specified by the relevant requirements of the Rules (end of survey interval or end date of window) by which it is to be completed.

A survey becomes overdue when it has not been completed by its limit date.

Examples:

- Anniversary date: 15<sup>th</sup> April

The 2000 annual survey can be validly carried out from 16<sup>th</sup> January 2000 to 15<sup>th</sup> July 2000. If not completed by 15<sup>th</sup> July 2000, the annual survey becomes overdue.

- Last bottom survey 20<sup>th</sup> October 2000:

If not completed by 20<sup>th</sup> October 2003 or end of the class period, whichever comes first, the bottom survey becomes overdue.

#### 2.1.5 Condition of class

A defect and/or deficiency to be dealt with in order to maintain class, within a specific period of time, is indicated as a condition of class. A condition of class is pending until it is cleared, through a survey by the attending Surveyor or upon evidence that requirements have been completed, to the satisfaction of the Society. Where it is not cleared by its limit date, the condition of class is overdue.

Conditions of class may be imposed in other cases, which, in the Society's opinion, require specific consideration.

#### 2.1.6 Memoranda

Those defects and/or deficiencies which do not affect the maintenance of class and which may therefore be cleared at the Owner's convenience and any other information deemed noteworthy for the Society's convenience are indicated as memoranda. Memoranda are not to be regarded as conditions of class.

#### 2.1.7 Exceptional circumstances

"Exceptional circumstances" means:

- unavailability of dry-docking facilities, or
- unavailability of repair facilities, or
- unavailability of essential materials, equipment or spare parts, or
- delays incurred by action taken to avoid severe weather conditions.

## 3 Certificate of Classification: issue, validity, endorsement and renewal

### 3.1 Issue of Certificate of Classification

**3.1.1** A Certificate of Classification, bearing the class notations assigned to the unit and an expiry date, is issued to any classed unit.

**3.1.2** A Provisional Certificate of Classification may serve as a Certificate of Classification in some cases, such as after an admission to class survey, after a class renewal survey, or when the Society deems it necessary.

**3.1.3** The Certificate of Classification is to be made available to the Society's Surveyors upon request.

### 3.2 Validity of Certificate of Classification, maintenance of class

**3.2.1** According to Ch 1, Sec 1, [2.5], the Society alone is qualified to confirm the class of the unit and the validity of its Certificate of Classification.

**3.2.2** During the class period, a Certificate of Classification is valid when it is not expired.

The class is maintained during a certain period or at a given date, when during the said period or at such date the conditions for suspension or withdrawal of class are not met.

Refer also to Ch 1, Sec 1, [1.3.3].

**3.2.3** At the request of the Owner, a statement confirming the maintenance of class may be issued by the Society based on the information in its records for that unit at the time.

This statement is issued on the assumption that the Owner has complied with the Rules, in particular with [6].

Should any information which would have prevented the Society from issuing the statement and which was not available at the time subsequently come to light, the statement may be cancelled.

Attention is drawn to Ch 2, Sec 3, [1.2], whereby the Society, upon becoming aware of a breach of the Rules, is empowered to suspend class from the date of the breach, which may be prior to the date of the statement.

**3.2.4** According to the same conditions as in [3.2.3], a statement declaring that the class is maintained "clean and free from condition of class" may be issued by the Society when there is no pending condition of class at that date.

**3.2.5** Classification-related documents and information are liable to be invalidated by the Society whenever their object is found to differ from that on which they were based or to be contrary to the applicable requirements. The Owner is liable for any damage which may be caused to any third party from improper use of such documents and information.

### **3.3 Endorsement of Certificate of Classification**

#### **3.3.1 Endorsement**

When periodical surveys are satisfactorily carried out, the Certificate of Classification is endorsed accordingly.

#### **3.3.2 Possible modifications to endorsements**

The Society reserves the right to modify the endorsements made by Surveyors.

### **3.4 Status of surveys and recommendations**

**3.4.1** Information given in the Certificate of Classification, associated endorsements, Rules and specific documents enables the Owner to identify the status of surveys and recommendations.

**3.4.2** The omission of such information does not absolve the Owner from ensuring that surveys are held by the limit dates and pending conditions of class are cleared to avoid any inconvenience which is liable to result from the suspension or withdrawal of class; see Ch 2, Sec 3.

## **4 Class renewal survey**

### **4.1 General principles**

**4.1.1** Class renewal surveys of hull, structure, equipment, and machinery are to be carried out at 5 year intervals to renew the Classification Certificate(s).

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

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

**4.1.4** A new period of class is assigned to the ship after the satisfactory completion of the class renewal survey, and a new Certificate of Classification is issued.

**4.1.5** When considered necessary by the Society the interval between class renewal surveys may be reduced.

**4.1.6** Class renewal survey requirements of units of unusual design, in lay-up or in unusual circumstances will be determined on individual basis.

**4.1.7** At the request of the Owner, and upon the Society's approval of the proposed arrangements, a system of Continuous Survey may be undertaken whereby the class renewal survey requirements are carried out in regular rotation in accordance with the Rules of the Society to complete all the requirements and scope of the particular class renewal survey within a five year period. Any defects that may affect classification found during the survey, are to be reported to the Society and dealt with to the satisfaction of the Surveyor.

## 4.2 Normal survey system (SS)

**4.2.1** When the normal survey system is applied to units with a 5 year period of class, the class renewal survey may be commenced at the fourth annual survey and continued during the following year with a view to completion by its due date. In this case the survey may be carried out by partial surveys at different times. The number of checks to be performed at each partial survey and the interval between partial surveys are to be agreed by the Society.

**4.2.2** A class renewal survey may be commenced before the fourth annual survey at the request of the Owner. In this case, the survey is to be completed within fifteen months. The conditions for the execution of partial surveys are the same as those referred to in [4.2.1].

## 4.3 Continuous survey system (CS)

**4.3.1** The request by the Owner for admission to the continuous survey system will be considered by the Society and agreement depends on the type and age of hull and machinery. This system may apply to the class renewal survey of hull (CSH), machinery (CSM) or other installations such as refrigerating installations (CSR) covered by an additional class notation.

**4.3.2** When the continuous survey system is applied, appropriate notations as indicated in [4.3.1] are entered in the Register.

**4.3.3** Units subject to the continuous survey system are provided with lists of items to be surveyed under this system.

**4.3.4** For items inspected under the continuous survey system, the following requirements generally apply:

- the interval between two consecutive surveys of each item is not to exceed five years
- the items are to be surveyed in rotation, so far as practicable ensuring that approximately equivalent portions are examined each year
- the Society may credit for continuous survey results of inspections carried out before the admission to the continuous survey scheme
- each item is to be surveyed at one time, as far as practicable; the Society may, however, allow possible repair work to be carried out within a certain period.

**4.3.5** For units under continuous survey, items not included in the continuous survey cycle are to be inspected according to the provisions given in [4.2]. Bottom surveys, when relevant, are to be carried out according to the requirements of [5.3]. In addition, the bottom survey which is to be carried out in conjunction with the end of class period is to be performed within 15 months before the end of this class period.

**4.3.6** Upon application by the Owner, the Society may agree, subject to certain conditions, that some items of machinery which are included in the continuous survey cycle are examined by the Chief Engineer. The Chief Engineer's inspection is to be followed by a confirmatory survey carried out by a Surveyor. The conditions for the application of this procedure are given in Pt A, Ch 2, App 2 of the Ship Rules.

**4.3.7** The continuous survey system does not supersede the annual surveys and other periodical and occasional surveys.

**4.3.8** A general examination of the unit, as detailed in Pt A, Ch 3, Sec 1 of the Ship Rules for annual surveys, is to be carried out at the end of the period of class.

**4.3.9** For laid-up units, specific requirements given in [8.1] apply.

**4.3.10** The continuous survey system may be discontinued at any time at the discretion of the Society, or at the request of the Owner, and a specific arrangement devised.

## 4.4 Planned maintenance survey system for machinery (PMS)

**4.4.1** A planned maintenance survey system may be considered as an alternative to the continuous survey system for machinery and is limited to components and systems covered by it. When such a system approved by the Society is implemented, a survey system other than those normally adopted and with intervals different from those of the continuous survey system as detailed in [4.3] may be accepted.

**4.4.2** The conditions for approval of the planned maintenance survey system, the determination of survey item intervals and the general scope of surveys are detailed in Pt A, Ch 2, App 1 of the Ship Rules.

**4.4.3** When the planned maintenance survey system is applied, the notation PMS is entered in the Register.

**4.4.4** The Chief Engineer shall be the responsible person onboard in charge of the PMS.

The conditions related to Chief Engineer's inspections within the scope of PMS are given in Pt A, Ch 2, App 2 of the Ship Rules.

Items surveyed by this authorised Chief Engineer will be subject to the confirmatory survey as detailed in Pt A, Ch 2, App 2 of the Ship Rules.

Documentation on overhauls of items covered by the PMS are to be reported and signed by the Chief Engineer.

**4.4.5** The planned maintenance survey system does not supersede the annual surveys and other periodical and occasional surveys.

**4.4.6** A general examination of the machinery, as detailed in Pt A, Ch 3, Sec 1 of the Ship Rules for annual surveys, is to be carried out at the end of the period of class.

**4.4.7** The planned maintenance survey system may be discontinued at any time at the discretion of the Society, or at the request of the Owner, and a specific arrangement devised.

## **5 Other periodical surveys**

### **5.1 Annual surveys**

**5.1.1** Annual surveys are to be carried out within 3 months before or after each anniversary date.

### **5.2 Intermediate surveys**

**5.2.1** An intermediate survey, where applicable, is to be carried out within the window from three months before the second to three months after the third anniversary date.

**5.2.2** The intermediate survey is not applicable to units with class symbol **II**.

### **5.3 Bottom survey**

**5.3.1** Bottom survey means the examination of the outside of the unit's bottom and related items. This examination may be carried out with the unit in dry-dock (or on a slipway) or afloat: in the former case, the survey will be referred to as dry-docking survey, while in the latter case as in-water survey.

**5.3.2** The Owner is to notify the Society whenever the outside of the unit's bottom and related items can be examined in dry dock or on a slipway.

**5.3.3** For units classed with the class symbol **I**, there are to be two examinations of the outside of the unit's bottom and related items in each period of class of five years.

The interval between any two such examinations is not to exceed 36 months.

An extension of examination of the unit's bottom of three months beyond the due date can be granted in exceptional circumstances, as defined in Pt A, Ch 2, Sec 2, [2.1.8] of Ship Rules.

Note 1: Attention is also drawn to the relevant requirements concerning the application of national and international regulations.

**5.3.4** For permanent units and for other units where drydocking is impracticable, the examination of the outside of the unit's underwater parts and related items may be carried out during an in-water survey, subject to the agreement of the Society if the additional class notation **INWATERSURVEY** is not granted.

**5.3.5** For mobile offshore drilling units operating in salt water for less than six (6) months each year, the survey interval may be increased by the Society.

The interval between examinations of the outside of unit's underwater parts and related items for units operating in fresh water or in particular site conditions may be greater, as agreed by the Society.

**5.3.6** Consideration may be given at the discretion of the Society to any special circumstances justifying an extension or a reduction of these intervals.

**5.3.7** For units under the normal survey system, one of the bottom surveys to be performed in each period of class is to be carried out in conjunction with the class renewal survey.

**5.3.8** For units under the continuous survey system of hull (CSH), one of the bottom surveys to be performed in each period of class is to be carried out in conjunction with the end of class period.

## 5.4 Propeller shaft survey

### 5.4.1 Definition

Propeller shaft survey means survey of propeller shafts and tube shafts (hereafter referred to as propeller shafts) as well as survey of other propulsion systems.

The different types of surveys to which propeller shaft may be subjected and the intervals at which they are to be carried out are given in Pt A, Ch 2, Sec 2 of the Ship Rules.

These surveys are:

- complete survey
- modified survey.

The scope is detailed in Pt A, Ch 3, Sec 5 of the Ship Rules. The requirements to be complied with at each survey are listed in [5.4.2] and [5.4.3].

### 5.4.2 Propeller shaft complete survey

Propeller shafts are to be submitted to complete examination as detailed in Pt A, Ch 2, Sec 5 of the Ship Rules. The scope of the modified survey is detailed in Pt A, Ch 3, Sec 5 in the Ship Rules.

### 5.4.3 Propeller shaft modified survey

A modified survey of the propeller shaft is an alternate way of examination as detailed in Pt A, Ch 2, Sec 5 of the Ship Rules and which scope is given in Pt A, Ch 3, Sec 5 of the Ship Rules.

### 5.4.4 Propeller shaft Monitoring System (MON-SHAFT)

Where, in addition to the conditions stated in [5.4.3] for modified survey, the additional class notation **MON-SHAFT** is assigned, the propeller shaft need not be withdrawn at both the complete and modified surveys provided that all condition monitoring data is found to be within permissible limits and the remaining requirements for the respective surveys are complied with.

### 5.4.5 Other propulsion systems

Driving components serving the same purpose as the propeller shaft in other propulsion systems, such as directional propellers, vertical axis propellers, water jet units, dynamic positioning systems and thruster assisted mooring systems, are to be submitted to periodical surveys at intervals not exceeding five years.

### 5.4.6 Extension of intervals of propeller shaft surveys

In the case of mobile offshore drilling unit, due to low running hours on propeller shafts, extended intervals between propeller shaft surveys may be considered based on:

- satisfactory diver's external examination of stern bearing and outboard seal area including wear check, as far as possible
- internal examination of the shaft area (inboard seals) in propulsion room(s)
- confirmation of satisfactory lubricating oil records (oil loss rate, contamination)
- examination/replacement of shaft seal elements in accordance with seal manufacturer's recommendations.

## 5.5 Boiler survey

### 5.5.1

There are to be two internal examinations of boilers in each period of class of five years.

In all cases, the interval between any two such examinations is not to exceed 36 months.

### 5.5.2

There is to be one internal examination of thermal oil heaters in each period of class of five years.

### 5.5.3

For units of eight years of age and over fitted with one single boiler supplying steam for main propulsion, the interval between two boiler surveys may be specially considered.

### 5.5.4

Boilers are also submitted to an external inspection as a part of the annual survey of machinery.

### 5.5.5

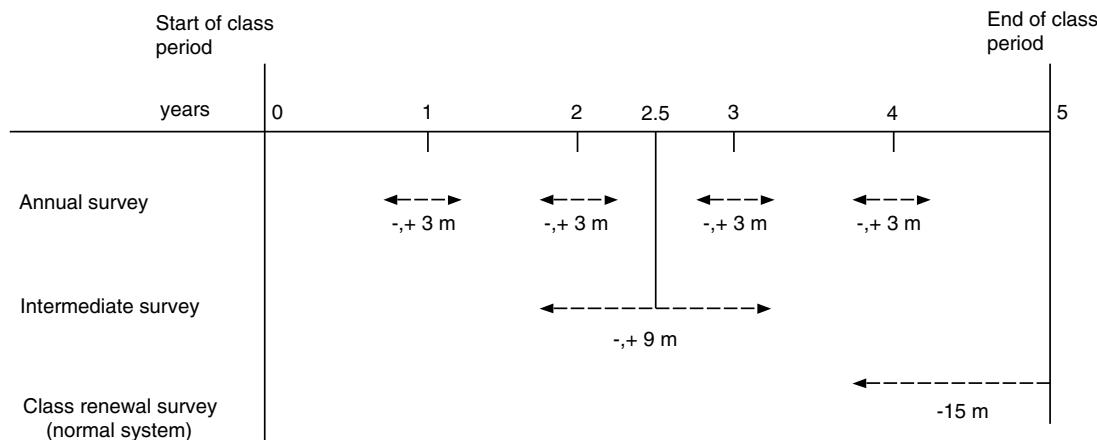
The scope of the boiler survey is detailed in Pt A, Ch 3, Sec 6 of the Ship Rules.

## 5.6 Links between anniversary dates and annual surveys, intermediate surveys and class renewal surveys

### 5.6.1

The link between the anniversary dates, the class renewal survey (when carried out according to the normal system), and the annual and intermediate surveys is given in Fig 1.

**Figure 1 : Links between anniversary dates and annual, intermediate and class renewal surveys**



## 6 Occasional surveys

### 6.1 General

**6.1.1** Refer to the Ship Rules Pt A, Ch 2, Sec 2, [6].

### 6.2 Damage survey

**6.2.1** It is the responsibility of the owner/operator of the unit to report to the Society without delay any damage, defect or breakdown, which could invalidate the conditions for which a classification has been assigned so that it may be examined at the earliest opportunity by the Society's Surveyor(s). All repairs found necessary by the Surveyor are to be carried out to his satisfaction.

### 6.3 Repairs

**6.3.1** Where repairs to hull, legs, columns or other structures, machinery or equipment, which affect or may affect classification, are planned in advance to be carried out, a complete repair procedure including the extend to proposed repair and the need for Surveyors attendance is to be submitted to and agreed upon by the Society reasonably in advance. Failure to notify the Society, in advance of the repairs, may result in suspension of the unit's classification until such time as the repair is redone or evidence submitted to satisfy the Surveyor that the repair was properly carried out. This applies also to repairs during voyage or on site.

**6.3.2** The above is not intended to include maintenance and overhaul to hull, other structures, machinery and equipment in accordance with recommended manufacturers procedures and established marine practice and which does not require Society approval; however, any repair as a result of such maintenance and overhauls which affects or may affect classification is to be noted in the units log and submitted to the Surveyor.

### 6.4 Reactivation surveys

**6.4.1** In the case of units which have been out of service for an extended period, the requirements for reactivation surveys will be specially considered in each case with due regard given to the status of surveys at the time of the commencement of the lay-up period, the length of the period, and conditions under which the unit had been maintained during that period.

### 6.5 Alterations

**6.5.1** No alterations which may affect classification are to be made to the hull or machinery of a classed unit unless plans of proposed alterations are submitted and approved by the Society before the work of alterations is commenced. Such work is to be carried out in accordance with approved plans and tested on completion as required by the Rules and to the satisfaction of the Surveyor.

### 6.6 Welding and replacement of materials

**6.6.1** Welding of steels, including high strength structural steel, is to be to the satisfaction of the Society.

**6.6.2** Welding or other fabrication performed on steels of special characteristics or repairs or renewals of such steel or in areas adjacent to such steel is to be accomplished with procedures approved by the Society considering the special materials involved. Substitution of steels differing from those originally installed is not to be made without approval by the Society.

**6.6.3** The Society may reference IACS Recommendations No 11 - Materials Selection Guideline for Mobile Offshore Drilling Units when considering suitable replacement materials.

## 7 Change of ownership

### 7.1

**7.1.1** In the case of change of ownership, the unit retains its current class with the Society provided that:

- the Society is informed of the change sufficiently in advance to carry out any survey deemed appropriate, and,
- the new Owner signs the appropriate request, involving acceptance of the Society's general conditions and Rules. This request covers inter alia the condition of the unit when changing ownership.

Note 1: The unit's class is maintained without prejudice to those provisions in the Rules which are to be enforced in cases likely to cause suspension or withdrawal of the class such as particular damages or repairs to the unit of which the Society has not been advised by the former or, as the case may be, new Owner.

Note 2: No information whatsoever related to the class of the unit will be provided or confirmed to any third party, unless the appropriate request for information is duly completed and signed by the party making the request and the authorisation of the current Owner is obtained.

## 8 Lay-up and re-commissioning

### 8.1 General principles

**8.1.1** A unit put out of commission may be subject to specific requirements for maintenance of class, as specified below, provided that the Owner notifies the Society of the fact.

If the Owner does not notify the Society of the laying-up of the unit or does not implement the lay-up maintenance programme, the unit's class will be suspended and/or withdrawn when the due surveys are not carried out by their limit dates in accordance with the applicable requirements given in Ch 2, Sec 3.

**8.1.2** The lay-up maintenance programme provides for a "laying-up survey" to be performed at the beginning of lay-up and subsequent "annual lay-up condition surveys" to be performed in lieu of the normal annual surveys which are no longer required to be carried out as long as the unit remains laid-up. The minimum content of the lay-up maintenance programme as well as the scope of these surveys are given in Pt A, Ch 3, App 1 of the Ship Rules. The other periodical surveys which become overdue during the lay-up period may be postponed until the re-commissioning of the unit.

**8.1.3** Where the unit has an approved lay-up maintenance programme and its period of class expires, the period of class is extended until it is re-commissioned, subject to the satisfactory completion of the annual lay-up condition surveys as described in [8.1.2].

**8.1.4** The periodical surveys carried out during the lay-up period may be credited, either wholly or in part, at the discretion of the Society, having particular regard to their extent and dates. These surveys will be taken into account for the determination of the extent of surveys required for the re-commissioning of the unit and/or the expiry dates of the next periodical surveys of the same type.

**8.1.5** When a unit is re-commissioned, the Owner is to notify the Society and make provisions for the unit to be submitted to the following surveys:

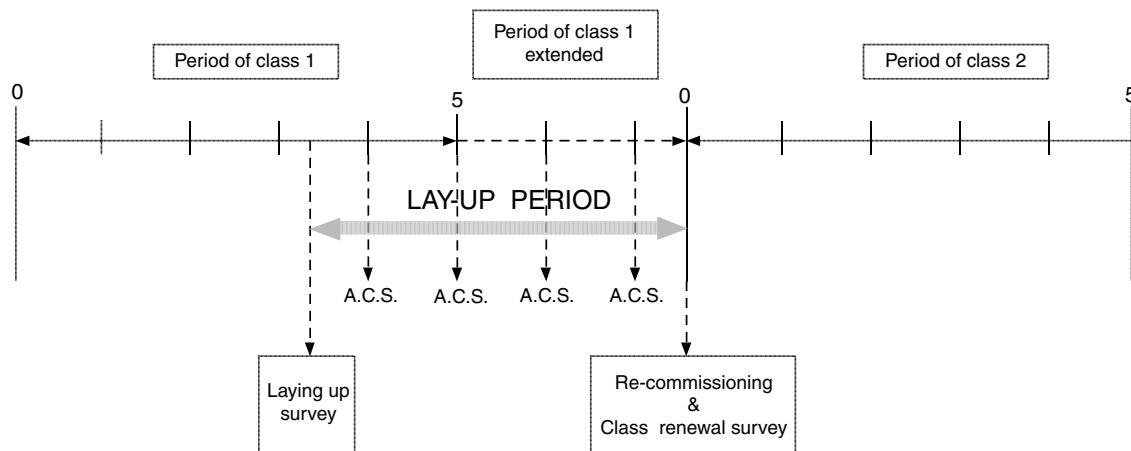
- an occasional survey prior to re-commissioning, the scope of which depends on the duration of the lay-up period
- all periodical surveys which have been postponed in accordance with [8.1.2], taking into account the provisions of [8.1.4].

**8.1.6** Where the previous period of class expired before the re-commissioning and was extended as stated in [8.1.3], in addition to the provisions of [8.1.5] a complete class renewal survey is to be carried out prior to re-commissioning. Those items which have been surveyed in compliance with the class renewal survey requirements during the 15 months preceding the re-commissioning may be credited. A new period of class is assigned from the completion of this class renewal survey.

**8.1.7** The principles of intervals or limit dates for surveys to be carried out during the lay-up period, as stated in [8.1.1] to [8.1.6], are summarised in Fig 2.

**8.1.8** The scope of the laying-up survey and annual lay-up condition surveys are described in detail in Pt A, Ch 3, App 1 of the Ship Rules.

Figure 2 : Survey scheme of a case of a lay-up going beyond the expiry date of the period of class



Note 1: A. C. S. means annual lay-up condition survey.

## 9 Conversions - Feasibility study

### 9.1 General

**9.1.1** A feasibility study is required for projects based on conversion of existing units.

As a minimum, complete re-measurements of the scantlings including comprehensive surveys are required to evaluate the condition of the unit. Minimum requirements will be defined on a case by case basis.

Note 1: For conversion of a ship into an offshore unit, reference should be made to the Guidance Note NI593 Ship Conversion into Surface Offshore Units and Redeployment of Surface Offshore Units.

# Section 2 Annual Survey

## 1 General

### 1.1 Application

**1.1.1** The requirements of this Section apply to annual surveys of all units. The specific requirements for annual surveys related to service notations and additional class notations assigned to units are addressed in Ch 2, Sec 5, Ch 4, Sec 3, Ch 4, Sec 5 and Ch 2, Sec 9.

**1.1.2** At the time of annual surveys, the unit is to be generally examined. The survey is to include a visual inspection of the hull, equipment and machinery of the unit and some tests thereof, so far as necessary and practicable in order to verify that the unit is in a acceptable general condition and is properly maintained.

**1.1.3** Owners are reminded that any modification to the unit's hull, equipment and machinery affecting its classification is to be made known to the Society.

## 2 Hull

### 2.1 Hull and hull equipment

**2.1.1** The survey is to include a general external examination and testing, where appropriate, of the following items, as applicable:

- outer shell plating above the waterline, relevant shell doors and accessible parts of the rudder(s)
- plating of freeboard deck and exposed decks, superstructures, with their openings and means of closure
- if applicable, structure in the vicinity of moon pool or other major openings or discontinuities
- cargo hatchways and other openings on exposed decks, with their coamings and their means of closure and securing arrangements
- sidescuttles and deadlights, chutes and other openings with their means of closure
- bulwarks, guard rails, freeing ports, gangways and lifelines, ladders
- scuppers and sanitary discharges, valves on discharge lines and their controls
- ventilators, air pipes, overflow pipes and gas vent pipes, with their means of closure and flame screens, where required
- all automatic air pipe heads installed on the exposed decks (i.e. those extending above the freeboard deck or superstructure decks)
- freeboard marks on the unit's sides
- deck equipment such as lifeboat davit foundations, bollards, fairleads, hawse pipes, etc., masts and associated rigging, including lightning conductors
- anchoring and mooring equipment, as far as practicable, including housing, supporting equipment and connection to the unit's main structure
- watertight bulkheads, their watertight doors and associated local and remote controls, and their watertight penetrations
- main and auxiliary steering arrangements, including their associated equipment and control systems, and manoeuvring gear
- fire divisions and fire doors, dampers in ventilation ducts, means of closure of skylights and other openings
- confirmation that emergency escape routes from accommodation and service spaces are satisfactory
- confirmation that the drainage from enclosed cargo spaces situated on the freeboard deck is satisfactory
- engine room
- where fitted, helicopter deck and its supporting structure, safety net and arrangements for the prevention of sliding
- availability of loading manual or, where required, electronic loading instrument, including standard test
- availability of approved stability documentation
- foundations of areas used for heavy lifting equipment, drilling equipment, diving equipment hoisting appliances, pipe laying stinger, jacket launching equipment (rocker arms, skid beams).

Note 1: Due attention is also to be given to fuel oil piping passing through ballast tanks, which is to be pressure tested where doubts arise.

**2.1.2** Suspect areas identified at previous class renewal surveys are to be examined. Areas of substantial corrosion identified at previous class renewal or intermediate surveys are to be subjected to thickness measurements.

**2.1.3** Ballast spaces are to be internally examined when required as a consequence of the results of the class renewal survey or the intermediate survey.

Thickness measurements are to be carried out as considered necessary by the Surveyor.

**2.1.4 Column stabilized units and TLP**

For column stabilized or TLP units, in addition, the survey includes the following:

- general examination of accessible areas, particularly of columns, lower hull and bracings
- assessment of watertightness of immersed parts
- external examination of parts and areas indicated in Ch 3, Sec 3, [2.2.1] and Ch 3, Sec 3, [2.2.3]
- mooring and tendon support foundation internally.

**2.1.5 Self-elevating units**

For self-elevating units, in addition, the survey includes the following:

- external examination, as far as practicable, with due consideration for working water draughts from the last survey, of the jackhouses and their foundations as well as the legs above the waterline
- external examination of the upper structure indicated in Ch 3, Sec 3, [2.2.1] and Ch 3, Sec 3, [2.2.3] including the visible areas of the hull in elevated position.

## **3 Machinery and systems**

### **3.1 General machinery installations**

**3.1.1** The survey of general machinery installations is to cover the following items:

- general examination of machinery and boiler spaces with particular attention to the fire and explosion hazards; confirmation that emergency escape routes are practicable and not blocked
- general examination of the machinery, steam, hydraulic, pneumatic and other systems and their associated fittings, for confirmation of their proper maintenance
- testing of the means of communication and order transmission between the navigating bridge and the machinery control positions and other control stations
- confirmation that the rudder angle indicator on the bridge is in working order
- examination, as far as practicable, of the bilge pumping systems and bilge wells, including operation of the pumps, remote reach rods and level alarms, where fitted
- visual examination of the condition of any expansion joints in sea water systems
- external examination of pressure vessels other than boilers and their appurtenances, including safety devices, foundations, controls, relieving gear, high pressure piping, insulation and gauges.

**3.1.2** When the unit is equipped with a refrigerating plant (whether or not covered by an additional class notation), the annual survey is to include the external examination of:

- pressure vessels of the installation to the same extent as indicated in [3.1.1]
- refrigerant piping, as far as practicable
- for refrigerating machinery spaces using ammonia as refrigerant:
  - ventilation system including functional test
  - water-spraying fire-extinguishing system; see Ch 3, Sec 1, [3.4.2] item d)
  - bilge system including functional test
  - electrical equipment, confirming its proper maintenance
  - gas detection system
  - breathing apparatus and protective clothing.

**3.1.3** When the unit is equipped with thruster installations, the annual survey is to include:

- an external examination of the machinery installation
- an operating test of the complete installation.

**3.1.4** For exhaust gas water heater and Waste Heat Recovery Unit (WHRU), a functional test while in operation is to be carried out, during which the following items are checked:

- the piping and shut off valves for detection of leakages
- the condition of the insulation
- the operation of indication, control and safety device.

## **3.2 Boilers**

**3.2.1** For main and auxiliary boilers, the annual survey consists of an external examination of boilers and their appurtenances, including safety devices, foundations, controls, relieving, high pressure and steam escape piping, insulation and gauges.

**3.2.2** For thermal oil heaters, a functional test while in operation is to be carried out, during which the following items are checked:

- the heater for detection of leakages
- the condition of the insulation
- the operation of indication, control and safety devices
- the condition of remote controls for shut-off and discharge valves.

A satisfactory analysis of the quality of oil is to be made available to the Surveyor.

**3.2.3** For exhaust gas thermal oil heaters, in addition to the requirements of [3.2.2], a visual examination and a tightness testing to the working pressure of the heater tubes are to be carried out.

## **3.3 Electrical machinery and equipment**

**3.3.1** The survey of electrical machinery and equipment is to cover the following items:

- general examination, visually and in operation, as feasible, of the electrical installations for power and lighting, in particular main and emergency generators, electric motors, switchboards, switchgears, cables and circuit protective devices, indicators of electrical insulation and automatic starting, where provided, of emergency sources of power
- checking, as far as practicable, the operation of emergency sources of power and, where they are automatic, also including the automatic mode.

**3.3.2** The survey is also to cover the bridge control of propulsion machinery, and related arrangements (alarms and safety devices), when fitted.

**3.3.3** The survey is also to cover the computerized systems. This survey includes:

- the verification by the Surveyor regarding the management of change in operation. Procedures for management of change and relevant change records (see Pt C, Ch 3, Sec 3, [6] are to be made available at the time of the survey.

Note 1: In the cases where the change requires approval from the Society up front, the relevant procedures and documentation for the change in question may be verified at that time.

- checking that revision of software mentioned in the records corresponds with revision effectively used for at least one computerized system chosen at the satisfaction of the Surveyor.

## **3.4 Column stabilized units and TLP**

**3.4.1** For column stabilized and TLP units, the survey includes also the following additional items:

- visual examination and functional testing of the ballasting systems to the satisfaction of the Surveyor, including the tank level gauges and remote valves
- means of access, ventilation, pumping as well as the emergency lighting into the columns and lower compartments
- if dry bracings are provided with flooding detection means, testing of the plant satisfactory operation
- general examination and review of records of operation of mooring or tensioning system.

## **3.5 Fire protection, detection and extinction**

**3.5.1** The survey of fire prevention and other general arrangements is to cover the following items:

- checking that fire control plans are properly posted
- examination and testing, as feasible, of the operation of manual and/or automatic fire doors, where fitted
- checking, as far as practicable, that the remote controls for stopping fans and machinery and shutting off fuel supplies in machinery spaces and, where fitted, the remote controls for stopping fans in accommodation spaces and the means of cutting off power to the galley are in working order
- examination and testing of the closing arrangements of ventilators, funnel annular spaces, skylights, doorways and tunnel, where applicable
- examination, as far as practicable, and testing, as feasible and at random, of the fire and/or smoke detection systems.

**3.5.2** The survey requirements for all types of fire-fighting systems that are usually found on board units related either to machinery spaces or to storage areas and/or spaces or to accommodation spaces, irrespective of the service notation assigned, are the following:

a) Water fire system:

- examination of the fire main system and confirmation that each fire pump including the emergency fire pump can be operated separately so that the two required powerful jets of water can be produced simultaneously from different hydrants, at any part of the ship whilst the required pressure is maintained in the fire main
- checking that fire hoses, nozzles, applicators, spanners and international shore connection (where fitted) are in satisfactory working condition and situated at their respective locations.

b) Fixed gas fire-extinguishing system:

- external examination of receivers of CO<sub>2</sub> (or other gas) fixed fire-extinguishing systems and their accessories, including the removal of insulation for insulated low pressure CO<sub>2</sub> containers
- examination of fixed fire-fighting system controls, piping, instructions and marking; checking for evidence of proper maintenance and servicing, including date of last system tests
- test of the alarm triggered before the CO<sub>2</sub> is released.

c) Sprinkler system:

- examination of the system, including piping, valves, sprinklers and header tank
- test of the automatic starting of the pump activated by a pressure drop
- check of the alarm system while the above test is carried out.

d) Water-spraying system:

- examination of the system, including piping, nozzles, distribution valves and header tank
- test of the starting of the pump activated by a pressure drop (applicable only for machinery spaces).

e) Fixed foam systems (low or high expansion):

- examination of the foam system
- test to confirm that the minimum number of jets of water at the required pressure in the fire main is obtained when the system is in operation
- checking the supplies of foam concentrate and receiving confirmation that it is periodically tested (not later than three years after manufacture and annually thereafter) by the manufacturer or an agent.

f) Dry powder system:

- examination of the dry powder system, including the powder release control devices
- checking the supplies of powder contained in the receivers and that it has maintained its original smoothness
- checking that the pressure of propelling inert gas contained in the relevant bottles is satisfactory.

**3.5.3** As far as other fire-fighting equipment is concerned, it is to be checked that:

- semi-portable and portable fire extinguishers and foam applicators are in their stowed positions, with evidence of proper maintenance and servicing, and detection of any discharged containers
- firemen's outfits are complete and in satisfactory condition.

**3.5.4** Where a helideck is fitted, the following is to be checked, as far as appropriate:

- drainage arrangements around the landing area
- fire fighting appliances and arrangements (to be surveyed as per [3.5.2], according to the equipment installed)
- overall examination of refuelling systems and hangar facilities for cleanliness and absence of leaks, condition of gutters and drainage arrangement.

## 3.6 Hazardous areas

**3.6.1** The survey consists in:

- examination of hazardous areas including their closures and boundaries
- confirmation, as far as practicable, that the following equipment are in satisfactory condition: ventilation systems, ducting arrangements, fire dampers, fans, alarms for loss of pressure, gas detection and associated arrangements, electrical and mechanical safe equipment, arrangement for purging sequences and for black start.

## 3.7 Other safety equipment

**3.7.1** The survey consists in:

- examination of navigation lights, associated alarm and signal devices including helideck lights, if fitted
- confirmation that other safety systems such as the alarm and communication system are in working order.

### **3.8 In operation (unit in service) phase**

**3.8.1** The verification by the Society regarding the management of change in operation is generally performed during the annual survey of the offshore unit. Procedures for management of change and relevant change records (see Pt C, Ch 3, Sec 3, [6.11]) are to be made available at the time of survey.

In the cases where the change requires approval from the Society up front, the relevant procedures and documentation for the change in question may be verified at that time.

## Section 3

## Intermediate Survey

### 1 General

#### 1.1 Application

**1.1.1** The requirements of this Section apply to intermediate surveys of all units, except units assigned with the service notation **drilling** for which the provisions of Ch 2, Sec 5 are applicable. The specific requirements for intermediate surveys related to service notations and additional class notations assigned to units are addressed in Ch 4, Sec 3, Ch 4, Sec 5 and Ch 2, Sec 9.

**1.1.2** The intermediate survey is to include examination and checks on a sufficiently extensive part of the structure to show that the structures of the unit are in satisfactory condition so that the unit is expected to operate until the end of the current period of class, provided that the unit is properly maintained and other surveys for maintenance of class are duly carried out during this period.

**1.1.3** Prior to the commencement of any part of the class renewal survey and intermediate survey, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance and the thickness measurement company representative, where involved.

### 2 Hull

#### 2.1 Survey

**2.1.1** The requirements given in Ch 3, Sec 2, Tab 1 for the survey and testing of salt water ballast spaces are to be complied with.

#### 2.2 Units with particular structure

**2.2.1** In addition, examination will be made of particularly critical areas of the structure such as:

- inside of bracings for column stabilized units and TLP
- leg-hull connection of self-elevating units
- structure around corners of moon pool or other large openings
- tension legs upper connectors internal supporting structure for TLPs
- tensioning system general examination and review of records of operation for TLPs
- mooring internal supporting structure
- mooring tensioning system general examination and review of records of operation
- topside supporting structure (stool)
- other critical areas, as found necessary by the Surveyor.

#### 2.3 Units including hazardous areas

**2.3.1** In addition, electrical equipment in hazardous areas will be examined and tested, with particular attention to:

- protective earthing
- integrity of flame-proof enclosures
- integrity of pressurised enclosures and associated fittings
- condition of increased safety equipment
- condition of cabling (damage to outer sheath, corrosion or metal braiding)
- interlocking systems of electrical power supply to spaces protected by air locks such as electric motors rooms, storage control rooms
- operation of pressurised equipment and functioning of alarms.

**Table 1 : Intermediate survey of hull (all units)**

ITEM	Age of unit (in years at time of intermediate survey)		
	5 < age ≤ 10	10 < age ≤ 15	age > 15
SALT WATER BALLAST SPACES (1) (2) (3) (4)	One peak tank and at least two representative spaces between the peak bulkheads are to be internally examined. Thickness measurements, if considered necessary by the Surveyor		
			For units over 15 years of age, tightness test of double bottom ballast spaces in ways of storage holds, if considered necessary by the Surveyor
(1)	If such examinations reveal no visible structural defects, the examination may be limited to a verification that the protective coating remains effective and that the sacrificial anodes, if any, are less than 50% depleted.		
(2)	Where the protective coating is found to be in poor condition, where corrosion or other defects are found, where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, or where sacrificial anodes are found to be more than 50% depleted, the examination is to be extended to other ballast spaces of the same type.		
(3)	For salt water ballast spaces other than double bottom tanks, where a protective coating is found to be in poor condition, and is not renewed, where soft coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class is to be subject to the spaces in question being internally examined at annual surveys. The Society may consider waiving such internal examination at annual surveys of tanks protected with soft coating, whose size is 12 m <sup>3</sup> or less. For salt water ballast double bottom tanks, where such breakdown of coating is found and is not renewed, where soft coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class may be subject to the tanks in question being internally examined at annual intervals.		
(4)	The representative spaces are to be based on the record of the previous class intermediate surveys, previous class renewal surveys, the repair history of the tanks and they should not be the same for each intermediate survey.		
<b>Note 1:</b> Due attention is also to be given to fuel oil piping passing through ballast tanks, which is to be pressure tested should doubts arise			

## Section 4

## Class Renewal Survey

### 1 General

#### 1.1 Application

**1.1.1** The requirements of this Section apply to class renewal surveys of all units. The specific requirements for class renewal surveys related to service notations and additional class notations assigned to units are addressed in Ch 2, Sec 5, Ch 4, Sec 3, Ch 4, Sec 5 and Ch 2, Sec 9.

**1.1.2** The class renewal survey is to include sufficiently extensive examination and checks to show that the structures, main and auxiliary machinery, systems, equipment and various arrangements of the unit are in satisfactory condition or restored to such condition as to allow the unit to operate for the new period of class to be assigned, provided that the unit is properly maintained and other surveys for maintenance of class are duly carried out during this period.

The examinations of the structure are to be supplemented by thickness measurements and testing as deemed necessary, to ensure that the structural integrity remains effective and sufficient to discover substantial corrosion, significant deformation, fractures, damages or other structural deterioration.

**1.1.3** The Owner is to provide the necessary facilities to enable this class renewal survey.

**1.1.4** Prior to the commencement of any part of the class renewal survey and intermediate survey, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance and the thickness measurement company representative, where involved.

**1.1.5** When the unit is under the continuous survey system for hull or machinery, the scope of the class renewal survey as described in this Section is carried out on a continuous basis over the period of class.

When the machinery installation is surveyed under the Planned Maintenance System, a specific programme of survey replaces the scope of the class renewal survey of machinery and systems as laid down in Article Ch 3, Sec 3, [3].

**1.1.6** Upon completion of the class renewal survey, or at the end of the period of class (if the relevant part of the unit is surveyed under the continuous survey system), a general examination of the unit having the same scope as that of an annual survey is to be carried out.

### 2 Hull and hull equipment

#### 2.1 Bottom survey

**2.1.1** A bottom survey in dry condition, including anchoring and mooring equipment, is to be carried out, unless underwater surveys have been accepted by the Society in lieu of dry-docking, as detailed in Ch 2, Sec 8.

**2.1.2** Anchors, windlass(es) and chain cables are to be ranged and examined, and the required complement and condition are to be checked. When the unit is more than 5 years old, chain cables are to be gauged. Any length of chain cable which is found to be damaged or excessively worn is to be renewed.

**2.1.3** Sea valves and cocks are to be opened up for internal examination.

**2.1.4** Thickness measurements of the outer shell, as and if required within the scope of the related class renewal survey, are to be carried out, if not already done within 15 months before the end of the class period.

#### 2.2 Decks, hatch covers and equipment

**2.2.1** Decks are to be examined, particular attention being given to the areas where stress concentration or increased corrosion are likely to develop, such as hatch corners and other discontinuities of structure.

Deck erections such as hatch coamings, deckhouses and superstructures are to be examined.

Deck and corresponding equipment inducing important loads such as heavy lifting equipment, helideck, drilling equipment, diving equipment hoisting appliances, pipe laying stinger, jacket launching equipment (rocker arms, skid beams).

Examination is also made of the connections of equipment and attachments to load carrying structural elements.

Due attention is to be given to the examination in way of end and side openings and related shell and inner doors.

**2.2.2** The survey of hatch covers and coamings, if any, is to include:

- checking of the satisfactory operation of all mechanically operated hatch covers: stowage and securing in open condition, proper fit, locking and efficiency of sealing in closed position, operational testing of hydraulic and power components, wires, chains and link drives
- checking of the effectiveness of sealing arrangements of all hatch covers by means of hose testing or equivalent
- thickness measurements of coaming and attached stiffeners, hatch cover plating and stiffeners (see Ch 3, Sec 3, Tab 3 or Tab 4 or Tab 6).

**2.2.3** The survey of hull equipment is also to cover the following points:

- windlass and chain stoppers, with disassembly as deemed necessary to verify the condition of the equipment and control and safety devices, hawse pipes
- steering arrangements, including steering gear, control and indication devices, operational tests and disassembly as deemed necessary; in the case of chain and rod gears, chains, rods, sheaves, pins and rollers are to be examined for wear
- connection of masts and standing rigging to the hull structure as well as condition of structure underneath.

**2.2.4** Piping systems outside tanks and compartments are to be visually examined and pressure tested as necessary, as per the requirements laid down for the class renewal survey of machinery and systems; see Ch 3, Sec 3, [3.5].**2.2.5** Automatic air pipe heads installed on the exposed decks (i.e. those extending above the freeboard deck or superstructure decks) are to be completely examined, both externally and internally, in accordance with the requirements given in Ch 3, Sec 3, Tab 1.**2.2.6** For surface units, thorough examination is to be made of outside plating, particularly bottom, side shells and main deck as well as to the structure in way of the drill well or moon pool, or other similar openings. Special attention is to be given to plating damages due to wave slam, impact resulting from surface craft or other causes.

Examination is to be made of the fore and aft structures, particularly of the supporting structures of rudder, line shafting, fixed or steerable nozzles.

**2.2.7** For column stabilized units and TLP, examination is to be made of the lower hulls, columns and bracings, giving particular attention to the connections of columns to the upper and lower hulls and to the intersections between columns, bracings and diagonals.

Examination is to be made of the upper hull including girders, bulkheads, decks and stiffeners with particular attention being paid to areas subject to high local loadings, vibrations due to machinery or equipment or stress concentrations.

**2.2.8** For self-elevating units, examination is to be made of the lower mats and spud cans, particularly of the connections with the legs.

Examination is to be made of the entire length of all legs, supplemented, if deemed necessary by the Surveyor, with non-destructive testing of sensitive areas. For truss legs, the examination is to include all chords with jacking racks and a representative percentage of vertical, horizontal and diagonal truss members to be selected with the agreement of the Surveyor.

Examination is to be made of the upper structure, particularly in way of jack houses, leg wells, substructure and skid beams, including the deck, side and bottom platings.

**Table 1 : Requirements for internal and external examination of automatic air pipe heads at class renewal survey**

Age of unit (in years at time of class renewal survey)		
age ≤ 5	5 < age ≤ 10	10 < age
Two air pipe heads, one port and one starboard, located on the exposed decks in the forward 0,25 L, preferably air pipes serving ballast tanks. See (1) and (2)	All air pipe heads located on the exposed decks in the forward 0,25 L. See (1) and (2)	All air pipe heads located on the exposed decks. See (3)
Two air pipe heads, one port and one starboard, on the exposed decks, serving spaces aft of 0,25 L, preferably air pipes serving ballast tanks. See (1) and (2)	At least 20% of air pipe heads on the exposed decks serving spaces aft of 0,25 L, preferably air pipes serving ballast tanks. See (1) and (2)	

(1) The selection of air pipe heads to be examined is left to the attending Surveyor.  
 (2) According to the results of this examination, the Surveyor may require the examination of other air pipe heads located on the exposed decks.  
 (3) Exemption may be considered for air pipe heads where there is substantiated evidence of replacement within the previous five years.

**Note 1:** For designs where the inner parts cannot be properly examined from outside, the examination is to include removal of the head from the air pipe.

**Note 2:** Particular attention is to be paid to the condition of the zinc coating in heads constructed from galvanised steel.

## 2.3 Internal spaces

**2.3.1** Holds, 'tweendecks, cofferdams, pipe tunnels and duct keels, void spaces and other dry compartments which are integral to the hull structure are to be internally examined, ascertaining the condition of the structure, bilges and drain wells, sounding, venting, pumping and drainage arrangements

**2.3.2** Machinery and boiler spaces, pump rooms and other spaces containing machinery are to be internally examined, ascertaining the condition of the structure. Particular attention is to be given to tank tops, shell plating in way of tank tops, brackets connecting side shell frames and tank tops, and bulkheads in way of tank tops and bilge wells. Particular attention is to be given to the sea suctions, sea water cooling pipes and overboard discharge valves and their connections to the shell plating. Where wastage is evident or suspected, thickness measurements are to be carried out, and renewals or repairs effected when wastage exceeds allowable limits.

Piping systems inside these spaces are to be dealt with according to Ch 3, Sec 3, [3.5].

**2.3.3** Chain lockers are to be internally examined, while the anchor chains are ranged as required for the bottom survey in dry condition. The pumping arrangements of the chain locker is to be tested.

**2.3.4** For column stabilized units, examination is to be made of bulkheads and internal stiffeners, of the lower hulls, columns and bracings, particular attention being given to the connections of the columns to the upper and lower hulls and to the intersections between columns, bracings and diagonals.

**2.3.5** For TLP units, examination is to be made of bulkheads and internal stiffeners, of the lower hulls, columns and bracings, particular attention being given to the connections of the columns to the upper and lower hulls and to the intersections between columns, bracings and diagonals. In addition, tension legs upper connectors internal supporting structure are to be subject to close-up survey.

**2.3.6** For self-elevating units, examination is to be made of the lower mats, spud cans and hull compartments, particularly of the connections with the legs to be non destructively tested if deemed necessary by the Surveyor.

Examination of cylindrical type legs includes the internal plating, vertical frames, bulkheads and ring stiffeners.

Examination is to be made of the upper structure, particularly in way of jack houses, leg wells, substructure and skid beams, including the deck, side and bottom platings, bulkheads, girders and internal stiffeners.

## 2.4 Tanks

**2.4.1** The type and number of tanks to be internally examined at each class renewal survey are detailed in Ch 3, Sec 3, Tab 2, according to the age of the unit.

This internal examination is to ascertain the condition of the structure, bilges and drain wells, sounding, venting, pumping and drainage arrangements, including piping systems and their fittings. Due attention is to be given to plating or double plates below the lower end of sounding and suction pipes.

Where the inner surface of the tanks is covered with cement or other compositions, the removal of coverings may be waived provided they are examined, found sound and adhering satisfactorily to the steel structures.

Note 1: For examination of independent (non-structural) tanks, refer to Ch 3, Sec 3, [3.5.9].

Note 2: Due attention is also to be given to fuel oil piping passing through ballast tanks, which is to be pressure tested when the ship is more than 10 years old.

**2.4.2** For salt water ballast spaces other than double bottom tanks, where a protective coating is found to be in poor condition, and is not renewed, where soft coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class is to be subject to the spaces in question being internally examined at annual surveys. The Society may consider waiving such internal examination at annual surveys of tanks protected with soft coating, whose size is 12 m<sup>3</sup> or less.

For salt water ballast double bottom tanks, where such breakdown of coating is found and is not renewed, where soft coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class may be subject to the tanks in question being internally examined at annual intervals.

**2.4.3** Boundaries of double bottom, deep, ballast, peak and other tanks, both integral and independent tanks, including holds adapted for the carriage of salt water ballast, are to be tested with a head of liquid to the highest extent possible but not less than the highest point that liquid will rise under service condition.

**Table 2 : Requirements for internal examination of integral (structural) tanks at class renewal survey**

Tank	Age of unit (in years at time of class renewal survey)			
	age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Peaks (all use)	all	all	all	all
Salt water ballast tanks (all types)	all	all	all	all
Fresh water	none	one	all	all
Fuel oil bunkertanks:				
• engine room	none	none	one	one
• storage area	none	one	two (1)	half, minimum 2 (1)
Lubricating oil tanks	none	none	none	one
Storage tanks	all	all	all	all
Process tanks	all	all	all	all

(1) One deep tank is to be included, if fitted.

**Note 1:** Independent non-structural tanks are to be surveyed according to Ch 3, Sec 3, [3.5.9].

**Note 2:** The extent of the survey of tanks dedicated to liquids other than those indicated in this table will be considered by the Society on a case by case basis according to the nature of the liquids.

**Note 3:** If a selection of tanks is accepted to be examined, then different tanks are to be examined at each class renewal survey, on a rotational basis. Tanks not internally examined may be examined externally from accessible boundaries.

**2.4.4** Boundaries of fuel oil, lube oil and fresh water tanks are to be tested with a head of liquid to the maximum filling level of the tank. Tank testing of fuel oil, lube oil and fresh water tanks may be specially considered based on a satisfactory external examination of the tank boundaries, and a confirmation from the Master stating that the pressure testing has been carried out according to the requirements with satisfactory results.

**2.4.5** Other testing procedures, such as the procedure used for the initial survey during construction, may be accepted.

For integral tanks which are intended to contain liquid cargoes such as edible oil, the Surveyor may waive the requirement specified in [2.4.4] subject to a satisfactory internal examination.

## 2.5 Thickness measurements

**2.5.1** The extent of thickness measurements is detailed below according to the age of the unit:

- Ch 3, Sec 3, Tab 3 for surface units
- Tab 4 for column stabilized units
- Tab 5 for TLP
- Tab 6 for self-elevating units.

Additionally, for any part of the unit where wastage is evident or suspect, the Surveyor may require thickness measurements in order to ascertain the actual thickness of the material.

**2.5.2** When the structure is coated and the coating is found to be in good condition, the Surveyor may, at his discretion, accept a reduced programme of thickness measurements in the corresponding areas. Other effective protective arrangements may also be considered.

**2.5.3** When thickness measurements indicate substantial corrosion, the number of thickness measurements is to be increased to determine the extent of substantial corrosion. Ch 3, Sec 3, Tab 4 may be used as guidance for additional thickness measurements.

**2.5.4** Special attention is to be paid to free flooding structural members and sea water compartments.

## 2.6 Critical areas

**2.6.1** Those critical areas shall be considered as all the special category elements highlighted on the structural categories drawing. They are located in way or at the vicinity of critical load transmission areas and/or of stress concentration locations.

**2.6.2** Non-destructive testing of those areas including welded connections shall be done as deemed necessary by the surveyor.

**2.6.3 Example of critical area on Offshore unit:**

- topside stool and internal reinforcement
- flare foundation
- crane pedestal
- riser support connection to the hull and internal reinforcement
- truster support
- mooring or tendon foundation and internal reinforcement
- casting use for structural purpose
- node of leg of jack-up
- interface between leg and unit.

**2.7 Lightweight survey**

**2.7.1** A lightweight survey is to be carried out during each class renewal survey. The scope is given in Pt B, Ch 1, Sec 1, [3].

**2.7.2** The Society may also require an inclining test to be carried out as specified in Pt B, Ch 1, Sec 1, [3].

**2.7.3** For column-stabilized units, alternative to inclining test may be allowed, based on provisions of Pt B, Ch 1, Sec 1, [3].

**2.7.4** For permanent units, alternative to inclining test may be allowed, based on provisions of Pt B, Ch 1, Sec 1, [3].

**Table 3 : Requirements for thickness measurements at class renewal survey for surface units**

Age of unit (in years at time of class renewal survey)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Suspect areas	Suspect areas	Suspect areas	Suspect areas
	Within the storage area or 0,5 L amidships: - selected deck plates - selected bottom plates - selected tank top plates - selected plates in splash zone (4)	Within the storage area or 0,5 L amidships: - each deck plate - selected tank top plates - selected bottom plates - selected plates in splash zone (4)	Within the storage area or 0,5 L amidships: - each deck plate - each tank top plate - each bottom plate - all plates in splash zone (4)
	One transverse section abreast a cargo space within the amidships 0,5L (5)	Two transverse sections abreast of two different cargo spaces within the amidships 0,5L (5)	Three transverse sections in way of cargo spaces within the amidships 0,5L (3) (5)
	Outside the storage area or 0,5 L amidships: - selected deck plates - selected bottom plates - selected plates in splash zone (4)	Outside the storage area or 0,5 L amidships: - selected deck plates - selected bottom plates - selected plates in splash zone (4)	- all exposed main deck plating full length - representative exposed superstructure deck plating (poop, bridge and forecastle decks) - all plates in splash zone (4) - all keel plates full length - all bottom plates in way of cofferdams, machinery space and aft end of tanks
	Hatch covers and coamings of the two foremost cargo holds (1)	All hatch covers and coamings (1)	
	Collision bulkhead, forward machinery space bulkhead, aft peak bulkhead (1) (2)  - sea water manifold in engine room - plating of sea chests - shell plating in way of overboard discharges as considered necessary by the attending Surveyor	All transverse and longitudinal bulkheads (plates and stiffeners) (1) (2)	
		Internals in forepeak tank  Selected internal structure such as floors and longitudinals, transverse frames, web frames, deck beams, 'tweendecks, girders, etc.  Measurements may be increased if the Surveyor deems it necessary	Internals in forepeak and aft tanks
(1)	Including plates and stiffeners.		
(2)	Measurements may be waived or reduced after satisfactory visual examination, when such bulkheads form the boundaries of dry (void) spaces.		
(3)	The number of transverse sections may be reduced at the Surveyor's discretion for units of length under 90 m.		
(4)	The splash zone includes areas around water line, for the range of working draughts.		
(5)	One being chosen in the vicinity of moon pool or other similar opening, if any.		

**Table 4 : Requirements of thickness measurements at class renewal survey (column stabilized units)**

Age of the unit (years)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Suspect areas	Suspect areas	Suspect areas	Suspect areas
	In each main structural element of the floater (node, pontoon, column): <ul style="list-style-type: none"> <li>selected deck plates</li> <li>1 girth belt (4)</li> <li>selected bottom plates</li> </ul>	In each main structural element of the floater (node, pontoon, column): <ul style="list-style-type: none"> <li>selected deck plates</li> <li>2 girth belts (4)</li> <li>selected bottom plates</li> </ul>	In each main structural element of the floater (node, pontoon, column): <ul style="list-style-type: none"> <li>each deck plate</li> <li>3 girth belts (4)</li> <li>each bottom plate</li> </ul>
	In tanks: selected tank top plates	In tanks: selected tank top plates	In tanks: each tank top plate
	In upper hull/deck: <ul style="list-style-type: none"> <li>selected deck plates</li> <li>1 girth belt (2) (3) (4)</li> <li>selected bottom plates</li> </ul>	In upper hull/deck: <ul style="list-style-type: none"> <li>selected deck plates</li> <li>2 girth belts (2) (3) (4)</li> <li>selected bottom plates</li> </ul>	In upper hull/deck: <ul style="list-style-type: none"> <li>each deck plate</li> <li>3 girth belts (2) (3) (4)</li> <li>each bottom plate</li> </ul>
	Column and bracings: selected plates and stiffeners in splash zone (1)	Column and bracings: selected plates and stiffeners in splash zone (1)	Column and bracings: all plates and stiffeners in splash zone (1)
	Forward and aft machinery space bulkheads, peak bulkheads	Forward and aft machinery space bulkheads, peak bulkheads	All transverse and longitudinal bulkheads (plates and stiffeners)
		Selected internal structure such as floors and longitudinals, transverse frames, web frames, deck beams, etc.	Selected internal structure as for units with $10 < \text{age} \leq 15$ , number of measurements may be increased as the Surveyor finds it necessary
(1) The splash zone includes areas around water line, for the range of working draughts. (2) One being chosen in the vicinity of the connection with a column. (3) One being chosen in the vicinity of moon pool or other similar openings, if any. (4) For column stabilized unit, girth belt are transversal to the main structure. It is a section for pontoon. It is an elevation for column. It is a main framing for upper hull.			

**Table 5 : Requirements of thickness measurements at class renewal survey (TLP units)**

Age of the unit (years)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Suspect areas	Suspect areas	Suspect areas	Suspect areas
	In floaters: <ul style="list-style-type: none"> <li>selected deck plates</li> <li>1 girth belt (4)</li> <li>selected bottom plates</li> </ul>	In floaters: <ul style="list-style-type: none"> <li>selected deck plates</li> <li>2 girth belts (4)</li> <li>selected bottom plates</li> </ul>	In floaters: <ul style="list-style-type: none"> <li>each deck plate</li> <li>3 girth belts (4)</li> <li>each bottom plate</li> </ul>
	In tanks: selected tank top plates	In tanks: selected tank top plates	In tanks: each tank top plate
	In upper hull/deck: <ul style="list-style-type: none"> <li>selected deck plates</li> <li>1 girth belt (2) (3) (4)</li> <li>selected bottom plates</li> </ul>	In upper hull/deck: <ul style="list-style-type: none"> <li>selected deck plates</li> <li>2 girth belts (2) (3) (4)</li> <li>selected bottom plates</li> </ul>	In upper hull/deck: <ul style="list-style-type: none"> <li>each deck plate</li> <li>3 girth belts (2) (3) (4)</li> <li>each bottom plate</li> </ul>
	Column and bracings: selected plates and stiffeners in splash zone (1)	Column and bracings: selected plates and stiffeners in splash zone (1)	Column and bracings: all plates and stiffeners in splash zone (1)
	Forward and aft machinery space bulkheads, peak bulkheads	Forward and aft machinery space bulkheads, peak bulkheads	All transverse and longitudinal bulkheads (plates and stiffeners)
	Tension legs upper connectors internal supporting structure	Selected internal structure such as floors and longitudinals, transverse frames, web frames, deck beams, etc.	Selected internal structure as for units with $10 < \text{age} \leq 15$ , number of measurements may be increased as the Surveyor finds it necessary
(1) The splash zone includes areas around water line, for the range of working draughts. (2) One being chosen in the vicinity of the connection with a column. (3) One being chosen in the vicinity of moon pool or other similar openings, if any. (4) For TLP, girth belt are transversal to the main structure. It is a section for pontoon. It is an elevation for column. It is a main framing for upper hull.			

**Table 6 : Requirements of thickness measurements at class renewal survey (self-elevating units)**

Age of the unit (years)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Suspect areas	Suspect areas	Suspect areas	Suspect areas
In upper pontoon: • selected deck plates • 1 transverse section (1) (3) • selected bottom plates • selected tank top plates machinery space bulkheads, other selected bulkheads	In upper pontoon: • selected deck plates • 2 transverse sections (1) (3) • selected bottom plates • selected tank top plates • machinery space bulkheads, other selected bulkheads • selected internal structure such as floors and longitudinals, frames, beams, etc.	In upper pontoon: • each deck plate • 3 transverse sections (1) (3) • each bottom plate • each tank top plate • all transverse and longitudinal bulkheads (plates and stiffeners) • selected internal structure as for units with 10 < age ≤ 15, number of measurements may be increased as the Surveyor finds it necessary	
In truss legs: selected chords, bracings and other truss members in splash zone (2) and in the vicinity of mat or spud can	In truss legs: selected chords, bracings and other truss members in splash zone (2) and in the vicinity of mat or spud can	In truss legs: all chords, bracings and other truss members in splash zone (2) and in the vicinity of mat or spud can	
In cylindrical legs: selected plates and stiffeners in splash zone (2) and in the vicinity of mat or spud can	In cylindrical legs: selected plates and stiffeners in splash zone (2) and in the vicinity of mat or spud can	In cylindrical legs: all plates and stiffeners in splash zone (2) and in the vicinity of mat or spud can	
Mat and spud cans: selected plates and stiffeners	Mat and spud cans: selected plates and stiffeners	Mat and spud cans: all plates and stiffeners	
Forward and aft machinery space bulkheads, peak bulkheads	Forward and aft machinery space bulkheads, peak bulkheads	All transverse and longitudinal bulkheads (plates and stiffeners)	
	Selected internal structure such as floors and longitudinals, transverse frames, web frames, deck beams, etc.	Selected internal structure as for units with 10 < age ≤ 15, number of measurements may be increased as the Surveyor finds it necessary	
<p>(1) One being chosen in the vicinity of moonpool or other similar opening, if any.  (2) The splash zone includes areas around water line, for the range of working draughts.  (3) One being chosen in the vicinity of a leg opening.</p>			

**Table 7 : Guidance for additional thickness measurements in way of substantial corrosion areas**

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

### 3 Machinery and systems

#### 3.1 General

**3.1.1** The survey items listed below are to be covered to the satisfaction of the Surveyor. However, other survey alternatives deemed equivalent by the Surveyor in relation to the characteristics and general condition of the unit concerned may also be accepted.

#### 3.2 Main and auxiliary engines and turbines

##### 3.2.1 General

Depending on the type of machinery, the following parts are to be opened up as necessary for inspection. Parts and components are to be pressure tested as appropriate or as deemed necessary by the Surveyor. A working test is also to be carried out, including testing of alarms and safety devices.

**3.2.2 Internal combustion engines**

- a) Columns and entablature
- b) Cylinders with their liners, cylinder covers (together with valves and valve gear), pistons with their rods, crossheads, slippers and guides (or gudgeon pins), connecting rods (with their top and bottom end bearings), control gear, driven scavenge pumps, driven air compressors, driven fuel pumps, supercharging blowers, fuel injection pumps, turning gear, etc.
- c) Crankshafts (together with their main bearings)
- d) Reverse gear, reduction gear and clutches, if fitted.

**3.2.3 Steam turbines**

- a) Condensers and their cooling water and condensate extraction pumps
- b) Casings and rotors (including their blading), impulse wheels (including guide blading and diaphragms), nozzles and nozzle boxes, journals and bearings, dummy pistons, labyrinth, external glands, etc.
- c) Shafts, including their flexible couplings.

Where the propulsion steam turbines are of a well-known type, and fitted with rotor position indicators and vibration indicators of an approved type, as well as measuring equipment of steam pressure at proper locations along the steam flow, and the arrangements for change-over in the event of emergency operation of the plant are readily operable, the first class renewal survey may be limited to the examination of rotor bearings, thrust bearings and flexible couplings, provided the Surveyor is satisfied from operation service records and power trials subsequent to the survey, that the turbine plant is in good working condition.

**3.2.4 Gas turbines**

- a) Casings, rotors and disks, impellers and blading of all turbines and compressors, combustion chambers, burners, heat exchangers, gas piping, compressed air piping with fittings, starting and reverse arrangements
- b) Shafts and their flexible couplings.

**3.2.5 Electric propulsion**

Where the propulsion machinery consists of an electrical system, the propulsion motors, generators, cables and all ancillary electrical gear, exciters and ventilating plant (including coolers) associated therewith are to be examined and the insulation resistance to earth tested. Due attention is to be given to windings, commutations and sliprings. The operation of protective gear and alarm devices is to be checked, as far as practicable. Interlocks intended to prevent unsafe operations or unauthorised access are to be checked to verify that they are functioning correctly.

**3.2.6 Thruster installations**

When the unit is equipped with thruster installations, the class renewal survey is also to include:

- An examination of the machinery and electrical installation, as applicable.
- An external examination of the propulsive part of the installation to be carried out at the dry dock survey due as part of the class renewal survey. During this examination other checks such as clearance readings, tightness of hub and blade sealing for controllable pitch propellers are to be verified. Locking arrangements for bolts, if fitted, are to be checked. Results of lubricating oil analysis to detect possible deterioration of internal gears and bearings or the presence of water are to be confirmed as acceptable. The Manufacturer's requirements may be taken into account. Dismantling of the assembly for the examination of internal parts may be required if the foregoing checks are not satisfactory
- a running test of the system under operating conditions.

**3.3 Reduction gears, main thrust and intermediate shaft(s)**

**3.3.1** Reduction gears complete with all wheels, pinions, shafts, couplings, bearings and gear teeth, including incorporated clutch arrangements, are to be opened up, as deemed necessary by the Surveyor, for visual inspection. For complicated assemblies, gears and roller bearings may be inspected without dismantling.

**3.3.2** All shafts, thrust blocks and bearings are to be examined.

**3.4 Pumps and other machinery items****3.4.1 General**

The items listed in Ch 3, Sec 3, [3.4.2] are to be opened up, as deemed necessary by the Surveyor, for visual inspection. Their parts and components are to be pressure tested as appropriate and considered necessary by the Surveyor. A working test is also to be carried out, including testing of alarms and safety devices if deemed necessary by the Surveyor.

**3.4.2 Items to be surveyed**

- a) Air compressors with their intercoolers, filters and/or oil separators and safety devices
- b) Heat exchangers, ventilation fans for boilers and other equipment used for essential services
- c) Piston pumps and centrifugal pumps for sea water, bilge and salt water ballast
- d) Screw pumps, gear pumps and centrifugal pumps other than those listed in c) above (opening up is not required).

### 3.5 Systems in machinery spaces

**3.5.1** Valves, cocks and strainers of the bilge and ballast systems are to be opened up, as deemed necessary by the Surveyor, for visual inspection, and, together with the piping and safety devices, examined and tested under working conditions.

**3.5.2** The fuel oil, lubricating oil, hydraulic oil, thermal oil, and feed and cooling water systems, together with pressure filters, heaters and coolers used for essential services, are to be opened up and examined or tested, as considered necessary by the Surveyor. Safety devices for the foregoing items are to be examined.

**3.5.3** The compressed air system together with its valves, fittings and safety devices is to be examined, as considered necessary by the Surveyor.

**3.5.4** Compressed air receivers and other pressure vessels for essential services are to be cleaned internally and examined internally and externally. Their fittings, valves and safety devices are to be opened up, as deemed necessary by the Surveyor, for visual inspection and pressure tested as appropriate.

**3.5.5** Steel pipes for superheated steam having a temperature of the steam at the superheater outlet exceeding 450°C are to be examined and tested in accordance with Ch 3, Sec 3, [3.5.7] to Ch 3, Sec 3, [3.5.8] at each class renewal survey.

**3.5.6** Steel pipes for saturated steam or superheated steam having a temperature of the steam at the superheater outlet not exceeding 450°C are to be examined and tested in accordance with Ch 3, Sec 3, [3.5.7] to Ch 3, Sec 3, [3.5.8] at each class renewal survey for units over 5 years of age. When the unit is 5 years of age or less, the inspection may be limited to a check of the satisfactory general condition of pipes.

**3.5.7** The examination and hydrostatic test of steel pipes for main steam machinery, and steel pipes for auxiliary steam machinery having internal diameter 75 mm and over, are to be carried out on a number of pipes selected by the Surveyor after the lagging in way is removed.

**3.5.8** Representative pipe lengths connected with bolted flanges are to be internally and externally examined, and hydrostatically tested to 1.1 times the working pressure at ambient temperature. Bolts and butt-welded joints between flanges and pipes are to be submitted to a non-destructive test for crack detection.

**3.5.9** Non-structural tanks located in machinery spaces are to be externally examined; the relevant fittings, with particular regard to the remote control shut-off valves under hydrostatic head, are to be externally examined to check the efficiency of manoeuvres and the absence of cracks or leakage.

**3.5.10** When the unit is equipped with a refrigerating plant, the class renewal survey is to include:

- examination and test at the design pressure of the parts of the plant under pressure
- for refrigerating machinery spaces using ammonia as refrigerant:
  - examination and test of the water-spraying fire-extinguishing system to the same extent as indicated in Ch 3, Sec 3, [3.8.3] item d)
  - examination of valves and pumps of the bilge system to the same extent as indicated in [3.4]
  - examination and test of the electrical equipment to the same extent as indicated in Ch 3, Sec 3, [3.6.11]
  - test of the gas detection system.

### 3.6 Electrical equipment and installations

**3.6.1** An electrical insulation resistance test is to be performed on the electrical equipment and cables. If needed, for the purpose of this test, the installation may be subdivided or equipment which may be damaged disconnected.

**3.6.2** The following minimum values, when performing the insulation test, are to be considered:

- For main and emergency switchboards, feeder circuit breakers being open, busbar circuit closed, measuring and monitoring instruments disconnected, the resistance of insulation measured across each insulated busbar and the hull, and across insulated busbars, should not be less than 1 megohm
- For generators, the equipment and circuits normally connected between the generator and the first circuit breaker being connected, the resistance of insulation (preferably at working temperature whenever possible), in ohms, is to be greater than 1 000 times the rated voltage, in volts. If appropriate, the Surveyor checks also that the insulation resistance of generators separate exciter gear is not less than 250 000 ohms
- The insulation resistance of the entire electrical system is to be checked with all circuit breakers and protective devices closed, except for generators; in general, the resistance should not be less than 100 000 ohms.

However, the variation of the resistance with time is to be checked, comparing the current figure with previous readings. If the insulation resistance was to drop suddenly or be insufficient, the defective circuits are to be traced, disconnecting the circuits as much as necessary.

**3.6.3** The prime movers of generators are to be surveyed in accordance with [3.2] and their governors tested. All generators are to be presented for inspection, clean and with covers opened and examined under working conditions.

**3.6.4** Main and emergency switchboards, section boards and distribution boards are to be cleaned and doors or covers opened for examination of their fittings. The condition of overcurrent protective devices and fuses is to be checked. Circuit-breakers of generators are to be tested, as far as practicable, to verify that protective devices including preference tripping relays, if fitted, operate satisfactorily. The tightening of busbar connections is to be checked.

**3.6.5** Electrical cables and cable runs are to be examined at random, in particular in places where deterioration is likely to occur; terminal boxes of essential services are also to be subjected to a random check.

**3.6.6** The motors and starters concerning essential services together with associated control and switchgear are to be examined and, if considered necessary by the Surveyor, checked, as far as practicable, under working conditions.

**3.6.7** Navigation light indicators are to be tested under working conditions, and correct operation on the failure of supply or failure of navigation lights verified.

**3.6.8** The emergency sources of electrical power, their automatic arrangements and associated circuits are to be tested.

**3.6.9** Emergency lighting, transitional emergency lighting, supplementary emergency lighting, general emergency alarm and public address systems are to be tested as far as practicable.

**3.6.10** The visible condition of electrical equipment and installations is also to be checked as regards precautions against shock, fire and other hazards of electrical origin.

**3.6.11** A general examination of the electrical equipment in areas where there may be flammable gas or vapour and/or combustible dust is to be carried out to ensure that the integrity of the electrical equipment of a safety type has not been impaired owing to corrosion, missing bolts, etc., and that there is not an excessive build-up of dust on or in dust-protected electrical equipment. Cable runs are to be examined for sheath and armouring defects, where practicable, and to ensure that the means of supporting the cables are in satisfactory condition. The proper condition of bonding straps for the control of static electricity is to be checked. Alarms and interlocks associated with pressurised equipment or spaces are to be tested for correct operation.

Note 1: Owners are reminded that maintenance, repairs or renewal of certified electrical equipment of a safe type remains their responsibility or that of their representatives.

## **3.7 Controls**

**3.7.1** Where remote and/or automatic controls, not covered by an additional class notation related to automated installation, are fitted for essential machinery, they are to be tested to demonstrate that they are in satisfactory condition.

## **3.8 Safety instrument, Gas and Fire detection, protection and extinction**

**3.8.1** The Owner or his representative is to declare to the attending Surveyor that no significant changes have been made to the arrangement of structural fire protection.

Note 1: Attention is drawn to the provisions of Ch 1, Sec 1, [3.1.1] regarding compliance with any additional and/or more stringent requirements issued by the Administration of the State whose flag the ship is entitled to fly.

**3.8.2** The class renewal survey of gas and fire prevention arrangements is to cover the following items.

- a) visible parts of items forming part of structural fire protection arrangements in accommodation spaces and in machinery spaces such as bulkheads, decks, doors, stairways, crew and service lift trunks, and light and air trunks are to be examined, due attention being given to their integrity and that of the insulating material
- b) the operation of manual/automatic fire doors, where fitted, is to be checked
- c) remote controls for stopping fans and machinery and shutting off fuel supplies in machinery spaces and, where fitted, remote controls for stopping fans in accommodation spaces and means of cutting off power to the galley are to be tested
- d) closing arrangements of ventilators, funnel annular spaces, skylights, doorways and tunnels, where applicable, are to be tested
- e) gas and/or Fire and/or smoke detection and alarm systems are to be tested.

**3.8.3** The survey requirements for all types of fire-fighting systems that are usually found on board units related either to machinery spaces or to storage areas and/or spaces or to accommodation spaces, irrespective of the service notation assigned, are the following:

- a) Water fire system:
  - the associated pumps are to be opened up and examined at the Surveyor's discretion
  - the fire main is to be hydrostatically tested to the working pressure at the Surveyor's discretion.

b) Fixed gas fire-extinguishing system:

Receivers of CO<sub>2</sub> (or other gas) fixed fire-extinguishing systems are to be externally examined together with all stationary fittings and devices. In addition, the following applies:

- the total loss of CO<sub>2</sub> is not to exceed 10% of the installed quantity (5% for Halon)
- after being repaired or discharged, containers are to be subjected to a hydrostatic test
- hydrostatic testing of high pressure CO<sub>2</sub> containers is to be carried out at intervals not exceeding 10 years; the number of the tested containers is to be not less than 10% of the total number
- low pressure CO<sub>2</sub> containers are to be internally inspected if the content has been released and the container is older than five years; depending upon the result of the internal examination, the Surveyor may require the container to be hydrostatically tested.

It is to be checked that the distribution pipework is proved clear.

c) Sprinkler system:

- the associated pumps are to be opened up and examined at the Surveyor's discretion.

d) Water spraying system:

- the associated pumps are to be opened up and examined at the Surveyor's discretion
- a working test is to be carried out as far as reasonable and appropriate.

e) Fixed foam systems (low or high expansion):

- the associated pumps are to be opened up and examined at the Surveyor's discretion.

f) Dry powder system:

- it is to be verified that the propelling inert gas bottles have been hydrostatically tested. The same applies to bottles disembarked for refilling or embarked for replacement.

**3.8.4** As far as other fire-fighting equipment is concerned, the following items are to be hydrostatically tested, at intervals not exceeding 10 years:

- any CO<sub>2</sub> bottles of extinguishers
- shells of foam extinguishers
- shells of powder extinguishers
- air or gas bottles associated with fire extinguishers whose shells are not kept under pressure (if internally examined, the test need not be performed).

**3.8.5** Where a helideck is fitted, the following is to be checked, as far as appropriate:

- drainage arrangements around the landing area
- fire fighting appliances and arrangements (to be surveyed as per [3.8.3] and [3.8.4], according to the equipment installed)
- other arrangements for helicopter refuelling and hangar facilities (fuel system, ventilation, fire protection and detection).

### **3.9 Other systems**

**3.9.1** For units including piping systems containing corrosive substances, such as not degassed drilling mud, the survey includes:

- examination of corresponding gauging devices, high level alarms, valves associated with overflow control and gas detectors
- confirmation that the remote operation of the corresponding pump room bilge is satisfactory
- confirmation that corresponding pump room rescue arrangements are in order
- confirmation that corresponding ventilation system is satisfactory.

**3.9.2** For self-elevating units, the Surveyor satisfies himself of the condition of the leg jacking systems including pinions, gears, wedges, locking pins, brakes and their powering sources, or other mechanisms for self-elevation and for leg securing (rack choke), that they are surveyed, opened up as deemed necessary and functionally tested.

Electrical equipment for the jacking system is to be externally examined, opened up if deemed necessary and functionally tested.

**3.9.3** For TLP, tensioning system is to be checked according to the specification.

## Section 5

# Scope of Surveys for Offshore Drilling Units

## 1 General

### 1.1 Application

**1.1.1** The requirements apply to all mobile offshore drilling units after their construction, which have been assigned one of the following service notations:

- **offshore ship - drilling**
- **offshore barge - drilling**
- **column stabilized unit - drilling**
- **self-elevating unit - drilling**

Note 1: The Society reserves the right to apply the requirements of this Section to non-drilling offshore units.

**1.1.2** The requirements apply to surveys of the hull, structure, equipment, and machinery subject to classification.

**1.1.3** The thickness measurement requirements for renewal surveys have been incorporated into Tab 1 to Tab 4.

**1.1.4** Prior to the commencement of any part of the class renewal survey and intermediate survey, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance and the thickness measurement company representative, where involved.

## 1.2 Definition

### 1.2.1 Ballast tank

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

### 1.2.2 Preload tank

A preload tank is a tank within the hull of a self-elevating unit. These tanks are periodically filled with salt water ballast and used to preload the footings of the unit prior to commencing drilling operations. Preload tanks are considered equivalent to ballast tanks.

### 1.2.3 Spaces

Spaces are separated compartments.

### 1.2.4 Coating condition

Coating condition is defined as follows:

- GOOD condition with only minor spot rusting
- FAIR condition with local breakdown at edges of stiffeners and weld Connections and/or light rusting over 20% or more of areas under consideration, but less than as defined for POOR condition
- POOR condition with general breakdown of coating over 20% or more of areas or hard scale at 10% or more of areas under consideration

### 1.2.5 Close-up survey

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

### 1.2.6 Girth Belt

A transverse section (girth belt) includes all continuous longitudinal members such as plating, longitudinals and girders at a given section of the unit.

For columns of column stabilized units and TLP, the girth belt may be considered as an horizontal section including continuous vertical members suchs as plating, vertical stiffeners and vertical girders.

### 1.2.7 Representative spaces

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

### 1.2.8 Critical structural area

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

### 1.2.9 Suspect area

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

### 1.2.10 Substantial corrosion

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

### 1.2.11 Excessive diminution

Excessive diminution is an extent of corrosion beyond allowable limits.

### 1.2.12 Corrosion prevention system

A corrosion prevention system is normally considered a full hard protective coating.

Hard protective coating is usually to be epoxy coating or equivalent. Other coating systems, which are neither soft nor semi-hard coatings, may be considered acceptable as alternatives provided that they are applied and maintained in compliance with the manufacturer's specifications.

### 1.2.13 Prompt and thorough repair

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

### 1.2.14 Special consideration

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

### 1.2.15 Propulsion assist

Propulsion assist are non-self-propelled units fitted with thrusters intended to assist in manoeuvring or propelling while under tow.

## 1.3 Repairs

**1.3.1** Any damage in association with wastage over the allowable limits (including buckling, grooving, detachment or fracture), or extensive areas of wastage over the allowable limits, which affects or, in the opinion of the Surveyor, will affect the unit's structural, watertight or weathertight integrity, is to be promptly and thoroughly repaired (see [1.2.13]).

For locations where adequate repair facilities are not available, consideration may be given to allow the unit to proceed directly to a repair facility. This may require temporary repairs for the intended voyage.

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

**1.3.3** Where the damage mentioned in [1.3.1] is isolated and of a localised nature which does not affect the unit's structural integrity, consideration may be given by the Surveyor to allow an appropriate temporary repair to restore watertight or weather tight integrity and impose a condition of class with a specific time limit.

## 2 Annual survey

### 2.1 Schedule

**2.1.1** Annual surveys are to be held within 3 months before or after each anniversary date from the date of the initial classification survey or the completion for the last class renewal survey.

### 2.2 Scope

**2.2.1** The survey consists of an examination for the purpose of verifying, as far as practicable, that the hull, structure, equipment, and machinery are maintained in accordance with the applicable rule requirements.

### 2.3 Annual survey - Hull, structure and equipment

**2.3.1** At each annual survey the exposed parts of the hull, deck, deck house, structures attached to the deck, derrick substructure, including supporting structure, accessible internal spaces, and the applicable parts listed in [2.3.4] to [2.3.7] are to be generally examined and placed in satisfactory condition as found necessary.

**2.3.2** The Surveyors are to be satisfied at each annual survey that no material alterations have been made to the unit, its structural arrangements, subdivision, superstructure, fittings, and closing appliances upon which the stability calculations or the load line assignment is based.

**2.3.3** Suspect areas identified at previous surveys are to be examined. Thickness measurements are to be taken of the areas of substantial corrosion and the extent of thickness measurements is to be increased to determine areas of substantial corrosion. Tab 4 may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the annual survey is credited as completed.

#### **2.3.4 All drilling units**

The following items are to be examined:

- Accessible hatchways, manholes and other openings.
- Machinery casings and covers, companionways, and deck houses protecting openings.
- Portlights together with deadcovers, cargo ports and similar openings in hull sides, ends, or in enclosed superstructures.
- Ventilators, tank vent pipes together with flame screens, and overboard discharges from enclosed spaces.
- Watertight bulkheads and end bulkheads of enclosed superstructures.
- Closing appliances for all the above, including hatchcovers, doors, together with their respective securing devices, dogs, sill, coamings and supports.
- Freeing ports together with bars, shutters and hinges.
- Windlass and attachment of anchor racks and anchor cables.
- Protection of the crew, guard rails, lifelines, gangways, and deck houses accommodating crew.

#### **2.3.5 Surface type units**

In addition to the requirements of [2.3.4] the following items are to be examined:

The hull and deck structure around the drilling well (moon-pool) and in vicinity of any other structural changes in section, slots, steps, or openings in the deck or hull and the back-up structure in way of structural members or sponsons connecting to the hull.

#### **2.3.6 Self elevating units**

In addition to the requirements of [2.3.4] the following items are to be examined:

- jack-house structures and attachments to upper hull or platform
- jacking or other elevating systems and leg guides, externally
- legs as accessible above the waterline
- plating and supporting structure in way of leg wells.

#### **2.3.7 Column stabilized units and TLP**

In addition to the requirements of [2.3.4] the following items are to be examined:

Columns, diagonal and horizontal braces together with any other parts of the upper hull supporting structure as accessible above the waterline.

Note 1: At the 1st annual survey after construction, column stabilized and self elevating units may be subject to examination of major structural components including non-destructive testing, as deemed necessary by the Society. If the Society deems such survey to be necessary, the extent should be agreed to by the Society and the Owner or operator prior to commencement of the survey.

### **2.4 Annual survey - Machinery**

#### **2.4.1 Self propelled units**

A general examination of main and auxiliary engines, boilers, steering machinery, pumps, pipings, electrical installation including those in hazardous areas, and fire extinguishing systems is to be carried out.

#### **2.4.2 Non-self propelled units**

A general examination of items required for classification such as auxiliary machinery, pumps, piping, electrical installation in hazardous areas and fire extinguishing systems is to be carried out.

#### **2.4.3 Units with propulsion-assist or dynamic positioning**

Propulsion-assist and dynamic positioning equipment should be surveyed on the basis of annual survey - machinery.

### **2.5 Annual survey - Electrical equipment**

**2.5.1** A general examination of electrical machinery, the emergency sources of electrical power, the switchgear, and other electrical equipment, including operation of same is to be carried out. The operation of the emergency sources of power, including their automatic operation, is to be confirmed as far as practicable.

## 2.6 Annual survey - Shipboard automatic and remote control systems

**2.6.1** A general examination of the automatic and remote-control system is to be made to the Surveyor's satisfaction. The machinery-space fire-detection and bilge water-level alarms are to be tested to confirm satisfactory operation.

## 2.7 Annual survey - Special features

**2.7.1** A general examination of hazardous areas, remote shutdown arrangements, fire fighting systems, self-elevating systems, piping systems, and bilge systems is to be made.

# 3 Intermediate survey

## 3.1 Schedule

**3.1.1** Intermediate surveys are to be held within 3 months before or after the second anniversary date, or within three months before or after the third anniversary date, after completion of the previous class renewal survey.

The Intermediate survey may replace the annual survey due on the second or the third anniversary date, after completion of the previous class renewal survey.

## 3.2 Scope

**3.2.1** The intermediate survey is to include, in addition to the requirements as outlined in Article [2], examination and checks on a sufficiently extensive part of the structure to show that the structures of the unit are in satisfactory condition so that the unit is expected to operate until the end of the current period of class, provided that the unit is properly maintained and other surveys for maintenance of class are duly carried out during this period.

**3.2.2** The examinations of the hull are to be supplemented by thickness measurements, if considered necessary by the surveyor, and testing as required, to verify the structural integrity. The aim of the examination is to discover excessive diminution, substantial corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

**3.2.3** The intermediate survey is to include examination of underwater parts as outlined in Article [7].

## 3.3 Ballast spaces

### 3.3.1 General

In conjunction with drydocking surveys (or equivalent) after class renewal survey No.1 and between subsequent class renewal surveys, the ballast spaces mentioned in [3.3.2] to [3.3.5] are to be internally examined, thickness gauged if considered necessary by the Surveyor, placed in satisfactory condition as found necessary, and reported upon. If such examination reveals no visible structural defects, the examination may be limited to a verification that the corrosion prevention arrangements remain effective.

### 3.3.2 All units

Particular attention is to be given to corrosion prevention systems in ballast spaces, free-flooding areas and other locations subjected to sea water from both sides.

### 3.3.3 Surface type units

One peak tank and at least two other representative ballast tanks between the peak bulkheads used primarily for water ballast are to be examined by the attending Surveyor in accordance with [3.3.1].

### 3.3.4 Self-elevating units

Representative ballast tanks or free-flooding compartments in mat or spud cans, if accessible, and at least two representative hull pre-load tanks are to be examined by the attending Surveyor in accordance with [3.3.1].

### 3.3.5 Column stabilized units and TLP

Representative ballast tanks in footings, lower hulls, or free-flooding compartments as accessible, and at least two ballast tanks in columns or upper hull, if applicable are to be examined by the attending Surveyor in accordance with [3.3.1].

## 3.4 Critical areas

**3.4.1** Examination will be made of particularly critical areas of the structure such as:

- inside of bracings for semi-submersible units
- leg-hull connection of self-elevating units
- structure around corners of moon pool or other large openings
- other critical areas, as found necessary by the Surveyor.

### **3.5 Electrical equipment in hazardous areas**

**3.5.1** In addition to annual surveys [2.5] to [2.7], electrical equipment in hazardous areas will be examined and tested, with particular attention to:

- protective earthing
- integrity of flame-proof enclosures
- integrity of pressurised enclosures and associated fittings
- condition of increased safety equipment
- condition of cabling (damage to outer sheath, corrosion or metal braiding)
- interlocking systems of electrical power supply to spaces protected by air locks such as electric motors rooms, storage control rooms
- operation of pressurised equipment and functioning of alarms.

## **4 Class renewal survey**

### **4.1 Schedule**

**4.1.1** Class renewal surveys of hull, structure, equipment, and machinery are to be carried out at 5 year intervals to renew the Classification Certificate(s).

**4.1.2** The first class renewal survey is to be completed within 5 years from the date of the initial classification survey and thereafter within 5 years from the credited date of the previous class renewal survey. Extensions of class beyond the 5th year may be granted in exceptional circumstances. In this case the next period of class will start from the expiry date of the class renewal survey before the extension was granted.

**4.1.3** For survey completed within 3 months before the expiry date of the class renewal survey, the next period of class will start from the expiry date of the class renewal survey. For survey completed more than three months before the expiry date of the class renewal survey, the period of class will start from the survey completion date.

**4.1.4** The class renewal survey may be commenced at the 4th annual survey and be progressed with a view to completion by the 5th anniversary date. When the class renewal survey is commenced prior to the 4th annual survey, the entire survey is to be completed within 15 months if such work is to be credited to the class renewal survey.

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

**4.1.6** When considered necessary by the Society the interval between class renewal surveys may be reduced.

**4.1.7** Class renewal survey requirements of units of unusual design, in lay-up or in unusual circumstances will be determined on an individual basis.

**4.1.8** At the request of the Owner, and upon the Society's approval of the proposed arrangements, a system of continuous survey may be undertaken whereby the class renewal survey requirements are carried out in regular rotation to complete all the requirements of the particular class renewal survey within a five year period. Any defects that may affect classification found during the survey, are to be reported to the Society and dealt with to the satisfaction of the Surveyor.

### **4.2 Scope**

**4.2.1** The class renewal surveys shall include, in addition to surveys outlined in Article [2], the following examinations, tests, and checks of sufficient extent to verify that the hull, structure, equipment, and machinery are in satisfactory condition in compliance with the applicable Rule requirements for the new period of class of 5 years to be assigned, subject to proper maintenance and operation and the periodical surveys carried out at the due dates.

**4.2.2** The examinations of the hull are to be supplemented by thickness measurements and testing as required, to verify the structural integrity. The aim of the examination is to discover excessive diminution, substantial corrosion, significant deformation, fractures, damages or other structural deterioration, that may be present.

**4.2.3** The class renewal survey is to include examination of underwater parts as outlined in Article [7].

**Table 1 : Minimum requirements for thickness measurements for surface-type units at class renewal survey**

Age of unit (in years at time of class renewal survey)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Suspect areas	Suspect areas	Suspect areas	Suspect areas
	One transverse section of deck plating abreast the moon pool opening within the amidships 0.6L, together with internals in way as deemed necessary. Where unit is configured with side ballast tanks, the plating and internals of the tanks are also to be gauged in way of the section chosen	Two transverse sections (Girth Belts) of deck, bottom and side plating abreast the moon pool and one hatch opening within the amidships 0.6L together with internals in way as deemed necessary. Where unit is configured with side ballast tanks, the plating and internals of the tanks to be gauged in way of the required belts, Remaining internals in ballast tanks to be gauged as deemed necessary	A minimum of three transverse sections (Girth Belts) of deck, bottom, side, and longitudinal-bulkhead plating in way of the moon pool and other areas within the amidships 0.6L, together with internals in way (including in perimeter ballast tanks, where fitted in way of belts)
	Moon pool boundary bulkhead plating	Moon pool boundary bulkhead plating	Moon pool boundary bulkhead plating
		Internals in forepeak tank and aft peak tank as deemed necessary	Internals in forepeak and after peak tanks as deemed necessary
			Lowest stoke of all transverse bulkheads in hold spaces. Remaining bulkhead plating to be gauged as deemed necessary
			All plates in two wind and water strakes, port and starboard, full length
			All exposed main deck plating full length and all exposed first-tier super-structure deck plating (poop, bridge and forecastle decks)
			All keel plates full length plus additional bottom plating as deemed necessary by the Surveyor, particularly in way of cofferdams and machinery spaces
			Duct keel or pipe tunnel plating or pipe tunnel plating and internals as deemed necessary
			Plating of sea chests. Shell plating in way of overboard discharges as considered necessary by the attending surveyor

**Note 1:** Thickness measurement locations are to be selected to provide the best representative sampling of areas likely to be most exposed to corrosion, considering ballast history and arrangement and condition of protective coatings.

**Note 2:** Thickness measurements of internals may be specially considered by the Surveyor if the hard protective coating is in GOOD condition.

**Note 3:** For units less than 100 meters in length, the number of transverse sections required at class renewal survey No.3 may be reduced to one (1), and the number of transverse sections required at subsequent class renewal surveys may be reduced to two (2).

**Note 4:** For units more than 100 meters in length, at class renewal survey No.3, thickness measurements of exposed deck plating within amidship 0,5 L may be required.

#### 4.3 Class renewal survey No.1 - Hull structure and equipment

##### 4.3.1 All drilling units

The following parts are to be examined:

- The hull or platform structure including tanks, watertight bulkheads and deck, cofferdams, void spaces, sponsons, chain lockers, duct keels, helicopter deck and its supporting structure, machinery spaces, peak spaces, steering gear spaces, and all other internal spaces are to be examined externally and internally for damage, fractures, or excessive diminution. Thickness gauging of plating and framing may be required where wastage is evident or suspected.
- All tanks, compartments and free-flooding spaces throughout the drilling unit are to be examined externally and internally for excess wastage or damage.

- c) Internal examinations of spud cans and mats may be specially considered.
- d) Watertight integrity of tanks, bulkheads, hull, decks and other compartments is to be verified by visual inspection.
- e) Suspect areas and critical structural areas should be examined and may be required to be tested for tightness, non-destructive tested or thickness gauged.
- f) All primary and special application structures and identified critical structural areas are to be subjected to close up survey. Primary application structures are structural elements essential to the overall integrity of the unit. Special application structures are those portions of primary structural elements which are in way of critical load transfer points, stress concentrations, etc.
- g) Tanks and other normally closed compartments are to be ventilated, gas freed and cleaned as necessary to expose damages and allow meaningful examination and thickness gauging in case of excessive diminution.
- h) Internal examination and testing of void spaces, compartments filled with foam or corrosion inhibitors, and tanks used only for lube oil, light fuel oil, diesel oil, fresh water, drinking water or other non-corrosive products may be waived provided that upon a general examination the Surveyor considers their condition to be satisfactory. External thickness gauging may be required to confirm corrosion control.
- i) Structures such as derrick substructure and supporting structure, jack-houses, deck houses, superstructures, helicopter landing areas, raw water (sea water intake) towers and their respective attachments to the deck or hull.
- j) Windlass and attachments of anchor racks and anchor cable fairleads.
- k) Foundations and supporting headers, brackets, and stiffeners for drilling related apparatus, where attached to hull, deck, superstructure or deck house.
- l) Thickness gaugings are to be carried out where wastage is evident or suspect.
- m) Where provided, the condition of corrosion prevention system of ballast tanks is to be examined. Where a hard protective coating is found in POOR condition and it is not renewed, where soft or semi-hard coating has been applied, or where a hard protective coating was not applied from time of construction, the tanks in question are to be examined at a frequency determined by the classification society. Thickness measurements are to be carried out as deemed necessary by the Surveyor.
- n) Thickness measurements are to be carried out in accordance with Tab 1, Tab 2 or Tab 3 as applicable. The Surveyor may extend the thickness measurements as deemed necessary. When thickness measurements indicate substantial corrosion, the extent of thickness measurements is to be increased to determine areas of substantial corrosion. Tab 4 may be used as guidance for these additional thickness measurements. These extended thickness measurements are to be carried out before the survey is credited as completed.

#### **4.3.2 Surface type units**

In addition to the requirements of [4.3.1] the following items are to be examined:

Structural appendages and ducts for positioning units.

#### **4.3.3 Self-elevating units**

Primary applications structures are:

- a) External plating of cylindrical legs.
- b) Plating of all components of lattice type legs.
- c) Combination of bulkhead, deck, side and bottom plating within the upper hull which form "Box" or "I" type main supporting structure.
- d) Jack-house supporting structure and bottom footing structure which receives initial transfer of load from legs.
- e) Internal bulkheads, shell and deck of bottom mat supporting structure which are designed to distribute major loads, either uniform or concentrated, into the mat structure.

Special application structures are:

- a) Vertical columns in way of intersection with the mat structure.
- b) Intersections of lattice type leg structure which incorporate novel construction, including the use of steel castings.

In addition to the requirements of [4.3.1] the following items are to be examined:

- All legs, including chords, diagonal and horizontal braces, gussets, racks, joints, together with leg guides. Tubular or similar type legs are to be examined externally and internally, together with internal stiffeners and pinholes as applicable.
- Structure in, around and under jack-house and leg wells. Non-destructive testing of these areas may be required.
- Leg jacking or other elevating systems externally.
- Leg connections to bottom mats or spud cans, including non-destructive testing of leg connections to mats or spud cans.
- Jetting piping systems or other external piping, particularly where penetrating mats or spud cans.
- Spud cans or mats. Where the spud cans or mat are partly or entirely obscured below the mud line where the class renewal survey is otherwise being completed, consideration may be given to postponement of the examinations until the next Rig move.

**Table 2 : Minimum requirements for thickness measurements for self-elevating units at class renewal survey**

Age of the unit (years)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Suspect areas (particular attention to be paid to the legs in way of the Splash Zone)	Suspect areas	Suspect areas	Suspect areas
	Legs in way of Splash Zone	Legs in way of Splash Zone	Legs in way of Splash Zone
	Primary application structures where wastage is evident	Representative gaugings, throughout, of special and primary application structures	Comprehensive gaugings, throughout, of special and primary application structures
	Representative gaugings of upper hull deck and bottom plating and internals of one preload (ballast) tank	Leg well structure	Leg well structure
		Representative gaugings of deck, bottom, and side shell plating of hull and mat	Representative gaugings of deck, bottom, and side shell plating of hull and mat
		Representative gaugings of upper hull deck and bottom plating and internals of at least two preload (ballast) tanks	Substructure of derrick as deemed necessary
			Representative gaugings of internals of all preload (ballast) tanks

**Note 1:** Structural application designation (Special, Primary, Secondary) are defined in [4.3.1] and [4.3.3].

#### 4.3.4 Column stabilized units and TLP

Primary application structures are:

- External shell structure of vertical columns, lower and upper hulls, and diagonal and horizontal braces.
- Deck plating, heavy flanges, and bulkhead within the upper hull or platform which form "Box" or "I" type supporting structure which do not receive major concentrated loads.
- Bulkheads, flats or decks and framing which provide local re-inforcement or continuity of structure in way of intersections except areas where the structure is considered special application.

Special application structures are:

- External shell structure in way of intersections of vertical columns, decks and lower hulls.
- Portions of deck plating, heavy flanges, and bulkheads within the upper hull or platform which form "Box" or "I" type supporting structure which receive major concentrated loads.
- Major intersections of bracing members.
- External brackets, portions of bulkheads, flats, and frames which are designed to receive concentrated loads at intersections of major structural members.
- "Through" material used at connections or vertical columns, upper platform decks, and upper or lower hulls which are designed to provide proper alignments and adequate load transfer.

In addition to the requirements of [4.3.1] the following items are to be examined:

- Connections of columns and diagonals to upper hull, structure or platform and lower hull, structure or pontoons.
- Joints of supporting structure including diagonals, braces and horizontals, together with gussets and brackets.
- Internal continuation or back-up structure for the above.
- Non-destructive examination of these areas may be required.

#### 4.4 Class renewal survey No.2 and subsequent class renewal surveys - Hull, structure and equipment

**4.4.1** These surveys are to be at least as comprehensive as class renewal survey No.1, with special attention being given to the condition and thickness of material in high corrosion areas. Representative gaugings will be required as per Tab 1 to Tab 4. Special attention should be paid to splash zones on structure, legs or related structure, and in ballast tanks, pre-load tanks, free-flooding spaces, spud cans and mats.

**Table 3 : Minimum requirements for thickness measurements for column-stabilized and TLP units at class renewal survey**

Age of the unit (years)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Suspect areas	Suspect areas	Suspect areas	Suspect areas
Columns and bracings where wastage is evident in Splash Zone	Representative gaugings of columns and bracings in Splash Zone together with internals in way as deemed necessary	Representative gaugings, throughout, of special and primary application structures	Comprehensive gaugings, throughout, of special and primary application structures
	Special and primary application structure where wastage is evident	One Transverse Section (Girth Belt) of each of 2 columns and 2 bracings in Splash Zone together with internals in way as deemed necessary	One Transverse Section (Girth Belt) of each of one-half of the columns and bracings in Splash Zone and internals in way as deemed necessary (i.e., gauge half of the unit's columns and bracings in Splash Zone).
		Lower hulls in way of mooring lines where wastage is evident	Lower hulls in way of mooring lines where wastage is evident
		One Transverse Section (Girth Belt) of each lower hull between one set of columns	One Transverse Section (Girth Belt) of each lower hull between one set of columns
			Representative gaugings of substructure of drilling derrick

**Note 1:** Structural application designation (Special, Primary, Secondary) are defined in [4.3.1] and [4.3.4].

**Table 4 : Guidance for additional thickness measurements in way of substantial corrosion**

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

## 4.5 Class renewal surveys - Machinery

### 4.5.1 General

Machinery installations of all types of units are to undergo class renewal surveys at intervals consistent with the class renewal survey of the hull, in order that both may be recorded concurrently.

### 4.5.2 Non-self-propelled units

In addition to the requirements for annual surveys, at each class renewal survey, special attention is to be given to the following items as applicable:

- All openings to the sea, including sanitary and other overboard discharges, together with cocks and valves connected therewith are to be examined internally and externally while the unit is in drydock, or at the time of underwater examination in lieu of drydocking, and the fastenings to the shell plating are to be renewed when considered necessary by the Surveyor.
- Pumps and pumping arrangements, including valves, cocks, pipes and strainers are to be examined. Non-metallic flexible expansion pieces in the main salt water circulating system are to be examined internally and externally. The Surveyor is to be satisfied with the operation of the bilge and ballast systems. Other systems are to be tested as considered necessary.
- The foundations of machinery are to be examined.
- Heat exchangers and other unfired pressure vessels within the scope of classification are to be examined, opened up or thickness gauged and pressure tested as considered necessary, and associated relief valves proved operable. Evaporators that operate with a vacuum on the shell need not be opened, but may be accepted on basis of satisfactory external examination and operational test or review of operating records.

### 4.5.3 Self-propelled units

In addition to the requirements for non-propelled units, the main and auxiliary propulsion machinery, including associated pressure vessels should be surveyed. In addition, examination of the steering machinery is to be carried out, including an operational test and checking or relief-valve settings. The machinery may be required to be opened for further examination as considered necessary by the Surveyor.

### 4.5.4 Units with propulsion - Assist or dynamic position

Propulsion-assist and dynamic positioning equipment should be surveyed on the basis of class renewal survey - Machinery.

## 4.6 Class renewal survey - Electrical equipment

**4.6.1** In addition to the requirements for annual surveys, at each class renewal survey, special attention is to be given to the following items as applicable:

- Fittings and connections on main switchboards and distribution panels are to be examined, and care is to be taken to see that no circuits are overfused.
- Cables are to be examined as far as practicable without undue disturbance of fixtures.
- All generators are to be run under load, either separately or in parallel. Switches and circuit breakers are to be tested.
- All equipment and circuits are to be inspected for possible development of physical changes or deterioration. The insulation resistance of the circuits is to be measured between conductors and between conductors and ground and these values compared with those previously measured.
- Electrical auxiliaries installed for vital purposes, generators and motors are to be examined and their prime movers opened for inspection. The insulation resistance of each generator and motor is to be measured.
- The windings of main propulsion generators and motors are to be thoroughly examined and found or made dry and clean. Particular attention is to be paid to the ends of all windings of stators and rotors.
- Emergency power systems are to be examined and tested.

## 4.7 Class renewal survey - Shipboard automatic and remote control systems

**4.7.1** In addition to the requirements of annual surveys the following parts are to be examined:

- Control actuators:  
All mechanical, hydraulic, and pneumatic control actuators and their power systems are to be examined and tested as considered necessary.
- Electrical equipment:  
The insulation resistance of the windings of electrical control motors or actuators is to be measured, with all circuits of different voltages above ground being tested separately to the Surveyor's satisfaction.
- Unattended plants:  
Control systems for unattended machinery spaces are to be subjected to dock trials at reduced power on the propulsion engine to verify the proper performance of all automatic functions, alarms, and safety systems.

## 4.8 Class renewal survey - Special features (all types)

### 4.8.1 General

Mobile offshore drilling units may have many items of machinery and electrical equipment not found on conventional vessels. Certain of these items are required for classification even if the unit is without propulsion machinery. Items to be especially examined and reported upon at all surveys are as given in [4.8.2] to [4.8.7].

### 4.8.2 Hazardous areas

Enclosed hazardous areas such as those containing open active mud tanks, shale shakers, degassers and desanders are to be examined and doors and closures in boundary bulkheads verified as effective. Electric lighting, electrical fixtures, and instrumentation are to be examined, proven satisfactory and verified as explosion-proof or intrinsically safe. Ventilating systems including ductwork, fans, intake and exhaust locations for enclosed restricted areas are to be examined, tested and proven satisfactory. Ventilating air alarm systems to be proven satisfactory. Electrical motors are to be examined including closed-loop ventilating systems for large D-C motors. Automatic power disconnect to motors in case of loss of ventilating air is to be proved satisfactory.

### 4.8.3 Remote shutdown arrangements

Remote shutdown for fuel-oil transfer service pumps and ventilating equipment, together with oil tank outlet valves where required to be capable of being remotely closed are to be proved satisfactory. Emergency switch(s) for all electrical equipment including main and emergency generators, except alarm and communication systems and lighting in vital areas such as escape routes and landing platforms, are to be proved satisfactory.

### 4.8.4 Fire fighting systems

A general examination of the fire detection and extinguishing systems is to be made in order that the Surveyor may be satisfied with its efficient state. The following items are to be especially examined:

- fire hoses, nozzles, and spanners at each fire station
- servicing of all portable extinguishers
- weighing and re-charging as necessary of all dry chemical and CO<sub>2</sub> extinguishers
- fire pumps and piping including operation and capacity
- alarm systems including fire and gas detection.

#### **4.8.5 Self-elevating systems**

On self elevating type mobile offshore drilling units, the elevating systems are to be examined and reported on. Pinions and gears of the climbing pinion gear train of rack and pinion systems are to be examined, as far as practicable, to the Surveyor's satisfaction by an effective crack detection method.

#### **4.8.6 Piping systems**

Piping systems used solely for drilling operations and complying either with the Society's requirements or a recognized standard are to be examined, as far as practical, operationally or hydrostatically tested to working pressure, to the satisfaction of the Surveyor.

#### **4.8.7 Miscellaneous**

Bilge alarm systems, if fitted, to be tested.

### **5 Continuous Survey (CS)**

#### **5.1 General**

**5.1.1** Definitions, description and schedule for continuous surveys are given in Ch 2, Sec 1, [4.3].

#### **5.2 Scope**

**5.2.1** When the unit is under the continuous survey system for hull or machinery, the scope of the class renewal survey as described in [4] is carried out on a continuous basis over the period of class.

### **6 Alternative**

#### **6.1**

**6.1.1** As an alternative to the renewal and intermediate surveys provided for in Articles [4] and [3] respectively, the Society may, at the Owner's request, approve a continuous survey programme provided that the extent and frequency of the surveys are equivalent to renewal and intermediate surveys. A copy of the continuous survey programme, together with the record of the surveys, should be kept on board the unit.

### **7 Survey of the outside of unit's bottom (bottom survey) and related items**

#### **7.1 Schedule**

**7.1.1** There is to be a minimum of two examinations of the outside of the unit's bottom and related items during each five-year class renewal survey period. One such examination is to be carried out in conjunction with the class renewal survey. In all cases the interval between any two such examinations is not to exceed 36 months. For units operating in salt water for less than six (6) months each year, the survey interval may be increased by the Society.

**7.1.2** Consideration may be given at the discretion of the Society, to any special circumstances justifying an extension of the interval.

**7.1.3** Proposals for alternative means of examining the unit's bottom and related items while afloat may be considered, provided they are in general agreement with [7.3].

#### **7.2 Parts to be examined**

##### **7.2.1 Surface-type units**

- External surfaces of the hull, keel, stem, stern frame, rudder, nozzles, and sea strainers are to be selectively cleaned to the satisfaction of the attending Surveyor and examined together with appendages, the propeller, exposed parts of stern bearing assembly, rudder pintle and gudgeon securing arrangements, sea chest and strainers, and their fastenings.
- Propeller shaft bearing, rudder bearing, and steering nozzle clearances are to be ascertained and recorded.

##### **7.2.2 Self-elevating units**

- External surfaces of the upper hull or platform, spud cans, mat, underwater areas of legs, together with their connections as applicable, are to be selectively cleaned to the satisfaction of the attending Surveyor and examined.
- At each drydocking survey or equivalent, after class renewal survey No.2, the Surveyor is to be satisfied with the condition of the internal structure of the mat or spud cans. Leg connections to mat and spud cans are to be examined at each drydock survey or equivalent. Non-destructive testing may be required of areas considered to be critical by the Society or found to be suspect by the Surveyor.

### 7.2.3 Column-stabilized units and TLP

External surfaces of the upper hull or platform, footings, pontoons and columns from lower hulls, underwater areas of columns, nodes and pontoons, bracing and their connections, sea chests, and propulsion units as applicable, are to be selectively cleaned and examined to the satisfaction of the attending Surveyor. Non-destructive testing may be required of areas considered to be critical by the Society or found to be suspect by the Surveyor.

## 7.3 Specific requirements for in-water survey in lieu of drydocking survey for mobile offshore drilling units

### 7.3.1 General

Following are the procedures and conditions under which a properly conducted in-water inspection may be credited as equivalent to a drydocking survey for a mobile offshore drilling unit.

Note 1: Attention is drawn to the requirements of the additional class notation **INWATERSURVEY** which may be considered

### 7.3.2 Conditions

#### a) Limitations

Underwater inspection in lieu of drydocking survey may not be acceptable where there is record of abnormal deterioration or damage to the underwater structure; or where damage affecting the fitness of the unit is found during the course of the survey.

#### b) Thickness gauging and non-destructive testing

Underwater means of internal thickness measurements of suspect areas may be required in conjunction with the underwater inspection. Means for underwater non-destructive testing may also be required for fracture detection.

#### c) Plans and data

Plans and procedures for the drydocking survey (underwater inspection) are to be submitted for review in advance of the survey and made available on board. These should include drawings or forms for identifying the areas to be surveyed, the extent of underwater cleaning, non-destructive testing locations (including NDT methods), nomenclature, and for the recording of any damage or deterioration found.

#### d) Underwater conditions

The in-water visibility and the cleanliness of the hull below the waterline is to be clear enough to permit a meaningful examination which allows the surveyor and diver and/or ROV pilot to determine the condition of the plating, appendages and the welding. The Classification Society is to be satisfied with the methods of orientation of the divers/ROVs on the plating, which should make use where necessary of permanent markings on the plating at selected points. Overall or spot cleaning may be required.

### 7.3.3 Physical features

#### a) General

The physical features mentioned in items b) to e) are to be incorporated into the unit's design in order to facilitate the underwater inspection. When verified they will be noted in the unit's classification for reference at subsequent surveys.

#### b) Stern bearing

For self-propelled units, means are to be provided for ascertaining that the seal assembly on oil-lubricated bearings is intact and for verifying that the clearance or wear of the stern bearing is not excessive. For use of the wear gauges, up-to-date records of the base depths are to be maintained on board. Whenever the stainless-steel seal sleeve is renewed or machined, the base readings for the wear gauge are to be re-established and noted in the unit's records and in the survey report.

#### c) Rudder bearings

For self-propelled units with rudders, means and access are to be provided for determining the condition and clearance of the rudder bearings, and for verifying that all parts of the pintle and gudgeon assemblies are intact secure. This may require bolted access plates and a measuring arrangement.

#### d) Sea suctions

Means are to be provided to enable the diver to confirm that the sea suction openings are clear. Hinged sea suction grids would facilitate this operation.

#### e) Sea valves

For the drydocking survey (underwater inspection) associated with the class renewal survey, means must be provided to examine any sea valve.

### 7.3.4 Procedures

#### a) Exposed areas

An examination of the outside of the structure above the waterline is to be carried out by the Surveyor. Means and access are to be provided to enable the Surveyor to accomplish visual inspection and non-destructive testing as necessary.

b) Underwater areas

An examination of the entire unit below the waterline is to be carried out by an approved service supplier. (Refer to NR533 Approval of Service Suppliers.)

c) Damage areas

Damage areas are to be photographed. Internal examination, measurements, marking and thickness measurements of such locations may be necessary as determined by the attending Surveyor. Means are to be provided for location, orienting and identifying underwater surfaces in photographs or on video tapes.

**7.3.5 Alternatives**

The Society is prepared to consider alternatives to the above guidelines including remotely operated vehicles, provided means and details for accomplishing results are not less effective.

## **8 Items related to drilling equipment**

### **8.1 Application**

**8.1.1** The requirements given in present Section for drilling equipment are additional to those given in the relevant Sections of the present Chapter.

### **8.2 Annual survey and class renewal survey**

**8.2.1** The survey will consist of:

- Confirmation to be obtained that no new drilling equipment has been installed without previous notification to the Society.
- Verification of the structural supports of drilling equipment. Special attention is to be paid to heavy equipment foundations and pipe rack.
- Verification of the structural condition of the moonpool area, drill floor and derrick substructure. The condition of these with respect to mechanical damages and corrosion is to be examined.
- Verification of fire extinguishing/deluge systems for drill floor and well testing area. Verification of alarms, warnings and release arrangements.
- Checking of the availability of eye wash station and emergency shower in close proximity in the mud mixing area.
- Checking, as far as practicable, of the alarm activation in manned control rooms due to loss of pressurisation of high pressure equipment.
- General visual examination of the condition of high pressure equipment and piping. Check for absence of damages or excessive corrosion.
- Review of the records of inspections and tests of safety valves.
- Checking of the conditions of insulation of hot surfaces.

## **9 Propulsion system surveys (propeller shaft surveys)**

### **9.1 General**

**9.1.1** Definitions, scope and schedule for propulsion system surveys are given in the following Rules parts:

- Ch 2, Sec 1, [5.4] of the present Rules
- Pt A, Ch 2, Sec 2, [5.5] of Ship Rules
- Pt A, Ch 3, Sec 5 of Ship Rules.

### **9.2 Extension of intervals of propeller shaft surveys**

**9.2.1** Surveys are to be carried out in accordance with the Rules of the Society, except that in the case of mobile offshore drilling unit, due to low running hours on propeller shafts, extended intervals between propeller shaft surveys may be considered based on:

- Satisfactory diver's external examination of stern bearing and outboard seal area including wear check as far as is possible.
- Internal examination of the shaft area (inboard seals) in propulsion room(s).
- Confirmation of satisfactory lubricating oil records (oil loss rate, contamination).
- Examination/replacement of shaft seal elements in accordance with seal manufacturer's recommendations.

### **9.3 Other propulsion systems**

**9.3.1** Driving components serving the same purpose as the propeller shaft in other propulsion systems, such as directional propellers, vertical axis propellers, water jet units, dynamic positioning systems and thruster assisted mooring systems, are to be submitted to periodical surveys at intervals not exceeding five years.

## 10 Boilers survey

### 10.1 General

**10.1.1** Definitions, extent and schedule for boiler surveys are given in the following Rules parts:

- Ch 2, Sec 1, [5.5] of the present Rules
- Pt A, Ch 2, Sec 2, [5.6] of Ship Rules.
- Pt A, Ch 3, Sec 6 of Ship Rules.

### 10.2 Scope

**10.2.1** At each boiler survey the boilers, superheaters, and economizers are to be examined internally (water-steam side) and externally (fire side).

**10.2.2** Boiler mountings and safety valves are to be examined at each boiler survey and opened as considered necessary by the Surveyor.

**10.2.3** The proper operation of the safety valves is to be confirmed at each survey.

**10.2.4** When considered necessary by the Surveyor, the boilers and superheaters are to be subjected to hydrostatic pressure test.

## 11 Survey preplanning and record keeping

### 11.1 General

**11.1.1** Requirements for survey preplanning and record keeping are given in [4.1].

### 11.2 Survey programme

**11.2.1** A specific survey programme for renewal surveys and special continuous surveys must be worked out in advance of the renewal survey by the Owner in cooperation with the Classification Society. The survey programme shall be in written format.

### 11.3 Plans and procedures

**11.3.1** Plans and procedures for survey of the outside of the unit's bottom and related items are to be submitted for review in advance of the survey and made available on board. These should include drawings or forms for identifying the areas to be surveyed, the extent of hull cleaning, non-destructive testing locations (including NDT methods), nomenclature, and for the recording of any damage or deterioration found. Submitted data, after review by the Society, will be subject to revision if found to be necessary in light of experience.

## 12 Occasional surveys

### 12.1 General

**12.1.1** Definitions, procedures and requirements for occasional surveys (including damage, repairs, alterations and welding and replacement of materials) are given in the following Rules parts:

- Ch 2, Sec 1, [6] of the present Rules
- Pt A, Ch 2, Sec 2, [6] of Ship Rules.

### 12.2 Lay-up and reactivation surveys

**12.2.1** When the classification society is notified by the Owner that a unit has been laid-up, this status will be noted in the vessel's survey status and surveys falling due during lay-up may then be held in abeyance until the vessel reactivates, at which time they are to be brought up-to-date.

**12.2.2** Units which have been laid up and are returning to active service, regardless of whether the Classification Society has been previously informed that the vessel has been in lay-up, a reactivation survey is required. The requirements for the reactivation survey are to be specially considered in each case, having due regard being given to the status of surveys at the time of the commencement of lay-up, the length of the lay-up period and the conditions under which the vessel has been maintained during that period.

### 12.3 Damage survey

**12.3.1** It is the responsibility of the Owner/operator of the unit to report to the Society without delay any damage, defect or breakdown, which could invalidate the conditions for which a classification has been assigned so that it may be examined at the earliest opportunity by the Society's Surveyor(s). All repairs found necessary by the Surveyor are to be carried out to his satisfaction.

## **12.4 Repairs**

**12.4.1** Where repairs to hull, legs, columns or other structures, machinery or equipment, which affect or may affect classification, are planned in advance to be carried out, a complete repair procedure including the extent of proposed repair and the need for Surveyors attendance is to be submitted to and agreed upon by the Society reasonably in advance. Failure to notify the Society, in advance of the repairs, may result in suspension of the unit's classification until such time as the repair is redone or evidence submitted to satisfy the Surveyor that the repair was properly carried out. This applies also to repairs during voyage or on site.

**12.4.2** The above is not intended to include maintenance and overhaul to hull, other structures, machinery and equipment in accordance with recommended manufacturers procedures and established marine practice and which does not require Society approval; however, any repair as a result of such maintenance and overhauls which affects or may affect classification is to be noted in the units log and submitted to the Surveyor.

## **12.5 Alterations**

**12.5.1** No alterations which may affect classification are to be made to the hull or machinery of a classed unit unless plans of proposed alterations are submitted and approved by the Society before the work of alterations is commenced. Such work is to be carried out in accordance with approved plans and tested on completion as required by the Rules and to the satisfaction of the Surveyor.

## **12.6 Welding and replacement of materials**

**12.6.1** Welding of steels, including high strength structural steel, is to be to the satisfaction of the Society.

**12.6.2** Welding or other fabrication performed on steels of special characteristics or repairs or renewals of such steel or in areas adjacent to such steel is to be accomplished with procedures approved by the Society considering the special materials involved. Substitution of steels differing from those originally installed is not to be made without approval by the Society.

**12.6.3** The Society may reference IACS Recommendations No.11 - "Materials Selection Guideline for Mobile Offshore Drilling Units" when considering suitable replacement materials.

## **13 Preparation for survey**

### **13.1 Conditions for survey**

**13.1.1** Requirements for preparations and conditions for surveys are given in Pt A, Ch 2, Sec 2, [2.5] of Ship Rules.

### **13.2 Access to structures**

**13.2.1** Requirements for access to structures are given in Pt A, Ch 2, Sec 2, [2.6] of Ship Rules.

**13.2.2** For survey, means are to be provided to enable the surveyor to examine the hull structure in a safe and practical way.

**13.2.3** For survey in void compartments and water 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 and passages through structures
- lifts and movable platforms
- boats or rafts
- other equivalent means.

### **13.3 Equipment for survey**

**13.3.1** Requirements for equipment for surveys are given in Pt A, Ch 2, Sec 2, [2.7] of Ship Rules.

Reference should also be made to NR533 Approval of Service Suppliers.

**13.3.2** Thickness measurement is normally to be carried out by means of ultrasonic test equipment. The accuracy of the equipment is to be proven to the Surveyor as required.

Thickness measurements are to be carried out by an approved service supplier.

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

- radiographic equipment
- ultrasonic equipment
- magnetic particle equipment
- dye penetrant
- other acceptable NDT Techniques.

### **13.4 Survey offshore or at anchorage**

**13.4.1** Guidelines for use of boats or rafts for close-up surveys are given in Pt A, Ch 2, Sec 2, [2.5] of Ship Rules.

**13.4.2** Survey offshore or at anchorage may be accepted provided the Surveyor is given the necessary assistance from the personnel onboard.

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

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

**13.4.5** Surveys of tanks by means of boats or rafts may only be undertaken at the sole discretion of the Surveyor, who is to take into account the safety arrangements provided, including weather forecasting and ship response in reasonable sea conditions.

## Section 6

# Additional Surveys Related to Storage Area of Oil Storage Units

### 1 General

#### 1.1 Application

**1.1.1** The requirements of this Section apply after construction to all oil storage units, with or without production installations on board, which have been assigned one of the following notations:

**offshore ship - oil storage**

**offshore barge - oil storage**

**1.1.2** The requirements for hull surveys apply to the surveys of the hull structure and piping systems in way of storage tanks, process tanks integral to the hull, pump rooms, cofferdams, pipe tunnels and void spaces within the storage area and all salt water ballast tanks. They are additional to the requirements applicable to the remainder of the unit, given in Ch 2, Sec 2 to Ch 2, Sec 4 according to the relevant surveys. For survey of inert gas installations, refer to Ch 2, Sec 9.

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

**1.1.4** Prior to the commencement of any part of the class renewal survey and intermediate survey, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance and the thickness measurement company representative, where involved.

**1.1.5** The requirements for machinery surveys apply to surveys of the machinery and equipment in the storage area or dedicated to storage service systems and are additional to those given in Ch 2, Sec 2 to Ch 2, Sec 4 for all units.

#### 1.2 Documentation on board

**1.2.1** The Owner is to supply and maintain documentation on board as specified in Ch 4, Sec 3, [1.2.2] and Ch 4, Sec 3, [1.2.3], which is to be readily available for examination by the Surveyor. The documentation is to be kept on board for the lifetime of the unit.

**1.2.2** A survey report file is to be a part of the documentation on board consisting of:

- reports of structural surveys
- thickness measurement reports.

The survey report file is also to be available in the Owner's management office.

**1.2.3** The following additional supporting documentation is to be available on board:

- main structural plans of crude oil storage and ballast tanks
- previous repair history
- crude oil and ballast history
- extent of use of inert gas system and tank cleaning procedures
- ship's personnel reports on:
  - structural deterioration/defects in general
  - leakage in bulkheads and piping systems
  - condition of coatings or cathodic protection system, if any
- any other information that may help to identify suspect areas requiring inspection.

**1.2.4** Prior to survey, the Surveyor examines the documentation on board and its contents, which are used as a basis for the survey.

**1.2.5** The data and information on the structural condition of the unit collected during the survey are evaluated for acceptability and structural integrity of the unit's storage area.

**1.2.6** When a survey is split between different survey stations, a report is to be made for each portion of the survey. A list of items examined and/or tested (pressure testing, thickness measurements, etc.) and an indication of whether the item has been credited are to be made available to the next attending Surveyor(s), prior to continuing or completing the survey.

## 2 Annual survey - Hull items

### 2.1 Weather decks

**2.1.1** The survey is to include the:

- examination of crude oil storage tank openings, including gaskets, covers, coamings and screens
- examination of crude oil storage tank pressure/vacuum valves and flame screens
- examination of flame screens on vents to all bunker, oily ballast and slop tanks and void spaces, as far as practicable
- examination of crude oil, crude oil washing, bunker, ballast and vent piping systems, including remote control valves, safety valves and various safety devices, as well as vent masts and headers
- confirmation that wheelhouse doors and windows, sidescuttles and windows in superstructure and deckhouse ends facing the storage area are in satisfactory condition.

### 2.2 Crude oil storage pump rooms

**2.2.1** The survey is to include the:

- examination of all pump room bulkheads for signs of oil leakage or fractures and, in particular, the sealing arrangements of penetrations in these bulkheads
- examination of the condition of all piping systems.

### 2.3 Ballast tanks

**2.3.1** Ballast tanks are to be internally examined when required as a consequence of the results of the class renewal survey or the intermediate survey.

**2.3.2** For units above 15 years of age, all ballast tanks adjacent to (i.e. with a common plane boundary) a storage tank with any means of heating, where such heating is confirmed to be in use, are to be internally examined. For single sided units, tanks or areas in tanks where coating was found to be in GOOD condition at the previous intermediate or class renewal survey may be specially considered by the Society. For double sided units, ballast tanks which were found, at the previous intermediate or class renewal survey, to have no substantial corrosion within the tank and which were found in compliance with either of the following conditions:

- coating in GOOD condition, or
- coating of the common boundary, including adjacent structures, in GOOD condition and the coating of the remaining parts of the tank in FAIR condition

may be specially considered by the Society.

**2.3.3** When considered necessary by the Surveyor, thickness measurements are to be carried out and if the results indicate that substantial corrosion is present, the extent of the measurements is to be increased in accordance with Ch 4, Sec 3, Tab 4 or Ch 4, Sec 3, Tab 5 for double sided units. These extended thickness measurements are to be carried out before the survey is credited as completed.

Suspect areas identified at previous class renewal surveys are to be examined.

Areas of substantial corrosion identified at previous class renewal or intermediate survey are to have thickness measurements taken.

## 3 Annual survey - Crude oil storage machinery items

### 3.1 Storage area and crude oil pump rooms

**3.1.1** The Owner or his representative is to declare to the attending Surveyor that no modifications or alterations which might impair safety have been made to the various installations in dangerous zones without prior approval from the Society.

The survey is to include the:

- confirmation that potential sources of ignition in or near the crude oil pump rooms, such as loose gear, excessive product in bilge, excessive vapours, combustible materials, etc., are eliminated and that access ladders are in satisfactory condition
- examination, as far as practicable, of crude oil, bilge, ballast and stripping pumps for excessive gland seal leakage, verification of proper operation of electrical and mechanical remote operating and shutdown devices and operation of the pump room bilge system, and checking that pump foundations are intact
- confirmation that the ventilation system, including portable equipment, if any, of all spaces in the storage area (including crude oil pump rooms) is operational, ducting is intact, dampers are operational and screens are clean
- confirmation that electrical equipment in dangerous zones, crude oil pump rooms and other spaces is in satisfactory condition and has been properly maintained
- confirmation that the remote operation of the crude oil pump room bilge system is satisfactory
- examination of the heating system
- examination of the storage arrangement and confirmation that the unit's storage hoses are suitable for their intended purpose and in satisfactory condition
- confirmation that any special arrangement made for bow or stern loading/unloading is in satisfactory condition and test of the means of communication and remote shutdown of the crude oil pumps.

## **3.2 Instrumentation and safety devices**

**3.2.1** The survey is to include the:

- examination of crude oil storage tank gauging devices, high level alarms and valves associated with overflow control
- verification that installed pressure gauges on crude oil discharge lines are properly operational
- confirmation that the required gas detection instruments are on board and satisfactory arrangements have been made for the supply of any required vapour detection tubes
- confirmation that devices provided for measuring the temperature of the crude oil, if any, operate satisfactorily.

## **3.3 Fire-fighting systems in storage area**

**3.3.1** The survey is to include the:

- external examination of piping and cut-out valves of fixed fire-fighting systems related to crude oil storage tanks and crude oil pump rooms,
- confirmation, as far as practicable and when appropriate, that the remote means for closing the various openings are operable,
- examination of the appropriate portable fire-extinguishing equipment,
- examination of fire-fighting systems of any type fitted on board such as deck foam, water-spraying, etc., as applicable.

## **4 Intermediate survey - Hull items**

### **4.1**

**4.1.1** The survey of weather decks is to include the:

- examination, as far as applicable, of crude oil, crude oil washing, bunker, ballast, steam and vent piping systems as well as vent masts and headers. If upon examination there is any doubt as to the condition of the piping, pressure testing, thickness measurement or both may be required
- confirmation that storage pipes are electrically bonded to the hull
- examination of vent line drainage arrangements.

**4.1.2** The requirements for survey of salt water ballast tanks given in Tab 1 or Tab 2 for double sided units are to be complied with.

**Table 1 : Intermediate survey of salt water ballast tanks for single hull**

Age of unit (in years at time of intermediate survey)	
$5 < \text{age} \leq 10$	$10 < \text{age}$
Overall survey of one peak tank and at least two representative salt water ballast tanks between the peak bulkheads used primarily for water ballast, including combined oil storage/ballast tanks, where fitted, are to be internally examined and selected by the attending Surveyor. See (1), (2), (3) and (4)	
	Close-up survey in salt water ballast tanks of: <ul style="list-style-type: none"> <li>• all web frame rings in a wing tank</li> <li>• one deck transverse in each remaining tank</li> <li>• both transverse bulkheads (complete) in a wing tank</li> <li>• one transverse bulkhead (lower part) in each remaining tank</li> </ul> See (5) and (6)
Thickness measurements of those areas found to be suspect areas at the previous class renewal survey See (7)	Thickness measurements of those areas found to be suspect areas, at the previous class renewal survey. See (8). Areas of substantial corrosion identified at the previous class renewal or intermediate survey are to have thickness measurements taken. Suspect areas identified at previous class renewal surveys are to be examined.
(1) If such survey reveals no visible structural defects, then the examination may be limited to verification that the protective coating remains efficient. (2) Where poor coating condition, corrosion or other defects are found in salt water ballast tanks or where a protective coating has never been applied i.e. neither at the time of construction nor thereafter, the examination is to be extended to other ballast tanks of the same type. (3) In salt water ballast tanks, where a protective coating is found to be in poor condition, and is not renewed, where soft coating has been applied, or where a protective coating has never been applied i.e. neither at the time of construction nor thereafter, the tanks in question are to be internally examined and thickness measurement carried out as considered necessary at annual surveys. (4) The representative spaces are to be based on the record of the previous class intermediate surveys, previous class renewal surveys, the repair history of the tanks and they should not be the same for each intermediate survey. (5) The extent of close-up surveys may be increased in accordance with the requirements in Ch 4, Sec 3, [6.4.3]. (6) For areas in tanks where protective coating and cathodic protection is found to be in good condition, the extent of close-up survey may be specially considered. (7) Where substantial corrosion, is found, the extent of thickness measurements is to be increased in accordance with the requirements in Ch 4, Sec 3, Tab 4. (8) Where substantial corrosion, is found, the extent of thickness measurements is to be increased in accordance with the requirements in Ch 4, Sec 3, Tab 4. These extended thickness measurements are to be carried out before the survey is credited as completed.	

**Table 2 : Intermediate survey of salt water ballast tanks for double sided units**

Age of unit (in years at time of class renewal survey)	
5 < age ≤ 10	10 < age
<p>Overall survey of one peak tank and at least two representative salt water ballast tanks between the peak bulkheads used primarily for water ballast, including combined oil storage/ballast tanks, where fitted, are to be internally examined and selected by the attending Surveyor.</p> <p>See (1), (2), (3) and (4)</p>	
	<p>Close-up survey in salt water ballast tanks of:</p> <ul style="list-style-type: none"> <li>• all web frames (9) in one complete tank (8)</li> <li>• the knuckle area (10) and the upper part (5 meters approximately) of one web frame in each remaining ballast tank</li> <li>• one transverse bulkhead (11) in each complete tank (8)</li> </ul> <p>See (5) and (6)</p>
<p>Thickness measurements of those areas found to be suspect areas at the previous class renewal survey</p> <p>See (7)</p>	<p>Thickness measurements of those areas found to be suspect areas at the previous class renewal survey. See (12). Areas of substantial corrosion, identified at the previous class renewal or intermediate survey are to have thickness measurements taken. Suspect areas identified at previous class renewal surveys are to be examined.</p>
<p>(1) If such survey reveals no visible structural defects, then the examination may be limited to verification that the protective coating remains efficient and that the sacrificial anodes, if any, are less than 50% depleted.</p> <p>(2) Where poor coating condition, corrosion or other defects are found in salt water ballast tanks or where a protective coating has never been applied i.e. neither at the time of construction nor thereafter, the examination is to be extended to other ballast tanks of the same type.</p> <p>(3) In salt water ballast tanks, where a protective coating is found to be in poor condition, and is not renewed, where soft coating has been applied, or where a protective coating has never been applied i.e. neither at the time of construction nor thereafter, the tanks in question are to be internally examined and thickness measurement carried out as considered necessary at annual surveys.</p> <p>(4) The representative spaces are to be based on the record of the previous class intermediate surveys, previous class renewal surveys, the repair history of the tanks and they should not be the same for each intermediate survey.</p> <p>(5) The extent of close-up surveys may be increased in accordance with the requirements in Ch 4, Sec 3, [6.4.3].</p> <p>(6) For areas in tanks where protective coating and cathodic protection is found to be in good condition, the extent of close-up survey may be specially considered.</p> <p>(7) Where substantial corrosion, is found, the extent of thickness measurements is to be increased in accordance with the requirements in Ch 4, Sec 3, Tab 5.</p> <p>(8) Complete ballast tank means double bottom plus double side plus double deck tank, as applicable, even if these tanks are separate.</p> <p>(9) Web frame means vertical web in side tank, hopper web in hopper tank, floor in double bottom tank and deck transverse in double deck tank (where fitted), including adjacent structural members. In fore and aft peak tank, web frame means a complete transverse web frame ring including adjacent structural members.</p> <p>(10) 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 meters from the corners both on the bulkhead and the double bottom.</p> <p>(11) Transverse bulkhead complete in ballast tanks, including girder system and adjacent structural members, such as longitudinal bulkheads, girders in double bottom tanks, inner bottom plating, hopper side, inner hull longitudinal bulkhead, connecting brackets.</p> <p>(12) Where substantial corrosion is found, the extent of thickness measurements is to be increased in accordance with the requirements in Ch 4, Sec 3, Tab 5. These extended thickness measurements are to be carried out before the survey is credited as completed.</p>	

## 5 Intermediate survey - Crude oil storage machinery items

### 5.1 Storage area and crude oil pump rooms

**5.1.1** A general examination of the electrical equipment and cables in dangerous zones such as crude oil pump rooms and areas adjacent to crude oil storage tanks is to be carried out for defective and non-certified safe type electrical equipment and fixtures, non-approved lighting and fixtures, and improperly installed or defective or dead-end wiring.

**5.1.2** The electrical insulation resistance of the electrical equipment and circuits terminating in or passing through the dangerous zones is to be tested; however, in cases where a proper record of testing is maintained, consideration may be given to accepting recent test readings effected by the ship's personnel.

**5.1.3** The satisfactory condition of the crude oil heating system is to be verified.

## 6 Class renewal survey - Hull items

### 6.1 Survey programme and preparation for hull survey

**6.1.1** In advance of the class renewal survey, not less than twelve months as far as possible, a specific survey programme is to be worked out by the Owner in cooperation with the Society. The survey programme is to be in a written format.

### 6.2 Scope of survey

**6.2.1** In addition to the requirements of annual surveys, the class renewal survey is to include examination, tests and checks of sufficient extent to ensure that the hull and related piping are in satisfactory condition for the new period of class to be assigned, subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

**6.2.2** All storage tanks, process tanks integral to the hull, slop tanks, salt water ballast tanks, including double bottom tanks, pump rooms, pipe tunnels, cofferdams and void spaces bounding crude oil storage tanks, decks and outer hull are to be examined, and this examination is to be supplemented by thickness measurement and testing as deemed necessary, to ensure that the structural integrity remains effective. The examination is to be directed at discovering substantial corrosion, significant deformation, fractures, damages or other structural deterioration and, if deemed necessary by the Surveyor, may include suitable non-destructive inspection.

**6.2.3** The survey extent of combined ballast/crude oil storage tanks is to be evaluated based on the records of ballast history, the extent of the corrosion prevention system provided and the extent of corrosion found.

**6.2.4** The survey extent of ballast tanks converted to void spaces will be specially considered by the Society in relation to the requirements for ballast tanks.

**6.2.5** Where provided, the condition of the corrosion prevention system of crude oil storage and ballast tanks is to be examined.

For tanks used for salt water ballast, where a protective coating is found to be in poor condition, and is not renewed, where soft coating has been applied, or where a protective coating has never been applied i.e. neither at the time of construction nor thereafter, the tanks in question are to be internally examined at annual surveys. Thickness measurement is to be carried out as considered necessary.

### 6.3 Overall and close-up surveys

**6.3.1** Each class renewal survey is to include an overall survey of all tanks and all spaces. For fuel oil tanks, however, the requirements given in Ch 2, Sec 4, Tab 2 are to be complied with.

**6.3.2** Each class renewal survey is to include a close-up examination of sufficient extent to establish the condition of storage tanks and salt water ballast tanks. The minimum requirements for close-up surveys are given in Ch 4, Sec 3, Tab 1 or Ch 4, Sec 3, Tab 2 for double sided units.

**6.3.3** 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 also in the following cases:

- where tanks have structural arrangements or details which have suffered defects in similar spaces or on similar units according to available information
- where tanks have structures approved with reduced scantlings.

**6.3.4** For areas in tanks where coatings are found to be in good condition, the extent of close-up surveys required according to Ch 4, Sec 3, Tab 1 or Ch 4, Sec 3, Tab 2 may be specially considered by the Society.

Table 3 : Close-up survey at class renewal survey for single hull

Age of unit (in years at time of class renewal survey)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
One web frame ring, in a wing ballast tank, if any, or a wing crude oil storage tank used primarily for water ballast ①	All web frame rings, in a wing ballast tank, if any, or a wing crude oil storage tank used primarily for water ballast ①	All web frame rings in all ballast tanks ① All web frame rings in a crude oil storage wing tank ① A minimum of 30% of all web frame rings in each remaining crude oil storage wing tank ① (1)	As class renewal survey for units between 10 and 15 years of age
One deck transverse, in a crude oil storage tank ②	One deck transverse ②: - in each remaining ballast tank - in a crude oil storage wing tank - in two crude oil storage centre tanks		Additional transverse areas as deemed necessary by the Society
	Both transverse bulkheads, in a wing ballast tank, if any, or a crude oil storage wing tank used primarily for water ballast ③	All transverse bulkheads, in all crude oil storage and ballast tanks ③	
One transverse bulkhead in a ballast tank ④ One transverse bulkhead in a crude oil storage wing tank ④ One transverse bulkhead in a crude oil storage centre tank ④	One transverse bulkhead in each remaining ballast tank ④ One transverse bulkhead in a crude oil storage wing tank ④ One transverse bulkhead in two crude oil storage centre tanks ④		
		A minimum of 30% of deck and bottom transverses in each crude oil storage centre tank ⑤ (1) Additional web frame ring(s) ①, as considered necessary by the Surveyor	

See Ch 4, Sec 3, Fig 1 or Ch 4, Sec 3, Fig 3 for areas ①, ②, ③, ④ and ⑤.

① Complete transverse web frame ring including adjacent structural member.

② Deck transverse including adjacent deck structural members.

③ Transverse bulkhead complete, including girder system and adjacent structural members.

④ Transverse bulkhead lower part, including girder system and adjacent structural members.

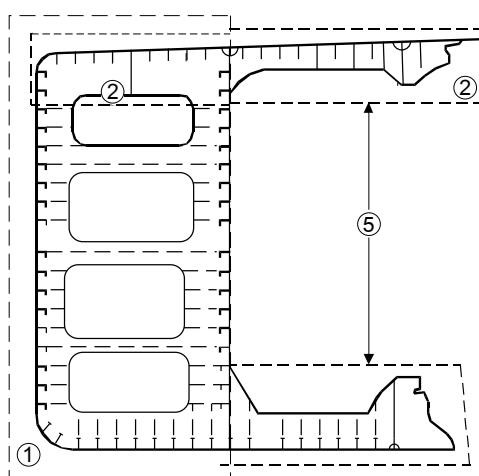
⑤ Deck and bottom transverse, including adjacent structural members.

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

**Note 1:** Ballast tanks include peak tanks.

Figure 1 : Areas subject to close-up surveys and thickness measurements

Typical transverse section



Typical transverse bulkhead

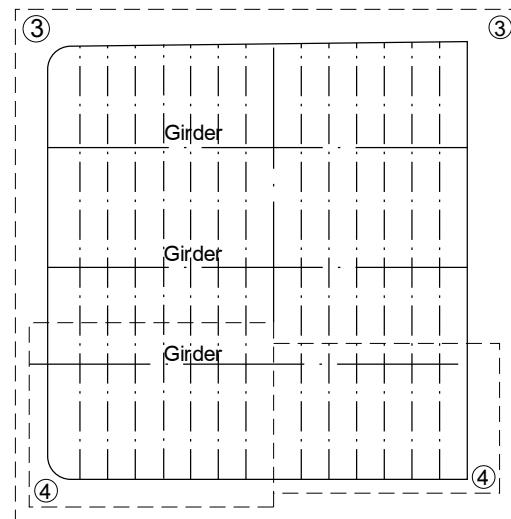


Table 4 : Close-up survey at class renewal survey of double sided units

Age of unit (in years at time of class renewal survey)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
One web frame ①, in a complete ballast tank (see Note 1)	All web frames ①, in a complete ballast tank (see Note 1) The knuckle area ⑥ and the upper part (5 meters approximately) of one web frame in each remaining ballast tank	All web frames ① in all ballast tanks	As class renewal survey for units between 10 and 15 years of age
One deck transverse, in a crude oil storage tank ②	One deck transverse ② in two crude oil storage tanks	All web frames ⑦ including deck transverse and cross ties, if fitted, in a crude oil storage tank One web frame ⑦ including deck transverse and cross ties, if fitted, in each remaining crude oil storage tank	Additional transverse areas as deemed necessary by the Society
One transverse bulkhead ④ in a complete ballast tank (see Note 1)	One transverse bulkhead ④ in each complete ballast tank (see Note 1)	All transverse bulkheads, in all crude oil storage ③ and ballast tanks ④	
One transverse bulkhead in a crude oil storage wing tank ⑤	One transverse bulkhead in a crude oil storage wing tank ⑤		
One transverse bulkhead in a crude oil storage centre tank ⑤	One transverse bulkhead in two crude oil storage centre tanks ⑤		

See Ch 4, Sec 3, Fig 3 for areas ①, ②, ③, ④, ⑤, ⑥ and ⑦.

① Web frame in a ballast tank means vertical web in side tank, hopper web in hopper tank, floor in double bottom tank and deck transverse in double deck tank (where fitted), including adjacent structural members. In fore and aft peak tank, web frame means a complete transverse web frame ring including adjacent structural members.

② Deck transverse including adjacent deck structural members (or external structure on deck in way of the tank, where applicable).

③ Transverse bulkhead complete in crude oil storage tanks, including girder system adjacent structural members (such as longitudinal bulkheads) and internal structure of lower and upper stools, where fitted.

④ Transverse bulkhead complete in ballast tanks, including girder system and adjacent structural members, such as longitudinal bulkheads, girders in double bottom tanks, inner bottom plating, hopper side, inner hull longitudinal bulkhead, connecting brackets.

⑤ Transverse bulkhead lower part in crude oil storage tank, including girder system, adjacent structural members (such as longitudinal bulkheads) and internal structure of lower stool where fitted.

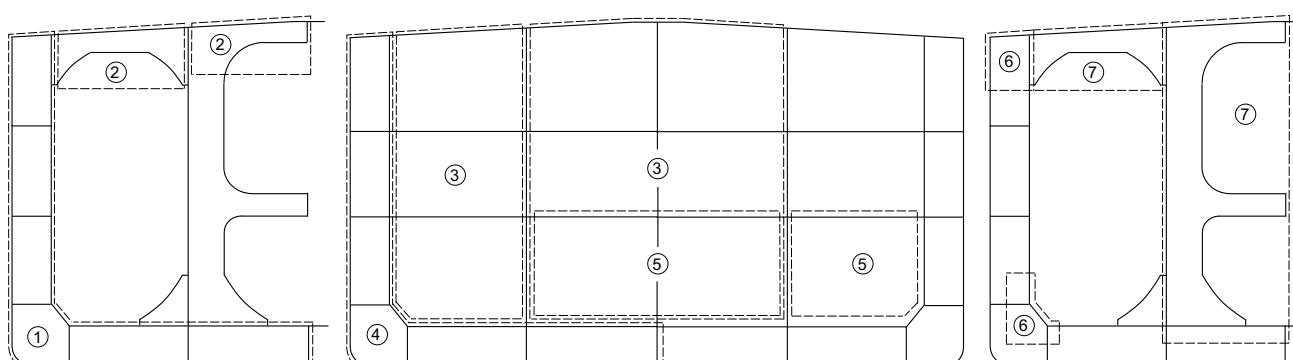
⑥ Knuckle area is the area of the web frame around the connections of the slope hopper plating to the inner hull bulkhead and the inner bottom plating, up to 2 meters from the corners both on the bulkhead and the double bottom.

⑦ Web frame in a crude oil storage tank means deck transverse, longitudinal bulkhead vertical girder, cross ties where fitted and transverse floors for units without double bottom, including adjacent structural members.

**Note 1:** Where no centre crude oil storage tank is fitted (as in the case of centre longitudinal bulkhead), transverse bulkheads in wing tanks are to be surveyed.

**Note 2:** Complete ballast tank means double bottom plus double side plus double deck tank, as applicable, even if these tanks are separate.

Figure 2 : Areas subject to close-up surveys and thickness measurements - double sided units



## 6.4 Thickness measurements

**6.4.1** The minimum requirements for thickness measurements at class renewal survey are given in Tab 5.

**6.4.2** The Surveyor may extend the thickness measurements as deemed necessary. Provisions for extended measurements for areas with substantial corrosion are given in Ch 4, Sec 3, Tab 4 or Ch 4, Sec 3, Tab 5 for double sided units and as may be additionally specified in the survey programme as required in [6.1] to determine the full extent of the corrosion pattern. These extended thickness measurements are to be carried out before the survey is credited as completed.

Suspect areas identified at previous class renewal surveys are to be examined.

Areas of Substantial Corrosion identified at previous class renewal or intermediate survey are to have thickness measurements taken.

**6.4.3** When pitting is found on bottom plating and its intensity is 20% or more, thickness measurements are to be extended in order to determine the actual plate thickness out of the pits and the depth of the pits. Where the wastage is in the substantial corrosion range or the average depth of pitting is 1/3 or more of the actual plate thickness, the pitted plate is to be considered as a substantially corroded area.

**6.4.4** For areas in spaces where coatings are found to be in good condition, the extent of thickness measurements according to Tab 5 may be specially considered by the Society.

**Table 5 : Thickness measurements at class renewal survey**

Age of unit (in years at time of class renewal survey)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Suspect areas	Suspect areas	Suspect areas	Suspect areas
One section of deck plating for the full beam of the unit within the storage area (in way of a ballast tank, if any, or a crude oil storage tank used primarily for water ballast)	Within the storage area: <ul style="list-style-type: none"> <li>each deck plate</li> <li>1 transverse section (1)</li> </ul>	Within the storage area: <ul style="list-style-type: none"> <li>each deck plate</li> <li>2 transverse sections (1) (2)</li> <li>selected bottom plates</li> <li>all wind and water strakes</li> </ul>	Within the storage area: <ul style="list-style-type: none"> <li>each deck plate</li> <li>3 transverse sections (1) (2)</li> <li>each bottom plate</li> <li>all wind and water strakes</li> </ul>
Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Tab 3 and Tab 4	Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Tab 3 and Tab 4	Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Tab 3 and Tab 4	Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Tab 3 and Tab 4
	Selected wind and water strakes outside the storage area	Selected wind and water strakes outside the storage area	All wind and water strakes outside the storage area
(1) Transverse sections are to be chosen where the largest reductions are likely to occur or as revealed by deck plating measurements. (2) At least one section is to be within 0,5L amidships and, where applicable, in way of a ballast tank.			

**Table 6 : Extended thickness measurements at those areas of substantial corrosion**

BOTTOM STRUCTURE		
Structural member	Extent of measurement	Pattern of measurement
Bottom plating	Minimum of 3 bays across tank, including aft bay Measurements around and under all suction bell mouths	5-point pattern for each panel between longitudinals and webs
Bottom longitudinals	Minimum of 3 longitudinals in each bay where bottom plating measured	3 measurements in line across flange and 3 measurements on vertical web
Bottom girders and brackets	At fore and aft transverse bulkhead, bracket toes and in centre of tanks	Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across face flat. 5-point pattern on girder/bulkhead brackets.
Bottom transverse webs	3 webs in bays where bottom plating measured, with measurements at both ends and middle	5-point pattern over 2 square meter area. Single measurements on face flat.
Panel stiffening	Where provided	Single measurements

DECK STRUCTURE		
Structural member	Extent of measurement	Pattern of measurement
Deck plating	Two bands across tank	Minimum of three measurements per plate per band
Deck longitudinals	Minimum of 3 longitudinals in each of two bays	3 measurements in line vertically on webs and 2 measurements on flange (if fitted)
Deck girders and brackets	At fore and aft transverse bulkhead, bracket toes and in centre of tanks	Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across face flat. 5-point pattern on girder/bulkhead brackets.
Deck transverse webs	Minimum of 2 webs, with measurements at both ends and middle of span	5-point pattern over 2 square metre area. Single measurements on face flat.
Panel stiffening	Where provided	Single measurements

SIDE SHELL AND LONGITUDINAL BULKHEADS		
Structural member	Extent of measurement	Pattern of measurement
Deckhead and bottom strakes and strakes in way of stringer platforms	Plating between each pair of longitudinals in a minimum of 3 bays	Single measurement
All other strakes	Plating between every third pair of longitudinals in same 3 bays	Single measurement
Longitudinals on deckhead and bottom strakes	Each longitudinal in same 3 bays	3 measurements across web and 1 measurement on flange
All other longitudinals	Every third longitudinal in same 3 bays	3 measurements across web and 1 measurement on flange
Longitudinal brackets	Minimum of 3 at top, middle and bottom of tank in same 3 bays	5-point pattern over area of bracket
Web frames and cross ties	3 webs with minimum of three locations on each web, including in way of cross tie connections	5-point pattern over approximately 2 square metre area, plus single measurements on web frame and cross tie face flats

TRANSVERSE BULKHEADS AND SWASH BULKHEADS		
Structural member	Extent of measurement	Pattern of measurement
Deckhead and bottom strakes, and strakes in way of stringer platforms	Plating between pair of stiffeners at three locations: approximately 1/4, 1/2 and 3/4 width of tank	5-point pattern between stiffeners over 1 metre length
All other strakes	Plating between pair of stiffeners at middle location	Single measurement
Strakes in corrugated bulkheads	Plating for each change of scantling at centre of panel and at flange of fabricated connection	5-point pattern over about 1 square metre of plating
Stiffeners	Minimum of three typical stiffeners	For web, 5-point pattern over span between bracket connections (2 measurements across web at each bracket connection and one at centre of span). For flange, single measurements at each bracket toe and at centre of span
Brackets	Minimum of three at top, middle and bottom of tank	5-point pattern over area of bracket
Deep webs and girders	Measurements at toe of bracket and at centre of span	For web, 5-point pattern over about 1 square metre. Three measurements across face flat
Stringer platforms	All stringers with measurements at both ends and middle	5-point pattern over 1 square metre of area plus single measurements near bracket toes and on face flats

**Table 7 : Extended thickness measurements at those areas of substantial corrosion for double sided units**

<b>BOTTOM, INNER BOTTOM (if any) AND HOPPER STRUCTURE</b>		
Structural member	Extent of measurement	Pattern of measurement
Bottom, inner bottom and hopper structure plating	Minimum of 3 bays across double bottom tank, including aft bay Measurements around and under all suction bell mouths	5-point pattern for each panel between longitudinals and floors
Bottom, inner bottom and hopper structure longitudinals	Minimum of 3 longitudinals in each bay where bottom plating measured	3 measurements in line across flange and 3 measurements on vertical web
Bottom girders, including the watertight ones	At fore and aft watertight floors and in centre of tanks	Vertical line of single measurements on girder plating with one measurement between each panel stiffener, or a minimum of three measurements
Bottom floors, including the watertight ones	3 floors in bays where bottom plating measured, with measurements at both ends and middle	5-point pattern over 2 square metre area
Hopper structure web frame ring	3 floors in bays where bottom plating measured	5-point pattern over about 1 square metre of plating. Single measurements on flange.
Hopper structure transverse watertight bulkhead or swash bulkhead	• lower 1/3 of bulkhead	5-point pattern over about 1 square metre of plating
	• upper 2/3 of bulkhead	5-point pattern over 2 square metre of plating
	• stiffeners (minimum of 3)	For web, 5-point pattern over span (2 measurements across web at each end and one at centre of span). For flange, single measurements at each end and centre of span.
Panel stiffening	Where provided	Single measurements

<b>DECK STRUCTURE</b>		
Structural member	Extent of measurement	Pattern of measurement
Deck plating	Two transverse bands across tank	Minimum of three measurements per plate per band
Deck longitudinals	Every third longitudinal in each of two bands with a minimum of one longitudinal	3 measurements in line vertically on webs and 2 measurements on flange (if fitted)
Deck girders and brackets (usually in storage tanks only)	At fore and aft transverse bulkhead, bracket toes and in centre of tanks	Vertical line of single measurements on web plating with one measurement between each panel stiffener, or a minimum of three measurements. Two measurements across flange. 5-point pattern on girder/bulkhead brackets.
Deck transverse webs	Minimum of 2 webs, with measurements at both ends and middle of span	5-point pattern over 1 square metre area. Single measurements on flange.
Vertical web and transverse bulkhead in wing ballast tank (2 metres from deck)	Minimum of 2 webs, and both transverse bulkheads	5-point pattern over 1 square metre area
Panel stiffening	Where provided	Single measurements

<b>STRUCTURE IN WING BALLAST TANKS</b>		
Structural member	Extent of measurement	Pattern of measurement
Side shell and longitudinal bulkhead plating:		
• upper stake and stakes in way of horizontal girders	Plating between each pair of longitudinals in a minimum of 3 bays (along the tank)	Single measurement
• all other stakes	Plating between every third pair of longitudinals in same three bays	Single measurement
Side shell and longitudinal bulkhead longitudinals on:		
• upper stake	Each longitudinal in same 3 bays	3 measurements across web and 1 measurement on flange
• all other stakes	Every third longitudinal in same 3 bays	3 measurements across web and 1 measurement on flange

Longitudinal brackets	Minimum of 3 at top, middle and bottom of tank in same 3 bays	5-point pattern over area of bracket
Vertical web and transverse bulkheads (excluding deckhead area): • strakes in way of horizontal girders	Minimum of 2 webs and both transverse bulkheads	5-point pattern over 2 square metre area
Horizontal girders	Plating on each girder in a minimum of three bays	2 measurements between each pair of longitudinal girder stiffeners
Panel stiffening	Where provided	Single measurements

LONGITUDINAL BULKHEADS IN CRUDE OIL STORAGE TANKS		
Structural member	Extent of measurement	Pattern of measurement
Deckhead and bottom strakes and strakes in way of the horizontal stringers of transverse bulkheads	Plating between each pair of longitudinals in a minimum of 3 bays	Single measurement
All other strakes	Plating between every third pair of longitudinals in same 3 bays	Single measurement
Longitudinals on deckhead and bottom strakes	Each longitudinal in same 3 bays	3 measurements across web and 1 measurement on flange
All other longitudinals	Every third longitudinal in same 3 bays	3 measurements across web and 1 measurement on flange
Longitudinal brackets	Minimum of 3 at top, middle and bottom of tank in same 3 bays	5-point pattern over area of bracket
Web frames and cross ties	3 webs with minimum of three locations on each web, including in way of cross tie connections	5-point pattern over approximately 2 square metre area of webs, plus single measurements on flanges of web frame and cross ties
Lower end brackets (opposite side of web frame)	Minimum of 3 brackets	5-point pattern over approximately 2 square metre area of brackets, plus single measurements on bracket flanges

TRANSVERSE WATERTIGHT AND SWASH BULKHEADS IN CRUDE OIL STORAGE TANKS		
Structural member	Extent of measurement	Pattern of measurement
Upper and lower stool, where fitted	<ul style="list-style-type: none"> <li>Transverse band within 25mm of welded connection to inner bottom/ deck plating</li> <li>Transverse band within 25mm of welded connection to shelf plate</li> </ul>	5-point pattern between stiffeners over 1 metre length
Deckhead and bottom strakes, and strakes in way of horizontal stringers	Plating between pair of stiffeners at three locations: approximately 1/4, 1/2 and 3/4 width of tank	5-point pattern between stiffeners over 1 metre length
All other strakes	Plating between pair of stiffeners at middle location	Single measurement
Strakes in corrugated bulkheads	Plating for each change of scantling at centre of panel and at flange of fabricated connection	5-point pattern over about 1 square metre of plating
Stiffeners	Minimum of three typical stiffeners	For web, 5-point pattern over span between bracket connections (2 measurements across web at each bracket connection and one at centre of span). For flange, single measurements at each bracket toe and at centre of span
Brackets	Minimum of three at top, middle and bottom of tank	5-point pattern over area of bracket
Horizontal stringers	All stringers with measurements at both ends and middle	5-point pattern over 1 square metre of area plus single measurements near bracket toes and on flange

**6.5 Tank testing**

**6.5.1** The requirements for tank testing at class renewal survey are given in Ch 4, Sec 3, Tab 6.

**6.5.2** The Surveyor may extend the tank testing as deemed necessary.

**6.5.3** Tanks are to be tested with a head of liquid to the highest extent possible but not less than the highest point that liquid will rise under service condition for crude oil storage tanks, and for ballast tanks.

**Table 8 : Tank testing at class renewal survey**

Age of unit (in years at time of class renewal survey)		
age ≤ 5	5 < age ≤ 10	10 < age
All ballast tank boundaries	All ballast tank boundaries	All ballast tank boundaries
Crude oil storage tank boundaries facing ballast tanks, void spaces, pipe tunnels, representative fuel oil tanks, pump rooms or cofferdams	Crude oil storage tank boundaries facing ballast tanks, void spaces, pipe tunnels, representative fuel oil tanks, pump rooms or cofferdams	Crude oil storage tank boundaries facing ballast tanks, void spaces, pipe tunnels, representative fuel oil tanks, pump rooms or cofferdams
	All crude oil storage tank bulkheads which form the boundaries of segregated stored products	All remaining crude oil storage tank bulkheads

**6.6 Storage area and crude oil pump rooms**

**6.6.1** Crude oil storage and crude oil washing piping on deck and crude oil, stripping, venting and ballast piping systems within the storage area are to be examined and operationally tested to working pressure to the attending Surveyor's satisfaction to ensure that their tightness and condition remain satisfactory. Special attention is to be given to any ballast piping in crude oil storage tanks and crude oil storage piping in ballast tanks and void spaces. Surveyors are to be advised on all occasions when this piping, including valves and fittings, is opened during repair periods and can be examined internally.

The surveyor may require dismantling and/or thickness measurements of piping. A hydraulic test is to be carried out in the event of repair or dismantling or crude oil, crude oil washing, or ballast piping, or where doubts arise.

**6.6.2** All safety valves on crude oil piping and of crude oil storage tanks are to be dismantled for examination, adjusted and, as applicable, resealed.

**6.6.3** All crude oil storage pump room boundaries are to be generally examined. All gas-tight shaft sealing devices are to be examined. The bottom of crude oil storage pump rooms is to be presented clean for the examination of stripping devices and gutters.

**7 Class renewal survey - Crude oil storage machinery items****7.1 Storage area and crude oil pump rooms**

**7.1.1** Crude oil, ballast and stripping pumps are to be internally examined and prime movers checked. A working test is to be carried out, as far as practicable.

Maintenance records of crude oil pumps are to be made available to the Surveyor.

**7.1.2** Where a crude oil washing system is fitted, piping, pumps, valves and deck-mounted washing machines are to be examined and tested for signs of leakage, and anchoring devices of deck-mounted washing machines are to be checked to the Surveyor's satisfaction.

**7.1.3** The satisfactory condition of the crude oil heating system is to be verified and, if deemed necessary by the Surveyor, the system is to be pressure tested.

**7.1.4** An operating test of the remote control of pumps and valves and of automatic closing valves is to be carried out.

**7.1.5** A general examination of the electrical equipment and cables in dangerous zones such as crude oil pump rooms and areas adjacent to crude oil storage tanks is to be carried out for defective and non-certified safe type electrical equipment and fixtures, non-approved lighting and fixtures, and improperly installed or defective or dead-end wiring.

The electrical insulation resistance of the electrical equipment and circuits terminating in or passing through the dangerous zones is to be tested; however, in cases where a proper record of testing is maintained, consideration may be given to accepting recent test readings effected by the ship's personnel.

## **7.2 Fire-fighting systems in crude oil storage area**

**7.2.1** The survey is to include the examination of fire-fighting systems of any type fitted on board for the protection of the storage area, crude oil pump room and other dangerous spaces, such as deck foam, water-spraying systems, etc., as applicable.

## Section 7

# Additional Surveys Related to Storage Area of Gas Storage Units

## 1 General

### 1.1 Application

**1.1.1** The requirements of this Section apply after construction to all gas storage units, which have been assigned one of the following notations:

**offshore ship - liquefied gas storage**

**offshore barge - liquefied gas storage.**

**1.1.2** The requirements apply to the surveys of the hull structure and piping systems in way of storage tanks, cofferdams, pipe tunnels and void spaces within the storage area and all salt water ballast tanks. They are additional to the requirements applicable to the remainder of the unit, given in Ch 2, Sec 2, Ch 2, Sec 3 and Ch 2, Sec 4 and according to the relevant surveys. For surveys of inert gas installations, reference is made to Ch 2, Sec 9.

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

**1.1.4** Prior to the commencement of any part of the class renewal survey and intermediate survey, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance and the thickness measurement company representative, where involved.

## 2 Annual survey - Hull items

### 2.1 General

**2.1.1** The annual survey of storage containment and storage handling systems is preferably carried out during loading or unloading operations. Access to storage tanks and/or inerted hold spaces is normally not required.

**2.1.2** Gas plant operational record (log) entries since the last survey are to be examined in order to check the past performance of the system and to establish whether certain parts have shown any irregularities in operation. The evaporation rate and the inert gas consumption are also to be considered.

### 2.2 Weather decks and storage handling rooms

**2.2.1** The survey is to include the:

- examination of all accessible gas-tight bulkhead penetrations including gas-tight shaft sealings
- examination of the sealing arrangements for tanks or tank domes penetrating decks or tank covers
- examination of vapour and gas tightness devices of the wheelhouse windows and doors, side scuttles and windows in way of ends of superstructures and deckhouses facing the storage area or bow or stern loading/unloading arrangements, and closing devices of air intakes and openings into accommodation, service and machinery spaces and control stations
- examination of storage, fuel, ballast, venting and process piping, including the expansion arrangements, insulation from the hull structure, pressure relief and drainage arrangements
- examination of venting systems, including vent masts and protective screens, for storage tanks, interbarrier spaces, hold spaces, fuel tanks and ballast tanks
- examination of storage tank and interbarrier space relief valves and associated safety systems and alarms
- examination of drip trays or insulation for deck protection against storage leakage
- examination of the storage pump room, storage compressor room and storage control room
- confirmation of proper maintenance of arrangements for the airlocks
- confirmation that all accessible storage piping systems are electrically bonded to the hull
- examination of closing and other arrangements of any special enclosed space provided for the crew in case of major storage leakage.

## 2.3 Other arrangements or devices

### 2.3.1 The survey is to include the:

- confirmation that the unit's storage hoses are suitable for their intended purpose and in satisfactory condition
- confirmation that any special arrangement made for bow or stern loading/unloading is satisfactory
- confirmation that relevant instruction and information material such as storage handling plans, filling limit information, cooling down procedures, etc., is on board.

## 2.4 Ballast tanks

**2.4.1** Ballast tanks are to be internally examined when required as a consequence of the results of the class renewal survey or the intermediate survey.

**2.4.2** When considered necessary by the Surveyor or where extensive corrosion exists, thickness measurements are to be carried out. Where substantial corrosion, is found, the extent of thickness measurements is to be increased to the satisfaction of the Surveyor.

## 3 Annual survey - Storage machinery items

### 3.1 Storage area and pump rooms

#### 3.1.1 The survey is to include the:

- examination of mechanical ventilation fans in gas-dangerous spaces and zones
- examination and confirmation of the satisfactory operation of mechanical ventilation of spaces normally entered during operation
- examination, as far as possible during operation, of storage heat exchangers, vaporisers, pumps, compressors and hoses
- confirmation that fixed and/or portable ventilation arrangements provided for spaces not normally entered are satisfactory
- examination of the gas detection safety arrangements for storage control rooms and of the measures taken to exclude ignition sources when such spaces are not gas-safe
- examination of storage (if accessible), bilge, ballast and stripping pumps for excessive gland seal leakage
- confirmation that electrical equipment in gas-dangerous spaces and zones is in satisfactory condition and has been properly maintained
- examination, as far as possible, of arrangements for the use of storage as fuel, and associated instrumentation and safety devices
- confirmation that, if fitted, storage reliquefaction or refrigeration equipment is in satisfactory condition
- confirmation that relevant instruction and information material such as storage handling plans, filling limit information, cooling down procedures, etc., is available on board.

### 3.2 Instrumentation and safety devices

#### 3.2.1 The survey is to include the:

- confirmation that installed pressure gauges on storage discharge lines are operational
- confirmation that storage tank liquid level gauges are operational and that high level alarms as well as automatic shut-off systems are satisfactory
- confirmation that the temperature indicating equipment of the storage containment system and associated alarms are satisfactory
- confirmation that the manually operated emergency shut-down system as well as automatic shutdown of storage pumps and compressors are satisfactory
- examination of the logbooks for confirmation that the emergency shutdown system has been tested
- confirmation that storage tank, hold and insulation space pressure gauging systems and associated alarms are satisfactory
- examination, and testing as appropriate, of fixed gas detection equipment
- confirmation of the availability and suitability of the portable gas detection equipment and instruments for measuring oxygen levels
- confirmation that storage leakage detection system has been tested and calibrated using gas span and that alarms have been tested.

Note 1: Verification of these devices is to be done by one or more of the following methods:

- visual external examination
- comparing of read outs from different indicators
- consideration of read outs with regard to the actual cargo and/or actual conditions
- examination of maintenance records with reference to cargo plant instrumentation maintenance manual
- verification of calibration status of the measuring instruments.

### 3.3 Fire-fighting systems in storage area

**3.3.1** The survey is to include the examination of fire-fighting systems of any type fitted on board for the protection of the storage area, storage pump room, storage compressor room and other dangerous spaces, such as deck foam, water-spraying and dry powder systems.

## 4 Intermediate survey - Hull items

### 4.1 General

**4.1.1** The aim of the intermediate survey is to supplement the annual survey by testing storage handling installations with related automatic control, alarm and safety systems for correct functioning.

**4.1.2** The intermediate survey is preferably to be carried out with the unit in a gas-free condition. In fact, the extent of the testing required for the intermediate survey will normally be such that the survey cannot be carried out during a loading or discharging operation.

### 4.2 Weather decks and storage installation

**4.2.1** The survey is to include the:

- examination, as far as applicable, of storage and process, liquid nitrogen (if any), ballast, stripping and vent piping systems as well as vent masts and headers. If upon examination there is any doubt as to the condition of the piping, pressure testing, thickness measurement or both may be required
- examination of vent line drainage arrangements
- confirmation that storage pipes and independent storage tanks, where applicable, are electrically bonded to the hull.

### 4.3 Salt water ballast tanks

**4.3.1** The requirements for survey of salt water ballast tanks given in Ch 4, Sec 5, Tab 1 are to be complied with.

**Table 1 : Intermediate survey of salt water ballast tanks**

Age of unit (in years at time of intermediate survey)		
5 < age ≤ 10	10 < age ≤ 15	age > 15
Overall survey of one peak tank and at least two representative salt water ballast tanks between the peak bulkheads used primarily for water ballast are to be internally examined and selected by the attending Surveyor. See (1), (2), (3) and (8)	Overall survey of one peak tank and at least two representative salt water ballast tanks between the peak bulkheads used primarily for water ballast are to be internally examined and selected by the attending Surveyor. See (2), (3), (7) and (8)	
	Close-up survey in two representative salt water ballast tanks of: - all plating and internal structures in one tank - one deck transverse and one transverse bulkhead (lower part) in the other tank See (4) and (5)	Close-up survey of all plating and internal structures in two representative salt water ballast tanks See (4) and (5)
Thickness measurements, if considered necessary by the Surveyor	Thickness measurements, if considered necessary by the Surveyor See (6)	Thickness measurements, if considered necessary by the Surveyor See (6)
(1) If such survey reveals no visible structural defects, then the examination may be limited to verification that the protective coating remains efficient. (2) Where poor coating condition, corrosion or other defects are found in salt water ballast tanks or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, or where sacrificial anodes where fitted are found to be more than 50% depleted, the examination is to be extended to other ballast tanks of the same type. (3) For salt water ballast spaces other than double bottom tanks, where a protective coating is found in poor condition, and is not renewed, where soft coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class is to be subject to the spaces in question being internally examined and thickness measurement carried out as considered necessary at annual surveys. For salt water ballast double bottom tanks, where such breakdown of coating is found and is not renewed, where soft coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class may be subject to the tanks in question being internally examined and thickness measurement carried out as considered necessary at annual surveys. (4) The extent of close-up surveys may be increased in accordance with the requirements in Ch 4, Sec 5, [6.4.3]. (5) For areas in tanks where protective coating is found to be in good condition, the extent of close-up survey may be specially considered. (6) Where substantial corrosion, is found, the extent of thickness measurements is to be increased to the satisfaction of the Surveyor. (7) If such survey reveals no visible structural defects, then the examination may be limited to verification that the protective coating remains efficient and that the sacrificial anodes, if any, are less than 50% depleted. (8) The representative spaces are to be based on the record of the previous class intermediate surveys, previous class renewal surveys, the repair history of the tanks and they should not be the same for each intermediate survey.		

## 5 Intermediate survey - Storage machinery items

### 5.1 Storage area and pump rooms

**5.1.1** Electrical equipment and cables in dangerous zones such as storage pump rooms, storage compressor rooms and spaces adjacent to and areas above storage tanks are to be examined as far as practicable and tested with particular regard to:

- protective earthing (spot check)
- integrity of flameproof enclosures
- damage of outer sheath of cables
- function test of pressurised equipment and associated alarms
- test of systems for de-energising non-certified safe electrical equipment located in spaces protected by air-locks, such as electric motor rooms, storage control rooms, etc...

**5.1.2** The electrical insulation resistance of the electrical equipment and circuits in dangerous zones is to be measured. These measurements are only to be effected when the unit is in a gas-free or inerted condition and are to be carried out within an acceptable time period. Where a proper record of testing is maintained, consideration may be given to accepting recent readings by the unit's personnel.

**5.1.3** In addition to the requirements of [5.1.1] and [5.1.2], the survey also consists of the:

- confirmation that the storage heating/cooling system is in satisfactory condition
- confirmation that spares are provided for storage area mechanical ventilation fans
- confirmation that the heating system of the hull structure is in satisfactory working condition
- general examination and test of leakage detection systems in interbarrier and hold spaces.

### 5.2 Instrumentation and safety devices

**5.2.1** The survey is to include the:

- examination of the installed pressure gauging systems on storage discharge lines, storage tanks, holds and insulation spaces and associated alarms
- examination of the storage tank liquid level gauges and high level alarms as well as automatic shut-off systems
- examination of the temperature indicating equipment of the storage containment system and associated alarms
- test of the above-mentioned instrumentation by changing pressure, level and temperature as applicable and comparing with test instruments. Simulated tests may be accepted for sensors which are not accessible or located within storage tanks or inerted hold spaces. The test is to include alarm and safety functions
- examination, as far as practicable, of the piping of the gas detection system for corrosion and damage. The integrity of the suction lines between suction points and analysing units is to be verified as far as possible
- calibration of gas detectors or verification thereof with sample gases
- confirmation of the availability and suitability of the portable gas detection equipment and instruments for measuring oxygen levels
- test of the manually operated emergency shutdown system (without flow in the pipelines) to verify that the system will cause the storage pumps and compressors to stop.

**5.2.2** The instrumentation and safety systems for burning storage as fuel are to be examined in accordance with the requirements indicated in [5.2.1].

## 6 Class renewal survey - Hull items

### 6.1 Survey programme

**6.1.1** A specific survey programme should be worked out in advance of the class renewal survey by the Owner in cooperation with the Society.

**6.1.2** The survey programme is to include conditions for survey, access to structures and equipment for surveys, taking into account the minimum requirements of Ch 4, Sec 5, Tab 2 and Ch 4, Sec 5, Tab 3 for close-up survey and thickness measurements, and Ch 4, Sec 5, [6.5] for tank testing.

### 6.2 Scope of survey

**6.2.1** In addition to the requirements of annual surveys, the class renewal survey is to include examination, tests and checks of sufficient extent to ensure that the hull and related piping are in satisfactory condition for the new period of class to be assigned, subject to proper maintenance and operation and to periodical surveys being carried out at the due dates.

**6.2.2** All storage tanks, salt water ballast tanks, including double bottom tanks, pump rooms, pipe tunnels, cofferdams and void spaces bounding storage tanks, decks and outer hull are to be examined, and this examination is to be supplemented by thickness

measurement and testing as deemed necessary, to ensure that the structural integrity remains effective. The examination is to be directed at discovering substantial corrosion, significant deformation, fractures, damages or other structural deterioration and, if deemed necessary by the Surveyor, may include suitable non-destructive inspection.

**6.2.3** The condition of the coating or corrosion prevention system of ballast tanks is to be examined.

For salt water ballast double bottom tanks, where such breakdown of coating is found and is not renewed, where soft coating has been applied or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class may be subject to the tanks in question being internally examined and thickness measurement carried out as considered necessary at annual intervals.

For salt water ballast spaces other than double bottom tanks, where a protective coating is found in poor condition and is not renewed, where soft coating has been applied, or where a protective coating has never been applied, i.e. neither at the time of construction nor thereafter, maintenance of class is to be subject to the spaces in question being internally examined and thickness measurement carried out as considered necessary at annual intervals.

### **6.3 Overall and close-up surveys**

**6.3.1** Each class renewal survey is to include an overall survey of all tanks and spaces. For fuel oil tanks, however, the requirements given in Ch 2, Sec 4, Tab 2 are to be complied with.

**6.3.2** Each class renewal survey is to include a close-up examination of sufficient extent to establish the condition of storage tanks and salt water ballast tanks. The minimum requirements for close-up surveys are given in Ch 4, Sec 5, Tab 2 for salt water ballast tanks and in Ch 4, Sec 5, [6.7.3] for storage tanks.

**6.3.3** 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 also in the following cases:

- in particular, in tanks having structural arrangements or details which have suffered defects in similar tanks, or on similar units according to available information
- in tanks having structures approved with reduced scantlings.

**6.3.4** For areas in tanks where coatings are found to be in good condition, the extent of close-up surveys required according to Ch 4, Sec 5, Tab 2 may be specially considered by the Society.

For units having independent tanks of type C, with a midship section similar to that of a general cargo ship, the extent of close-up surveys of salt water ballast tanks may be specially considered by the Society.

### **6.4 Thickness measurements**

**6.4.1** The minimum requirements for thickness measurements at class renewal survey are given in Ch 4, Sec 5, Tab 3.

**6.4.2** 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. Where substantial corrosion is identified and is not rectified, this will be subject to re-examination at intermediate surveys.

**6.4.3** For areas in spaces where coatings are found to be in good condition the extent of thickness measurements according to Ch 4, Sec 5, Tab 3 may be specially considered by the Society.

**6.4.4** For units 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 the tank top plating to the satisfaction of the Surveyor.

**Table 2 : Requirements for close-up survey at class renewal survey**

Age of unit (in years at time of class renewal survey)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
One transverse section (1), in a ballast wing tank or ballast double hull tank	All plating and internal structures (4), in a ballast wing tank or ballast double hull tank	All plating and internal structures (4), in all ballast tanks	As class renewal survey for units between 10 and 15 years of age
<p>(1) Complete transverse web frame ring including adjacent structural members.</p> <p>(2) Deck transverse including adjacent deck structural members.</p> <p>(3) Transverse bulkhead lower part, including girder system and adjacent structural members.</p> <p>(4) Complete tank, including all tank boundaries and internal structure, and external structure on deck in way of the tank where applicable.</p>			
<p><b>Note 1:</b> Salt water ballast tanks include peak tanks.</p> <p><b>Note 2:</b> Double hull tank includes double bottom and side tank even if these tanks are separate.</p>			

Age of unit (in years at time of class renewal survey)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
	One deck transverse (2), in each remaining ballast tank or on deck		
One transverse bulkhead (3), in a ballast tank	One transverse bulkhead (3), in each remaining ballast tank		
<p>(1) Complete transverse web frame ring including adjacent structural members.</p> <p>(2) Deck transverse including adjacent deck structural members.</p> <p>(3) Transverse bulkhead lower part, including girder system and adjacent structural members.</p> <p>(4) Complete tank, including all tank boundaries and internal structure, and external structure on deck in way of the tank where applicable.</p>			
<p><b>Note 1:</b> Salt water ballast tanks include peak tanks.</p> <p><b>Note 2:</b> Double hull tank includes double bottom and side tank even if these tanks are separate.</p>			

**Table 3 : Requirements for thickness measurements at class renewal survey**

Age of unit (in years at time of class renewal survey)			
age ≤ 5	5 < age ≤ 10	10 < age ≤ 15	age > 15
Suspect areas	Suspect areas	Suspect areas	Suspect areas
One section of deck plating for the full beam of the unit within the storage area	Within the storage area: <ul style="list-style-type: none"> <li>each deck plate</li> <li>one transverse section (1)</li> <li>selected bottom plates</li> <li>selected stakes in splash zone</li> </ul>	Within the storage area: <ul style="list-style-type: none"> <li>each deck plate</li> <li>two transverse sections (1) (2)</li> <li>selected bottom plates</li> <li>all stakes in splash zone</li> </ul>	Within the storage area: <ul style="list-style-type: none"> <li>each deck plate</li> <li>three transverse sections (1) (2)</li> <li>each bottom plate</li> <li>all stakes in splash zone</li> </ul>
Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Tab 2	Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Tab 2	Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Tab 2	Measurements, for general assessment and recording of corrosion pattern, of those structural members subject to close-up survey according to Tab 2
	Selected stakes in the splash zone outside the storage area	Selected stakes in the splash zone outside the storage area	Selected stakes in the splash zone outside the storage area
<p>(1) Transverse sections are to be chosen where the largest reductions are likely to occur or as revealed by deck plating measurements.</p> <p>(2) At least one section is to be within 0,5 L amidships and, where applicable, in way of a ballast tank.</p>			

## 6.5 Tank testing

**6.5.1** All boundaries of salt water ballast tanks are to be pressure tested. For fuel oil tanks, only representative tanks are to be pressure tested. For storage tanks, refer to Ch 4, Sec 5, [6.7].

**6.5.2** The Surveyor may extend the tank testing as deemed necessary.

**6.5.3** Salt water ballast tanks and fuel oil tanks are to be tested with a head of liquid to the top of air pipes.

## 6.6 Storage tank structure

**6.6.1** All storage tanks are to be cleaned and examined internally.

**6.6.2** When accessible, the outer surface of uninsulated storage tanks or the outer surface of storage tank insulation together with any vapour or protective barrier is to be examined. Special attention is to be given to the tank and insulation in way of chocks, supports and keys. Removal of insulation, in part or entirely, may be required in order to verify the condition of the tank or the insulation itself if deemed necessary by the Surveyor.

Where the arrangement is such that the insulation cannot be examined entirely, the surrounding structures of wing tanks, double bottom tanks and cofferdams are to be examined for cold spots when the storage tanks are in the cold condition, unless voyage records together with the instrumentation give sufficient evidence of the integrity of the insulation system.

**6.6.3** Thickness measurements may be required if deemed necessary by the Surveyor.

Close-up surveys are to be carried out in independent cargo tanks of type B and C at those areas where corrosion may develop.

**6.6.4** Non-destructive testing is to supplement storage tank inspection with special attention to be given to the integrity of the main structural members, tank shell and highly stressed parts, including welded connections as deemed necessary by the Surveyor.

The following items are, *inter alia*, considered highly stressed areas:

- storage tank supports and anti-rolling or anti-pitching devices
- web frames or stiffening rings
- Y-connection of shell plates and longitudinal bulkhead of bilobe tanks
- swash bulkhead boundaries
- dome and sump connections to the shell plating
- foundations for pumps, towers, ladders, etc
- pipe connections.

**6.6.5** For independent tanks of type B, the extent of non-destructive testing is to be as given in a programme specially prepared for the storage tank design.

**6.6.6** The tightness of all storage tanks is to be verified by an appropriate procedure. Provided that the effectiveness of the unit's gas detection equipment has been confirmed, it will be acceptable to utilise this equipment for the tightness test of independent tanks below deck.

**6.6.7** Where the results of the examinations dealt with in [6.6.1] to [6.6.6] or the examination of the voyage records raise doubts as to the structural integrity of a storage tank, a hydraulic or hydropneumatic test is to be carried out.

For integral tanks and for independent tanks of type A and B, the test pressure is not to be less than the MARVS.

For independent tanks of type C, the test pressure is not to be less than 1,25 times the MARVS.

**6.6.8** When the unit is 10 years old, at every alternate class renewal survey, independent storage tanks of type C are to be either:

- hydraulically tested to 1,25 times the MARVS, and thereafter non-destructively tested in accordance with [6.6.4], or
- subjected to thorough non-destructive testing in accordance with a programme specially prepared for the tank design.

If a special programme of non-destructive testing does not exist, special attention is to be given to the detection of surface cracks in welded connections in highly stressed areas as listed in [6.6.4].

At least 10% of the length of the welded connections in each of the above-mentioned areas is to be tested. This testing is to be carried out internally and externally, as applicable. Insulation is to be removed as necessary for the required non-destructive testing.

Where hold space atmosphere control is permanently maintained, the scope of external examination of the tanks and their supports may be reduced at the Surveyor's discretion.

**6.6.9** As far as accessible, hold spaces and hull insulation (if provided), secondary barriers and tank supporting structures are to be visually examined. The secondary barrier of tanks is to be checked for its effectiveness by means of a pressure/vacuum test, a visual examination or any other acceptable method.

**6.6.10** For membrane, semi-membrane and internal insulation tank systems, inspection or testing is to be carried out in accordance with a programme specially prepared for the tank system concerned.

**6.6.11** All gas-tight bulkheads are to be examined and the effectiveness of gas-tight shaft sealing is to be verified.

**6.6.12** It is to be verified that independent storage tanks are electrically bonded to the hull.

**6.6.13** The pressure relief valves for the storage tanks are to be opened for examination, adjusted, function tested and sealed. If the storage tanks are equipped with relief valves with non-metallic membranes in the main or pilot valves, these non-metallic membranes are to be replaced. Where a proper record of continuous overhaul and re-testing of individually identifiable relief valves is maintained, consideration may be given to acceptance on the basis of opening, internal examination and testing of a representative sample of valves, including each size and type of liquefied gas or vapour relief valves in use, provided there is evidence in the log-book that the remaining valves have been overhauled and tested since crediting of the previous class renewal survey.

## 6.7 Weather decks and storage handling rooms

**6.7.1** Piping for storage and process, liquid nitrogen (if any), ballast, stripping and venting systems is to be examined to the Surveyor's satisfaction. Insulation is to be removed as deemed necessary to ascertain the condition of the pipes. If the visual examination raises doubts as to the integrity of the pipelines, a pressure test at 1,25 times the MARVS for the pipeline is to be carried out. After reassembly the complete piping systems are to be tested for leaks.

It is to be verified that storage piping systems are electrically bonded to the hull.

**6.7.2** The pressure relief valves on storage piping are to be function tested. A random selection of valves is to be opened for examination and adjusted.

**6.7.3** All storage pump room, compressor room and control room boundaries are to be generally examined. Gas-tight shaft sealing devices are to be examined. The bottom of storage pump rooms and storage compressor rooms is to be presented clean for the examination of stripping devices and gutters.

**6.7.4** Pressure/vacuum relief valves, rupture discs and other pressure relief devices for interbarrier spaces and/or hold spaces are to be examined and, if necessary, opened and tested in accordance with their design.

Vent line drainage arrangements are to be examined.

## **7 Class renewal survey - Storage machinery items**

### **7.1 Storage area, storage pump rooms, storage compressor rooms**

**7.1.1** Storage, ballast and stripping pumps are to be internally examined and prime movers checked. A working test is to be carried out.

Maintenance records of storage pumps are to be made available to the Surveyor.

**7.1.2** Electrical equipment and cables in dangerous zones such as storage pump rooms, storage compressor rooms and spaces adjacent to and areas above storage tanks are to be examined as far as practicable and tested with particular regard to:

- protecting earthing (spot check)
- integrity of flameproof enclosures
- damage of outer sheath of cables
- function testing of pressurised equipment and associated alarms
- testing of systems for de-energising non-certified safe electrical equipment located in spaces protected by air-locks, such as electric motor rooms, cargo control rooms, etc.

**7.1.3** The electrical insulation resistance of the electrical equipment and circuits in dangerous zones is to be measured. These measurements are only to be effected when the unit is in a gas-free or inerted condition and are to be carried out within an acceptable time period. Where a proper record of testing is maintained, consideration may be given to accepting recent readings by the unit's personnel.

**7.1.4** When there is a reliquefaction or refrigeration plant, and/or arrangements for the use of storage as fuel, the corresponding machinery and equipment, such as storage pumps, compressors, heat exchangers, condensers and process pressure vessels, are to be surveyed to the same extent as required for similar equipment on board oil storage at the class renewal survey.

**7.1.5** In addition to the requirements of [7.1.1] to [7.1.4], the survey also consists of:

- confirmation that spares are provided for storage area mechanical ventilation fans
- confirmation that the installation for heating the hull structure is in satisfactory working condition
- general examination and testing of leakage detection systems in interbarrier spaces and hold spaces
- examination of gas detection piping system for corrosion or damage; checking, as far as possible, of the integrity of suction lines between suction points and analysing units
- examination and tests of systems for the removal of water from interbarrier spaces and hold spaces
- examination of portable equipment, such as hoses and spool pieces used for segregation of piping systems for storage, inert gas and bilge pumping.

### **7.2 Fire-fighting systems in storage area**

**7.2.1** The survey is to include the examination of fire-fighting systems of any type fitted on board for the protection of the storage area, storage pump room, storage compressor room and other dangerous spaces, such as deck foam, water-spraying, dry powder systems etc., as applicable in accordance with the relevant requirements.

## Section 8

# Survey of Underwater Parts and Temporary Mooring Equipment

### 1 Scope of survey

#### 1.1 Structure and appurtenances

**1.1.1** The underwater parts of the structure are to be examined for corrosion, or deterioration due to chaffing from anchoring equipment or supply craft or contact with the ground and for any undue unfairness or buckling. Special attention is paid to bilge keels if applicable. Plate unfairness or other deterioration which do not necessitate immediate repairs, is to be recorded.

**1.1.2** Sea chests and their gratings, sea connections and overboard discharge valves and cocks and their fastenings to the hull or sea chests are to be examined. Valves and cocks need not be opened up more than once in a class term unless considered necessary by the Surveyor.

**1.1.3** Particular attention is to be paid to the following areas:

- for surface units:
  - moon pool and other openings
  - turrets
  - spread moored area
- for column stabilized units:
  - connections of columns to the lower hulls
  - intersections between bracings and diagonals
  - covers to any outside access openings
- for TLP units:
  - connections of columns to the lower hulls
  - intersections between bracings and diagonals
  - covers to any outside access openings
  - tension leg
  - foundations of lower connectors, as far as practicable
- for self-elevating units:
  - spud cans
  - bracing members
  - trusses of legs
  - leg foundation.

**1.1.4** The condition of anodes and of their attachments to the structure are ascertained at random.

**1.1.5** Anodes more than 75% depleted are to be replaced.

**1.1.6** When a unit is in dry-dock or on a slipway, it is to be placed on blocks of sufficient height and with the necessary staging to permit the examination of underwater parts of the structure, including, if fitted, rudder, propeller, sea chests and valves.

#### 1.2 Temporary Mooring equipment

**1.2.1** Temporary mooring equipment shall be considered as mooring equipment not covered by **POSA** or **TLS** notation.

**1.2.2** For units fitted with temporary mooring equipment, the corresponding anchors, chain cables and/or wire ropes, windlasses and winches are to be examined and checked. This operation does not need to be carried out more than once in a five year period, unless considered necessary by the Surveyor. Worn out or damaged chain lengths and wire ropes are to be renewed.

**1.2.3** Housing and supporting equipment (rack, fairleads, tendon porch, etc.), are to be examined together with their outside and inside connection to the unit's structure.

### 1.3 Propulsion and manoeuvring

**1.3.1** Visible parts of rudder, rudder pintles, rudder stock and couplings as well as stern frames, if any, are to be examined. If considered necessary by the Surveyor, the rudder is to be lifted or the inspection plates removed for the examination of pintles. The clearance in the rudder bearings and the rudder lowering are to be checked and recorded.

Where applicable, pressure test of the rudder may be required as deemed necessary by the Surveyor.

**1.3.2** Visible parts of propeller, stern bush, propeller shaft boss, brackets and tightness systems are to be examined. The clearances of the propeller shaft (or wear gauge) are to be checked and recorded. For controllable pitch propellers, the Surveyor is to be satisfied with the fastenings and tightness of hub and blade sealing.

Visible parts of other propulsion systems and propellers for steering purposes are also to be examined.

Dismantling is to be carried out, if considered necessary, notably where leakages are detected.

**1.3.3** Visible parts of thrusters are to be examined.

## 2 In-water surveys

### 2.1 General

**2.1.1** The in-water survey is to provide the information normally obtained from a bottom survey in dry condition. Special consideration shall be given to ascertaining rudder bearing clearances and stern bush clearances of oil stern bearings based on a review of the operating history, on board testing and stern oil sample reports. These considerations are to be included in the proposal for in-water surveys.

During in-water survey, cathodic protection potential readings are to be taken. The amount of readings is to be representative of the whole immersed part of the structure of the unit.

**2.1.2** Proposals for in-water surveys are to be submitted in advance of the survey so that satisfactory arrangements can be agreed with the Society.

**2.1.3** In principle, no outstanding conditions of class are to exist requiring repair work to be carried out to the underwater part of the shell plating, the rudder, the propeller or the propeller shaft, unless the Society is satisfied that such repairs may be carried out while the unit is afloat.

**2.1.4** The in-water survey is to be carried out with the unit at a suitable draught; the in-water visibility is to be good and the structure below waterline is to be sufficiently clean to permit meaningful examination.

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

**2.1.5** The in-water survey is to be carried out, under surveillance of a Surveyor, by divers or by suitably equipped remotely operated vehicles (ROV's). The divers are to be employed by a firm approved as service supplier by the Society. Upon completion of the survey, the approved diving firm is to submit to the attending Society Surveyor a detailed report including video tapes, as well as photographic documentation of the main parts inspected.

**2.1.6** The in-water survey scope of work maybe mergeable over a three months period (weather condition, in-water visibility, diver's safety...). The overlap and the sequence of inspection shall be provided at satisfaction of the surveyor.

**2.1.7** The Surveyor is to be satisfied with the methods of localisation of the diver(s) on the plating which should make use where necessary of permanent markings on the plating at selected points and with the method of pictorial representation. An efficient two-way communication between the Surveyor and diver(s) is to be provided.

**2.1.8** If the in-water survey reveals damage or deterioration that requires immediate attention, the Surveyor may require that the unit be drydocked in order that a detailed survey can be undertaken and the necessary repairs carried out.

**2.1.9** The under water marking plan shall be approved by the Society.

**2.1.10** An in-water survey may normally be carried out if the unit has been granted the additional class notation **INWATERSURVEY** as defined in Ch 1, Sec 2, [8.4.9]. Upon application by the Owner, the Society may also authorise, on a case-by-case basis, such bottom in-water survey for units not assigned with the additional class notation **INWATERSURVEY**.

## 2.2 Arrangements for in-water surveys

**2.2.1** It is advisable that both the Surveyor and the divers are provided with detail drawings of the structure and hull attachments below the water line, including:

- all shell openings
- stem
- rudder and fittings
- sternpost
- propeller, including the means used for identifying each blade
- anodes, including securing arrangements
- bilge keels
- welded seams and butts.

The plans are to include all the necessary instructions to facilitate the divers' work, specially for taking clearance measurement when applicable.

**2.2.2** The unit is to be provided with special constructional features so as to make the underwater survey easy and efficient, that is:

- a) markings of a water-resistant nature are to be fitted on the underwater parts of the structure to facilitate the localisation of inspected parts, showing in particular, the location of main bulkheads
- b) sea valves, if needed to be opened up as per [1.1.2], including valve chests, are to be provided with suitable blanking arrangements so that cocks, valves and strainers can be examined
- c) rudder arrangements are to be such that rudder pintle clearances and fastenings arrangements can be easily checked
- d) propeller shaft arrangements are to be such that clearances can be easily checked.

**2.2.3** The Society is to take into consideration the units which, for specific reasons, depart from the requirements of [2.2.1] or [2.2.2].

## Section 9

## Other Surveys

### 1 Survey of inert gas and hydrocarbon blanketing installations

#### 1.1 General

**1.1.1** The requirements of the present Article are applicable to all inert gas installations fitted on board floating storage units, covered or not by additional service feature **INERTGAS**, and to hydrocarbon blanketing installations.

#### 1.2 Annual survey

##### 1.2.1 All units

The survey of inert gas installation, as far as applicable, consists of the:

- general examination of the installation in operation condition
- external examination of the condition of piping and components for signs of corrosion or gas leakage / effluent leakage
- confirmation of the proper operation of inert gas blowers
- observation of the operation of the scrubber room ventilation system
- checking of deck water seal for automatic filling and draining; checking for presence of water carry-over and checking the condition of the non-return valve
- examination of the operation of remotely operated or automatically controlled valves and, in particular, the flue gas isolating valve(s)
- observation of a test of the interlocking feature of soot blowers
- observation that the gas pressure regulating valve automatically closes when the inert gas blowers are secured
- checking, as far as practicable, the following alarms and safety devices of the inert gas system using simulated conditions when necessary:
  - high oxygen content of gas in the inert gas main
  - low gas pressure in the inert gas main
  - low pressure in the supply to the deck water seal
  - high temperature of gas in the inert gas main
  - low water pressure to the scrubber
  - accuracy of portable and fixed oxygen measuring equipment by means of calibration gas
  - high water level in the scrubber
  - failure of inert gas blowers
  - failure of the power supply to the automatic control system for the gas regulating valve and to the instrumentation for continuous indication and permanent recording of pressure and oxygen content in the inert gas main
  - high pressure of gas in the inert gas main.

##### 1.2.2 Additional requirements for gas storage units

Inert/drying gas systems, including the means for prevention of backflow of storage vapour to gas-safe spaces, are to be verified as being in good condition.

#### 1.3 Intermediate survey

##### 1.3.1 Inert gas installations of all storage units

Requirements of the present article are additional to those of [1.2] for annual survey, which remain applicable.

For installations covered by additional service feature **INERTGAS**, the following applies:

- main parts such as scrubbers, washing machines, blowers and deck water seals are to be overhauled for examination
- valves are to be dismantled for examination
- pipe sections are to be dismantled for examination except where representative UTM of the piping has been carried out to the surveyor's satisfaction
- all alarms will be examined and tested.

For installations other than those covered by additional service feature **INERTGAS**, main parts such as scrubbers, washing machines, blowers and deck water seals are to be overhauled for examination.

### 1.3.2 Inert gas installations of gas storage units

In addition to requirements of [1.2] for annual survey, the following applies:

- the main equipment, such as inert gas producers, isolating valves, when fitted, are to be examined
- special attention is to be paid to low temperature nitrogen storage plant and to the associated arrangement for protection of hull structure against nitrogen leakage.

### 1.3.3 Hydrocarbon blanketing installations

Requirements of the present article are additional to those of [1.2] for annual survey, which remain applicable.

The following applies:

- main parts such as blower, compressor, filter, gas regulating valve, pressure released valve, vacuum protection system and deck water seals are to be overhauled for examination
- valves are to be dismantled for examination
- pipe sections are to be dismantled for examination except where representative UTM of the piping has been carried out to the surveyor's satisfaction
- all alarms and sensors will be examined and tested.

## 1.4 Class renewal survey

**1.4.1** The scope of class renewal survey of all inert gas installations is equivalent to the one laid down in [1.3] for the intermediate survey.

## 2 Survey of additional class notation AUTO

### 2.1 Annual survey

**2.1.1** The annual survey of classed automated installations consists of the:

- examination of the machinery and automated plant operational record (log book) entries - when such a log book exists - since the last survey in order to check the past performance of the system, and to establish if certain parts have shown any irregularities in operation and which corrective measures have been taken
- general examination of the control systems covered by the notation and random check, as far as possible taking into account operating conditions, of the proper operation of main measuring, monitoring, alarm and automatic shut-down system, in particular for essential auxiliaries
- checking the fire detectors, in particular in machinery spaces, and bilge flooding alarms
- checking a number of other alarms selected at random.

### 2.2 Class renewal survey

**2.2.1** The class renewal survey of classed automated installations consists of:

- the examinations, tests and checks listed in [2.1] for the annual survey, and
- an additional programme of examinations, tests and checks prepared in agreement with the Owner and based on operating data and on the experience of previous surveys.

All points which cannot be checked when the unit is in operation will be given particular consideration by this programme. All alarm and safety devices will be tested and settings adjusted if necessary, except if evidence exists of the proper operation of these installations, or if they have been subject of a systematic maintenance.

Fire smoke detectors fitted in the machinery spaces are to be tested in similar conditions as for the first certificate delivery; alternatively, written evidence of reconditioning and recalibrating by the Manufacturer or by his representative may be accepted.

## 3 Survey of additional service feature POSA, POSA-HR, POSA JETTY and POSA MU

### 3.1 Periodical surveys

**3.1.1** Requirements regarding periodical surveys are given in NR493 Classification of Mooring Systems for Permanent and Mobile Offshore Units.

## 4 Survey of production units

### 4.1 Application

**4.1.1** Requirements given in the present Article for production units are additional to those given in the relevant Sections of this Chapter.

## 4.2 Survey requirements for units assigned with service notation oil production unit

### 4.2.1 Annual survey and class renewal survey

The survey will consist of the:

- confirmation to be obtained that no new production equipment has been installed without previous notification to the Society
- examination of the support structure of production plant and its connection to the unit's structure
- verification of the risers foundations securing the riser to the unit
- confirmation that production pipes, pumps, accessories and other production equipment are permanently fixed
- confirmation that piping systems for the process are separated from other piping systems of the unit
- confirmation that process piping are not passing through any space other than those devoted to production purposes
- verification of the arrangements made in order to ensure that substances which are flammable, toxic or are likely to present a hazard due to reaction when mixed are kept separated
- verification of the means provided to collect and safely dispose liquid leaks from process equipment
- confirmation that drainage systems for safe areas are entirely separated and distinct from drainage systems from hazardous areas
- checking, as far as practicable, of the alarm activation in manned control rooms due to loss of pressurisation of high pressure equipment
- general visual examination of the condition of high pressure equipment and piping. Checking for absence of damages or excessive corrosion
- review of the records of inspection and tests of safety valves
- examination of the conditions of insulation of hot surfaces.

## 4.3 Survey requirements for additional class notation PROC, PROC-GL and PROC-GP

### 4.3.1 Annual survey

The survey will consist of the:

- external inspection of pressure vessels, heat exchangers, attached instrumentation and safety devices
- visual inspection of piping systems including drainage shut down and blowdown valves
- examination of pumps for excessive gland seal leakage
- external inspection of compressors and tests of protective devices
- examination of flare and flare pilot system or cold venting system
- examination of well control equipment
- inspection of support structure
- examination of fire and gas detection system
- examination of fire water system.

### 4.3.2 Class renewal survey

In addition to the survey performed as per [4.3.1], class renewal survey will mainly consist in internal examination of main process equipment (pressure vessels, exchangers, pumps, compressors, boilers,...) and pipings.

Safety valves setting will be checked. Safety systems will be tested for proper operation (i.e. ESD, process shutdown, fire and gas detection, fire water).

Configuration of the process system (equipment in parallel) and planned shutdowns will be taken into account to minimise production break.

In case of doubt, pressure test may be requested at the satisfaction of the Surveyor.

## 5 Survey of swivels and riser, umbilical and/or power cable systems

### 5.1 Application

5.1.1 The requirements given in the present Article for swivels and riser, umbilical and/or power cable systems are additional to those given in the relevant Sections of the present Chapter.

The survey requirements for swivel systems, as described in [5.2], are applicable to units assigned with the structural type notation **offshore buoy** and to surface units assigned with service notation **oil production unit** and/or **oil storage** and/or **liquefied gas storage**, whenever the unit is fitted with such equipment.

The survey requirements for riser, umbilical and/or power cable systems, as described in [5.3], are applicable to units assigned the additional class notation **SUR2SUB**.

## 5.2 Swivel systems

### 5.2.1 Annual survey

The survey will consist of the:

- external inspection of pressure swivels, attached instrumentation and safety devices
- external inspection of electrical swivels, attached instrumentation and safety devices
- visual inspection of piping systems including leak drainage system
- examination of sealing systems for leakage
- tests of protective devices
- examination of electrical cables and connectors and performance of insulation resistance test of circuits
- inspection of support structure
- examination of fire and gas detection systems
- examination of fire water system.

### 5.2.2 Class renewal survey

In addition to the survey performed as per [5.2.1], class renewal survey will mainly consist in internal examination of swivels and pipings, where accessible and if considered necessary by the Surveyor.

Rotation tests are to be performed, as far as practicable, with measurement of starting and running moments.

Safety systems will be tested for proper operation.

Planned shutdowns will be taken into account to minimise production break.

In case of doubt, pressure test may be requested at the satisfaction of the Surveyor.

## 5.3 Riser, umbilical and/or power cable systems

### 5.3.1 Annual survey

The records of operation of the riser system and the records of the examination carried out by the unit's crew, if any, are to be presented to the Surveyor at each annual survey, for review.

The examination of the riser, umbilical and/or power cable components is to be performed if above waterline.

In the case of significant damages revealed during these examinations, or if the Surveyor determines that problems have been experienced since the last annual survey, a more extensive survey may be required by the Surveyor.

### 5.3.2 Class renewal survey

The overall integrity of the riser, umbilical or power cable system is to be examined, e.g. by general visual inspection of all the lines, over their full length, by ROVs or divers. Examination, by visual inspection or other appropriate methods, of the integrity of the critical components with respect to corrosion, wear and other possible modes of degradation is to be performed.

## 6 Survey of additional class notations COMF HEALTH-NOISE-g-SIS and COMF HEALTH-VIB-g-SIS

### 6.1 General

**6.1.1** When modifications, alterations or repairs have occurred and which may affect the noise and vibration environment, the Owner is to inform the Society in order to submit the unit to a survey so as to maintain the additional class notations.

### 6.2 Annual survey

**6.2.1** The Owner or his representative is to declare to the attending Surveyor that no significant modifications have been made without the prior approval of the Society, in particular with respect to:

- modifications/repairs carried out in accommodation, service, navigation and control spaces
- HVAC/duct routing modifications
- machinery modifications, main repairs
- list of any alterations, repairs or damages.

### 6.3 Class renewal survey

**6.3.1** The usual life-cycle of the offshore units may induce vibration and noise increase.

- Class Renewal Survey No. 1:

The scope is the same as for Annual survey

- Class Renewal Survey No. 2 and subsequent:
  - noise and vibration measurements at service condition to be carried out,
  - insulation measurements to be carried out.

Renewal surveys are to cover 30% of the initial survey measuring points.

Note 1: Renewal survey requirements are to be compared to the **habitability** notation requirement when the notation was assigned. More recent requirements may be considered on Owner request.

## **7 Survey of additional class notation DRILL**

### **7.1 Application**

**7.1.1** Requirements given in the present Article are additional to those given in the relevant Sections of the present Chapter.

These requirements are applicable only when the additional class notation **DRILL** has been assigned to the unit.

For survey requirements and for periodical surveys refer to NR570, Section 4.

## **8 Survey of additional class notation OHS**

### **8.1 Periodical surveys**

**8.1.1** Requirements regarding periodical surveys, lay-up and re-commissioning surveys, are given in NR595, Section 4.

## **9 Survey of service notation Lifting**

### **9.1 General**

**9.1.1** The requirements of this Article are additional to those laid down in NR526 or NR595, whichever is applicable.

### **9.2 Annual survey**

**9.2.1** The survey is to include verification and testing of the lifting equipment, as follows:

- verification of the presence onboard of the following documents:
  - technical manual
  - planned maintenance system
- general examination of the electrical cabling
- functional testing of the main and alternative two-way communication system at the lifting operating position
- verification of the structural arrangement and foundations of the lifting equipment
- testing of hydraulic installations
- load tests in accordance with the rules or requirements referred to in the lifting equipment certificate.

### **9.3 Class renewal survey**

**9.3.1** The requirements given in Rule Notes NR526 and NR595 are applicable for renewal survey.

In addition, load tests in accordance with the rules or requirements referred to in the lifting equipment certificate are to be carried out.

## **10 Survey of additional class notation HEL**

### **10.1 Application**

**10.1.1** The requirements of this Article apply to units which have been assigned the additional class notation **HEL** defined in Ch 1, Sec 2, [8.4].

### **10.2 Annual survey**

**10.2.1** The Society considers that as a minimum these following issues are to be examined during the periodic surveys to confirm that there has been no alteration or deterioration in the condition of the helicopter landing area:

a) The general examination of the physical characteristics of the helideck is to include:

- the dimensions as measured
- the declared D-value
- the deck shape, and
- the scale drawings of deck arrangement.

b) The general examination of the preservation of obstacle-protected surfaces is to include:

- the minimum 210° Obstacle Free Sector (OFS) surface
- the 150° Limited Obstacle Sector (LOS) surface, and
- the minimum 180° falling 5:1 gradient surface with respect to significant obstacles.

Note 1: If one or more of these surfaces is infringed due, for example, to the proximity of an adjacent installation or vessel, an assessment is to be made to determine any possible negative effect which may lead to operating restrictions.

c) The general examination of the marking and lighting is to include:

- the adequate helideck perimeter lighting
- the adequate helideck touchdown marking lighting ("H" and TD/PM Circle lighting) and/or floodlighting
- the status lights (for day and night operations)
- the helideck markings
- the dominant obstacle paint schemes and lighting, and
- the general installation lighting levels including floodlighting.

Note 2: Note: Where inadequate helideck lighting exists the Helideck Limitation List (HLL) is to be annotated 'daylight only operations'.

d) The general examination of the deck surface is to include:

- the surface friction
- the Helideck net (as applicable)
- the drainage system
- the deck edge perimeter safety netting
- the tie-down points, and
- the cleaning of all contaminants (to maintain satisfactory recognition of helideck markings and preservation of the helideck friction surface).

e) The verification of the environment effects is to include:

- foreign object damage
- air quality degradation due to exhaust emissions, hot and cold vented gas emissions and physical turbulence generators
- bird control
- any adjacent helideck/installation having significant environmental effects in any air quality assessment, and
- flares.

f) The general examination of the rescue and fire-fighting facilities is to include:

- the primary and complementary media types, quantities, capacity and systems
- the Personal Protective Equipment (PPE), and
- the crash box.

g) The general examination of the communications and navigation system arrangements is to include:

- the aeronautical radio(s)
- the radio/telephone (R/T) call sign to match helideck name and side identification which should be simple and unique
- the Non-Directional Beacon (NDB) or equivalent (as appropriate), and
- the radio log.

h) The general examination of the Fuelling facilities is to include:

- the fuel system, ventilation, fire protection and detection
- the pump and aircraft bonding safety systems.

i) The general examination of the additional operational and handling equipment is to include:

- the windsock
- the meteorological information (recorded by an automated means)
- the Helideck Motion System recording and reporting (where applicable)
- the passenger briefing system
- the chocks
- the tie-downs, and
- the weighing scales for passengers, baggage and freight.

## 11 Survey of additional class notation OAS

### 11.1 Periodical surveys

11.1.1 Requirements regarding periodical surveys are given in NI629 Classification of Offshore Access Systems.

## 12 Survey of additional class notations SUSTAINABILITY-1 and SUSTAINABILITY-2

### 12.1 General

12.1.1 The requirements of this Article apply to ships which have been assigned the additional class notations **SUSTAINABILITY-1** or **SUSTAINABILITY-2** as defined in Ch 1, Sec 2, [8.4.13].

12.1.2 When modifications, alterations or repairs have occurred, which may affect the noise and vibration environment, the Owner is to inform the Society in order to submit the unit to a survey so as to maintain the additional class notations.

### 12.2 First annual survey

#### 12.2.1 Confirmation of no discharge period

During the first annual survey, the Surveyor is to collect the results of tests and measurements undertaken by the Owner according to Pt C, Ch 5, Sec 1, [4.2.2].

#### 12.2.2 Audit

An onboard audit of the operational procedures, as required in Pt C, Ch 5, Sec 1, Tab 2 is to be done by the Surveyor in order to ascertain that the Master and crew are familiar with the unit's onboard procedures for preventing pollution and in order to check that the discharge records mentioned in Pt C, Ch 5, Sec 2, [1] are properly completed.

### 12.3 Annual survey

12.3.1 The Owner or his representative is to declare to the attending Surveyor that no significant alterations have been made, without prior approval from the Society, to the equipment and arrangements related to sustainability and covered by Part C, Chapter 4.

#### 12.3.2 Ozone-depleting substances

The survey is to include the following items:

- verification that the procedures for regular checking of systems with ozone-depleting substances are available on board and confirmation that personnel in charge are identified
- confirmation that appropriate entries are being made in the record book for ozone-depleting substances.

#### 12.3.3 Prevention of sea pollution

The survey is to include, as far as practicable:

- confirmation that the IOPP and ISPP certificates are available on board and due surveys are up to date
- confirmation that the ballast water management plan is available on board
- external examination of the most important components of the sewage treatment plant, the garbage treatment plant, the oil filtering equipment, the incinerators if fitted, the comminuters and grinders, the hazardous wastes recovery unit if fitted
- general examination of the holding tanks, including examination of a possible corrosion protection of the inside surfaces of the tanks which are to be in good condition
- verification of the satisfactory condition of the standard discharge connections for oil and wastewater
- external examination and operating tests of the following equipment and systems:
  - systems and equipment for the prevention of pollution by oil, as required in Pt C, Ch 5, Sec 2, [1.4] and Pt C, Ch 5, Sec 3, [1.3]
  - sewage and greywater installation and treatment plants and advanced wastewater treatment plant, if fitted
  - hazardous waste recovery unit, if fitted, comminuters and grinders
  - refrigerant leakage prevention and retention facilities
  - fire-fighting media containment and disposal equipment
- confirmation that the hazardous wastes are stowed as specified in the garbage management plan
- ascertainment of the correct concentration of the disinfectant in the effluent of the sewage or wastewater treatment plant
- ascertainment of possible concentration of other chemicals in the effluent of the sewage or wastewater treatment plant.

#### 12.3.4 Prevention of air pollution

The survey is to include:

- confirmation that the IAPP is valid and that each concerned engine has a valid EIAPP certificate

- external examination and operating tests of the following equipment and systems:
  - hydrocarbon blanket gas system
  - vent recovery system
  - SCR or other NOx reducing system, if fitted
- confirmation that the NOx emission control procedure is available on board and confirmation that personnel in charge are identified
- verification that the procedures for defining, ordering and checking fuel oils for control of SOx emission are available on board and confirmation that personnel in charge are identified
- when an onboard incinerator is fitted:
  - verification that the ISPP certificate is valid
  - external examination of the incinerator and confirmation that such equipment operates satisfactorily
  - test of the alarms, exhaust monitoring devices and emergency stop located outside the compartment.

#### **12.3.5 Energy efficiency and GHG emission management**

The survey is to include:

- confirmation that the Energy efficiency and GHG emission management plan is on board and the record books are kept up to date and confirmation that personnel in charge are identified
- verification that the personnel in charge are trained to implement the energy efficiency and GHG emission, improvement measures and corrective actions

#### **12.3.6 Review of records**

It is to be confirmed that appropriate entries are being made in the following records books for the period since the previous survey:

- oil record book
- garbage record book
- records of ballast exchanges after international voyages and ballast water record book, if applicable
- sewage and grey water discharge book
- NOx emissions records
- fuel oil sulphur content records
- results of the tests on effluents and wastes done by the Owner according to Pt C, Ch 5, Sec 1, [4.2.3]
- energy efficiency and GHG emission Key Performance Indicators (KPIs)
- operational activities related to energy efficiency and GHG emission improvement
- execution of energy efficiency and GHG emission improvement measures and corrective actions.

**12.3.7** The annual survey is to include verification as per [6.2.1].

### **12.4 Class renewal survey**

**12.4.1** In addition to the requirements of [12.3], the class renewal survey is to include:

- demonstration, under working conditions, of the correct functioning of the most important components of the sewage treatment plant or AWT plant if fitted, the garbage treatment plant, the oil filtering equipment, the incinerators if fitted, the comminuters and grinders, the hazardous waste recovery unit if fitted
- ascertainment of the correct functioning of the alarms
- confirmation of the operation and calibration of the emissions analysers, if fitted
- verification as per [6.3.1].

## Section 10

# Suspension and Withdrawal of Class

## 1 General

### 1.1 Discontinuance of class

**1.1.1** The class may be discontinued either temporarily or permanently. In the former case it is referred to as "suspension" of class, in the latter case as "withdrawal" of class. In both these cases, the class is invalidated in all respects. In the case of withdrawal, the name of the offshore unit is deleted from the Register. The current version of the Register can be consulted on the Society website.

### 1.2 Suspension of class

**1.2.1** The class may be suspended either automatically or following the decision of the Society. In any event, the offshore unit will be considered as not retaining its class from the date of suspension until the date when class is reinstated.

**1.2.2** The class may be automatically suspended when one or more of the following circumstances occur:

- when a offshore unit is not operated in compliance with the rule requirements, such as in cases of services or conditions not covered by the service notation, or trade outside the navigation restrictions for which the class was assigned
- when a offshore unit proceeds to sea with less freeboard than that assigned, or has the freeboard marks placed on the sides in a position higher than that assigned, or, in cases of offshore unit where freeboard are not assigned, the draught is greater than that assigned
- when the Owner fails to inform the Society in order to submit the offshore unit to a survey after defects or damages affecting the class have been detected
- when repairs, alterations or conversions affecting the class are carried out either without requesting the attendance of the Society or not to the satisfaction of the Surveyor.

Suspension of class with respect to the above cases will remain in effect until such time as the cause giving rise to suspension has been removed. Moreover, the Society may require any additional surveys deemed necessary taking into account the condition of the offshore unit and the cause of the suspension.

**1.2.3** In addition, the class is automatically suspended:

- When the class renewal survey has not been completed by its limit date or within the time granted for the completion of the survey, unless the offshore unit is under attendance by the Society's Surveyors with a view to completion prior to resuming trading.
- When the annual or intermediate surveys have not been completed by the end of the corresponding survey time window (see Ch 2, Sec 1, [2.1.3]) unless the offshore unit is under attendance for completion of the survey.

Continuous survey item(s) due or overdue at the time of annual surveys is (are) to be dealt with. The offshore unit's class will be subject to a suspension procedure if the item(s) is (are) not surveyed or postponed by agreement with the Society.

Suspension of class with respect to the above cases will remain in effect until such time as the class is reinstated once the due items and/or surveys have been dealt with.

**1.2.4** In addition to the circumstances for which automatic suspension may apply, the class of a offshore unit may also be suspended following the decision of the Society:

- when a condition of class is not dealt with within the time limit specified, unless it is postponed before the limit date by agreement with the Society
- when one or more surveys are not held by their limit dates (see Ch 2, Sec 1, [2.1.4]) or the dates stipulated by the Society also taking into account any extensions granted in accordance with the provisions of Part A
- when, due to reported defects, the Society considers that a offshore unit is not entitled to retain its class even on a temporary basis (pending necessary repairs or renewals, etc.)
- when the offshore unit has not been maintained in proper condition, as set forth in Ch 1, Sec 1, [3.3.2]
- in other circumstances which the Society will consider on their merits (e.g. in the event of non-payment of fees or where the Owner fails to render the offshore unit available for the occasional surveys) as listed in Ch 2, Sec 1, [6.1.1].

Suspension of class decided by the Society takes effect from the date when the conditions for suspension of class are met and will remain in effect until such time as the class is reinstated once the due items and/or surveys have been dealt with.

### **1.3 Withdrawal of class**

**1.3.1** The Society will withdraw the class of a offshore unit in the following cases:

- at the request of the Owner
- as a rule, when the causes that have given rise to a suspension currently in effect have not been removed within six months after due notification of suspension to the Owner
- when the offshore unit is reported as a constructive total loss
- when the offshore unit is lost
- when the offshore unit is reported scrapped.

Withdrawal of class may take effect from the date on which the circumstances causing such withdrawal occur.

The contract for the classification of the offshore unit is terminated as of right in the above cases.

The class is also withdrawn according to the provisions of article 9 of the Marine & Offshore Division General Conditions in case of contract termination.

**1.3.2** When the withdrawal of class of a offshore unit comes into effect, the Society will:

- forward the Owner written notice
- delete the offshore unit from the Register
- notify the flag Administration
- make the information available to the Underwriters, at their request.

### **1.4 Suspension/withdrawal of additional class notations**

**1.4.1** If the survey requirements related to maintenance of additional class notations are not complied with, the suspension or withdrawal may be limited to the notations concerned.

The same procedure may apply to service notations of offshore unit which are assigned with more than one service notation.

**1.4.2** The suspension or withdrawal of an additional class notation or a service notation (where a offshore unit is assigned with more than one service notation) generally does not affect the class.

## Appendix 1

# Thickness Measurements: Extent, Determination of Locations, Acceptance Criteria

## 1 General

### 1.1 Aim of the Appendix

**1.1.1** Thickness measurements are a major part of surveys to be carried out for the maintenance of class, and the analysis of these measurements is a prominent factor in the determination and extent of the repairs and renewals of the unit's structure.

**1.1.2** This Appendix is intended to provide Owners, companies performing thickness measurements and the Society's Surveyors with a uniform means with a view to fulfilling Rule requirements for thickness measurements. In particular, it will enable all the above-mentioned parties to carry out:

- the planning and preparation
- the determination of extent and location, and
- the analysis

of the thickness measurements in cooperation.

### 1.2 Scope of the Appendix

**1.2.1** Separate Articles below provide the following information:

- references to rule requirements and some additional information on the extent of the thickness measurements to be performed during surveys according to types of unit and related surveys (see Article [2])
- locations of the measurements for the main parts of the unit (see Article [3])
- acceptance criteria of thickness measurements (see Article [4]).

Tables and sketches are also given to detail the above points according to the types of units.

## 2 Extent of measurements

### 2.1 General

**2.1.1** For the maintenance of class, thickness measurements may be required during annual, intermediate and class renewal surveys.

Tab 1 gives the references to the requirements for minimum thickness measurements.

Some additional explanations are also given about the wording used in the Rules as well as the general principles of the required thickness measurements during class renewal surveys.

**Table 1 : References to requirements related to thickness measurements**

Structural type notation / Service notation	Type of survey		
	Class renewal	Intermediate	Annual
surface units: <b>offshore ship</b> <b>offshore barge</b> except when the service notation <b>drilling</b> is assigned	Systematic measurements and suspect areas: Ch 2, Sec 4, [2.5] and Ch 2, Sec 4, Tab 3  Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance	Ch 2, Sec 3, Tab 1 Thickness measurements to be taken if deemed necessary by the Surveyor  Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance	Areas of substantial corrosion identified at previous surveys: Ch 2, Sec 2, [2.1.2]  Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance

Structural type notation / Service notation	Type of survey		
	Class renewal	Intermediate	Annual
<b>column stabilized unit</b> <b>offshore TLP</b> except when the service notation <b>drilling</b> is assigned	<p>Systematic measurements and suspect areas: Ch 2, Sec 4, [2.5] and Ch 2, Sec 4, Tab 4</p> <p>Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance</p>	<p>Ch 2, Sec 3, Tab 1 Thickness measurements to be taken if deemed necessary by the Surveyor</p> <p>Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance</p>	<p>Areas of substantial corrosion identified at previous surveys: Ch 2, Sec 2, [2.1.2]</p> <p>Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance</p>
<b>self-elevating unit</b> except when the service notation <b>drilling</b> is assigned	<p>Systematic measurements and suspect areas: Ch 2, Sec 4, [2.5] and Ch 2, Sec 4, Tab 6</p> <p>Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance</p>	<p>Ch 2, Sec 3, Tab 1 Thickness measurements to be taken if deemed necessary by the Surveyor</p> <p>Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance</p>	<p>Areas of substantial corrosion identified at previous surveys: Ch 2, Sec 2, [2.1.2]</p> <p>Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance</p>
<b>offshore buoy</b>	see NR494	see NR494	see NR494
<b>drilling</b>	<p>Ch 2, Sec 5, [4]</p> <p>Extent of thickness measurements:</p> <ul style="list-style-type: none"> <li>surface unit: Ch 2, Sec 5, Tab 1</li> <li>self-elevating unit: Ch 2, Sec 5, Tab 2</li> <li>column stabilized unit: Ch 2, Sec 5, Tab 3</li> </ul> <p>Ch 2, Sec 5, Tab 4, according to the different locations, where substantial corrosion is found.</p>	<p>Ch 2, Sec 5, [3]</p> <p>Ch 2, Sec 5, Tab 4, according to the different locations, where substantial corrosion is found.</p>	<p>Ch 2, Sec 5, [2]</p> <p>Ch 2, Sec 5, Tab 4, according to the different locations, where substantial corrosion is found.</p>
<b>oil storage</b>	<p>Planning and general requirements: Ch 2, Sec 6, [6.1] and Ch 2, Sec 6, [6.4]</p> <p>Ch 2, Sec 6, Tab 3 and Ch 2, Sec 6, Tab 4</p> <p>Extent of systematic thickness measurements: Ch 2, Sec 6, Tab 5</p> <p>Ch 2, Sec 6, Tab 6 and Ch 2, Sec 6, Tab 7, according to the different locations, where substantial corrosion is found</p>	<p>Ch 2, Sec 6, [4]</p> <p>Ch 2, Sec 6, Tab 6 and Ch 2, Sec 6, Tab 7, according to the different locations, where substantial corrosion is found</p>	<p>Ch 2, Sec 6, [2.3]</p> <p>Limited to salt ballast tanks and when deemed necessary by the Surveyor</p> <p>Ch 2, Sec 6, Tab 6 and Ch 2, Sec 6, Tab 7, according to the different locations, where substantial corrosion is found</p>
<b>liquefied gas storage</b>	<p>Planning and general requirements: Ch 2, Sec 7, [6.1] and Ch 2, Sec 7, [6.4]</p> <p>Elements subjected to close-up survey: Ch 2, Sec 7, Tab 2</p> <p>Extent of systematic thickness measurements: Ch 2, Sec 7, Tab 3</p> <p>Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance</p>	<p>Ch 2, Sec 7, Tab 1 Thickness measurements to be taken if deemed necessary by the Surveyor</p> <p>Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance</p>	<p>Ch 2, Sec 7, [2.4.2]</p> <p>Limited to salt ballast tanks and when deemed necessary by the Surveyor</p> <p>Where substantial corrosion is found, the extent of thickness measurements may be increased to the Surveyor's satisfaction, using Ch 2, Sec 4, Tab 7 as guidance</p>

### 3 Number and locations of measurements

#### 3.1 General

**3.1.1** Considering the extent of thickness measurements as required by the Rules and indicated in Article [2], the locations of the points to be measured are given here for the most important items of the structure. Thus the number of points can be estimated.

#### 3.2 Locations of points

**3.2.1** Tab 2 provides explanations and/or interpretations for the application of those requirements indicated in the Rules which refer to both systematic thickness measurements related to the calculation of global hull girder strength (for surface unit) and specific measurements connected to close-up surveys.

Figures are also given to facilitate the explanations and/or interpretations given in the table. These figures show typical arrangements and they may be used as guidance for units other than those illustrated.

**Table 2 : Interpretations of rule requirements for the locations and number of points to be measured**

A) SYSTEMATIC MEASUREMENTS		
ITEM	INTERPRETATION	FIGURE
Selected plates on deck, tank top, bottom, double bottom and wind and water strakes (for all unit types)	"Selected" means at least a single point on one out of three plates, to be chosen on representative areas of average corrosion	No figure
All deck, tank top and bottom plates and wind and water strakes (for all units types)	At least two points on each plate to be taken either at each 1/4 extremity of plate or at representative areas of average corrosion	No figure
Transverse section	Refer to the definition given in Pt A, Ch 2, Sec 2, [2.2.5] of the Ship rules. One point to be taken on each plate. Both web and flange to be measured on longitudinals. For unit with cargo tank older than 10 years of age: within 0,1D (where D is the ship's moulded depth) of the deck and bottom at each transverse section to be measured, every longitudinal and girder is to be measured on the web and face plate, and every plate is to be measured at one point between longitudinals	Surface unit: Fig 1 (single hull) and Fig 2 (double hull) For pontoon of column-stabilized unit and TLP: Fig 11
Transverse rings (1)	At least two points on each plate in a staggered pattern and two points on the corresponding flange where applicable. Minimum 4 points on the first plate below deck. Additional points in way of curved parts. At least one point on each of two stiffeners between stringers / longitudinal girders	Surface unit: Fig 3 (single hull) and Fig 4 (double hull) For pontoon of column-stabilized unit and TLP: Fig 12
Bulkheads on units other than: • oil storage (2) • chemical storage (2) • liquefied gas storage (2)	"Selected bulkheads" means at least 50% of the bulkheads	Fig 5 for general bulkhead For pontoon of column-stabilized unit and TLP: Fig 13
Selected internal structure such as floors and longitudinals, transverse frames, web frames, deck beams, 'tweendecks, girders	The internal structural items to be measured in each space internally surveyed are to be at least 20% within the cargo area and 10% outside the cargo area	Fig 6
One section of deck plating for the full beam of the surface unit within the cargo area	Two single points on each deck plate (to be taken either at each 1/4 extremity of plate or at representative areas of average corrosion) in the transverse section concerned	No figure
All cargo hold hatch covers and coamings	Including plates and stiffeners	Fig 7 for units fitted with hold hatch covers and coamings
Girth belt	It is applicable for column-stabilized units and TLP. It represent the sectional and rings of the main structural element. It is a section for pontoon. It is an elevation for column. It is a main framing for upper hull. On section of the girth belt, one point to be taken on each plate. Both web and flange to be measured on longitudinals. On ring of the girth belt, at least two points on each plate in a staggered pattern and two points on the corresponding flange where applicable. Minimum 4 points on the first plate below deck. Additional points in way of curved parts. At least one point on each of two stiffeners between stringers/girders.	Column section: Fig 14 Node junction (ring type): Fig 15

B) CLOSE-UP SURVEYS AND RELATED MEASUREMENTS (oil storage and liquefied gas storage)		
ITEM	INTERPRETATION	FIGURE
Web frame ring (for oil storage)	Refer to the definition given in Ch 2, Sec 6, Tab 3 and Ch 2, Sec 6, Tab 4 "Adjacent structural members" means plating and stiffeners of deck, bottom, double bottom, sides and longitudinal bulkheads in the vicinity of the web frame ring	Extent of area is shown as ① in Ch 2, Sec 6, Fig 1 Location of points are given in Fig 3
Transverse section (for chemical and liquefied gas storage)	Refer to the definitions given in Ch 2, Sec 7, Tab 2 "Adjacent structural members" means plating and stiffeners of deck, bottom, double bottom, sides and longitudinal bulkheads in the vicinity of the web frame ring	No figure
Deck transverse	This is the upper part of the web frame ring including the adjacent structural members (see meaning given above).	Extent of area is shown as ② in Ch 2, Sec 6, Fig 1 Location of points are given in Fig 3
Deck and bottom transverses (for oil storage)	Refer to the definition given in Ch 2, Sec 6	Extent of area is shown as ② and ⑤ in Ch 2, Sec 6, Fig 1 Location of points are given in Fig 3
Transverse bulkheads	"Complete" means the whole bulkhead including stringers and stiffeners and adjacent structural members as defined above	Extent of area is shown as ③ in Ch 2, Sec 6, Fig 1 Location of points are given in Fig 8
	"Lower part" means lower part of bulkhead up to 1/4 of ship's depth or 2 metres above the lower stringer, whichever is the greater (stringers, stiffeners and adjacent structural members included)	Extent of area is shown as ④ in Ch 2, Sec 6, Fig 1 Location of points are given in Fig 8
Transverse bulkheads in cargo tanks for oil storage with double hull	At least two points on each plate. Minimum 4 points on the first plate below main deck At least one point on every third stiffener to be taken between each stringer At least two points on each plate of stringers and girders, and two points on the corresponding flange. Additional points in way of curved part Two points of each diaphragm plate of stools, if fitted	Fig 9
Transverse bulkheads in ballast tanks for oil storage with double hull	At least 4 points on plates between stringers / longitudinal girders, or per plate if stringers/girders not fitted At least two points on each plate of stringers and girders, and two points on the corresponding flange. Additional points in way of curved part At least one point on two stiffeners between each stringer / longitudinal girder	Fig 10
Adjacent structural members (for oil storage)	On adjacent structural members one point per plate and one point on every third stiffener/longitudinal	No figure
All plating and internal structures (for chemical and liquefied gas storage)	Refer to the definitions given in Ch 2, Sec 7	No figure
(1) Transverse rings means all transverse material appearing in a cross-section of the unit's hull, in way of a double bottom floor, vertical web and deck transverse.		
(2) For these units refer to B)		

Figure 1 : Location of measurements on transverse section for surface unit (single hull)

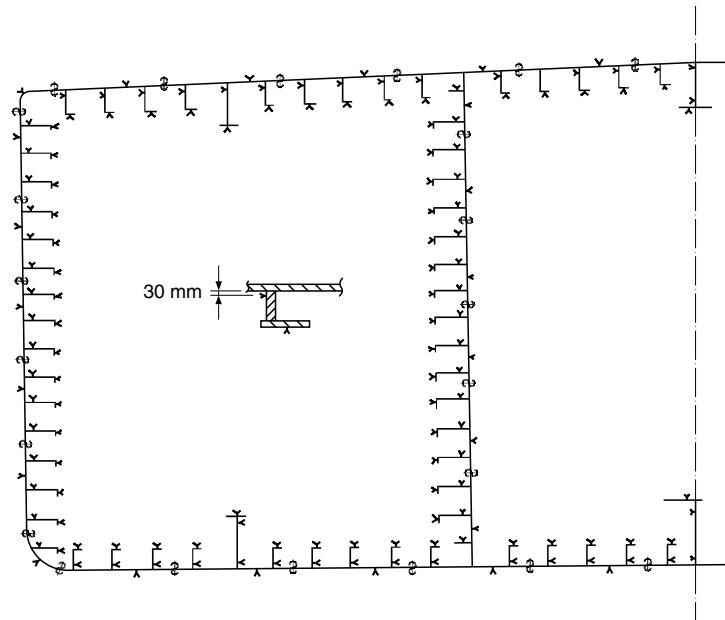


Figure 2 : Location of measurements on transverse section for surface unit (double hull)

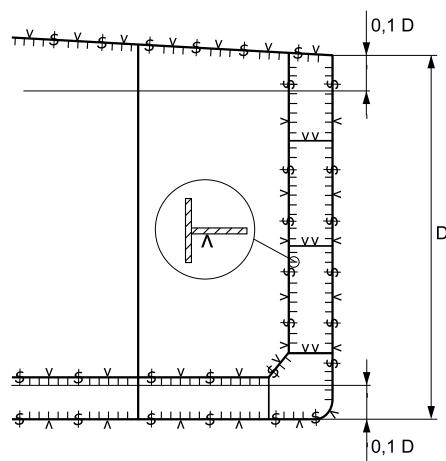


Figure 3 : Location of measurements on web frame rings and longitudinal elements for oil storage (single hull)

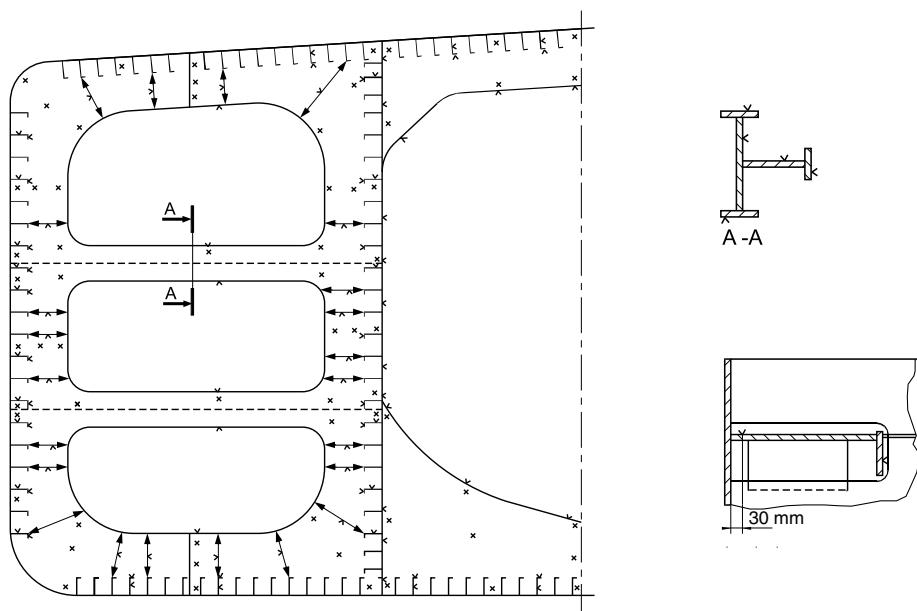


Figure 4 : Location of measurements on web frame rings and longitudinal elements for oil storage (double hull)

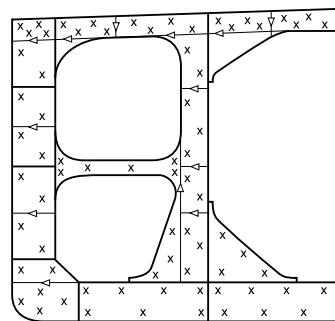


Figure 5 : Locations of measurements on bulkheads (general)

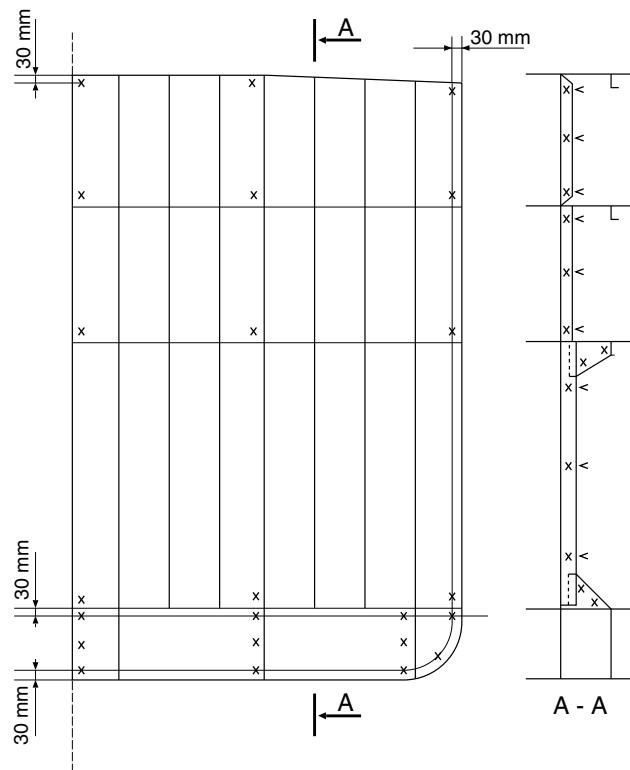


Figure 6 : Locations of measurements on selected internal structural elements of general cargo unit

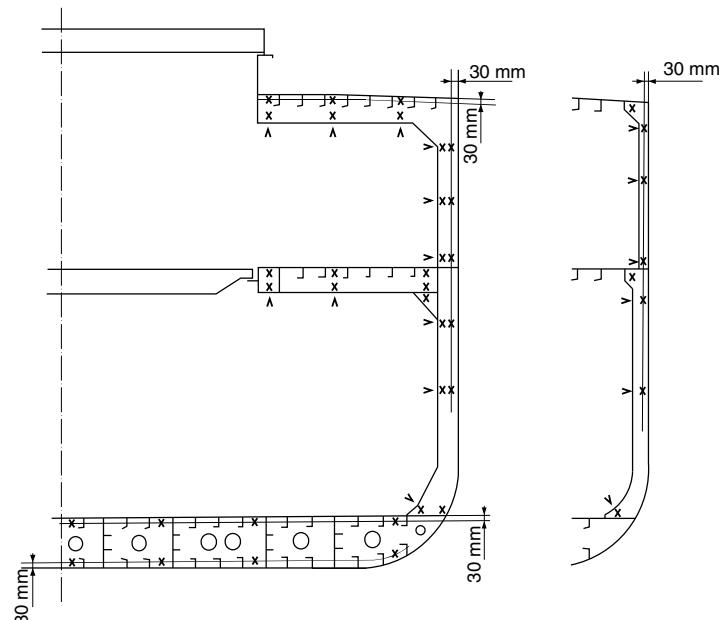
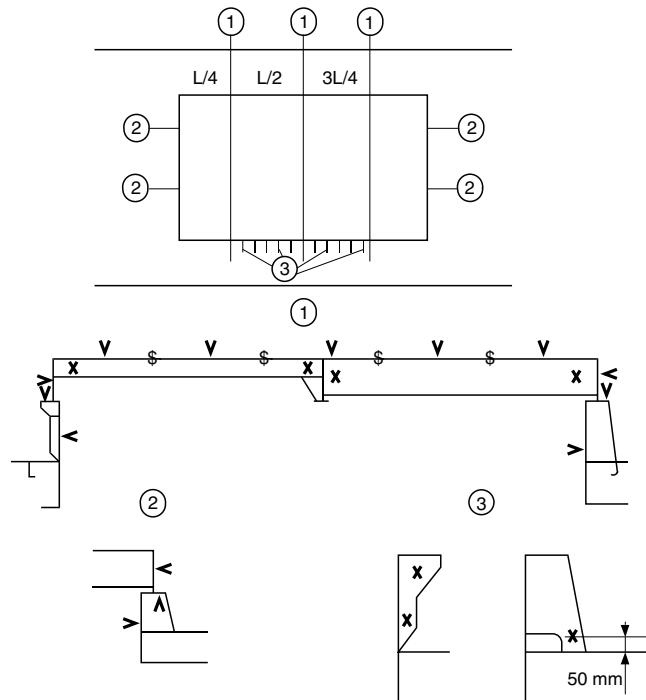


Figure 7 : Locations of measurements on hatch covers and coamings



(1) Three sections at L/4, L/2, 3L/4 of hatch cover length, including:

- one measurement of each hatch cover plate and skirt plate
- measurements of adjacent beams and stiffeners
- one measurement of coaming plates and coaming flange, each side

(2) Measurements of both ends of hatch cover skirt plate, coaming plate and coaming flange

(3) One measurement of one out of three hatch coaming brackets and bars, on both sides and both ends

Figure 8 : Locations of measurements on transverse bulkheads (oil storage)

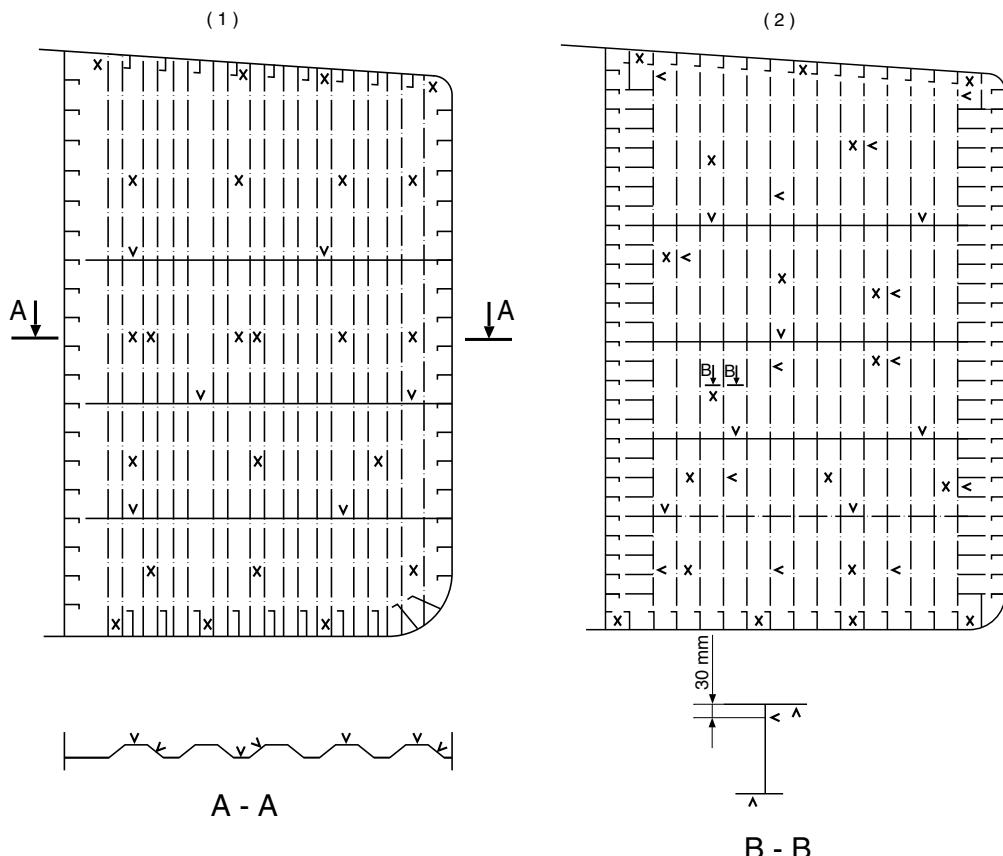


Figure 9 : Location measurements on transverse bulkheads in cargo tanks

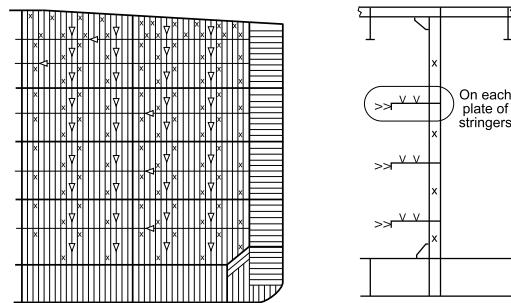


Figure 10 : Location of measurements on transverse bulkhead in ballast tanks

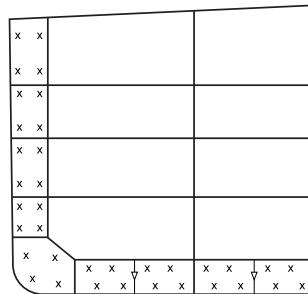


Figure 11 : Typical location of measurement for pontoon normal transverse section of column-stabilized unit and TLP

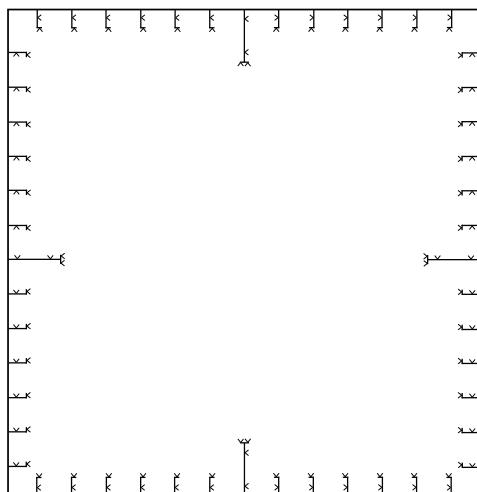


Figure 12 : Typical location of measurement for pontoon reinforced transverse section of column-stabilized unit and TLP

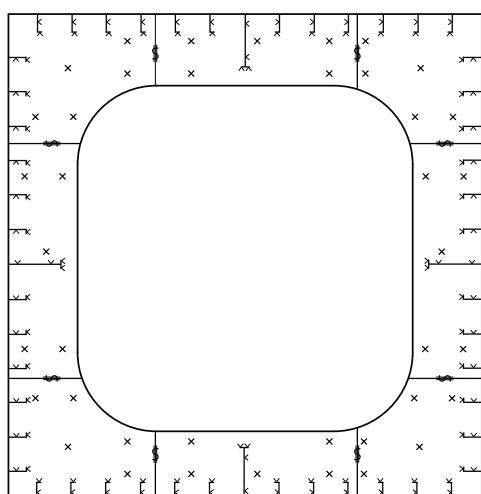


Figure 13 : Typical location of measurement for pontoon bulkhead of column-stabilized unit and TLP

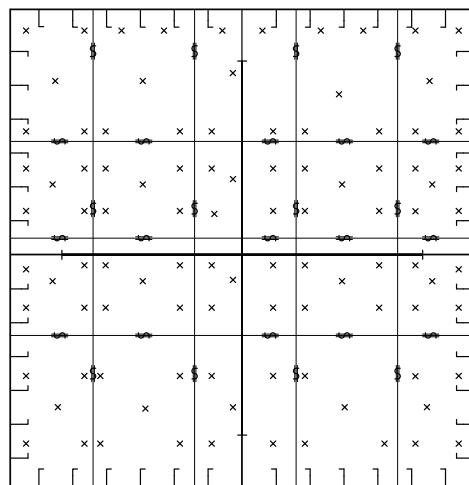


Figure 14 : Typical location of measurement for column-stabilized unit and TLP

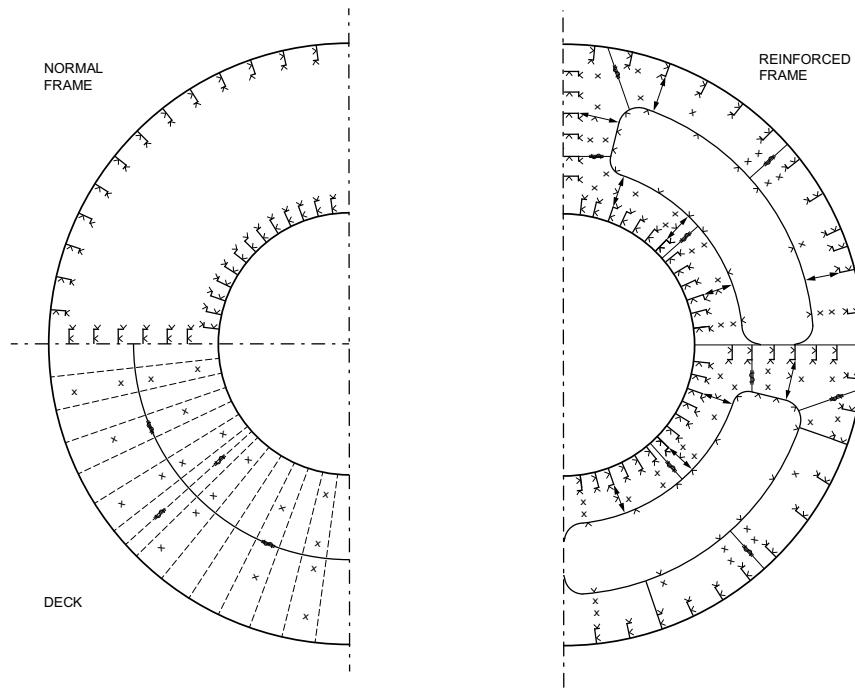
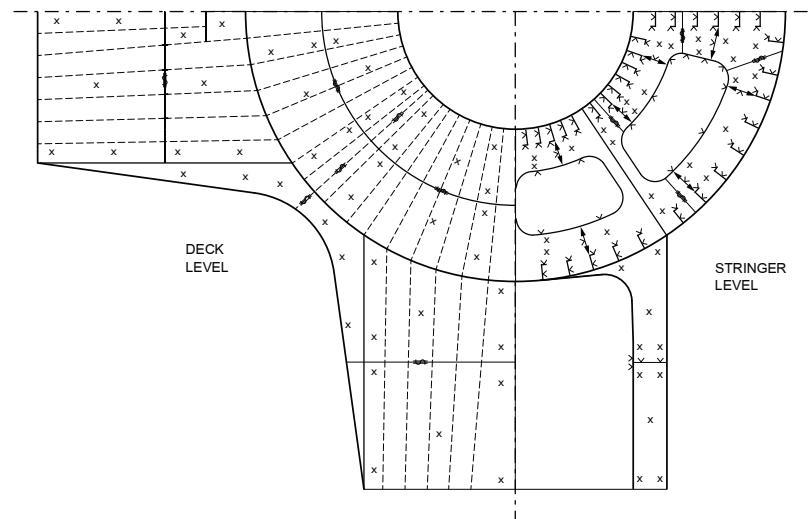


Figure 15 : Typical location of measurement for junction node of column-stabilized unit and TLP



## 4 Acceptance criteria for thickness measurements

### 4.1 General

**4.1.1** Acceptance criteria stipulate limits of wastage which are to be taken into account for reinforcements, repairs or renewals of steel structure. These limits are generally expressed for each structural item as a maximum percentage of acceptable wastage (W). When the maximum percentage of wastage is indicated, the minimum acceptable thickness ( $t_{min}$ ) is that resulting from applying this percentage to the rule thickness ( $t_{rule}$ ), according to the following formula:

$$t_{min} = \left(1 - \frac{W}{100}\right) t_{rule}$$

However, when the rule thickness is not available, the as-built thickness can be used.

Note 1: When owner corrosion margin is mentioned on drawings, it may not be included in  $t_{rule}$ .

Only for criteria related to an item (see [4.3.4] b), the Society may establish a list of renewal thicknesses tailored to the different structural items. In such a case these thicknesses are used in lieu of the minimum thicknesses calculated from the percentage of wastage.

Note 2: In any case, at the request of the Owner, the Society may perform a direct calculation based on the current measurements.

**4.1.2** In cases where the unit has some structural elements with reduced wear margins (e.g. due to unit conversion, increase of draught), the minimum acceptable thickness for these elements is to be calculated with reference to the rule scantlings without taking account of any reduction originally agreed.

**4.1.3** Decisions on steel renewals are taken by the attending Surveyor applying the criteria given in this Article and based on his judgment and the actual condition of the ship. Should advice be needed to support his decision, the Surveyor may refer to the relevant technical office of the Society.

### 4.2 Criteria

**4.2.1** The acceptance criteria for the minimum thicknesses are divided into:

- criteria on longitudinal strength for surface unit, given in [4.3]
- criteria on yield strength for column stabilized and TLP unit, given in [4.4]
- criteria on yield strength for self-elevating unit, given in [4.5]
- criteria for critical area, given in [4.6]
- criteria on buckling strength, given in [4.7] for surface unit
- criteria on pitting, given in [4.8].

**4.2.2** Each measured structural item is to be checked against the above criteria, as far as applicable. When the criteria are not met, reinforcements, repairs and renewals are to be carried out as appropriate.

**4.2.3** For yield strength, each structural item is to be assessed according to four different criteria which vary with regard to the domain under which it is considered, namely:

- a) An isolated area, which is meant as a part of a single structural item. This criterion takes into consideration very local aspects such as grooving of a plate or web, or local severe corrosion; however, it is not to be used for pitting for which separate criteria are considered (see [4.8]).
- b) An item, which is meant as an individual element such as a plate, a stiffener, a web, etc. This criterion takes into consideration the average condition of the item, which is assessed by determining its average thickness using the various measurements taken on the same item.
- c) A group of items, which is meant as a set of elements of the same nature (plates, longitudinals, girders) contributing either to the longitudinal global strength of the unit in a given zone or to the global strength of other primary transverse elements not contributing to the unit longitudinal strength, e. g. bulkheads, hatch covers, web frames.
- d) A zone for surface unit, which is meant as all and only longitudinal elements contributing to the longitudinal strength of the unit; in this regard, the three main zones are defined as deck zone, neutral axis zone and bottom zone. This criterion takes into consideration the average condition of all groups of items belonging to the same zone.

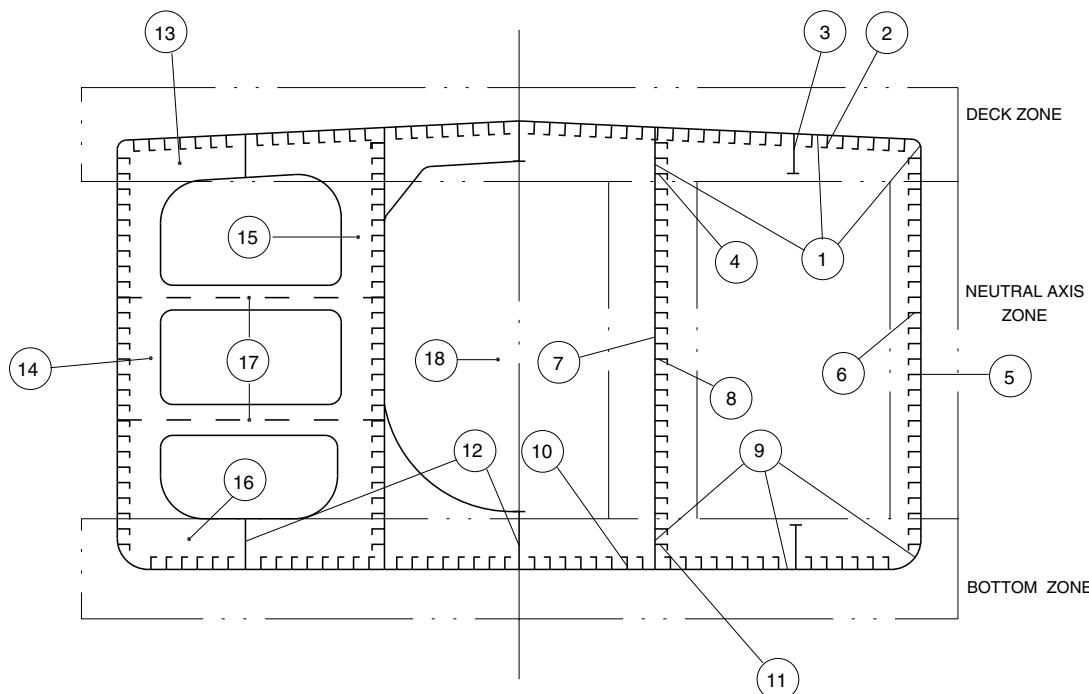
### 4.3 Longitudinal strength criteria for surface unit

**4.3.1** Local and global strength criteria in the present Article are applicable to surface units.

These criteria may also be used for other unit types taking into consideration the equivalence or similarity of structural elements and their contribution to local and/or global strength.

**4.3.2** For the evaluation of the surface unit longitudinal strength, it is a prerequisite that welding between longitudinal members and deck, side and bottom plating is maintained effective so as to keep continuity of hull structures.

Figure 16 : layout of items to be assessed for a surface unit



**4.3.3** Each structural item to be assessed as illustrated in a typical transverse section (see Fig 16).

These structural items to be assessed are listed in Tab 3 and are grouped according to their position and contribution to the local or global strength of the unit.

**4.3.4** The assessment of the thickness measurements is to be performed using the values given in the Tab 3 for each structural element with regard to the four criteria defined in [4.2.3], in the following order:

- Assessment of isolated areas (column 1 in the table). If the criterion is not met, the wasted part of the item is to be dealt with as necessary.
- Assessment of items (column 2 in the table). If the criterion is not met, the item is to be dealt with as necessary in the measured areas as far as the average condition of the item concerned is satisfactory. In cases where some items are renewed, the average thicknesses of these items to be considered in the next step are the new thicknesses.
- Assessment of groups of items (column 3 in the table). If the criterion is not met, a sufficient number of elements are to be renewed in order to obtain an increased average thickness satisfying the considered criterion of the group (generally the elements to be renewed are those most wasted). As an example, for the assessment of the group "deck plates" all deck plates are measured and an average thickness of each of them is estimated. Then the average of all these values is to satisfy the criteria given for this group.
- Assessment of zones (column 4 in the table). In principle, the criterion of the zone is met when all groups of items belonging to the zone meet their own criteria (see c) above). However, a greater diminution than those given in column 3 may be accepted for one group of items if, considering the other groups of items belonging to the same zone, the overall diminution of the zone does not exceed the criterion given for it in column 4.

Example: The deck zone consists of two groups of items:

- deck plating, which has an average diminution of 12% (criterion 10%)
- deck longitudinals, which has an average diminution of 4% (criterion 10%).

Even though the deck plating group exceeds its acceptance criterion, the average diminution of the zone, which can be very roughly estimated at 8%, is acceptable and thus the deck plating group can be accepted as it is.

Note 1: This criterion applicable to the zones is based on the general rule that the current hull girder section modulus is not to be less than 90% of the rule section modulus within 0,4L amidships. When the zone criterion is used, the assessment is made on the basis of the original modulus instead of the rule modulus. At the request of the Owner, a direct calculation using the ship's current thicknesses may be performed by the Society in order to accept greater diminutions than those given for this criterion.

**4.3.5** These criteria take into consideration two main aspects:

- the overall strength of the hull girder
- the local strength and integrity of the hull structure, such as bulkheads, etc.

As a rule, they are applicable to the structure within the cargo area of surface units having a length greater than 90 metres. However, they may also be used for smaller surface units and for structure outside the cargo area according to the following principles excluding critical areas:

- for surface units having a length less than 90 metres, the percentages of acceptable wastage given in the tables can be increased by 5 (%) (e.g. 15% instead of 10%, etc.), except for those of deck and bottom zones
- for structure outside the cargo area, the same 5 (%) increase can be applied,

on the understanding, however, that both conditions cannot be applied at the same time.

**Table 3 : Local and global acceptance criteria for surface unit (given in % of wastage)**

Group of items (1)	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
<b>ITEMS CONTRIBUTING TO THE LONGITUDINAL STRENGTH (TRANSVERSE SECTION)</b>					
	DECK ZONE (2)	—	—	—	10
1	Deck plating, deck stringer, sheer strake and longitudinal bulkhead upper strake (3)	25	20	10	—
2	Deck and sheer strake longitudinals web flange	— 25 20	— 20 15	10 — —	— — —
3	Deck longitudinal girders web flange	— 25 20	— 20 15	10 — —	— — —
4	Longitudinals connected to long. bulkhead upper strake (3) web flange	— 25 20	— 20 15	10 — —	— — —
	NEUTRAL AXIS ZONE (2)	—	—	—	15
5	Side shell plating (3)	25	20	15	—
6	Side shell longitudinals and stringers (3) web flange	— 25 20	— 20 15	15 — —	— — —
7	Longitudinal bulkhead plating	25	20	15	—
8	Longitudinal bulkhead longitudinals and stringers web flange	— 25 20	— 20 15	15 — —	— — —
	BOTTOM ZONE (2)	—	—	—	10
9	Bilge and bottom strakes, longitudinal bulkhead lower strake and keel plate (3)	25	20	10	—
10	Bilge and bottom longitudinals (3) web flange	— 25 20	— 20 15	10 — —	— — —
11	Longitudinals connected to longitud. bulkhead lower strake web flange	— 25 20	— 20 15	10 — —	— — —
12	Bottom girders web flange	— 25 20	— 20 15	10 — —	— — —
<b>OTHER ITEMS</b>					
13	Deck transverse web frame web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
14	Side shell web frame web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —

Group of items (1)	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
15	Longitudinal bulkhead web frame web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
16	Bottom transverse web frame web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
17	Cross tie web flange brackets / stiffeners	25 20 20	15 15 15	— — —	— — —
18	Transverse bulkheads (4) plating stringer web stringer flange stiffener web stiffener flange	25 25 20 30 25	20 20 15 20 15	15 — — — —	— — — — —
19	Thruster casing (4) plating stringer web stringer flange stiffener web stiffener flange	— 25 25 20 30 25	— 20 20 15 20 15	10 — — — — —	— — — — — —
20	Mooring foundation plating stringer web stringer flange stiffener web stiffener flange	— 25 25 20 30 25	— 20 20 15 20 15	10 — — — — —	— — — — — —
21	Drill floor, moonpool, stool of derrick, derrick (if classed) plating stringer web stringer flange stiffener web stiffener flange derrick beam web derrick beam flange	— 25 25 20 30 25 20 20	— 20 20 15 20 15 15 15	10 — — — — — — —	— — — — — — — —

(1) Items are shown in the Fig 16. Some items are not called for clarity of drawings.  
 (2) Each zone is to be evaluated separately.  
 (3) For double hull, the structural elements of the inner skin (plating, longitudinals, girders, bulkheads) are to be included in the corresponding elements of the outer skin.  
 (4) Including swash bulkheads, forward and aft peak bulkheads.

#### 4.4 Yield criteria for column stabilized units and TLP

##### 4.4.1 Local and global strength criteria in the present Article are applicable to column stabilized and TLP units.

These criteria may also be used for other unit types taking into consideration the equivalence or similarity of structural elements and their contribution to local and/or global strength.

**4.4.2** For the evaluation of the unit global strength, it is a prerequisite that welding between external shell and internal member is maintained effective so as to keep continuity of hull structures.

**4.4.3** Structural items to be assessed include: columns, diagonal and horizontal braces together with any other parts of the upper hull supporting structure as accessible above the waterline as shown in Fig 17, Fig 18 and Fig 19.

Figure 17 : Profile view of pontoon type column-stabilized unit

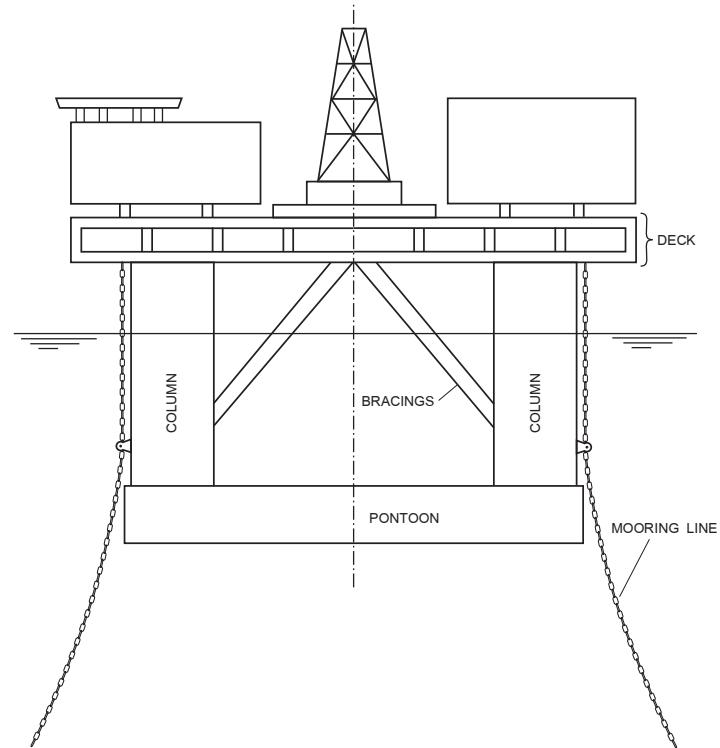


Figure 18 : Transverse view of pontoon type column-stabilized unit

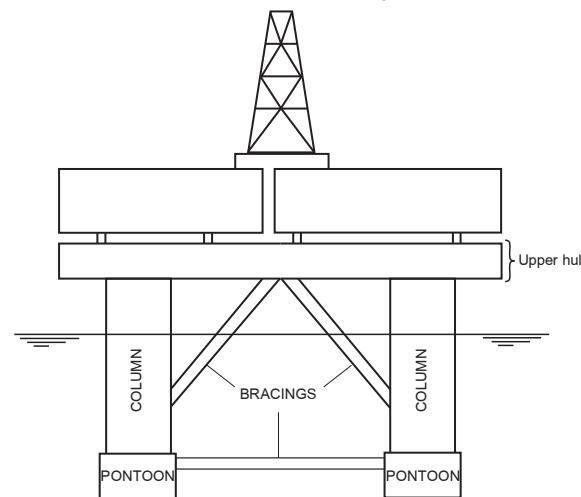
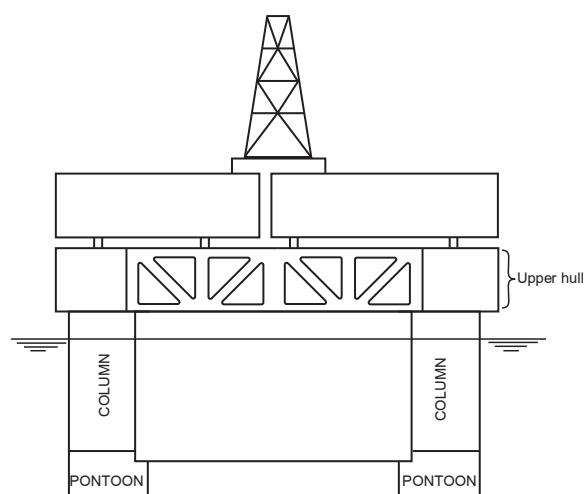


Figure 19 : Profile and transverse view of a ring type column-stabilized or TLP unit with truss upper hull



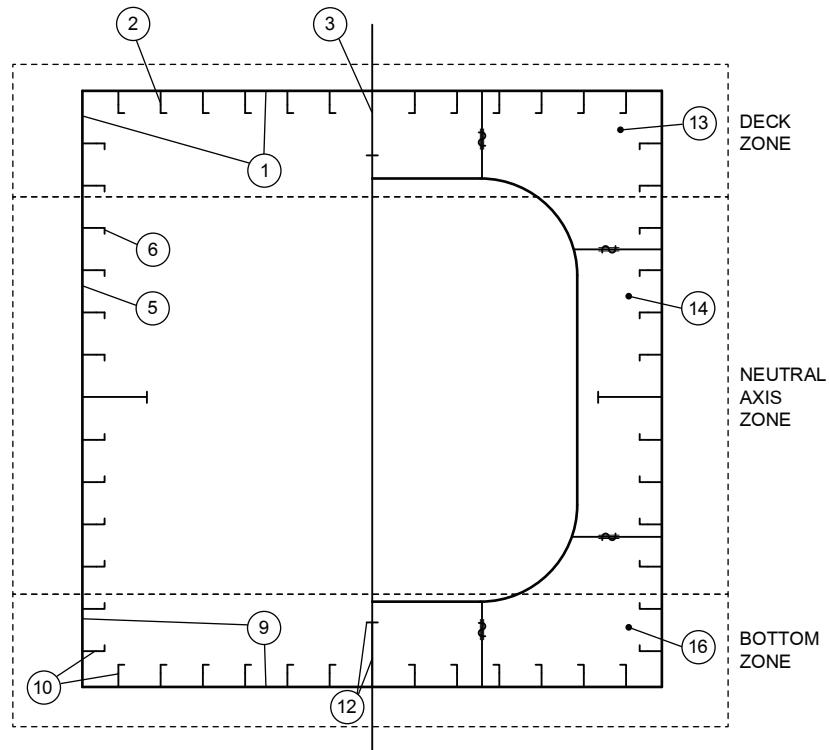
**4.4.4** The structural items to be assessed are listed in Tab 4 to Tab 8 and grouped according to their position and contribution to the local and/or global strength of the unit.

- For twin pontoons type column-stabilized unit refer to Tab 4, Tab 5 and Tab 8
- For ring pontoon type of column-stabilized unit and for TLP refer to Tab 4, Tab 5, Tab 6 and Tab 7 or Tab 8 depending on the upper hull type

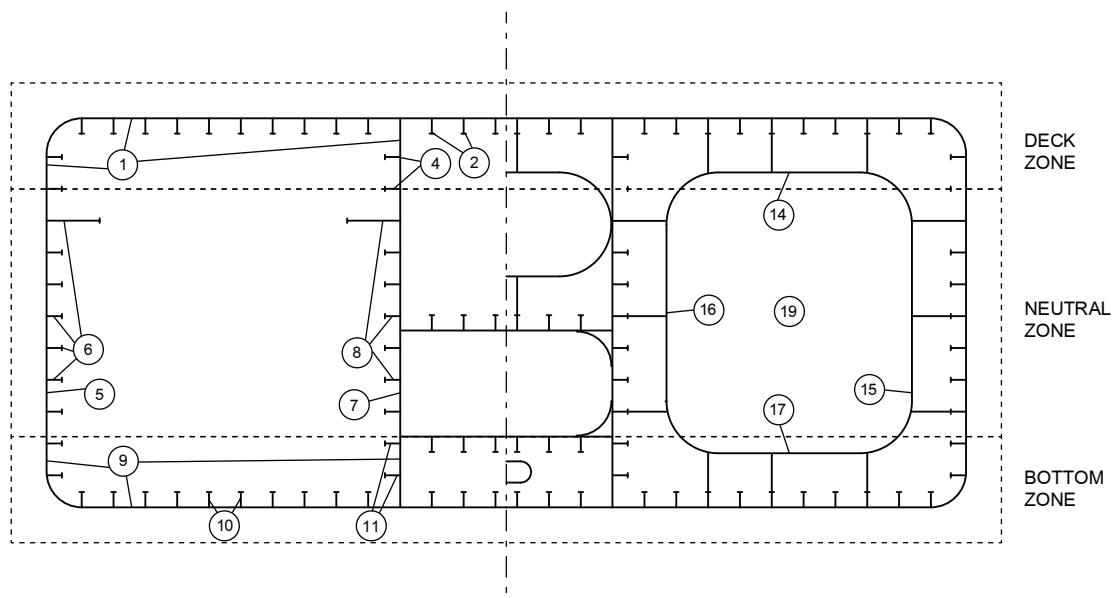
The following structural items to be assessed are illustrated in Fig 20 and Fig 21:

- pontoon
- column
- node.

**Figure 20 : Layout of pontoon section for TLP**



**Figure 21 : Layout of pontoon section for column stabilized unit**



**4.4.5** The assessment of the thickness measurements is to be performed using the values given in the Tab 4 for each structural element with regard to the four criteria defined in [4.2.3], in the following order:

- Assessment of isolated areas (column 1 in the table). If the criterion is not met, the wasted part of the item is to be dealt with as necessary.
- Assessment of items (column 2 in the table). If the criterion is not met, the item is to be dealt with as necessary in the measured areas as far as the average condition of the item concerned is satisfactory. In cases where some items are renewed, the average thicknesses of these items to be considered in the next step are the new thicknesses.
- Assessment of groups of items (column 3 in the table). If the criterion is not met, a sufficient number of elements are to be renewed in order to obtain an increased average thickness satisfying the considered criterion of the group (generally the elements to be renewed are those most wasted). As an example, for the assessment of the group "deck plates" all deck plates are measured and an average thickness of each of them is estimated. Then the average of all these values is to satisfy the criteria given for this group.
- Assessment of zones (column 4 in the table), for pontoon only. In principle, the criterion of the zone is met when all groups of items belonging to the zone meet their own criteria (see c) above). However, a greater diminution than those given in column 3 may be accepted for one group of items if, considering the other groups of items belonging to the same zone, the overall diminution of the zone does not exceed the criterion given for it in column 4.

Example: The deck zone consists of two groups of items:

- deck plating, which has an average diminution of 12% (criterion 10%)
- deck longitudinals, which has an average diminution of 4% (criterion 10%).

Even though the deck plating group exceeds its acceptance criterion, the average diminution of the zone, which can be very roughly estimated at 8%, is acceptable and thus the deck plating group can be accepted as it is excluding critical areas.

**4.4.6** These criteria take into consideration two main aspects:

- the overall strength of the hull
- the local strength and integrity of the hull structure, such as bulkheads, watertight area, etc.

**Table 4 : Pontoon section local and global acceptance criteria for column stabilized unit and TLP (given in % of wastage)**

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
<b>ITEMS CONTRIBUTING TO THE GLOBAL STRENGTH (TRANSVERSE SECTION)</b>					
	TOP ZONE (1)	–	–	–	10
1	Deck plating, deck stringer, sheer strake and longitudinal bulkhead upper strake	25	20	10	–
2	Deck and sheer strake longitudinals web flange	– 25 20	– 20 15	10 – –	– – –
3	Deck longitudinal girders web flange	– 25 20	– 20 15	10 – –	– – –
4	Longitudinals connected to long. bulkhead upper strake web flange	– 25 20	– 20 15	10 – –	– – –
	NEUTRAL AXIS ZONE (1)	–	–	–	15
5	Side shell plating	20	15	–	–
6	Side shell longitudinals and stringers web flange	– 25 20	– 20 15	15 – –	– – –
7	Longitudinal bulkhead plating	20	15	–	–
8	Longitudinal bulkhead longitudinals and stringers web flange	– 25 20	– 20 15	15 – –	– – –

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
	<b>BOTTOM ZONE (1)</b>	—	—	—	10
9	Bilge and bottom strakes, longitudinal bulkhead lower strake and keel plate (2)	25	20	10	—
10	Bilge and bottom longitudinals (2) web flange	— 25 20	— 20 15	10 — —	— — —
11	Longitudinals connected to longitud. bulkhead lower strake web flange	— 25 20	— 20 15	10 — —	— — —
12	Bottom girders web flange	— 25 20	— 20 15	10 — —	— — —
	<b>BRACING (1)</b>	—	—	—	10
13	plate web flange tube	20 25 20 20	15 20 15 15	— — — —	— — — —

OTHER ITEMS					
14	Deck transverse web frame web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
15	Side shell web frame web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
16	Longitudinal bulkhead web frame web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
17	Bottom transverse web frame web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
18	Cross tie web flange brackets / stiffeners	25 20 20	15 15 15	— — —	— — —
19	Transverse bulkheads plating stringer web stringer flange stiffener web stiffener flange	25 25 20 30 25	20 20 15 20 15	15 — — — —	— — — — —
20	Internal reinforcement for outfitting (riser, caisson, tug and pusher point, towing outfitting...) plating stringer web stringer flange stiffener web stiffener flange manhole coaming	— — 20 30 20 30 20 20	— — 15 20 15 20 15 20	10 — — — — — — —	— — — — — — — —

(1) Each zone is to be evaluated separately.  
 (2) For double bottom, the structural elements of the inner bottom (plating, longitudinals, girders, bulkheads) are to be included in the corresponding elements of the bottom.

**Table 5 : Column section local and global acceptance criteria for column stabilized unit and TLP  
(given in % of wastage)**

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
1	Deck/platform plating	25	20	15	–
2	Deck/platform stiffeners	–	–	15	–
	web	25	20	–	–
	flange	20	15	–	–
3	Deck/platform web frame			15	
	web	25	20	–	–
	flange	20	15	–	–
4	brackets / stiffeners	25	20	–	–
	Side shell plating	25	20	10	–
5	Side shell vertical/horizontal stiffener	–	–	10	–
	web	25	20	–	–
	flange	20	15	–	–
6	Side shell web frame			10	
	web	25	20	–	–
	flange	20	15	–	–
7	brackets / stiffeners	25	20	–	–
	vertical bulkhead plating	25	20	10	–
8	Bulkhead stiffeners	–	–	15	–
	web	25	20	–	–
	flange	20	15	–	–
9	Bulkhead web frame				
	web	25	20	–	–
	flange	20	15	–	–
9	brackets / stiffeners	25	20	–	–
10	Cross tie	25	15	–	–
	web	20	15	–	–
	flange	20	15	–	–
10	brackets / stiffeners				
<b>BRACING (1)</b>		–	–	–	10
12	plate	20	15	–	–
	web	25	20	–	–
	flange	20	15	–	–
	tube	20	15	–	–

(1) Each zone is to be evaluated separately.

**Table 6 : Node section local and global acceptance criteria for ring type column stabilized unit and TLP  
(given in % of wastage)**

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
<b>DECK ZONE (1)</b>		–	–	–	10
1	Deck plating, deck stringer, sheer strake and longitudinal bulkhead upper strake	25	20	10	–
2	Deck and sheer strake longitudinals	–	–	10	–
	web	25	20	–	–
	flange	20	15	–	–
3	Deck longitudinal girders	–	–	10	–
	web	25	20	–	–
	flange	20	15	–	–
4	Longitudinals connected to long. bulkhead upper strake	–	–	10	–
	web	25	20	–	–
	flange	20	15	–	–
<b>SIDE SHELL ZONE (1)</b>		–	–	–	15
5	Side shell plating	25	20	15	–
6	Side shell longitudinals and stringers	–	–	15	–
	web	25	20	–	–
	flange	20	15	–	–

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
7	Longitudinal bulkhead plating	25	20	15	–
8	Longitudinal bulkhead longitudinals and stringers web flange	– 25 20	– 20 15	15 – –	– – –
	BOTTOM ZONE (1)	–	–	–	10
9	Bilge and bottom strakes, longitudinal bulkhead lower strake and keel plate	25	20	10	–
10	Bilge and bottom longitudinals web flange	– 25 20	– 20 15	10 – –	– – –
11	Longitudinals connected to longitud. bulkhead lower strake web flange	– 25 20	– 20 15	10 – –	– – –
12	Bottom girders web flange	– 25 20	– 20 15	10 – –	– – –
<b>OTHER ITEMS</b>					
13	Deck transverse web frame web flange brackets / stiffeners	25 20 25	20 15 20	– – –	– – –
14	Side shell web frame web flange brackets / stiffeners	25 20 25	20 15 20	– – –	– – –
15	Longitudinal bulkhead web frame web flange brackets / stiffeners	25 20 25	20 15 20	– – –	– – –
16	Bottom transverse web frame web flange brackets / stiffeners	25 20 25	20 15 20	– – –	– – –
17	Cross tie web flange brackets / stiffeners	25 20 20	15 15 15	– – –	– – –
18	Transverse bulkheads plating stringer web stringer flange stiffener web stiffener flange	25 25 20 30 25	20 20 15 20 15	15 – – – –	– – – – –
19	Thruster casing plating stringer web stringer flange stiffener web stiffener flange	– 25 25 20 30 25	– 20 20 15 20 15	10 – – – – –	– – – – – –
20	Mooring foundation or tendon foundation plating stringer web stringer flange stiffener web stiffener flange casting	– 25 25 20 30 25 20	– 20 20 15 20 15 15	10 – – – – – –	– – – – – – –
(1) Each zone is to be evaluated separately.					

**Table 7 : Upper Hull section for truss structure local and global acceptance criteria for column stabilized unit and TLP (given in % of wastage)**

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
<b>ITEMS CONTRIBUTING TO THE LONGITUDINAL STRENGTH (TRANSVERSE SECTION)</b>					
	all DECK level (1)	—	—	—	15
1	Deck plating, deck stringer, sheer strake and longitudinal bulkhead upper strake (2)	25	20	15	—
2	Deck and sheer strake vertical web flange	— 25 20	— 20 15	10 — —	— — —
3	Deck longitudinal girders web flange	— 25 20	— 20 15	10 — —	— — —
4	Longitudinals connected to long. bulkhead upper strake (2) web flange	— 25 20	— 20 15	10 — —	— — —
5	Box girder, brace or girder part of the main structure primary web flange tubular plating	— 20 20 20 20	— 15 15 15 15	10 — — — —	— — — — —
NEUTRAL AXIS ZONE (1)		—	—	—	15
6	Side shell plating (2)	25	20	15	—
7	Side shell longitudinals and stringers (2) web flange	— 25 20	— 20 15	15 — —	— — —
8	Longitudinal bulkhead plating	25	20	15	—
9	Longitudinal bulkhead longitudinals and stringers web flange	— 25 20	— 20 15	15 — —	— — —
10	Box girder, brace or girder part of the main structure primary web flange tubular plating	— 20 20 20 20	— 15 15 15 15	10 — — — —	— — — — —
BOTTOM ZONE (1)		—	—	—	10
11	Bilge and bottom strakes, longitudinal bulkhead lower strake and keel plate (2)	25	20	10	—
12	Bilge and bottom longitudinals (2) web flange	— 25 20	— 20 15	10 — —	— — —
13	Longitudinals connected to longitud. bulkhead lower strake web flange	— 25 20	— 20 15	10 — —	— — —
14	Bottom girders web flange	— 25 20	— 20 15	10 — —	— — —
15	Box girder, brace or girder part of the main structure primary web flange tubular plating	— 20 20 20 20	— 15 15 15 15	10 — — — —	— — — — —

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
<b>OTHER ITEMS</b>					
16	blast wall	20	15	–	–
17	Deck transverse web frame				
	web	25	20	–	–
	flange	20	15	–	–
	brackets / stiffeners	25	20	–	–
18	Side shell web frame				
	web	25	20	–	–
	flange	20	15	–	–
	brackets / stiffeners	25	20	–	–
19	Longitudinal bulkhead web frame				
	web	25	20	–	–
	flange	20	15	–	–
	brackets / stiffeners	25	20	–	–
20	Bottom transverse web frame				
	web	25	20	–	–
	flange	20	15	–	–
	brackets / stiffeners	25	20	–	–
21	Cross tie				
	web	25	15	–	–
	flange	20	15	–	–
	brackets / stiffeners	20	15	–	–
22	Transverse bulkheads (3)				
	plating	25	20	15	–
	stringer web	25	20	–	–
	stringer flange	20	15	–	–
	stiffener web	30	20	–	–
	stiffener flange	25	15	–	–
23	Main equipment support:				
	plating	–	–	15	–
	stringer web	20	15	–	–
	stringer flange	20	15	–	–
	stiffener web	20	15	–	–
	stiffener flange	35	20	–	–
		20	15	–	–
<p>(1) Each zone is to be evaluated separately.</p> <p>(2) For double hull oil tankers, the structural elements of the inner skin (plating, longitudinals, girders, bulkheads) are to be included in the corresponding elements of the outer skin.</p> <p>(3) Including swash bulkheads, forward and aft peak bulkheads.</p>					

**Table 8 : Upper Hull section for deck box local and global acceptance criteria for column stabilized unit and TLP structure (given in % of wastage)**

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
<b>ITEMS CONTRIBUTING TO THE GLOBAL STRENGTH</b>					
	TOP ZONE (1)	–	–	–	10
1	Deck plating, deck stringer, sheer strake and longitudinal bulkhead upper strake (2)	25	20	10	–
2	Deck and sheer strake longitudinals	–	–	10	–
	web	25	20	–	–
	flange	20	15	–	–
3	Deck longitudinal girders	–	–	10	–
	web	25	20	–	–
	flange	20	15	–	–

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
4	Longitudinals connected to long. bulkhead upper strake (2) web flange	— 25 20	— 20 15	10 — —	— — —
	NEUTRAL AXIS ZONE (1)	—	—	—	15
5	Side shell plating (2)	25	20	15	—
6	Side shell longitudinals and stringers (2) web flange	— 25 20	— 20 15	15 — —	— — —
7	Longitudinal bulkhead plating	25	20	15	—
8	Longitudinal bulkhead longitudinals and stringers web flange	— 25 20	— 20 15	15 — —	— — —
	BOTTOM ZONE (1)	—	—	—	10
9	Bilge and bottom strakes, longitudinal bulkhead lower strake and keel plate (2)	25	20	10	—
10	Bilge and bottom longitudinals (2) web flange	— 25 20	— 20 15	10 — —	— — —
11	Longitudinals connected to longitud. bulkhead lower strake web flange	— 25 20	— 20 15	10 — —	— — —
12	Bottom girders web flange	— 25 20	— 20 15	10 — —	— — —
	<b>OTHER ITEMS</b>				
13	Deck transverse web frame: web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
14	Side shell web frame: web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
15	Longitudinal bulkhead web frame: web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
16	Bottom transverse web frame: web flange brackets / stiffeners	25 20 25	20 15 20	— — —	— — —
17	Cross tie: web flange brackets / stiffeners	25 20 20	15 15 15	— — —	— — —
18	Transverse bulkheads: (3) plating stringer web stringer flange stiffener web stiffener flange	25 25 20 30 25	20 20 15 20 15	15 — — — —	— — — — —
19	other decks: (3) plating stringer web stringer flange stiffener web stiffener flange	25 25 20 30 25	20 20 15 20 15	15 — — — —	— — — — —
(1)	Each zone is to be evaluated separately.				
(2)	For double hull oil tankers, the structural elements of the inner skin (plating, longitudinals, girders, bulkheads) are to be included in the corresponding elements of the outer skin.				
(3)	Including swash bulkheads, forward and aft peak bulkheads.				

## 4.5 Yield criteria for self-elevating units

**4.5.1** Local and global strength criteria in the present Article are applicable to self-elevating units.

**4.5.2** The structure of the pontoon of self-elevating units is to be assessed as applicable for the hull of surface unit in [4.3]

**4.5.3** The structural items specific to self-elevating units are listed in Tab 9.

**4.5.4** The assessment of the thickness measurements is to be performed using the values given in the Tab 9 for each structural element with regard to the four criteria defined in [4.2.3], in the following order:

- assessment of isolated areas (column 1 in the table). If the criterion is not met, the wasted part of the item is to be dealt with as necessary.
- assessment of items (column 2 in the table). If the criterion is not met, the item is to be dealt with as necessary in the measured areas as far as the average condition of the item concerned is satisfactory. In cases where some items are renewed, the average thicknesses of these items to be considered in the next step are the new thicknesses.
- assessment of groups of items (column 3 in the table). If the criterion is not met, a sufficient number of elements are to be renewed in order to obtain an increased average thickness satisfying the considered criterion of the group (generally the elements to be renewed are those most wasted). As an example, for the assessment of the group "deck plates" all deck plates are measured and an average thickness of each of them is estimated. Then the average of all these values is to satisfy the criteria given for this group.
- assessment of zones (column 4 in the table). In principle, the criterion of the zone is met when all groups of items belonging to the zone meet their own criteria (see c) above). However, a greater diminution than those given in column 3 may be accepted for one group of items if, considering the other groups of items belonging to the same zone, the overall diminution of the zone does not exceed the criterion given for it in column 4.

Example: The deck zone consists of two groups of items:

- deck plating, which has an average diminution of 12% (criterion 10%)
- deck longitudinals, which has an average diminution of 4% (criterion 10%).

Even though the deck plating group exceeds its acceptance criterion, the average diminution of the zone, which can be very roughly estimated at 8%, is acceptable and thus the deck plating group can be accepted as it is excluding critical areas.

Note 1: This criterion applicable to the zones is based on the general rule that the current hull girder section modulus is not to be less than 90% of the rule section modulus within 0,4L amidships. When the zone criterion is used, the assessment is made on the basis of the original modulus instead of the rule modulus. At the request of the Owner, a direct calculation using the unit's current thicknesses may be performed by the Society in order to accept greater diminutions than those given for this criterion.

**4.5.5** These criteria take into consideration two main aspects:

- the overall strength of the hull
- the local strength and integrity of the hull structure, such as bulkheads, etc.

**Table 9 : Local and global acceptance criteria for self-elevating unit (given in % of wastage)**

Group of items (1)	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
<b>STRUCTURAL ITEMS OF THE PONTOON</b>					
As applicable for hull of surface unit, see Tab 3.					
<b>OTHER ITEMS</b>					
19	leg foundation:	–	–	10	–
	plating	25	20	–	–
	stringer web	25	20	–	–
	stringer flange	20	15	–	–
	stiffener web	30	20	–	–
	stiffener flange	25	15	–	–
20	leg:	–	–	10	–
	plating	20	15	–	–
	column	20	15	–	–
	bracing	20	15	–	–
21	spud can:	–	–	10	–
	plating	20	15	–	–
	stringer web	30	25	–	–
	stringer flange	25	20	–	–
	stiffener web	30	25	–	–
	stiffener flange	20	15	–	–

(1) As applicable to surface unit, see Tab 3

## 4.6 Yield criteria for critical area

**4.6.1** The assessment of the thickness measurements is to be performed using the values given in the Tab 10 for each structural element with regard to the four criteria defined in [4.2.3], in the following order:

- Assessment of isolated areas (column 1 in the table). If the criterion is not met, the wasted part of the item is to be dealt with as necessary.
- Assessment of items (column 2 in the table). If the criterion is not met, the item is to be dealt with as necessary in the measured areas as far as the average condition of the item concerned is satisfactory. In cases where some items are renewed, the average thicknesses of these items to be considered in the next step are the new thicknesses.

**Table 10 : Local and global acceptance for critical area (given in % of wastage)**

Group of items	Description of items	1 Isolated area	2 Item	3 Group	4 Zone
<b>ALL ITEMS</b>					
1	plating	10	5	—	—
	stringer web	10	5	—	—
	stringer flange	10	5	—	—
	stiffener web	10	5	—	—
	stiffener flange	10	5	—	—
	tubular	10	5	—	—
	box girder	10	5	—	—

## 4.7 Buckling strength criterion

**4.7.1** These criteria are applicable to surface units having a length greater than 120 metres. For other unit type those criteria shall be applied.

The structural items contributing to the global strength of the unit, such as deck and bottom plating, deck and bottom girders, etc., are to be assessed with regard to their buckling strength, as deemed necessary by the Surveyor. In such a case, buckling strength criteria given in Ch 2, App 3, Tab 7 are not to be exceeded.

Note 1: The minimum thickness will be specially considered for units built with excess hull girder section modulus.

Note 2: The surveyor in case of local deformation shall request re-analysis of the section property with actual thickness measurement.

**Table 11 : Buckling strength criterion**

ITEMS	RATIO	MATERIAL ( $R_{eH}$ )		
		235	315	355 and 390
Bottom and deck plates	$s / t$	56,0	51,0	49,0
Longitudinals	flat bar web	$h_w / t_w$	20,0	18,0
Flanged longitudinals / girders	web	$h_w / t_w$	56,0	51,0
	symmetrical flange	$b_f / t_f$	34,0	30,0
	asymmetrical flange	$b_f / t_f$	17,0	15,0

Symbols:  
 $R_{eH}$  : minimum yield stress of the material, in N/mm<sup>2</sup>;  
 $s$  : longitudinal spacing, in mm;  
 $t$  : actual plate thickness, in mm;  
 $h_w$  : web height, in mm;  
 $t_w$  : web thickness, in mm;  
 $b_f$  : flange breadth, in mm;  
 $t_f$  : flange thickness, in mm;

## 4.8 Pitting

**4.8.1** The maximum acceptable depth for isolated pits is 35% of the as-built thickness.

**4.8.2** For areas with different pitting intensity, the intensity diagrams shown in Fig 22 are to be used to identify the percentage of affected areas.

For areas having a pitting intensity of 50% or more, the maximum average depth of pits is 20% of the as-built thickness. For intermediate values between isolated pits and 50% of affected area, the interpolation between 35% and 20% is made according to Tab 12.

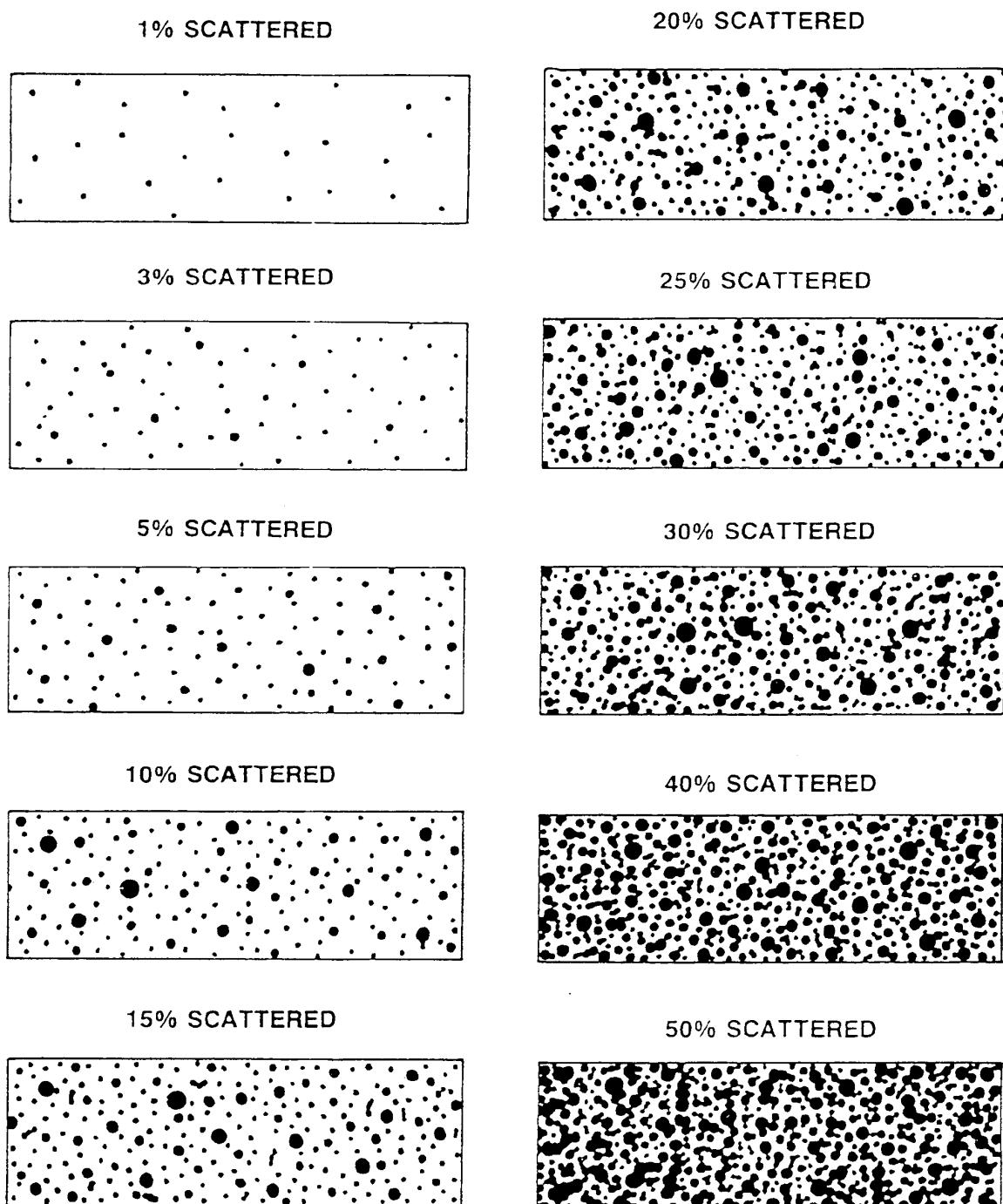
**4.8.3** In addition, the thickness outside the pits in the area considered is to be assessed according to [4.3] to [4.7].

Note 1: Application of filler material (plastic or epoxy compounds) is recommended as a means to stop or reduce the corrosion process, but it is not considered an acceptable repair for pitting exceeding the maximum allowable wastage limits. Welding repairs may be accepted when performed in accordance with procedures agreed with the society.

**Table 12 : Pitting intensity and corresponding maximum average depth of pitting**

PITTING INTENSITY (%)	MAXIMUM AVERAGE PITTING DEPTH (% of the as-built thickness)
Isolated	35,0
5	33,5
10	32,0
15	30,5
20	29,0
25	27,5
30	26,0
40	23,0
50	20,0

**Figure 22 : Pitting intensity diagrams (from 1% to 50% intensity)**





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