

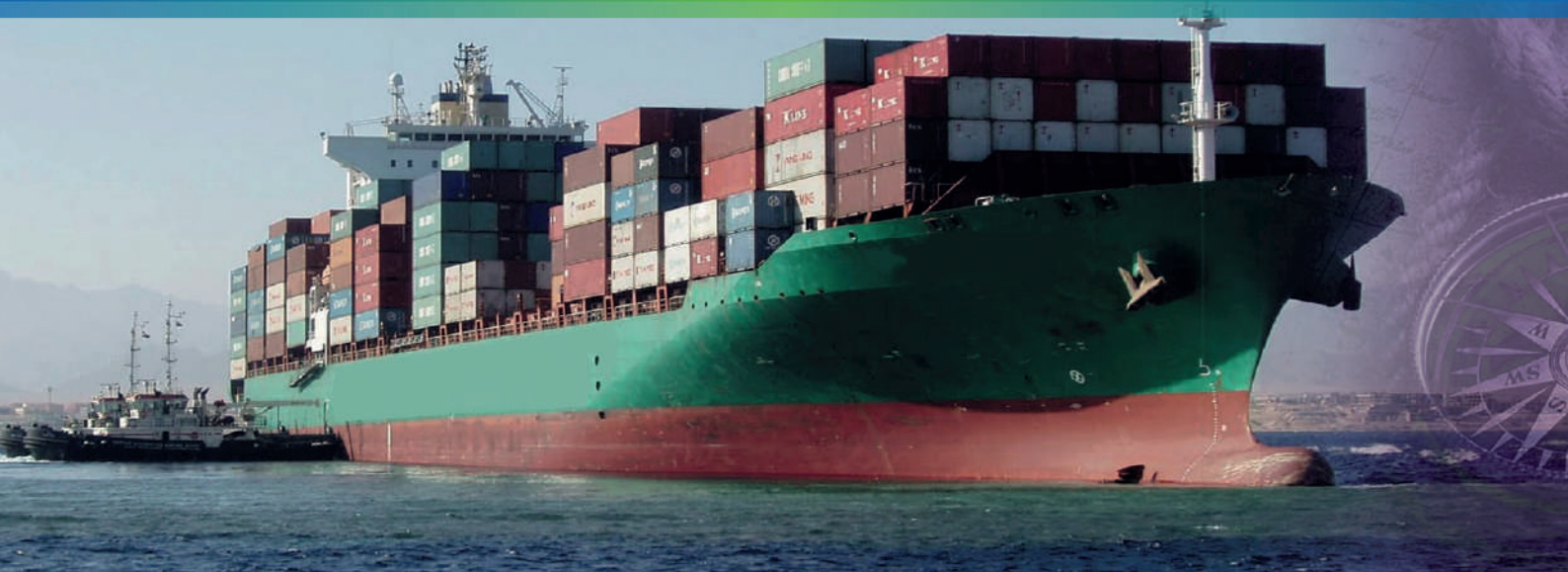
Volume 1



OMCS CLASS

Overseas Marine Certification Services

Your Reliable
Classification Society





OMCS CLASS
Overseas Marine Certification Services

PRINCIPLES FOR THE CLASSIFICATION AND CONSTRUCTION OF STEEL SHIPS

VOLUME I

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PART A: GENERAL INFORMATION

CHAPTER 1: GENERAL

1.1 HISTORY

OMCS CLASS- **Overseas Marine Certification Services** (hereinafter referred to as OMCS), was founded in 2004 when a group of qualified professionals of the maritime industry, decided to create a company to contribute and increase the well known name of the Panama Registry.

OMCS was therefore recognised on July 04th, 2004 under the laws of the Republic of Panama to carry out inspections and issue all statutory certificates on behalf of the Panamanian Administration. In 2005, OMCS was certified by ABS against the ISO 9002 Code.

Now a days OMCS has 50 representative offices around the world and it is continuously striving to perform and improve its works, whilst complying with National and International regulations and its Policy of Quality.

1.2 POLICY OF QUALITY

Overseas Marine Certification Services (OMCS) is a company at the service of the international maritime community, with a great strength of character in its entire staff to successfully fulfil all clients' needs. It is also and OMCS objective to maintain a process of continuous improvement in order to be recognised as a ranking high International Classification and Certification Company.

OMCS was established for the purpose of obtaining for the use of merchants, ship owners and underwriters a faithful Classification of Merchant Shipping offering the maritime market accessible prices without detriment to quality of services and seriousness.

To fulfil the expectations and requirements of the Marine market, OMCS Quality Policy objectives are:

- Offer our clients real quality services.
- Issue Certificates in an expeditious way.
- Maintain properly trained personnel.
- Maintain and adequate procedures according the needs of our clients.

- Ensure that our services meet the specified requirements and
- Assure a process of continuous improvement.

1.3 ORGANISATION

Overseas Marine Certification Services is an independent organisation of professional maritime experts with technical support of a board composed of representatives from universities, professional associations, shipyards and ship owners.

The function of this Technical Board is to consider any technical problems connected with OMCS' business and any proposed alterations in the existing Regulations. The term of office of all nominated members of the Technical Board is 2 years.

Meetings of the Technical Board are convened as often as is necessary, but there are to be at least one meeting in each year. The Technical Committee is also empowered to appoint sub-committees for the purpose of considering any particular problem.

1.4 FORBIDDANCE

No OMCS employee is allowed under any circumstances, to accept, from any person, with whom his job brings the employee into contact, any present, or payment of any sort whatsoever which is of more than the nominal value. Fees and expenses will be quoted by OMCS Base and agreed between OMCS- non-exclusive representative and client according local and geographical factors.

1.5 LEGAL CLAUSE

In providing works or services neither Overseas Marine Certification Services (hereinafter referred to as OMCS) nor any of its personnel warrants the accuracy of any information supplied.

OMCS or its representatives (on behalf of each of whom this notice is given) shall be under no liability to any person who is not a party to the arrangement with OMCS pursuant to which any certificate or report is issued.

Any agreement concerning the provision of OMCS' services is depending on the exclusive jurisdiction of the Panamanian courts and will be governed by Panamanian law.

CHAPTER 2: CLASSIFICATION PRINCIPLES

2.1 CONDITIONS FOR CLASSIFICATION

2.1.1 Scope of application:

2.1.1.1 Regulations for the Classification of Vessels apply to:

- a. Ships of 24 m length and above.
- b. Ships of less than 24 m length intended to operate in unrestricted waters.
- c. Single hull ships of normal form and speed.
- d. Sea-going ships designed primarily for the carriage of general cargo.
- e. Refrigerated cargo ships where a controlled atmosphere (AC) notation is requested.
- f. Oil tankers, chemical tankers and gas carriers.

2.1.1.2 On OMCS agreement, these Regulations may also be applied to classification of vessels not mentioned in 2.1.1.1.

2.1.1.3 Vessels built in accordance with OMCS Rules or in accordance with sound and recognised International requirements, will be assigned a class on OMCS records and will continue to be classed so long as they are found to be maintained in accordance with the requirements of these Regulations.

2.1.1.4 The Rules are framed on the understanding that vessels will be properly loaded and operated. They are not meant for special distributions of loading.

2.1.1.5 When longitudinal strength calculations have been required, loading guidance is supplied to the Master by means of a Loading Manual and by means of a loading instrument.

2.1.1.6 The Rules are framed on the understanding that vessels will not be operated in wind and sea states higher than those agreed for the design basis.

2.1.1.7 Where an on board computer system, having a longitudinal strength and/or a stability computation capability, is provided on a new vessel, or newly installed on an existing ship, then the system is to be certified for such use.

2.1.2 Additional conditions:

2.1.2.1 Additional requirements:

- a. Concerning gas tankers are given in the International Code for the Construction and Equipment of Ships carrying Liquid Gases in Bulk (IGC Code- IMO).
- b. Concerning chemical tankers are specified in the International Code for the Construction and Equipment of Ships carrying dangerous Chemicals in Bulk (IBC Code-IMO).
- c. Concerning High Speed Craft are specified in the International Code of Safety for High Speed Craft (HSC Code- IMO).

2.1.2.2 Loading conditions and any other preparations required to allow a vessel with a class notation specifying service limitations to undertake a voyage beyond its operational limits, are to be in accordance with arrangements agreed by OMCS prior to the voyage.

2.1.2.3 OMCS reserves the right to suspend or withdraw the classification of a vessel, if the vessel does not comply with OMCS Regulations.

2.1.2.4 Any damage or stranding, which could invalidate the conditions for which a class has been assigned, is to be reported to OMCS without delay.

2.1.2.5 The Rules do not cover certain technical characteristics, such as stability, trim, hull vibration, etc.

2.1.2.6 Where a vessel is so badly damaged that class has to be suspended. OMCS is prepared to assist the Owner with advice if requested.

2.2 CLASS OF A VESSEL

2.2.1 Definitions: Following definitions have been adopted for use within the Regulations and Rules:

- a. **Accommodation space:** is a space used as public space, lavatory, cabin, office, hospital, pantry, etc.
- b. **Administration:** means the Government of the state whose flag is flown by the vessel.
- c. **Approved:** means approved by the Administration representative, by an IACS class society or by an OMCS representative.
- d. **Ballast tank:** that is being used for water ballast.
- e. **Bulk carrier:** is a vessel with single deck, topside tanks and hopper side tanks in cargo spaces.
- f. **Cargo Area:** is that part of the vessel that contains cargo tanks, slop tanks and adjacent cargo pump rooms, and deck areas throughout the entire length of the vessel over the above mentioned spaces.



- g. Cargo Space:** is a space used for cargo including trunk for that space.
- h. Classification cycle:** a cyclical 5-year period, starting from the date of ship's construction completion or the date of Class Renewal survey completion.
- i. Class of a Ship:** a combination of ship's (hull, machinery, installations, equipment) features determined by the requirements of the relevant Rules.
- j. Coating condition:** -Good- condition with only minor spot rusting.
- Fair- condition with local breakdown at edges of stiffeners or light rusting over areas under consideration.
- Poor-condition with general breakdown of coating over 20% areas under consideration.
- k. Combination carrier:** is a tanker designed to carry oil or solid cargoes in bulk.
- l. Container Ship:** a ship specially equipped with container cell guides and intended for the carriage of containers.
- m. Control station:** is a space where the vessel's emergency source of power is located or where the fire recording or control equipment is centralised.
- n. Corrosion protection system:** normally considered either:
1. A full hard coating, or
 2. A full hard coating supplemented by anodes.
- o. Critical Areas:** locations which have been identified from calculations to require monitoring or from the service history of the subject ship to be sensitive to cracking, buckling or corrosion.
- p. Crude oil tanker:** oil tanker intended for the carriage of crude oil.
- q. Chemical Tanker:** a tanker intended for the carriage of noxious liquid substances.
- r. Date of build:** The date of completing Initial Survey for Assignment of Class to a new ship.
- s. Dredger:** a ship intended for dredging port areas.
- t. Examination:** - External examination (general) - a visual inspection of structure or machinery, without dismantling, to provide a general assessment of their condition.
- Internal examination – a visual examination of structure or machinery in dismantled condition or a visual examination of an arrangement from the inside, aimed at the assessment of their condition.



- Close-up examination – a thorough visual examination of structure or machinery being within Surveyor’s reach.

- u. Existing ship:** is a vessel that is not a new vessel.
- v. Ferry:** a ship intended for regular carriage of means of road and railway transport.
- w. Fishing vessel:** a ship specially intended and equipped for fishing and excavating other living resources of the sea.
- x. Floating crane:** a ship having a pontoon type hull with a jib crane installed on a deck.
- y. Gas tanker:** a tanker specially intended for the carriage of liquefied gases listed in Chapter 19 of the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code).
- z. High speed craft:** a craft capable of a maximum speed, in m/s, equal to or exceeding $3,7V^2$ where V = displacement corresponding to the design waterline, (m³).
- aa. Hopper barge:** a ship provided with hold fitted with bottom and side flaps opening for the purpose of discharging the cargo (spoil).
- bb. Machinery Space:** is any space containing main propulsion machinery, auxiliary machinery, main or auxiliary boilers.
- cc. Noxious liquid substance:**-any substance of Category A, B, C or D according to Chapter 17 and 18 of the IBC Code, as well as any other liquid substance assessed under the provisions of Appendix I to Annex II of MARPOL 73/78 as falling into Category A, B, C, or D.
- dd. Operation, strength, tightness tests:**
 - Operation tests -close-up examinations of machinery or appliance under working conditions.
 - Strength tests:
 - Destructive strength tests –when a load is applied to test samples and increased until the sample is damaged.
 - Non-destructive strength tests – when a test load is applied to the tested body. The tested object should not be damaged during testing.
 - Tightness test- when a pressure of the liquid is applied to the tested body.
- ee. Passenger ship:** is a vessel which carries more than twelve passengers.
- ff. Passenger space:** is a space provided for the accommodation and use of passengers.



- gg. Ro-Ro cargo space:** is a space not subdivided in any way and extending a substantial length of the ship goods, vehicles, trailers, etc can be loaded or unloaded in a horizontal direction.
- hh. Soft coatings:** coatings that always remain soft and can be damaged by walking, touching, erosion, etc.
- ii. Semi-hard coatings:** coatings that when drying convert in such a way that they stay flexible and have the ability to prevent corrosion for at least three years.
- jj. Hard coatings:** coatings that always remain hard, and are usually epoxy coating or equivalent.
- kk. Reefer carrier:** a ship with refrigerated and holds adapted for the carriage of perishable goods.
- ll. Representative spaces:** spaces that are expected to reflect the conditions of other spaces of similar type and similar corrosion protection systems.
- mm. Rules:** Rules for the Classification and Construction of Vessels.
- nn. Substantial corrosion:** an extent of corrosion such that assessment of corrosion pattern indicates wastage in excess of 75% of allowable margins.
- oo. Supply vessel:** a ship intended for the carriage of service materials and cargo and for assistance in drilling and excavating work at sea.
- pp. Survey:** a set of activities relating to a ship, its machinery, appliances, etc. realized through carrying out appropriate examinations, measurements and tests.
- qq. Survey completion:** survey is considered completed when all activities determined in the Rules and Regulations for specified survey have been carried out, recommended repairs have been finalised and deficiencies have been rectified as to ensure safe departure of ship to the sea and its safe operation. Completion of survey is confirmed by a new temporary certificate or endorsement of a full-term certificate. The date of survey completion is a date of issuing temporary certificate or endorsement of full-term certificate.
- rr. Suspect areas:** locations showing substantial corrosion or considered by the Surveyor to be prone to damage or rapid wastage.
- ss. Symbol of class of a ship:** a group of conventional notes and marks specifying a class assigned to a ship, kind of survey during her building, as well as marks showing her structural features and operational limitations important for classification purposes. The full symbol of class consists of the main symbol of class and additional marks like:
- tt. Marks of refrigerating plants:** a group of conventional notes specifying kind of survey during construction of refrigerating plants and indicating their structural features.



uu. Marks of machinery: a group of conventional notes specifying kind of survey during construction of machinery.

vv. Tanker: is a vessel constructed for the carriage in bulk of liquid cargoes of an inflammable nature.

ww. Transverse section: a section which includes all longitudinal members such as plating, longitudinals and girders at the deck, side, bottom, inner bottom and longitudinal bulkhead. For transversely framed vessels, a transverse section includes adjacent frames with their end connections.

xx. Tug: a ship intended and equipped for towing.

yy. Weather deck: is a deck completely exposed to the weather from above and sides.

zz. Weather tight: means that seawater will not penetrate into the vessel.

2.2.2 OMCS Character symbols

2.2.2.1 General: All vessels when accepted into class will be assigned classification symbols according to our society notation.

2.2.2.2 Vessel symbols: A list of classification symbols that vessels receive according given qualifications is as follows:

.C: This symbol indicates compliance with hull requirements of OMCS classification regulations.

.CM: This symbol indicates compliance with hull and machinery requirements of OMCS classification regulations.

.I: It is assigned to new vessels constructed under OMCS regulations

.O: This symbol indicates vessel is suitable for ocean-going service.

.EP: This symbol indicates that the vessel's anchor, mooring arrangements and chain cables meet the applicable requirements of OMCS classification regulations suitable for a specific service only.

2.2.3 Hull class marks

2.2.3.1 If necessary a hull note will be appended to the classification symbol describing the vessel's type, cargo carried and specifics for example, .CM.O. Oil tanker, FP above 60°C (see also in 2.2.6.4 below).

2.2.3.2 With regard to service limitations other notes will be considered as follows:

- a. **.SP:** Harbour Service. When service is carried out within harbour sheltered waters and to a distance usually not beyond 20 miles from coast in weather with wind speed and sea state corresponding to Beaufort scale 5 or less, e.g. .SP Buenaventura port.
- b. **.NC:** Coastal Navigation. When vessel operates between ports along the coast keeping land visible or usually not beyond 50 miles from shore. Owner to contact local or vessel's flag administration to confirm coastal service definition, e.g. .NC Peruvian coast
- c. **.AP:** Sheltered Waters Service. When vessel operates in smooth waters next to coastal features or between islands, e.g. .AP Cartagena- San Blas islands.
- d. **.NP:** Particular navigation. Comprises rivers or navigation in specific areas, e.g. .NP Paraná River.

2.2.3.3. The symbol I may also be assigned to a ship built under the survey of another IACS society subject to:

-) Approval of current technical documentation.

-) Carrying out Initial Survey within the scope of Class Renewal Survey, including recommendations stated in the ship's classification status issued by the losing Society.

2.2.3.4 If a ship has not been built under the survey of any IACS Classification Society, but has later been assigned OMCS Class, the symbols of class are put in square brackets.

2.2.3.5 **IC:** This mark is assigned when an approved loading instrument has been installed.

2.2.3.6. **CPTL:** Protection coatings in W.B. tanks.

2.2.3.7 **.H:** Ice strengthened.

2.2.4. Machinery class marks: The following marks may be assigned as considered appropriate:

- a. (.CDC) This mark indicates that the vessel has the means to operate the propulsion machinery with continuous supervision from a centralised control station installed within or close to the propulsion machinery space.
- b. (.CDP) This mark indicates that the vessel has the means to operate the propulsion machinery with continuous supervision from the bridge and from a centralised control station within or close to the propulsion machinery space.



2.2.5 Refrigerated cargo installation class marks:

- a. (.CR) This notation will be assigned when the arrangements of the refrigerated cargo installation have been found to be equivalent to rule requirements, and the installation has been tested in accordance with the relevant requirements of the rules.
- b. (.F) This notation is assigned to refrigerated cargo vessels suitable designed to carry fruit in hold spaces cargo or containers intended for the carriage of fruit. It indicates that the following parameters have been assessed and found satisfactory.
 - The rate of air circulation and the air refreshing arrangements through the refrigerated spaces or chambers, or to containers.
 - The temperature controls and monitoring arrangements.
 - The installation's capability to cool down a complete cargo of fruit to its carrying temperature will also be assigned to fishing vessels that have the refrigerating capacity to freeze down their catch.

2.2.6 Additional information

2.2.6.1. The Society will define other notations representing additional indications when considered necessary by means of provisional regulations, which will be published in the form of pre-regulations.

2.2.6.2. Examples:

- a. For the majority of existing general cargo vessels trading in the Caribbean sea the symbols assigned will be: .CM.O
- b. An existing vessel operating as floating dock at Barranquilla will generally be assigned: .C.EP.SP Barranquilla port.
- c. A new tanker vessel in coastal navigation with engine operated from control station close to the engine compartment will generally be assigned with: I.NC Oil tanker .CDC
- d. An existing barge navigating through Paraná river will generally be qualified: .C.EP Barge .NP Paraná river

2.2.6.3. Additional notes for previous marks:

- a. C: Hull
- b. CM: Hull and machinery



- c. I: Symbol corresponding to Courier New (Latin Basic), representing the capital letter I and meaning:
 - 1. Isthmus (Panama and OMCS characteristic).
 - 2. Connexion between the world marine market and
 - 3. A strip between the old and the new styles and conception of classification. The future means that the rules and regulations will be a responsibility of both the class society and the vessel's owner.
- d. .EP: Particular equipment (Equipo particular)
- e. .O: Ocean (Océano)
- f. .SP: Harbour services (Servicios de Puerto)
- g. .NC: Coastal navigation (Navegación costanera)
- h. .AP: Protected waters (Aguas protegidas)
- i. .NP: Particular navigation (Navegación particular)
- j. .CDC: Control from console (Control desde la consola)
- k. .CDP: Control from bridge (Control desde el puente)
- l. .H: Symbol from extended Latin for ice strengthened vessels.

2.2.6.4. Ships complying with the basic requirements specified for the given type, are assigned one of the below given hull notes as above mentioned in 2.2.3.1.

- a. Barge: **BARGE**
- b. Bulk Carrier: **BC**
- c. Cement carrier: **CEMENT C.**
- d. Container ship: **CONT. SHIP**
- e. Crude oil tanker: **CRUDE O. TKR.**
- f. Chemical Tanker: **CHEM.TKR**
- g. Dredger: **DREDGER**
- h. Ferry: **FERRY**
- i. Fire fighting ship: **FIRE FIGHTING**



- j. Fishing vessel: **PES**
- k. Floating crane: **FLOATING CRANE**
- l. Gas tanker: L.G. **TKR**.
- m. High speed craft: **HSC**
- n. Hopper barge: **HOPPER BARGE**
- o. Livestock carrier: **LIVESTOCK C.**
- p. Ore carrier: **ORE C.**
- q. Passenger ship: **PSGR SHIP**
- r. Product carrier carrying cargoes with an ignition temperature not exceeding 60° C (closed cup test) and with a pressure of vapour (acc. to Reid) below the atmospheric pressure: **PRODUCT C.A.**
- s. Product carrier carrying cargo with an ignition temperature above 60°C (close cup test): **PRODUCT C.B**
- t. Reefer carrier: **REEFER C.**
- u. Rescue vessel: **RESCUE**
- v. Research ship: **RESEARCH**
- w. Roll on-roll of ship: **RO-RO**
- x. Ship intended for operation in the area of oil spillage: **OIL**

RECOVERY

- y. Supply vessel: **SUPPLY**
- z. Tanker carrying only specified liquid cargo in bulk (other than oil tanker, Product carrier, chemical tanker or gas tanker): **TKR FOR**
- aa. Tug: **TUG.**

2.2.6.5 Enhanced hull survey mark: All bulk carriers, oil tanker, chemical tankers are carriers and combination Carriers are assigned the mark: ESP which means they are subject to an enhanced survey programme.

2.2.6.6 A ship, other than container ship, complying with the relevant requirements of the carriage of containers on deck, is assigned the mark:

- a. ACC(...)affixed to the symbol of class.
- b. Design number of twenty-foot equivalent units (TEU) is given in round brackets.

2.2.6.7 Mark of inert gas system: Oil tankers, chemical tankers and combination carriers fitted with an approved system for inerting the cargo tanks: .GI affixed to the symbol of class.

2.2.6.8 Mark of ships adapted for the carriage of timber: Ships intended or adapted for the carriage of timber and complying with requirements of Stability and Subdivision are assigned the mark: .TIMBER affixed to the other symbols of class.

2.2.6.9 Mark for fishing vessels: Vessels which, due to their features, arrangements and equipment, are suitable for catching fish or other living resources of the waters. The vessels that comply with the specific requirements of the rules for the construction and classification of fishing vessels are assigned the mark .PES affixed to the other symbols of class.

CHAPTER 3: CLASSIFICATION SURVEY DURING CONSTRUCTION

3.1 CLASSIFICATION SURVEY DURING CONSTRUCTION

For a ship requiring classification survey during construction, the construction, materials, scantlings, and workmanship of the hull, equipment and machinery are to be examined in detail in order to ascertain that they meet the appropriate requirements of the Rules.

3.2 APPROVAL OF PLANS

For a ship requiring classification survey during construction, the plans and documents showing the details of the construction, materials, scantlings and particulars of the hull, equipment and machinery are to be submitted in triplicate and approved before the work is commenced. The same applies also to the cases of any subsequent modifications to the approved drawings or documents.

3.3 MATERIALS

All materials used for a ship requiring classification survey during construction are to be manufactured under alternative process considered equivalent to the approved method and are to be adequate to the relevant requirements of the Rules.

3.4 CORROSION PROTECTION COATING FOR SEAWATER BALLAST SPACES

For ships not intended to receive a corrosion control notation, all seawater ballast spaces having boundaries formed by the hull envelope are to have an effective corrosion protection coating.

3.5 MACHINERY MANUFACTURE

Main engines, shafting arrangement, boilers, pressure vessels, electrical equipment, essential auxiliary machinery, and piping arrangements to be installed on a ship intended for classification are to receive survey during construction. Shop trials are to be carried out on completion under the same condition as when they are installed on the ship. Various tests on any special part amongst the automatic or remote control systems and measuring devices considered necessary by the Society may be requested at the manufacturing sites.

3.6 CARGO HANDLING MACHINERY AND GEAR

The Society shall assign the safe working load, etc. in accordance with the requirements of the International Labour Organization (ILO) to the cargo handling machinery and gear installed in ships classed or intended to be classed with the Society which come under either of the following:

1. The cargo handling machinery and gear of safe working load not less than 1 ton which are installed in ships flying Honduran flag of 300 tons gross and over
2. The cargo handling machinery and gear installed in the ships other than those specified in (1) above, for which the assignment of the safe working load, etc. is required.

3.7 WORKMANSHIP

For classification survey of a ship, the materials, workmanship and arrangements are to be surveyed under the supervision of the Society's Surveyor from the commencement of the work until the completion of the ship. Any item not complying with the Rules or the approved plans or any material, workmanship or arrangement found to be unsatisfactory must be rectified.

3.8 TEST

In the classification survey during construction, hydrostatic, watertight and performance tests are to be carried out in accordance with the relevant part of the Rules. Also the control systems and measuring device after installation are to receive the necessary tests.

3.9 STABILITY

The experiment on stability is to be carried out upon completion of the ship in order to ascertain that the stability is adequate for the service intended. The particulars of stability are to be submitted to the Society for approval and one copy of the approved materials is to be provided to the master.

3.10 TRIAL

Trials are to be carried out for all equipment, machinery and electrical equipment under working conditions after completion of the ship in order to ascertain their performances. In the sea trials, speed test, astern test, steering test, emergency steering test and turning test are to be carried out. In addition, the operating conditions of machinery and other behaviours of the ship during the trial are to be examined.

CHAPTER 4: CLASSIFICATION SURVEY AFTER CONSTRUCTION

4.1 CLASSIFICATION SURVEY AFTER CONSTRUCTION

In the classification survey after construction, the actual scantlings of main parts of the ship are to be measured in addition to such examinations of the construction, materials, workmanship and actual conditions of hull, machinery, outfitting and equipment as required for the Special Survey corresponding to the ship's age.

4.2 SUBMISSION OF PLANS

In the classification survey after construction, plans and documents as may be required for classification survey during construction are to be submitted. If plans cannot be obtained, facilities are to be given for the Society's Surveyor to take the necessary information from the ship.

4.3 SUBMISSION OF OTHER CLASSIFICATION DOCUMENTS

When a ship holding other Society's classification documents is intended for classification, the copies of certificates and survey documents are to be submitted.

4.4 TESTS

In the classification survey after construction, the watertight tests, hydraulic pressure test, sea trials and experiment on stability are to be carried out in accordance with the requirements of the Rules. Sea trials and experiment on stability may be dispensed with provided that sufficient data on the previous tests are available and neither alteration nor repair affecting the stability has been made since the previous tests.

CHAPTER 5: CERTIFICATES

5.1 CLASSIFICATION CERTIFICATE

Where ships have been undergone the classification survey during or after construction to the satisfaction of the Surveyor and approved by the Classification Committee, the ships will be classed and entered in the Register Book with the issue of the Classification Certificates

5.2 PROVISIONAL CLASSIFICATION CERTIFICATE

Where ships have undergone a classification survey during or after construction to the satisfaction of the Surveyor, the Provisional Classification Certificates may be issued

5.3 CERTIFICATE FOR CONSTRUCTION SURVEY

Where ships not intending to be classed have undergone the survey during construction, or marine engines, boilers, auxiliary machinery and outfittings have undergone the surveys during construction to the satisfaction of the Surveyors, the Certificates for Construction Survey will be issued.

5.4 SURVEY REPORT

On completion of the classification survey, Special Survey, Annual Survey and Occasional Survey, the Survey Reports will be issued. Ship's particulars, survey results, the date and description of the next surveys, etc. are to be stated in the Survey Reports. The Survey Reports will be used as notice to the Owners.

5.5 KEEPING OF THE CERTIFICATES AND SURVEY REPORTS

The Classification Certificate, The Provisional Classification Certificate, Particular Sheets and Survey Report, etc. are always to be kept on board by the master of the ship and are to be produced when requested by the Society's Surveyors.

5.6 ENDORSEMENT OF CERTIFICATE

Where ships classed with the Society have satisfactorily undergone the survey for maintenance of class, the Classification Certificate or the Provisional Classification Certificate will be endorsed accordingly.

5.7 LOSS, RE-ISSUE AND RETURN OF CERTIFICATE

5.7.1 When the Classification Certificate, Provisional Classification Certificate, Particular Sheets, or Survey Report is lost or impaired, when the items stated in them requires alteration, or when there is no space left in them for endorsement, the application for re-issue must be made without delay.

5.7.2 When a ship holding the Provisional Classification Certificate is furnished with the Classification Certificate, then the certificate is re-issued except in the case of its loss, or when the classification is cancelled, the old certificate is to be returned to the Society without delay.

5.8 CERTIFICATES OF RELATED EQUIPMENT

The Society may, upon application, survey such equipment relating to ships as prime movers, shaftings, boilers, pressure vessels, auxiliary machinery, electrical equipment and other machinery installations and issue certificates where they are in satisfaction of the Surveyor.

CHAPTER 6: APPLICATION FOR SURVEY

6.1 CLASSIFICATION SURVEY

The application for Classification Survey is to be made by the Builder for a ship during construction and by the Owner or the Manager for a ship after construction.

6.2 PERIODICAL AND OTHER SURVEYS

The application for surveys of ship for the continuation of her classification is to be made by the Owner (including Master of the ship, hereinafter referred to as “ the Owner ”).

6.3 RE-ISSUE OF CERTIFICATES

The application for re-issue and return of the Classification Certificate, Provisional Classification Certificate, Particular Sheet and Survey Reports are to be made by the Owner or Master of the ship.

CHAPTER 7: DUTIES OF OWNER

7.1 DUTIES OF REPORT

When any of the following cases occurs, the Owner is to report to the Society without delay:

- a. When the ship is sustained with a sea casualty by which her present class is deemed affected.
- b. When the ship is placed in a dry-dock or on a slipway.
- c. When the ship is laid up or dismantled.
- d. When the Owner is changed.

7.2 COOPERATION TO SURVEY

7.2.1 All such preparations as required for classification survey and Periodical Surveys necessary for the maintenance of class are to be made by the applicant of the survey in accordance with the requirements of the Rules.

7.2.2 The owner, master, chief engineer or their representatives are to attend the survey according to the items to be examined and are to give necessary assistance.

7.2.3 When a ship is to be surveyed, it is the duty of the Owner to inform the Society’s Surveyor the correct place and items of survey.

CHAPTER 8: COMPETENCE AND DUTIES OF SURVEYOR

8.1 COMPETENCE OF SURVEYOR

- a. The surveyor can attend the classed ships at all reasonable times.
- b. The surveyor may suspend surveys when the necessary preparations required in the rules have not been made or any appropriate attendant is not present.
- c. The surveyor may, if deemed necessary by the condition of a classed ship, request additional surveys of a part though such part may not fall under the survey items.
- d. The surveyor will notify the survey applicant of his recommendations for repairs or renewals when the hull, machinery or other equipments are in conflict with the requirements of the Rules, damaged, or worn out. Upon this notification the applicant is to carry out the repairs to the satisfaction of the Surveyor.

8.2 DUTIES OF SURVEYOR

- a. The surveyor is to undertake all the surveys on a classed ship for which the application is made and is to report to the Head Office without delay.
- b. For the convenience of owner the surveyor is to avoid for unnecessary duplication of surveys or repair works in carrying out his surveys.

8.3 RESPONSIBILITY OF SOCIETY

The society will put its utmost efforts for the assurance of its Surveyors and all other employed personnel for the proper execution of the society's functions and be responsible or liable for any damage arising in consequence of any act or omission of these persons, or of any inaccuracy and omission in the records, certificates, and reports, etc. issued by the Society.

CHAPTER 9: WITHDRAWAL OF CLASSIFICATIONS AND RECLASSIFICATION

9.1 WITHDRAWAL OF CLASS

- 9.1.1 When a ship classed with the society falls under any of the following cases, the society can decide to withdraw the classification and registry of the ship upon the approval of the Classification Committee;

- a. When the withdrawal of classification is applied for by the Owners.
- b. When the required surveys for the continuation of classification have not been duly carried out in due date.
- c. When the society considers that the ship has not passed the survey in accordance with the rules.
- d. When the Maritime Administration due to sinking, dismantling, etc, cancels the registry of the ship.
- e. When the fees for the surveys are not paid.
- f. When the Owner fails to fulfill the Surveyor's recommendations.
- g. When any damage to the ship is to such an extent as affecting her class and is not repaired, or the ship has been altered without approval of the Society.
- h. When the loading of the ship exceeds the load line assigned by the Society, or the freeboard marks have been placed higher on ship's sides than the position assigned by the Society.
- i. The assessment for (3) of preceding Paragraph is to be made upon completion of special survey.

9.2 RECLASSIFICATION

When reclassification is desired for a ship for which the class previously assigned has been withdrawn, the Society will carry out a survey for reclassification appropriate to the age, condition of the ship, and the circumstances of the case and if the ship is considered passed, the Society will reinstate her classification.

PART B: CLASIFICATION REGULATIONS INFORMATION

CHAPTER 10: CLASSIFICATION REGULATIONS

10.1 GENERAL

10.1.1 Definition

Anniversary date means the day and the month of each year will correspond to the due date of the next Special Survey from the completion date of the initial classification survey or of the Special Survey.

10.1.2 Kinds of surveys

Periodical and other surveys to maintain the classification are divided as follows:

(1) Periodical survey

- (a) Special Survey
- (b) Intermediate Survey
- (c) Annual Survey

(2) Other surveys

- (a) Docking Survey
- (b) Propeller Shaft Survey
- (c) Boiler Survey
- (d) Continuous Survey
- (e) Occasional Survey
- (f) Alteration Survey

10.1.3 Postponement of due date of survey

If a ship at the time of the Special Survey is not in a port in which it is to be surveyed or if a ship is in transit to another port to be surveyed, the due date of Special Survey may be postponed within the period of *3 months* at the request of the Owner through the approval of the Society.

However, for fishing vessels, the due date of the Special and Intermediate Survey may be postponed within the appropriate period subject to the Society's approval.

10.1.4 Shortening of survey interval

Special, Intermediate or Annual Survey may be carried out in advance even if it is not due, upon application by an Owner.

However, if Annual or Intermediate Survey is carried out more than *3 months* earlier than the anniversary date, the anniversary date will be newly assigned to the date of *3 months* later than the date on which the survey was completed.

The subsequent Annual or Intermediate Survey shall be completed at the interval, which will correspond to the new anniversary date.

10.1.5 Dispensation of survey

Survey items carried out to the standard of Special Survey within the period of *12 months* ahead of the actual due date of Special Survey or to the standard of Intermediate Survey within the period of 6 months ahead of the actual due date of Intermediate Survey may be dispensed with in the surveys at the discretion of the Surveyor.

10.1.6 Duplication of surveys

When heavier kind of survey is carried out in advance at the periodical survey, the periodical survey may be dispensed with.

10.1.7 Execution of heavier survey

At the periodical survey, any items as specially considered necessary by the Surveyor or specially requested by the Owner may be inspected to the standard of heavier periodical surveys.

10.1.8 Laid up ships

No periodical surveys are to be carried out for classed ships when they are laid up. In order to put the laid up ship into service, the ship has to receive the heaviest kind of survey amongst all the due surveys during laid up period.

10.1.9 Tests

At the periodical survey, when the repair to the ship is likely to affect the ship's speed or safety and when the Surveyor considers necessary, the speed trials and inclining experiment are to be carried out.

10.1.10 Repairs

When the Surveyor recommends the necessity of repairs in consequence of his surveys, he is to notify the applicant the reasons of his recommendations and the applicant after such notification must receive the supervision of the Surveyor during the repairs.

10.1.11 Wear limit on structural members

When the thickness of hull structural members or the scantlings of equipment, etc. exceed the wear limit, they have to be renewed with those having the original scantlings or the scantlings considered suitable by the Society. As regards the scantling of structural members which have been reduced by virtue of an approved system of corrosion control, the present scantling are to be examined regarding them as having been corroded by the reduced amount since the time of construction.

However, when the original scantlings were larger than the required ones, or when deemed appropriate by the Society, these requirements may be modified taking into account of the location, extent, kind of the wear.

CHAPTER 11: ANNUAL SURVEY

11.1 DUE DATE

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

11.2 HULL AND EQUIPMENT

11.2.1 At Annual Surveys, the general conditions of hull, fittings and equipment are to be examined, so as far as practicable, with special attention being paid to the following:

- a. Coamings and closing appliances of hatchways on exposed deck and within unenclosed superstructures. Means for ensuring weather tightness or water tightness of steel hatch covers in accordance with these regulations.



- b. Exposed engine casings and their openings, engine room skylights, fiddley openings and their closing appliances.
- c. Coamings and closing appliances of ventilators and air pipes on weather decks.
- d. Watertight doors and stop valves in watertight bulkheads and closing appliances in superstructure end bulkheads.
- e. Flush bunker scuttles and manhole covers.
- f. Bulwarks, shutters of freeing ports in bulwarks or guard rails.
- g. Gangways, cargo or coal ports and side scuttles.
- h. Scuppers and other discharge pipes below the freeboard deck.
- i. Permanent gangways or other equivalent means of access.
- j. In ships marked with timber load lines, metal sockets which are provided for securing uprights and eye plates for lashing.
- k. Load line marks.
- l. Cargo handling machinery and gear.
- m. The structure of fire protection and fire doors to be tested in operation.
- n. Main, auxiliary steering gears and their control systems are to be examined and tested in operation.
- o. General conditions of machinery and boiler spaces are to be examined.
- p. General condition of outside of the hull above the water line including weather deck and the arrangement for drainage, mooring and anchoring is to be examined so far as could be seen.

11.2.2 In tankers, the following requirements in addition to the preceding paragraph are also to be complied with:

- a. Cargo pump rooms are to be examined, with attention being paid to the sealing arrangements of all penetrations of bulkheads, ventilating arrangements, foundations and gland seals of pumps
- b. Cargo oil pipes in pump rooms or on weather deck as well as breather valves, flame screens on vents, purge systems, gas free systems, inert gas systems and other piping systems are to be examined. Where

considered necessary by the Surveyor, pressure tests and (or) gauging for piping are to be carried out and the submission of gauging method and recording are to be in accordance with the requirements of 13.5.1 K.

11.3 MACHINERY

- a. At Annual Surveys, the general operating conditions of machinery and electrical installations are to be examined as far as possible. Where deemed necessary by the Surveyor, opening up examination may be requested.
- b. Boilers and thermal oil installations are to be externally examined including their safety devices. However, for boilers, operating conditions of safety valves are to be tested at the discretion of the Surveyor.
- c. Operational test of means of communication between the navigating bridge and the machinery control stations and, if provided, between the navigating bridge and the steering gear room is to be made.
- d. Performance of emergency sources of electrical power is to be tested. At the discretion of the Surveyor, however, the test may be dispensed with.
- e. The parts which are opened up for maintenance at the Owner's option are to be examined as necessary.
- f. In tankers, tests and examinations specified in 12.4.7, 12.4.8. 12.4.9b are to be made. Where deemed necessary by the Surveyor, insulation resistance of electrical equipments is to be tested in accordance with the requirements of Special Survey.
- g. Performance tests for CMA-ships, UMA-ships and UMAA-ships are to be conformed to the requirements of 12.4.9.

CHAPTER 12: INTERMEDIATE SURVEY

12.1 DUE DATE

Intermediate Surveys are to be carried out within *3 months* before or after the third anniversary date (the second anniversary date for fishing vessels) from the completion date of the initial classification survey or of the previous Special Survey.

However, for passenger ships, submersibles, nuclear ships, hydrofoils and air cushion vehicles and for fishing vessels, over 15 years old/ Intermediate Surveys are: to be carried out within *3 months* before or after each anniversary date.

12.2 POSTPONEMENT OF SURVEY ITEMS

Under special circumstances, some of survey items may be postponed within the period of 12 months subject to the Society's approval.

However, some of survey items for high-speed internal combustion engines with special construction may be postponed within the period as considered appropriate by the Society in consideration of their running hours.

12.3 HULL AND EQUIPMENT

At Intermediate Surveys, in addition to all the requirements specified in the preceding 12.3, the following items are to be surveyed:

12.3.1 Drainage, anchoring and mooring arrangements are to be examined. Where deemed necessary by the Surveyor, their performance tests are to be made.

12.3.2 In case of tankers over 10 years old, bulk carriers, ships mainly engaged in carrying logs and other ships over 15 years old, each one of cargo oil tank or hold at the forward and aft ends are to be internally examined. Where the results of these internal examinations are found unsatisfactory, the remaining tanks or holds may be requested for examinations at the discretion of the Surveyor.

12.3.3 In case of all ships over 5 years old and up to 10 years of age:

a. For spaces used for sea ballast water, an internal general examination of representative spaces is to be carried out. If such inspections reveal no visible structural defects, the examination may be limited to verification that the protective coatings remain efficient.

b. Where significant coating break down, corrosion or other defects are found in sea water ballast spaces excluding double bottom tanks or where a protective coating was not applied from the time of construction, the examination is to be extended to other ballast spaces of the same type.

c. When a protective coating is found to have deteriorated and it is not renewed or where a protective coating was not applied from the time of construction, maintenance of class is to be made subject to the spaces in question being internally examined and gauged as necessary at annual intervals.

12.3.4 In case of all ships over 10 years old:

- a. For spaces used for sea ballast water, an internal general examination of all such spaces is to be carried out. If such inspections reveal no visible structural defects, the examination may be limited to verification that the protective coatings remain efficient.
- b. In spaces other than double bottom tanks, where a protective coating is found to have deteriorated and it is not renewed, or where a protective coating was not applied from the time of construction, maintenance of class is to be made subject to the spaces in question being internally examined and gauged as necessary at annual intervals.

12.4 MACHINERY

In addition to all the requirements of Annual Survey, the following requirements are to be fulfilled with.

12.4.1 Steam reciprocation engines

- a. Internal examinations of the cylinders and slide valves are to be carried out. Pistons and side valves may not have to be removed except when deemed necessary by the Surveyor.
- b. Examinations are to be carried out while rotating the crank shaft after removing the upper part of main bearings and crank pin bearings.

12.4.2 Steam turbines

- a. Examinations are to be carried out while rotating the rotor after removing the upper part of the turbine and rotor shaft bearings. The examinations on rotors may be dispensed with when deemed unnecessary by the Surveyor.
- b. The clutch coupling is to be examined.

12.4.3 Internal combustion engines

- a. Internal examinations of the cylinders and combustion side of the cylinder covers are to be carried out. Pistons may not have to be removed except when deemed necessary by the Surveyor.
- b. Examinations are to be carried out while rotating the crank shaft after removing the upper parts of main bearings and crank-pin bearings. The deflections of crank webs are to be measured and where deemed necessary the alignment of the bearing is to be adjusted.



12.4.4 Auxiliary engines

Examinations on auxiliary engines driving generators (except emergency use) and other auxiliary machinery related with ship propulsion are to be carried out as in the case of main engine.

12.4.5 Other essential auxiliaries

General examinations are to be carried out on other essential auxiliary machinery. Detailed examinations may, however, be carried out when deemed necessary by the Surveyor.

12.4.6 Spare parts and accessories are to be examined

12.4.7 Electrical installations

Where deemed necessary by the Surveyor, insulation resistance test is to be made and in case of tanker the condition of hazardous areas are to be examined.

12.4.8 Cargo oil pumps, ballast pumps and stripping pumps

In tanker, main parts of cargo oil pumps, ballast pumps and stripping pumps are to be examined.

12.4.9 Performance test

- a. Performance tests are to be made in accordance with the requirements in Special Survey.
- b. In tankers, the following items are to be tested in addition to the requirement specified in the previous a.
 - Remote operating and shut down devices of cargo oil pumps, bilge pumps, ballast pumps and stripping pumps in cargo pump rooms.
 - Bilge system in pump room
 - Level indicator system of cargo tanks
 - Pressure gauges on cargo discharge lines.
- c. For CMA-ships and UMA-ships, the following items are to be tested in addition to the requirements of the previous (a) and (b). Where appropriate records of daily checks and periodical maintenances throughout

the period since the last Periodical Survey have been kept, some of the tests may be dispensed with at the Surveyor's discretion.

- Safety devices for propulsion engines, and emergency stop devices fitted in the remote control station for the propulsion engines
- Safety devices for boilers and thermal oil installations
- Safety devices for electric generating plants.
- Communication systems among the navigating bridge, accommodation spaces for engineers, centralized control station and machinery space; and engineer's alarm systems
- Bilge systems for machinery spaces
- Fire detecting systems for machinery spaces.

d. For UMAA-ships general examination for the man-saving equipment is to be carried out in addition to the requirements of the previous (3). Where considered necessary by the Surveyors, performance test for the equipment may be required.

CHAPTER 13: SPECIAL SURVEY (HULL AND EQUIPMENT)

13.1 DUE DATE

13.1.1 Special Surveys are to be carried out at a date not exceeding 5 years (4 years for fishing vessels) from the completion date of classification survey or the due date of the previous Special Survey. However, if Special Surveys are carried out at a date, which shall be more than 3 months earlier than the due date of Special Survey, the next Special Survey shall be assigned at the date of 5 years after the completion date of the concerned Special Survey.

13.1.2 Special Surveys may be commenced at the 4th anniversary date and be progressed during the succeeding year with a view to completion by the 5th anniversary date. As part of the preparation for the Special Survey, the thickness determination is to be dealt with, so far as practicable, in connection with the 4th Annual Survey.

13.2 POSTPONEMENT OF SURVEY ITEM

Under special circumstances, where all the requirements for fishing vessels cannot be fulfilled at one time, some parts of the Special Survey may be postponed within the limit of 12 months from the due date subject to the approval of the Society after surveys on the general conditions of the hull and machinery.

13.3 KINDS OF SPECIAL SURVEYS

The first Special Survey on a ship after the classification survey during construction is designated as Special Survey No. 1 and subsequent Special Surveys are designated as Special Survey No. 2 to No. 6. The kinds of Special Surveys on a ship for the classification survey after construction are to be determined based upon the Special Surveys applied to the classification survey according to the ship's age.

13.4 MODIFICATIONS OF THE REQUIREMENTS

13.4.1 The surveyor may suitably modify the requirements for Special Surveys having regard to the size, service engaged, age, structural arrangement, results of last survey, and the actual condition of the ship.

13.4.2 For tanks where effective coatings are found to be in a satisfactory condition, the extent of internal examination or gauging requirements specified in this Chapter may be specially considered at the discretion of the Surveyor.

13.5 SPECIAL SURVEY NO 1

13.5.1 In the Special Survey No 1, examinations are to be made in accordance with all the requirements specified in the Intermediate Survey and, in addition, the following requirements:

- a. Closing appliances with their cargo. Coal and other ports as well as side scuttles located below the freeboard or superstructure decks are to be examined and their performances are to be tested where required by the Surveyor.
- b. Inside of the hull is to be examined after coal and ballast are cleared, articles not permanently attached to the hull removed as far as possible, all limber boards removed, mud boxes opened, strainers of bilge suction pipes exposed and interior of the hull cleaned.
- c. Single bottom construction is to be examined after removing at least one strake of bottom ceilings on each side of the centerline in way of bilges and flooring plates in machinery space where deemed necessary. Special attention is to be paid to ascertain that the cement of other composition laid on the inner surface of bottom plating is in satisfactory condition.
- d. A sufficient amount of ceiling of double bottom is to be removed and the condition of the top plating examined.



- e. The following tanks and divisions are to be thoroughly cleaned out, gas freed as necessary and examined, every precaution being paid to ensure safety during inspection. The internal examination of the deep fuel oil tanks (tanks used exclusively for fuel oil) except both peak tanks may be dispensed with, provided, after an external examination, the Surveyor is satisfied with the condition of the tanks.
- Cofferdams
 - B. Water tank (tanks used for fresh or sea-water)
 - Tanks used exclusively for fuel oil (other than double bottom tank)
 - Cargo tanks (other than those of tanker)
- f. When tanks are examined internally, the condition of striking plates below each sounding pipe is to be examined.
- g. Cargo tanks other than those of tanker and water tanks are to be tested under the pressure corresponding to the maximum head that can be experienced in service. Tests of the tanks may be dispensed with, provided after an external and internal examination of the tanks, the Surveyor is satisfied with the condition of the tanks.
- h. Structure under boilers is to be examined.
- i. All decks are to be examined, attention being paid to the welded parts of the strength deck, structures in way of discontinuities and corners of hatchway openings, etc. It is also to be ascertained whether the deck composition satisfactorily adheres to the plating.
- j. Where holds are insulated for carriage of refrigerated cargo, the limber boards and hatch covers are to be lifted and the condition of framing, plating, etc. to be examined.
- k. The thickness of structural members are to be gauged by an appropriate ultrasonic equipment or other approved means in accordance with the requirements of Chapter 9 of this chapter.
- l. Hawse pipes; chain lockers and cable holdfasts are to be examined.
- m. The arrangements for main, auxiliary steering gear including their control systems, mooring and anchoring are to be examined and their performances are to be tested. The performance may, however be dispensed with at the discretion of the Surveyor.
- n. Cargo handling machinery and gear are to be tested and thoroughly examined.
- o. The performance of hand bilge pumps is to be tested.
- p. Particulars concerning the structures for fire protection are to be examined, and operation test of fire doors are to be carried out

- q. In tanks to which an approved measure of corrosion control in accordance with these regulations is applied, the condition of coating or corrosion protection is to be examined.
- r. For spaces used for sea water ballast, excluding double bottom tanks, where a protective coating was not applied from the time of construction, maintenance of class is to be made subject to the spaces in question being internally examined at annual intervals.

When extensive corrosion is found, thickness gauging is to be carried out.

13.5.2 In tankers, in addition to the preceding requirements, the following requirements are also to be complied with:

- a. All cargo tanks and water ballast tanks, pump rooms, pipe tunnels, cofferdams and void spaces bounding cargo tanks are to be thoroughly cleaned out, gas freed and examined. Every precaution is to be paid to ensure safety during inspection. Additionally, cargo pump rooms are to be examined, with attention being paid to the sealing arrangements of all penetrations of bulkheads, ventilating arrangements, foundations and gland seals of pump.
- b. In oil tankers, condition of the inner surface of the bottom plating is to be examined in order to ascertain that there is no excessive pitting of the plating.
- c. In oil tankers, bell mouths of the cargo suction pipes are to be removed to enable examination of the shell plating and bulkheads in that vicinity as considered necessary by the Surveyor.
- d. Cargo tank boundaries facing water ballast tanks, void spaces, pipe tunnels, fuel oil tanks, pump rooms or cofferdams are to be tested under the pressure corresponding to the maximum head that can be experienced in service.
- e. All piping systems in the tanks and spaces specified in (a) above, cargo oil pipes on weather deck, breather valves, flame screens on vents, purge systems, gas free systems, inert gas systems and other piping systems are to be examined. When considered necessary by the Surveyor, pressure tests and/or gauging for piping are to be carried and the submissions of gauging method and recording are to be in accordance with the requirements of Chapter 9.
- f. For oil tankers, each plate in one section of the strength deck plating for the full beam of the ship in way of water ballast tank, if any, or a cargo tank used primarily for water ballast within 0,5 L amidships is to be gauged and the submission of gauging method and recording are to be in accordance with the requirements of Chapter 9.
- g. Hydrostatic tests may be carried out afloat at the discretion of the Surveyor, provided that the internal examination of the bottom is carried out afloat.

13.6 SPECIAL SURVEY NO 2

At the special survey No 2 all the requirements specified in the special survey No 1 and, in addition, the following requirements are to be complied with:

13.6.1 Throughout the ship, in way of single bottoms one strake of ceilings on each side near to keels on and in way of double bottoms and deep water or oil tanks ceilings at bilge (including limber hole) and center line part, lower parts of pillars and bulkheads, shaft tunnels and any other parts deemed necessary by the Surveyor are to be removed and the internal structures are to be examined.

13.6.2 Fuel oil tanks are to be thoroughly cleaned out, gas freed and examined, every precaution being paid to ensure safety during inspections. Fuel oil tanks excluding both peak tanks need not all be examined internally, provided, after an external examination and from an internal examination of each one double bottom tank forward and aft and of one selected deep tank, the Surveyor is satisfied with the condition of the tanks.

13.6.3 Fuel oil tanks are to be tested under the pressure corresponding to the maximum head that can be experienced in service. Tests of the tanks may be dispensed with, provided, after an external examination, the Surveyor is satisfied with the condition of the tanks.

13.6.4 Shell plating in way of the side scuttles is to be examined with special attention, and where deemed necessary by the Survey, the thickness of the said parts and any other parts of the structure being excessively corroded is to be gauged and the submission of gauging method and recording are to be in accordance with the requirements of Chapter 9.

13.6.5 The worn parts of wood deck are to be ascertained by drilling. The wood deck is to be renewed where it is worn out by more than 20 percent of its original thickness or where its condition is found unsatisfactory.

13.6.6 Where deemed necessary by the Surveyor, watertight tests are to be applied to the shell plating, watertight bulkheads, shaft tunnels and watertight doors.

13.6.7 For ships other than oil tankers, the thickness of the following parts within 0.5 L amidships is to be gauged. The submission of gauging method and recording are to be in accordance with the requirements of Chapter 9.

- a. Each plate in one section of the strength deck plating for the hull beam of the ship.
- b. Each strength deck plate in way of water ballast tanks, if any.
- c. Each strength deck plate, on or underneath which log cargoes or other cargoes being prone to accelerate corrosion has been carried.

13.6.8 In tankers, in addition to the requirements of 13.5.2 (d), cargo tank bulkheads, which form the boundaries of segregated cargoes, are to be tested under the pressure corresponding to the maximum head that can be experienced in service.

13.6.9 For oil tankers, the thickness of the following parts is to be gauged and the submission of gauging method and recording are to be in accordance with the requirements of Chapter 9.

- a. Each strength deck plate within 0.5 L amidships.
- b. Each plate and member in one transverse section within 0.5 L amidships.
- c. Each plate in one selected strake of the side shell plating in way of cargo area outside 0.5 L amidships on each side above the ballast water line.

13.7 SPECIAL SURVEY NO3

At the Special Survey No 3, all the requirements specified in the Special Survey No 2 and, in addition, the following requirements are to be complied with:

13.7.1 All ceilings, sparring, wood linings, casings in the holds, and floor plates in the machinery spaces are to be removed in sufficient quantities to enable the Surveyor to examine the conditions of structure under them; outside and inside of the ship throughout are to be chipped and the conditions of steel structure as well as discharge, air, and sounding pipes are to be examined.

13.7.2 Fuel oil tanks and lubricating oil tanks are to be thoroughly cleaned out, gas freed and examined, every precaution being paid to ensure safety during inspections. Fuel oil tanks excluding both peak tanks need not all be examined internally, provided, after an external examination and from an internal examination of each one double bottom tank amidships, forward and aft and of a half numbers of deep tanks, the Surveyor is satisfied with the condition of the tanks. Lubricating oil tanks need not be examined internally provided, after an external examination, the Surveyor is satisfied with the condition of the tanks.

13.7.3 Cargo tanks other than those of tanker, water tanks, fuel oil tanks and lubricating oil tanks are to be tested under the pressure corresponding to the maximum head that can be experienced in service. The tests of the fuel oil tanks may be dispensed with, provided, after an external examination and from testing of each one double bottom tank forward and aft and of one deep tank, the Surveyor is satisfied with the condition of the tanks.

13.7.4 Wood planks and other covering on steel decks are to be removed as required by the Surveyor and examined, and portions of them are to be removed so that the condition of shell plating and adjacent steel materials may be ascertained.



13.7.5 The lining in way of the side scuttles is to be removed as required by the Surveyor, and the shell plating examined.

13.7.6 Where the holds are insulated for carriage of refrigerated cargoes, the limbers and hatches are to be removed, in each of the chambers to enable the Surveyor to ascertain the condition of the plating and framing.

13.7.7 For ships other than oil tankers, the thickness of the following parts are to be gauged and the submission of gauging method and recording are to be in accordance with the requirements of Chapter 9.

- a. Each strength deck plate within 0.5 L amidships.
- b. Each plate and member in one transverse section within 0.5 L amidships.
- c. Each plate in one selected strake of side shell plating in way of cargo spaces outside 0.5 L amidships on each side above the ballast water line.

13.7.8 In tankers, all cargo tank bulkheads are to be tested under the pressure corresponding to the maximum head that can be experienced in service.

13.7.9 The condition of the masts and derrick posts is to be examined. Measurement of the thickness of the structure may be required if considered necessary by the Surveyor and the submission of gauging method and recording are to be in accordance with the requirements of Chapter 9.

13.7.10 For oil tankers, the thickness of the following parts is to be gauged and the submission of gauging method and recording are to be in accordance with the requirements of Chapter 9.

- a. Each strength deck plate within 0.5 L amidships.
- b. Each plate and member in two transverse sections within 0.5 L amidships.
- c. Each plate in one selected strake of side shell plating in way of cargo area outside 0.5 L amidships and each plate in another selected strake of side shell plating outside 0.5 L amidships from stern on each side above the ballast water line.

13.8 SPECIAL SURVEY NO 4

At the Special Survey No 4, all the requirements specified in the Special survey No 2 and, in addition, the following requirements are to be complied with:

13.8.1 Fuel oil and lubricating oil tanks are to be thoroughly cleaned out, gas freed and examined, every precaution being paid to ensure safety during the inspections.

13.8.2 Cargo tanks other than those of tanker, water tanks, fuel oil tanks and lubricating oil tanks are to be tested under the pressure corresponding to the maximum head that can be experienced in services.

13.8.3 For ships other than oil tankers, thickness of the following parts are to be gauged and the submission of gauging method and recording are to be in accordance with the requirements of Chapter 9.

- a. Each strength deck plate within 0.5 L amidships.
- b. Each plate and member in two transverse sections within 0.5 L amidships.
- c. Each plate in one selected strake of side shell plating in way of cargo spaces outside 0.5 L amidships and each plate in another selected strake of side shell plating outside 0.5 L amidships from stem to stern, on each side above the ballast water line.

13.8.4 In tankers, all cargo tank bulkheads are to be tested under the pressure corresponding to the maximum head that can be experienced in service.

13.8.5 For oil tankers, the thickness of the following parts are to be gauged and the submission of gauging method and recording are to be in accordance with the requirements of Chapter 9.

- a. Each strength deck plate within 0.5 L amidships.
- b. Each plate and member in three transverse sections within 0.5 L amidships.
- c. Each bottom shell plate within 0.5 L amidships.
- d. Each plate in two selected strakes of side shell plating outside 0.5 L amidships from stem to stern on each side above the ballast water line.

13.9 SPECIAL SURVEY NO 5

At the Special Survey No 5, all requirements for Special Survey No 4 and the following requirements are to be complied with: For ships other than oil tankers, the thickness of the following parts are to be gauged and the submission of gauging method and recording are to be in accordance with the requirements Chapter 9.

- a. Each strength deck plate within 0.5 L amidships.
- b. Each plate and member in three transverse sections within 0.5 L amidships.
- c. Each plate in two selected strakes of side shell plating outside 0.5 L amidships from stem to stern on each side above the ballast water line.

13.10 SPECIAL SURVEY NO 6

At the Special Survey No. 6, all requirements for Special Survey No. 3 and the following requirements are to be complied with:

13.10.1 Fuel oil and lubricating oil tanks are to be thoroughly cleaned out, gas freed and examined, every precaution being paid to ensure safety during the inspections.

13.10.2 Cargo tanks other than those of tanker, water tanks, fuel oil tanks and lubricating oil tanks are to be tested under the pressure corresponding to the maximum head that can be experienced in service.

13.10.3 For ships other than oil tankers, the thickness of the following parts are to be gauged and the submission of gauging method and recording are to be in accordance with the requirements of Chapter 9 .

- a. Each strength deck plate within 0.5 L amidships
- b. Each plate and member in three transverse sections within 0.5 L amidships
- c. Each plate in two selected strakes of side shell plating outside 0.5 L amidships from stem to stern on each side above the ballast water line.

13.10.4 For oil tankers, the thickness of the following parts are to be gauged and the submission of gauging method and recording are to be in accordance with the requirements of Chapter 9

- a. Each strength deck plate within 0.5 L amidships
- b. Each plate and member in three transverse sections within 0.5 L amidships
- c. Each bottom shell plate within 0.5 L amidships

- d. Each plate in two selected strakes of side shell plating outside 0.5 L amidships from stem to stern on each side above the ballast water line.

13.11 SPECIAL SURVEYS AFTER THE SPECIAL SURVEY NO.6

At the Special Surveys after the Special Survey No. 6, all the requirements specified in Special Survey No. 6 are to be conformed to.

CHAPTER 14: SPECIAL SURVEY (MACHINERY, ETC.)

14.1 DUE DATE

Special Survey of machinery is to be carried out at the same time and intervals as required for hull and equipment with respect to the type of machinery.

14.2 REQUIREMENTS OF SURVEY

The following requirements are to be complied with for all types of machinery

14.2.1 All shafts except the propeller and stern tube shafts, thrust blocks and line shaft bearings are to be examined. The lower halves of bearings need not be exposed, if alignment and wear are found satisfactory.

14.2.2 Reduction gears are to be examined. Where deemed necessary by the Surveyor, reduction gears are to be opened up and the gear wheels, pinions, gear shafts and bearings are to be examined.

14.2.3 Intercoolers, filters, oil separators, air compressors including safety devices and all the pumps used for essential services are to be examined. Where deemed necessary by the Surveyor, they are to be opened up and examined.

14.2.4 Operational conditions of steering gear are to be examined. Where deemed necessary by the Surveyor, main parts are to be opened up and examined.

14.2.5 Operational conditions of windlass, mooring winches and cargo winches are to be examined. Where deemed necessary by the Surveyor, main parts of them are to be opened up and examined.

14.2.6 Evaporators are to be opened up and examined. Their safety valves are also to be checked under working condition.

14.2.7 The foundation bolts and chocks of main and auxiliary engines, gear casings, thrust blocks and line shaft bearings are to be examined.

14.2.8 Air tanks and other pressure vessels for essential services together with their mountings and safety devices are to be opened up and examined internally and externally. If internal examination of them is not practicable, they are to be tested hydraulically to 1.5 times the working pressure.

14.2.9 Pumping and piping arrangements

- a. Valves, cocks and strainers of the bilge system including the emergency bilge suction valve are to be examined and where deemed necessary by the Surveyor, they are to be opened up.
- b. The fuel oil, feed and lubricating of systems, the ballast connections and blanking arrangement to deep tanks which may carry liquid or dry cargoes, together with all filters, heaters, coolers and condensers for essential services are to be opened up and examined. The pressure tests may be carried out, including safety devices, where deemed necessary by the Surveyor.
- c. Fuel oil tanks which do not form part of the ship's structure are to be examined internally and externally and, if considered necessary by the Surveyor, they are to be tested to the pressure specified for new tanks. At the Special Survey No.1, internal examination of the tanks may be dispensed with, provided they are found satisfactory in external examination. All mountings, fittings and remote controls are to be examined as far as practicable.
- d. Where deemed necessary by the Surveyor, the performance tests of pressure gauges, revolutions and thermometers are to be made.

14.2.10 Spare parts to be examined.



14.2.11 Where automatic and remote controls are fitted up for essential machinery, they are to be tested to demonstrate that they are in good working order.

14.2.12 Main steam pipes, where considered necessary by the Surveyor, are to be examined after removing the lagging indicated by the surveyor. The thickness of pipes is also to be checked as necessary.

14.2.13 In tanker, the performance tests for the following items are to be carried out in addition to the above-mentioned requirements.

- a. Remote operating and shut down devices of cargo oil pumps, bilge pumps, ballast pumps and stripping pumps in cargo pump room.
- b. Bilge system in pump room
- c. Level indicator system of cargo tanks.
- d. Pressure gauges on cargo discharge lines.
- e. Inert gas systems.

In case of inert gas systems fitted, the performance test for the following items is to be carried out.

However, the performance test for inert gas systems not specified in the Rules is to be in accordance with the requirements as deemed appropriate by the Society.

- i. Inert gas blowers.
- ii. Deck water seal and non-return valves.
- iii. All remotely operated or automatically controlled valves.
- iv. Flue gas isolating valves and interlock of soot blowers.
- v. Measuring devices

14.2.14 For CMA-ships and UMA-ships, the following are to be tested in addition to the previous performance test. Where appropriate records of daily checks and periodical maintenances throughout the period since the last Periodical Survey have been kept, some of the tests may be dispensed with at the Surveyor's discretion.

a. Propulsion engines



- i. Remote control systems (installed in the centralized control station and the bridge) and change-over devices of control position.
- ii. Safety devices.
- iii. Automatic power reduction systems (or power reduction demand systems).
- iv. Emergency stop devices (installed in the remote control station for the propulsion engine).

b. Boilers

- i. Automatic and remote control systems.
- ii. Safety devices

c. Electric generating plant

- i. Automatic and remote control systems.
- ii. Safety devices.
- iii. Automatic start of stand-by power supply unit after black-out, where applicable.
- iv. Preferential trip systems.

d. Automatic change-over devices of essential pumps and automatic starting devices (or remote start/stop devices) of air compressors.

e. Communication systems among the navigating bridge, accommodation spaces for engineers, centralized control station and machinery spaces; and engineer's alarm systems.

f. Alarm systems

- i. Function of alarm systems and indicator devices.
- ii. Confirmations of setting points of alarms

- g. Remote monitoring systems (installed in the centralized control station)
- h. Bilge systems for machinery spaces
- i. *Fire detecting systems for machinery spaces

14.2.15 For UMA A ships, the performance test for the following systems and equipment is to be carried out in addition to the requirement in 14.2.14. Where appropriate records of daily check and periodical maintenances have been kept, some of the tests may be dispensed with at the Surveyor's discretion.

- a. Automatic control system, remote control system, etc. specified in 14.2.14.
- b. Man saving equipment

14.2.16 Where considered necessary by the Surveyors, sea trials may be required after completion of the above-mentioned tests in 14.2.14 and 14.2.15.

14.2.17 Boilers and thermal oil installations are to be externally examined including their safety devices. In particular, operating conditions of safety valves for boilers are to be tested.

14.2.18 Essential parts of incinerators are to be opened up and internally examined.

14.3 REQUIREMENTS OF MAIN ENGINE SURVEY

At the Special Survey for main engine, the following requirements are to be conformed to with respect to the type of engine:

14.3.1 For internal combustion engines, cylinders, cylinder covers, pistons, piston rods and connecting rods, crosshead pins, crank pins, cam shafts and their driving gears, essential valves and valve arrangements, fuel oil pumps and fittings, scavenge pumps, scavenge blowers, superchargers, intercoolers, filter or oil separators and safety devices, crank shaft and all bearings, clutches, reverse gears, attached pumps, cooling system, crank case and explosion relief devices are to be opened up and examined and the deflections of crank arms are to be measured.

Vibration dampers or balancers and foundation bolts are to be examined.

14.3.2 For steam turbines, turbine blades, rotors, stop valves, shafts, glands, thrust adjusting bearings, oil drains, and sealing pipes are to be opened up and examined. At special survey No 1 only, for vessels having more than 1 main propulsion ahead turbine with emergency stream crossover arrangement, the turbine casings need not be opened provided approved vibration indicators and rotor position indicators are fitted and that the operating records are considered satisfactory by the Surveyor. An operational test of the turbines may be required if considered necessary by the Surveyor.

14.4 REQUIREMENTS ON AUXILIARY ENGINES

In the Special Survey for auxiliary engines, the requirements corresponding to those of the main engine are to be conformed to.

14.5 REQUIREMENTS ON ELECTRICAL EQUIPMENT

In the Special Survey for electrical equipment, the following requirements are to be conformed to:

14.5.1 Main and emergency switchboards, section panels, and sub-distribution fuse panels are to be examined and over current protective devices and fuses inspected to verify that they provide suitable protection for their respective circuits.

14.5.2 Where deemed necessary by the Surveyor, the generators are to be running under the loaded condition, either separately or in parallel and the performances of speed governors, switches and circuit breakers are to be tested.

14.5.3 The insulation resistances of generators, switchboards, motors, cables and other electrical equipment are to be tested and adjusted if it is found not to comply with the requirements. However, this test may be dispensed with, where it is found that the measured records remain efficient and they comply with the requirements.

14.5.4 Where deemed necessary by the Surveyor, the lighting arrangements, internal communication and signaling systems, mechanical ventilation systems, and other electrical equipment are to be tested for effectiveness.

14.5.5 In tankers, all electrical equipment and cables in dangerous spaces are to be examined to verify that they are in good order.

14.6 SAFETY INSPECTIONS ON REFRIGERATING MACHINERIES

In the Special Survey, the following safety inspections are to be carried out for the refrigerating machinery given in 20.1.1 of the Rules:

14.6.1 The conditions of safety devices are to be examined.

14.6.2 Leaks of the refrigerants are to be tested while the machinery is examined in running condition

14.6.3 Coils of coil type condensers and evaporators, shell tube type condensers and shells of receivers are to be tested at a pressure of at least 90 percent of the designed pressure. Where, however, relief valves attached to them are adjusted to a pressure less than the aforementioned designed pressure, the test pressure may be reduced to a pressure of 90 percent of the pressure to which the relief valves are adjusted. The above pressure test may be dispensed with except for those using NH₃ or CH₃ CL as refrigerants.

CHAPTER 15: DOCKING SURVEY

15.1 DUE DATE

Ships registered with classification are to be examined in a dry dock or on slipway within the period of every 30 months.

For submersibles, nuclear ships, hydrofoils and air cushion vehicles and for fishing vessels 15 years of age and over from launching date the docking survey is to be carried out within the period of every 12 months.

15.2 POSTPONEMENT OF SURVEY

The docking survey may be postponed subject to the Society's approval within the period given in the followings.

15.2.1 For submersibles, air cushion vehicles, hydrofoils and passenger ships (not engaged in international service) and for fishing vessels 15 years of age and over from launching date, the docking survey is to be carried out within the period of 18 months from the completion date of the previous docking survey.

15.2.2 For nuclear ships and which are engaged in international service, the docking survey is to be carried out within the period of 15 months from the completion date of the previous docking survey.

15.2.3 The docking survey for ships other than the requirements specified in 15.2.1 and 15.2.2. is to be carried out on two occasions in any 5 years period, but with a period not exceeding 36 months between examinations.

15.3 REQUIREMENTS OF SURVEYS

15.3.1 At each Docking Survey, the following requirements are to be complied with:

- a. The ship is to be placed on blocks of sufficient height in a dry-dock on a slip way and proper staging is to be elected and cleaned as may be necessary for the examination of the shell plating, stern frame and rudder. Attention is to be given to parts of the structure particularly liable to excessive corrosion or to deterioration from causes such as chafing and lying on the ground and to any undue unfairness of the plating of the bottom.
- b. The rudder and the coupling bolts of the rudder are to be examined and the clearances in the rudder bearings to be measured. However, the rudder is to be lifted or removed for examination of the pintles if considered necessary by the Surveyor.
- c. Anchors and chain cables are to be arranged, measured and examined. However, these surveys may be dispensed with provided that anchors and chain cables had been arranged, measured and examined at the previous docking survey and the Surveyor is satisfied with the conditions of the anchors and the chain cables.
- d. All openings outside the hull, sea chests, sea valves, discharge valves and cocks are to be opened up and examined. However, the surveys for valves or cocks other than sea valves may be dispensed with provided that their valves and cocks for ships less than 15 years of age had been opened up and examined at the previous docking survey and the Surveyor is satisfied with the condition of these valves and cocks.
- e. The propeller and side trusted are to be examined. The clearance in the stern bush of the efficiency of the oil grand should be ascertained. For a controllable pitch propeller and special type propellers, the sealing and tightness conditions are to be ascertained. In the case where the pitch control device is fitted, it is to be ascertained that the device is in good working order. However, if considered necessary, the device is to be opened up for further examination.
- f. The clearance between the propeller shaft and the after bearing of stern tube or the shaft bracket bearing is to be measured for water-lubricated stern tube bearings, and if it exceeds the values given below, the lignum vitae bush is to be adjusted. Stern tube shafts are also to be adjusted. Stern tube shafts are also to be complied with these requirements.

Diameter of propeller shaft, d_p	Allowable clearance
$d_p \leq 230mm$	6.0 mm

230mm $\leq dp \leq 305mm$	8.0mm
305mm < dp	9.5mm

- g. Where the Docking Survey is carried out within a period of 1 year or interval of Special Survey, the tests of tanks and gauging in addition to the preceding Par 1 are to be made in accordance with the requirements of relevant Special Survey.

15.4 IN-WATER SURVEY

The Society may accept in-water Surveys in lieu of any one of the two docking surveys required in a 5 year period on ships not exceeding 10 years of age, where specially approved by the Society.

CHAPTER 16: SURVEYS ON PROPELLER SHAFT AND STERN TUBE SHAFT

16.1 SURVEY INTERVALS OF KIND 1 PROPELLER SHAFTS

16.1.1 Kind 1 propeller shafts with water-lubricated stern tube bearings (which include shaft bracket bearings, same being referred to hereinafter in this Chapter) are to be surveyed at intervals of 5 years from the completion date of the previous drawn-out survey. However, where the items specified in 17.3.1 (a) to (c) are carried out not to the satisfaction of the Surveyor, the survey is to be carried out at intervals of 3 years.

16.1.2 The shafts with oil lubricated bearings and oil glands are to be drawn out for survey at intervals of 5 years from the completion date of the previous drawn-out survey.

16.1.3 Where the shafts are made of approved corrosion resistance materials and lubricated by seawater, regardless of the 16.1.1 and 16.1.2, the drawn out survey is to be carried out at intervals of 3 years.

16.2 SURVEY INTERVALS OF KIND 2 PROPELLER SHAFTS

Kind 2 propeller shafts are to be drawn out at interval of 2 years.

16.3 SURVEY INTERVALS OF STERN TUBE SHAFTS

The requirements in 16.1 and 16.2 are generally to be applied to the stern tube shafts.

16.4 EXTENSION OF SURVEY

Notwithstanding the requirements in 16.1 and 16.3., the interval of the propeller shaft survey may be prolonged with special considerations being paid to the following.

16.4.1 where oil-lubricated stern tube bearings are adopted along with the shafts, the survey interval may be prolonged, for not more than 30 months from the due date, subject to the following (a) to (g) being carried out with satisfactory results.

- a. Surveys specified in 17.3.1 (a), (b) or (c) are to be carried out.
- b. Propeller shaft exposed in the engine room is to be examined.
- c. Wear down at the after end of the stern tube bearing, if any is to be measured.
- d. The oil sealing glands are to be checked.
- e. It is to be ascertained that the operation in the barred speed range for torsional vibration is avoided.
- f. Low oil level alarms of lubricating oil tanks, oil temperature measuring devices and oil circulating pumps are to be examined.
- g. Lubricating oil record book is to be examined.

16.4.2 For oil lubricated stern tube bearings where new oil seals may be fitted without removal of the propeller and the propeller is fitted keyless to the shaft taper or the propellers fitted to a solid flange coupling at the aft end of the shaft, the interval of the propeller shaft survey may be prolonged within the period of 5v years, subject to the following (a) to (b) being carried out with satisfactory results.

- a. Surveys specified in 16.4.1(a), (c), (e) (f) and (g) are to be carried out.
- b. The exposed aft bearing contact area of the shaft and the forward bearing of the stern tube, as far as practicable, are to be examined.
- c. All accessible parts of the shaft including the propeller connection to the shafts are to be examined.
- d. The oil sealing glands are to be opened-up and examined.

16.5 POSTPONEMENT OF SURVEY

The drawn out survey may be postponed, upon application by the Owner, within the period not to exceed 6b months from the due date specified in 16.1. to 16.3., subject to the Society's approval.

16.6 SURVEY ITEMS

16.6.1 The surveys are to be carried out as follows:

- a. Shafts with keyed propeller attachments are to be examined by an efficient crack detection method (generally, magnetic particle method, the same being referred to hereinafter in this Chapter) from the end of the cylindrical part of the shaft (or from the after edge of the liner, if any) for one-third of the length of the aft shaft taper.
- b. For shafts having coupling flanges at the after end, the flange fillet and coupling bolts are to be examined by the efficient crack detection method.

16.6.2 Other parts of the propeller shaft than required by previous Par 1, sleeves, fillets of coupling flange to the intermediate shaft and the coupling bolts are to be examined with the propeller shaft drawn from the stern tube bearings.

16.6.3 The stern tube bearings are to be examined and bearing wear down is to be measured.

16.6.4 Major parts of the stern tube sealing devices are to be opened and examined.

16.6.5 Propeller blade fixing bolts are to be examined by the efficient crack detection method.

16.6.6 Propeller boss bore in way of the propeller shaft taper section is to be examined. For all controllable pitch propellers, pitch control gear and working parts are to be examined.

16.6.7 Where the water-lubricated stern tube bearings are adopted, the seawater piping for lubrication is to be examined.

16.6.8 Where the oil-lubricated stern tube bearings are adopted, low oil level alarms of lubricating oil tanks, oil temperature measuring devices and oil circulating pumps are to be examined.

16.6.9 Where the oil-lubricated stern tube bearings are adopted, lubricating oil record book is to be examined.

16.7 ASCERTAINMENT OF PROPELLER PULL-UP LENGTH

Where keyless type propeller is taper fitted to the propeller shaft, it is to be ascertained at each time when the propeller is fitted, that the pull-up length is within the upper and lower limits of pull-up length approved by the Society in accordance with the requirements.

CHAPTER 17: BOILER AND THERMAL OIL INSTALLATION SURVEY

17.1 SURVEY INTERVALS

17.1.1 Water tube boilers used for propulsion, including re-heat boilers, are to be surveyed internally every 2 years, except for ships with single main boiler of water tube type or with main boilers of smoke tube type, where surveys are to be performed every 2 years until the ship is 8 years old and every year thereafter.

17.1.2 All other boilers of essential service, and boilers of non-essential service having working pressure exceeding 3.5 bar (kgf/cm² and a heating surface exceeding 4.5 m² are to be surveyed internally every 2 years.

17.1.3 Thermal oil installations are to be surveyed internally and externally at 2 yearly intervals.

17.2 EXTENSION OF SURVEY

17.2.1 The surveys of boilers may be postponed within 3 months from the due date for yearly survey intervals and within 6 months from the due date for 2 yearly survey intervals when requested by the Owner, on the basis of the approval by the Society.

17.2.2 The surveys of thermal oil installations may be postponed within 6 months from the due date when requested by the Owner, on the basis of the approval by the Society.

17.3 SURVEY ITEMS

17.3.1 The surveys of boilers are to be carried out as follows:

- a. Boilers are to be examined internally and externally, after the water in the boiler being blown off, covers of manholes and sight holes removed, the fire and watersides thoroughly cleaned, and, where deemed necessary by the Surveyor, the parts of lagging are to be removed and inspected.
- b. Super heaters and economizers are to be examined.
- c. The doors of furnace are opened up and examined and bolts or studs fastening them directly to drums or headers are to be examined.

- d. Valves and cocks on boilers are opened up and examined and bolts or studs fastening them directly to drums or headers are to be measured, where deemed necessary by the Surveyor.
- e. The thickness of boilerplates and tubes, and diameter of stays are to be measured, where deemed necessary by the Surveyor.
- f. When the boiler is repaired or when deemed necessary by the Surveyor, the hydrostatic test is to be carried out at a pressure above the allowable pressure.
- g. Fuel oil burning system including valves, pipe fastenings and pipes between pumps and burners are to be examined. Automatic combustion control device, if provided, is to be examined as to the efficient operation.
- h. Safety valves are to be adjusted upon completion of survey.
- i. Unfired steam generators, exhaust gas heaters and steam reservoirs or similar pressure vessels for the purpose of processing fishes are to be examined in accordance with the requirements specified for boilers.

17.3.2 The surveys of thermal oil installations are to be carried out as follows:

- a. The tightness of the installation with special attention to flange connections and valves and packing is to be examined.
- b. The coils in the oil-fired furnace are to be externally examined.
- c. Plant instrumentation including regulation and safety systems is to be examined and tested.
- d. Liquid relief valves are to be examined.
- e. Fuel oil equipment is to be examined.
- f. Where deemed necessary by the Surveyors, further surveys may be required.

CHAPTER 18: THICKNESS MEASUREMENTS

18.1 GENERAL

Thickness measurements are conducted, in order to prevent hull casualties on vessels. Through thickness measurements reports we obtain a clear image of vessel's strength and water integrity. Results of thickness measurements guide us to the necessary renewals and/or repairs in steel work for best maintenance of the vessel.

18.2 CONDUCTING OF THICKNESS MEASUREMENTS

Thickness measurements are to be carried out by a qualified company, certified by H.M.I. and at presence of attending authorized surveyor.

18.3 EXTENT OF THICKNESS MEASUREMENTS

The extent of thickness measurements on the occasion of Special Class Surveys is given in table 2.9.1.

Table 2.9.1 Extent of thickness measurements

Special Survey I Age of ship ≤ 5 years	Special Survey II Age of ship $> 5, \leq 10$ years	Special Survey III Age of ship $> 10, \leq 15$ years	Special Survey IV Age of ship > 15 years
Main structural parts, plates and stiffeners showing signs of tear and wear	Main structural parts, plates and stiffeners showing signs of tear and wear	Main structural parts, plates and stiffeners showing signs of tear and wear	Main structural parts, plates and stiffeners showing signs of tear and wear
	Within the cargo length area or 0.5L amidships:	Within the cargo length area or 0.5L amidships:	Within the cargo length area or 0.5L amidships:
	- Selected deck plates	- Each deck plate	- Each deck plate
	- 1 transverse section	- 2 transverse sections	- 3 transverse sections
	- Selected tank top plates	- Selected tank top plates	- Each tank top plate
	- Selected bottom plates	- Selected bottom plates	- Each bottom plate
	- Selected wind and water strakes	- All wind and water strakes	- All wind and water strakes
	Outside the cargo length area or 0.5L amidships:	Outside the cargo length area or 0.5L amidships:	Outside the cargo length area or 0.5L amidships:
	- Selected deck plates	- Selected deck plates	- Each deck plate
	- Selected wind and water strakes	- Selected wind and water strakes	- All wind and water strakes
	- Selected bottom plates	- Selected bottom plates	- Each bottom plate

	The two first cargo hold hatch covers and coamings (plates and stiffeners)	All cargo hold hatch covers and coamings (plates and stiffeners)	All cargo hold hatch covers and coamings (plates and stiffeners)
	Collision bulkhead, forward machinery space bulkhead, aft peak bulkhead	Collision bulkhead, forward machinery space bulkhead, aft peak bulkhead, selected cargo hold transverse and longitudinal bulkheads (plates and stiffeners)	All transverse and longitudinal bulkheads (plates and stiffeners)
		Selected internal structural members such as floors and longitudinals, transverse frames, web frames, deck beams, tweendecks, girders, etc.	As for Special Survey III. Number of measurements may be increased as deemed necessary by the Surveyor

18.4 ADDITIONAL THICKNESS MEASUREMENTS

Additional to table 1 thickness measurements should be conducted at areas with substantial corrosion

18.5 ALLOWABLE DIMINUTION

Where thickness measurements results of diminution is should not exceeding values of tables 2.9.2 and 2.9.3

Table 2.9.2 Maximum reduction of individual plates and stiffeners

Structural item		Category 1 ships	Category 2 & 3 ships
Hull envelope, individual plates, shell and deck plating recorded along the strake (deck, bottom, wind and water)		20%	30%
Longitudinal structural members	Plating	20%	30%
	Stiffeners	25%	25%
Transverse structural members in cargo oil and water ballast tanks		20%	25%

Watertight and oiltight transverse bulkheads (including deep tanks bulkheads)	Plating	25%	30%
	Stiffeners and corrugated bulkhead plating	25% (See Note 1)	25%
Miscellaneous structural members (including deck plates inside line of openings)	Plating	25%	30%
	Stiffeners	25%	25%
Cargo hold transverse frames and end brackets		20%	25%

NOTES:

- For dry bulk cargo ship transverse bulkheads of corrugated construction the maximum allowable reduction is as follows:
 - Cargo hold designed to be completely filled with salt water ballast (deep tank): 25%
 - Cargo hold designed to be partially filled with salt water ballast and aft transverse bulkhead of cargo hold No.1: 15%
 - Remaining cargo hold transverse bulkheads: 20%
- For definition of ship categories see table D note 5.
- The maximum reduction is for the average thickness measured over the plate area or over the length between supports.

Table 2.9.3 Maximum reduction of topside and bottom areas (Transverse sections)

Structural item		Category 1 ships		Category 2 ships		Category 3 ships	
		Over 0.5L amidships	At 0.075L from ends	Over 0.5L amidships	At 0.075L from ends	Over 0.5L amidships	At 0.075L from ends
Topside areas	Plating	10%	20%	10%	30%	15%	30%
	Longitudinals	15%	25%	15%	25%	20%	30%
Bottom areas	Plating/Single bottom construction	10%	20%	10%	30%	15%	30%
	Plating/Double bottom construction	15%	20%	15%	30%	20%	30%
	Longitudinals	15%	25%	15%	25%	20%	30%

NOTES:

- Intermediate values are to be obtained by linear interpolation.

2. Topside area comprises deck (outside line of openings for dry cargo ships) stringer and sheer strake (including rounded gunwales) together with associated longitudinals.
3. Bottom area comprises keel, bottom and bilge plating together with associated longitudinals.
4. For ships of Categories 1 and 2 a greater reduction may be permitted over 0.5L amidships provided that the hull girder section modulus – using the actual gauged thickness – is not less than 90% of the Rules' section modulus for the new ship. A reassessment of scantlings would be required where this consideration is requested.
5. Ship categories are as follows:
Category 1: Oil tankers, chemical tankers, dry bulk cargo ships, combination carriers and liquefied gas ships having a length $L \geq 90$ metres.
Category 2: All remaining ship types not included in Category 1 and having length $L \geq 90$ metres.
Category 3: All ship types having a length $L < 90$ metres.
6. Where the reduction of topside or bottom area (plating and longitudinals) is in excess of 0.75 of the values given herein, additional transverse sections are to be measured as recommended by the Surveyor.
7. The maximum reduction is for the average reduction measured on plates or longitudinals in way of topside or bottom areas at transverse sections.

18.6 REPAIRS/RENEWALS

Detailed inspections should be carried out to assure repairs/renewals to reveal hull strength and structural integrity.

18.7 INSULATED AREAS

In case of insulated areas limbers and hatches are to be lifted and sufficient insulation is to be removed in each of the chambers, to enable the Surveyor to have a clear image of the condition of structure and to allow conduction of thickness measurements where needed

18.8 THICKNESS MEASUREMENT REPORT

18.8.1 Thickness measurements results should be recorded in appropriate reports. In addition to the results of the measurements said reports should contain following information:

- a. Location (port and country) of measurements.
- b. Date when the measurements were carried out.
- c. Type of measuring equipment.
- d. Name and the qualification of the operators.
- e. The original thickness.
- f. The corresponding thickness measured.

18.9 PARTIAL CORROSION AREAS

In case of partial corrosion in areas of stress concentration replacement or reinforcement is to be carried out regardless of tables 2.9.2 and 2.9.3.

18.10 SHIP'S OF SPECIAL TYPES

Additional details on thickness measurements for ship's of special types are given in Chapter 3.

CHAPTER 19: CONTINUOUS SURVEY

19.1 SURVEY INTERVALS

At the request of the Owner, and upon approval of the proposed arrangements by the Society, a system of continuous survey may be undertaken for all the items of hull and machinery installations to be surveyed at the Special Survey.

When such a system is adopted, all the requirements of the Special Survey are to be surveyed in regular rotation, as far as practicable, with uniform annual share within 5 year period and to be completed at the due date of the next Special Survey.

19.2 SPECIAL CONSIDERATION TO CONTINUOUS SURVEY OF MACHINERY

For the items opened up and examined at the Intermediate or Special Survey, the opened up inspection may be dispensed with, as considered satisfactory by the Surveyor after visual examination and operating test for such items.

19.3 FURTHER EXAMINATIONS

If any examination, during the Continuous Survey reveals defects, further parts are to be opened up and examined where deemed necessary by the Surveyor.

19.4 SURVEY ARRANGEMENT BASED ON APPROVED PLANNED MAINTENANCE SYSTEM MACHINERY

19.4.1 An approval of the maintenance system for the ships provide with machinery automatic systems may be granted, where deemed appropriate by the Society, after reviewing the maintenance procedures on those items and systems which are subject to the continuous machinery survey, upon request from the owners.

19.4.2 When it is intended to arrange a planned maintenance system, the detailed information and documents deemed necessary by the Society are to be submitted for the approval of the Society and, if found satisfactory, a certificate of approval for planned maintenance system will be issued.

19.4.3 The survey based on the planned maintenance system may be carried out by the chief engineer with the qualification specified in the following (a) to (c), in accordance with the maintenance scheme approved by the Society. At the periodical survey, the performance and maintenance records are to be submitted to the attending surveyor and to be examined to verify that the scheme is being correctly operated and that the machinery has been functioning satisfactorily since the previous survey and, if found satisfactory, such survey on the basis of an approved planned maintenance system may be considered as an alternative to continuous machinery survey. However, the intervals for the planned maintenance system are not to exceed those specified for continuous machinery survey.

- a. He is to be chief engineer with the first-grade license issued in the relevant nation
- b. He has sailed a minimum of 3 years as chief engineer
- c. He has sailed a minimum of 1 year as chief engineer on the ship installed with the similar type of engine, at the company where the application for survey arrangement based on planned maintenance system is submitted to the society.

19.4.4 Damage and repairs: The damage of important components and machinery is to be reported to the Society. The survey of such damaged components and machinery is to be carried out by the Society's surveyor who will decide whether recommendations to class are entered. All parts of machinery undergoing substantial repair are to be surveyed before, during and after repair at the discretion of the Society's surveyor.

19.5 SURVEY ARRANGEMENT BASED ON CONDITION MONITORING SYSTEM FOR MACHINERY

19.5.1 When it is ascertained that the ship under approved planned maintenance system has been installed with condition monitoring equipment and that the confirmatory inspection for the following items has been carried out to the satisfaction of the Surveyor at the periodical survey, the machinery survey intervals based

on the planned maintenance system may be extended. However, the materials specified in the following sub-par. (2) are to be submitted to the Society's surveyor.

- a. Conditions and functions of condition monitoring equipment.
- b. Measurements and analysis results obtained from condition monitoring equipment for each machine to be considered.
- c. Operating condition of each machine.

19.5.2 The measurements and analysis results obtained from the previous paragraph are to be reviewed. For the machinery and components found unsatisfactory by the Society's surveyor, opening up examination may be requested.

19.5.3 The initial confirmatory inspection after installation of the approved condition monitoring system is to be carried out by the Society's surveyor within 1 year from the date of approval.

CHAPTER 20: OCCASIONAL SURVEY

20.1 OCCASIONAL SURVEY

20.1.1 All classed ships are to be subjected to Occasional Surveys when they fall under either of the following conditions at the periods other than Special, Intermediate, or Annual Survey:

- a. When main parts of hull or machinery, or important fittings or equipment, which have been surveyed by the Society, have been damaged, or are about to be repaired or altered.
- b. When whole or a part of machinery are about to be shifted.
- c. When safety valves are opened up or when settings of safety valves are altered.
- d. When propeller shafts are drawn out and the survey of the shaft is requested by the ship-Owner.
- e. When load lines are required to be changed or to be newly marked.
- f. Other cases where surveys are designated or whenever the Surveyor deems survey necessary.
- g. When the due dates of surveys are to be postponed.

20.2 ITEMS OF SURVEY

In the Occasional Surveys, the necessary parts are to be examined in each case of 10.1.

CHAPTER 21: ALTERATION SURVEY

21.1 ALTERATION SURVEY

All classed ships are to be subjected to survey when hull, machinery, or equipment is about to be altered.

21.2 APPROVAL SURVEY

When it is intended to obtain surveys for alterations, plans and documents equivalent to the survey during construction are to be submitted to the society for the approval before the work is commenced.

21.3 ITEMS OF SURVEY

In the surveys for alterations, the altered parts are to be examined in accordance with the survey items equivalent to the survey during construction.

CHAPTER 22: SURVEY OF SHIPS CARRYING DANGEROUS GOODS AND OTHER SPECIAL CARGOES

22.1 SURVEYS

For surveys of ships carrying dangerous goods and other special cargoes, the Society may request to apply, in addition to this Rule, related international conventions and other regulations as deemed appropriate.

■ **Panama Head Office**

Address: No.0750-D Williamson
Place
La Boca, Balboa,
Panama, Rep. of Panama.
E-mail: omcs@omcsclass.org
Telephone: (507)314-1756 / 52
Telefax: (507)314-1757
24 / 7 Contact
Number: (507) 6780-5046
Number: (507) 6676-8505
Mail Address: P.O. Box 0843-02416,
Balboa, Ancon, Panama.

■ **Far East Regional Office (FERO)**

Address: Room 1506, Suncome
Liauw 's Plaza, No. 738,
Shangcheng Road,
Pu-Dong New Area;
Shanghai, R.P.C.
E-mail: china@omcsclass.org
Telephone: (86) 21 58360772 / 73
Telefax: (86) 21 58360772 - 616
(86) 21 58360773 - 616
24 / 7 Contact
Number: (86) 18721978211

■ **Middle East Regional Office (MERO)**

Address: P. O. Box 487211,
Dubai / UAE
E-mail: dubai@omcsclass.org
24 / 7 Contact
Number: (971) 501048562

www.omcsclass.org

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