



REPUBLIC OF CROATIA  
**Ministry of the Sea, Transport  
and Infrastructure**  
**Maritime Safety Directorate**



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**TITLE:** SAFETY, SECURITY AND ENVIRONMENTAL PROTECTION PROVISIONS FOR CROATIAN FLAGGED FSRUs

**VALID FROM:** 2<sup>nd</sup> of December 2020, with the entry into the force of this circular expires validity of circular CIRC-MMPI-010 from 23<sup>rd</sup> of October 2017

**REFERENCE:** IMO documents and specific requirements of Croatian Maritime Administration as stated in the text

**DIRECTED TO:** Croatian shipping companies and recognized organizations

## 1. General

The purpose of this circular is to inform all interested parties about Croatian provisions for Floating Storage and Regasification Units (hereinafter referred to as: the FSRU) flying the flag of the Republic of Croatia and operating in Croatian waters.

It is to be noted that currently there are no IMO guidelines specifically developed for FSRUs and therefore Ministry of the Sea, Transport and Infrastructure (hereinafter referred to as: MSTI) based this Circular on best practices followed by the other Maritime Administrations, IACS Member's Rules and industry practices, as well as the IMO circular MSC-MEPC.2/Circ.9: "Guidance for the application of safety, security and environmental protection provisions to FPSO and FSU".

Taking into account that FSRU, when moored/anchored at the approved location in Croatian waters, is considered as to be a floating object (Art. 5 (29) of the Maritime Code (Off. Gazette Nos. 181/04, 76/07, 146/08, 61/11, 56/13, 26/15, 17/18)), in accordance with Art. 76 and Art. 77 of the Code, seaworthiness and overall safety of FSRU is the responsibility of Croatian Register of Shipping (hereinafter referred to as: CRS) which is reflected in paragraph 7 of this Circular. In such case CRS shall act on behalf of MSTI as the national Recognised Organisation, following provisions of the Croatian Maritime Code and provisions of the Rules for statutory certification of sea-going ships, General requirements (Croatian Off. Gazette, No. 15/2019, as they may be further amended).

FSRU, when undertaking international voyages as a tanker for liquified gas, shall be certified by a classification society (RO) recognised by the Maritime Administration of the Republic of Croatia and being responsible for the classification and statutory certification.

When operating as a floating object, MSTI and CRS shall perform verification of the FSRU with a purpose to establish its overall safety with particular attention to seaworthiness and the safety against loss of human lives, property at sea, considerable physical damage or

unacceptable environmental pollution. In such case production and utility systems and equipment will be verified with the aim primarily to cover safety and pollution prevention aspects. reliability and operational aspects of storage and regasification equipment will not be covered, except where considered significant for safety or pollution prevention.

## **2. Definitions**

**2.1 Floating Storage and Regasification Unit (FSRU)** is a ship adequately moored/anchored at the operating location approved by MSTI and that has LNG storage and regasification equipment for LNG vaporising, holding valid certificate of registry issued by the Maritime Administration of Croatia.

Notwithstanding above, FSRU may be re-located from its operational location and/or deployed to trade as a ship, as defined in 2.4.

**2.2 Recognised organisation** (hereinafter referred to as: the RO) is a classification society recognised by the Maritime Administration of the Republic of Croatia pursuant to the requirements of the Regulation (EC) No. 391/2009 of the European Parliament and of the Council on common rules and standards for ship inspection and survey organisations and being responsible for statutory certification in the case of FSRU undertaking international voyages as tanker for liquefied gas.

**2.3 Class Certificate** is a certificate issued by the RO confirming compliance with the classification rules and regulations of the RO applicable to FSRUs.

**2.4 Off-location** denotes the following cases when FSRU is to be re-located from its operational location:

- FSRU's voyages for dry-docking, repair or maintenance work;
- disconnection of the FSRU in extreme environmental or emergency conditions, during which FSRU is disconnected from shore and its storage and/or regasification equipment is not in use.

In addition to above and if FSRU has a capability to be deployed and can trade as a tanker for liquefied gas and, when performing international voyages as such, statutory certificates issued under provisions of applicable international maritime Conventions and Codes (SOLAS, MARPOL, ILLC 66, TMC 69, etc.) should be on board.

## **3. Applicable international instruments**

### **3.1 International statutory instruments applicable while FSRU is on location (fixed)**

#### **3.1.1 SOLAS 74 and Codes adopted under this Convention**

##### **3.1.1.1 Chapter IX, ISM Code**

An approved Safety Management System, including a maintenance programme particularly for essential marine systems and equipment shall be effective at all times.

Competence of on-board personnel, both marine and production shall be maintained to an adequate level.

##### **3.1.1.2 Chapter XI-2, ISPS Code**

FSRU shall comply with Chapter XI-2 and ISPS Code, taking into account recommendations contained in MSC/Circ.1111.

Certification according to ISPS Code is to be performed by CRS.

##### **3.1.1.3 Chapter VII, IGC Code**

In general, FSRU is to be in compliance with the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code), i.e. depending on the

keel laying date / date of conversion either with IGC Code adopted by Res. MSC.5(48), as last amended by the Res. MSC.220(82), or with IGC Code adopted under IMO Res. MSC.370(93).

All deviations of FSRU design, including any alternative design and arrangements in respect to IGC Code are to be recorded and approved by the MSTI prior putting into service.

### **3.1.2 MARPOL 73/78**

#### **3.1.2.1 Annex I**

The FSRU is to be in compliance with the requirements of the Annex I of the Convention.

#### **3.1.2.2 Annex IV, V and VI**

The FSRU is to be in compliance with the requirements of the Annex IV, V and VI of the Convention.

### **3.1.3 International Convention on Tonnage Measurement of Ships (TMC 69)**

The FSRU is to be in compliance with TMC 69.

### **3.1.4 International Convention on the Control of Harmful Anti-Fouling Systems (AFS Convention)**

The FSRU is to be in compliance with AFS Convention.

### **3.1.5 Maritime Labour Convention 2006 (MLC 2006)**

The FSRU is to be in compliance with the following requirements of MLC 2006:

- Title 3: provisions in respect to crew accommodations.
- Title 4: Regulation 4.3: Health and safety protection and accident prevention.

### **3.1.6 International Load Line Convention (LLC 66)**

In the case when FSRU is operating as a tanker for liquefied gas and is to undertake international voyage under its own propulsion, it is to be in compliance with the requirements of the Load Line Convention. In such case Load Line marking should be conducted by the RO.

### **3.1.7 ILO Convention No. 152**

The FSRU is to comply with ILO No. 152.

### **3.1.8 BWM Convention**

The FSRU does not need to comply with the provisions of International Convention for the Control and Management of Ship's Ballast Water and Sediments 2004 (BWM).

However, if the FSRU has a capability to be deployed and can trade as a tanker for liquefied gas and, when performing international voyages as such, provisions of BWM Convention are to be complied with.

## **3.2 International statutory instruments applicable while FSRU is "off-location"**

When it is accessory to disconnect and FSRU to undertake an international voyage under its own propulsion, or if the FSRU has a capability to be deployed and can trade as a tanker for liquefied gas and, when performing international voyages as such, statutory certificates issued under provisions of applicable international maritime Conventions and Codes (SOLAS, MARPOL, ILLC 66, TMC 69, BWM, etc.) should be on board.

### 3.3 Class Certificate and class surveys

The FSRU will be regularly surveyed and maintained in class with valid Class Certificate issued by the RO, for its intended purpose and service with appropriate type and class notation(s).

If the FSRU is a tanker for liquefied gas fitted with a regasification plant it must be classed by the RO with type notation "Tanker for liquefied gas" or equivalent and with additional class notation "REGAS" or equivalent (reference to the requirements for specified type notation and additional class notation is to be made in the applicable rules for the classification of classification societies recognised by MSTI).

If the FSRU is assigned with type notation "Tanker for liquefied gas" and when performing international voyages as such it must be classed by the RO.

Requirements for additional class notation to be assigned with regard to survey of the outer part of the bottom in lieu of dry-docking of the FSRU (UWILD or similar) are to comply with 3.3.1.

Upon the request and on the case-by-case basis alternative survey arrangements for cargo tanks at the renewal survey may be accepted, based on submission of alternative survey programme to be approved by the RO and as further accepted by MSTI.

#### 3.3.1 Survey of outer bottom of the FSRU

- 3.3.1.1 Due to the specific nature of the FSRUs when operating as a floating object, in-water survey of outer bottom in lieu of dry-docking will be accepted for those FSRUs possessing a valid class notation for extended dry-docking (EDD or similar), or is otherwise approved by the RO for such extended dry-docking, provided that at least two satisfactory in-water surveys are carried out in any five-year period with the interval between the surveys not exceeding 36 months.

Such acceptance is based on the provisions of the Rules for statutory certification of sea-going ships, General requirements, Annex V, para. 4.27.2 (Croatian Off. Gazette, No. 15/2019), periodicity of surveys of underwater part of hull of floating object in dry-dock is allowed to be agreed on the case-by-case basis, taking into account type of the floating object, its size, age and location.

- 3.3.1.2 The extent and scope of such in-water surveys shall be in accordance with the plans/documents approved by the RO at the design stage of construction/conversion of the FSRU. The documentation related to RO certificate shall clearly indicate the maximum duration up to which the FSRU is designed to undergo in-water surveys in lieu of docking.

The conditions for allowing an in-water survey in lieu of extended docking survey are given in the Annex to this Circular.

- 3.3.1.3 The safety management system on board shall contain necessary procedures for regular monitoring and reporting of the condition of the hull and underwater fittings/equipment of the FSRU. The owner/operator shall establish a scheme of inspections, duly approved by the RO, for undertaking the in-water survey in lieu of the dry-docking and the conformity of compliance to the scheme shall be verified by the RO.
- 3.3.1.4 The owner/operator of the FSRU shall maintain the approval records from the RO of the satisfactory completion of underwater hull inspection, clearly indicating the validity and the recommendations, if any. In the case of any adverse finding during the in-water survey which reveals damage or deterioration that requires early attention, the RO must require that the FSRU be dry-docked forthwith in order that a more detailed survey / necessary rectification can be undertaken.
- 3.3.1.5 The owner/operator of the FSRU shall maintain a satisfactory review of the FSRU's history with particular attention to previous findings with respect to damage, repair or watertight integrity of the underwater hull structure and fittings.

### **3.4 Safe manning**

Minimum safe manning levels shall address the number of seafarers required to ensure that FSRU is sufficiently, effectively, and efficiently manned, taking into consideration the guidelines contained in IMO Res. A.1047(27).

### **3.5 Other international standards**

It is expected that FSRU complies with the international standards laid down by the following organisations, as far as applicable:

- Oil Companies International Marine Forum (OCIMF);
- International Group of Liquefied Natural Gas Importers (GIIGNL);
- Society of International Gas Carriers and Terminal Operators (SIGTTO) (or any successor body of the name);

and any other internationally recognised agency or organisation with whose standards and practices it is customary for international operators of FSRUs to comply with.

Additionally, it is expected that FSRU holds a valid operational OCIMF Ship Inspection Reporting system (SIRE) certificate.

Compliance with appropriate API and ISO standards is also expected, but not being compulsory.

### **3.6 Statutory surveys and issue of statutory certificates**

CRS is responsible to issue statutory certificates to the FSRU when operating as a floating object under provisions of the Maritime Code and provisions of the Rules for statutory certification of sea-going ships, General requirements. As a separate item, classification is to be provided by the RO.

Therefore, the FSRU, when operating as a floating object, is to be subjected to the following statutory surveys by CRS according to the Rules for statutory certification of sea-going ships, General requirements, Annex I, Annex II and Annex V respectively and specific requirements of this Circular:

- Initial survey;
- Annual surveys;
- Renewal survey.

Notwithstanding above, if the FSRU is assigned with type notation "Tanker for liquefied gas" and when performing international voyages as such, statutory certificates are to be issued by the RO also being responsible for classing the FSRU. Statutory surveys are to be conducted according to applicable requirements of:

- the Rules for statutory certification of sea-going ships, General requirements (Croatian Off. Gazette, No. 15/2019, as they may be further amended);
- IMO Res. A.1140(31), as it may be further amended;

with the FSRU being regularly surveyed and maintained with valid statutory certificates throughout its service as FSRU, irrespective whether it is to be utilised as tanker on international voyages or not.

Above stated requirements are including the possibility for FSRU holding simultaneous and separate statutory certificates for floating object and as tanker for liquefied gas, with currently unused certificates to be placed in a sealed envelope and kept in the custody of the Master.

In no case validity of statutory certificates issued for FSRU as floating object by CRS should go beyond the period of validity of the Class Certificate and statutory certificates issued as Tanker for liquefied gas by the RO.

## **4. Risk Assessment**

A risk assessment analysis is to be approved by the RO and verified by the CRS on behalf of MSTI.

### **4.1 Assessment Criteria**

A risk assessment is to be carried out to identify significant hazards and accident scenarios that may affect the FSRU or any part thereof and consider the benefit of existing or potential risk control options.

The objective of the risk assessment is to identify areas of the design that may require the implementation of risk control measures to reduce identified risk(s) to an acceptable level.

The risk assessment should be conducted by using recognised techniques such as the HAZard Identification (HAZID), Failure Mode Effect and Criticality Analysis (FMCEA) or similar. The identified risk control options (prevention and mitigation measures) deemed necessary to be implemented is to be considered part of the design basis.

The results should also include, but not to be limited to, the following as evidence of effectiveness:

- description of methodology and standards applied;
- potential variation in scenario interpretation or sources of error in the study;
- validation of the risk assessment process by the RO;
- quality system under which the risk assessment was developed;
- the source, suitability and validity of data used within the assessment;
- the knowledge base of persons involved within the assessment;
- system of distribution of results to relevant parties; and
- validation of results by the RO.

The overall criteria to be applied to systems and equipment be designed should be aimed to minimise the risk of hazards to personnel, property and environment. Implementation of this criteria is intended to:

- prevent an abnormal condition from causing an upset condition;
- prevent an upset condition from causing a release of hydrocarbons or cryogenic fluids;
- safely collect and dispose of hydrocarbon or cryogenic fluids released;
- prevent formation of explosive mixtures;
- prevent ignition of flammable liquids or gases and vapours released; and
- limit exposure of personnel to fire and cryogenic hazards.

### **4.2 Significant hazards and accident scenarios**

It is recommended that hazards to be addressed in the risk assessment should include at least:

- fire and explosion;
- evacuation (escape routes also);
- extension of hazardous areas;
- pressurised gas discharge to shore;
- high-pressure gas venting;
- process upset conditions;
- storage and handling of flammable refrigerants;
- continuous presence of liquid and vapour cargo outside the cargo containment system;
- tank over-pressure and under-pressure;
- LNG carrier-to-FSRU transfer of liquid cargo;
- cryogenic release;
- collision risk during berthing manoeuvres;
- loss of ability to offload liquefied gas or discharge gas ashore;
- loss of any one critical component in the process system; and
- loss of electrical power.

## **5. Operating Manual(s)**

Detailed instruction manual(s) are to be provided on board, covering the operations, safety and maintenance requirements, personal protective equipment and occupational health hazards relevant to the use of the cargo system and regasification plant.

Such detailed instructions may be integrated as a single manual or they may be produced as separate operation-specific manuals. In the case of FSRU with assigned type notation "Tanker for liquefied gas" FSRU manuals may be developed (or integrated) using standard and mandatory ship manuals as a base.

Operating Manual(s) are to be approved by the RO and verified by the CRS on behalf of MSTI.

Operating Manual(s) are to be compliant with the requirements of LNG terminal regulations / operating manuals also, if applicable.

The operational parameters of all systems and components for removing liquefied gas from the storage tanks, pressurising, heating and vaporising liquefied gas and in some cases odorising the liquefied gas vapour and discharge ashore of vaporised gas through an off-loading system are to be addressed in the manual(s).

The content of the manual(s) is to include, but is not limited to:

- procedures for cargo tank cooldown and warm-up, transfer (including LNG carrier-to-FSRU transfer and FSRU to shore transfer), cargo sampling, inerting and gas-freeing, ballasting, tank cleaning and changing cargoes;
- cargo temperature and pressure control systems;
- cargo system limitations, including minimum temperatures (cargo system and inner hull), maximum pressures, transfer rates, filling limits and sloshing limitations;
- nitrogen and inert gas systems;
- firefighting procedures: operation and maintenance of firefighting systems and use of extinguishing agents;
- special equipment needed for the safe handling of the particular cargo;
- fixed and portable gas detection;
- control, alarm and safety systems (including terminal control room);
- emergency shutdown systems;
- procedures to change cargo tank pressure relief valve set pressures;
- emergency procedures, including cargo tank relief valve isolation, single tank gas-freeing and entry and emergency LNG carrier-to-FSRU transfer operations;
- information regarding the cargo system and associated systems applicable to the regasification plant;
- boil-off gas treatment system;
- system limitations, including minimum temperatures, maximum pressures, transfer rates;
- details of depressurisation and high pressure blow-down philosophy and arrangements;
- gas piping systems including details of pipes and associated components, design pressures and temperatures;
- procedures for start-up of the regasification plant;
- descriptions and schematic diagrams for control and monitoring system including set points for abnormal conditions;
- details of all electrical equipment in the regasification plant compartment;
- isolation of the regasification plant for the purpose of inspection and maintenance;
- emergency shutdown arrangements, cause and effects;
- mooring arrangement and philosophy; and
- environmental limitation and operating restrictions as associated with sloshing (if applicable).

## **6. Positioning and mooring of the FSRU when operating as a floating object**

When operating as a floating object the FSRU is to be positioned at the location approved by MSTI. Such location is to be protected with calm clear water providing good underwater

visibility and being appropriate with regard to FSRU scantlings (especially with regard to clearance between water depth and FSRU' bottom for the purpose of underwater surveys).

Mooring plan is to be developed and approved either by the RO, or by CRS showing:

- berthing arrangements,
- mooring location,
- mooring configuration.

Mooring system and fender loads are to be included when specifying limitations of cargo transfer operations. For jetty mooring, details of the site-specific design of FSRU mooring system and components are to be included.

## **7. Surveys and statutory certification of the FSRU when operating as a floating object**

### **7.1 Initial survey**

7.1.1 Before its first putting into service (commissioning) under Croatian flag as a floating object the FSRU is to be subjected to initial survey to ensure that the relevant requirements are complied with and that these items are satisfactory for the intended service.

Initial survey should include general requirements stated in the Rules for statutory certification of sea-going ships, General requirements, Annex II, as far as applicable and, the examination of the certificates and documents and checking of the following items:

1. review and checking the validity of the Class Certificate issued by the RO;
2. review of statutory certificates (issued by the RO as for the Tanker for liquefied gas):
  - .1 checking the validity, as appropriate, of the International Certificate of Fitness for the Carriage of Liquefied Gases in Bulk;
  - .2 checking the validity, as appropriate, of the Cargo Ship Safety Equipment Certificate, the Cargo Ship Safety Radio Certificate and the Cargo Ship Safety Construction Certificate or the Cargo Ship Safety Certificate;
  - .3 checking the validity of the Safety Management Certificate (SMC) and that a copy of the Document of Compliance (DOC) is on board;
  - .4 checking the validity of the International Load Line Certificate;
  - .5 checking the validity of the International Oil Pollution Prevention Certificate;
  - .6 checking, when appropriate, the validity of the International Sewage Pollution Prevention Certificate;
  - .7 checking, when appropriate, the validity of the International Air Pollution Prevention Certificate;
  - .8 confirming, when appropriate, the validity of the International Energy Efficiency Certificate;
  - .9 confirming, when appropriate, that confirmation of compliance for the SEEMP part II is provided to and retained on board the ship;
  - .10 confirming, when appropriate, the validity of the Statements of Compliance related to fuel oil consumption reporting;
  - .11 checking that the ship's complement complies with the Minimum Safe Manning Document;
  - .12 checking that the master, officers and ratings are certificated as required by the STCW Convention;
  - .13 checking whether any new equipment has been fitted and, if so, confirming that it has been approved before installation and that any changes are reflected in the appropriate certificate;
  - .14 checking, as far as applicable and as far as appropriate, statements of compliance with international standards stated in 3.5;
3. checking the International Tonnage Certificate, 1969;
4. review of survey status and conditions of class as imposed by the RO, if any;
5. review of statutory recommendations as imposed by the RO, if any;



6. verification of the Risk Assessment Analysis, as approved by the RO (para. 4 of the Circular);
7. verification of the Operating Manual(s), as approved by the RO (para. 5 of the Circular);
8. review and approval of the stability file, FSRU related only (in the case of stability instrument is on board it must be approved and examined by the RO);
9. review and approval of the mooring plan (para. 6 of the Circular);
10. review and acceptance of in-water in lieu of dry-docking survey scheme and in particular compliance with the provisions of 3.3.1.3, 3.3.1.4 and 3.3.1.5;
11. review and approval of the safety and fire plan, FSRU related only;
12. review and approval of the plan of hazardous zones, FSRU related only;
13. issuing of the Statement on technical acceptance and technical particulars;
14. on-board survey of FSRU safety related items only: mooring, service records, life-saving appliances, fire and gas detection, fire-prevention and fire-fighting equipment, flare systems, personnel protective equipment, pollution prevention, equipment in hazardous zones, alarms, escape routes, emergency procedures and emergency response actions, emergency shut-down systems, blow-down systems, emergency mooring release, security access control;
15. witnessing during commissioning of the equipment, fittings, arrangements and materials;
16. issuing of the Safety certificate for floating object;
17. issuing of the International Ship Security Certificate.

**NOTE:** If some of above listed safety related items are already checked / surveyed / verified by the RO, CRS may omit physical survey and perform checking of appropriate documents / reports of the RO instead.

## **7.2 Annual survey**

The Annual survey should include requirements stated in the Rules for statutory certification of sea-going ships, General requirements, Annex V, para. 4.27.1, as far as applicable and, the examination of the certificates and documents and checking of the following items:

1. review and checking the validity of the Class Certificate Survey status issued by the Class;
2. review of statutory certificates listed in 7.1.1.2 and as issued by the RO;
3. review of survey status and conditions of class as imposed by the RO, if any;
4. review of statutory recommendations as imposed by the RO, if any;
5. on board visual examination and checking of FSRU safety related items only: mooring, life-saving appliances, fire-detection, fire-extinction and fire-fighting equipment, personnel protective equipment, pollution prevention, equipment in hazardous zones, alarms, escape routes;
6. endorsement of the Safety certificate for floating object.

## **7.3 Renewal survey**

The Renewal survey should include requirements stated in the Rules for statutory certification of sea-going ships, General requirements, Annex V, para. 4.27.2, as far as applicable and, the examination of the certificates and documents and checking of the following items:

1. review of the Class Certificate;
2. review of the reports and records from the renewal class surveys of structure, equipment, fittings arrangements and materials;
3. review of statutory certificates listed in 7.1.1.2;
4. review of the reports and records from the renewal statutory surveys of structure, equipment, fittings arrangements and materials for the purpose of issuing statutory certificates listed in 7.1.1.2;

5. review of the reports and records from the survey of the outer part of the bottom and, in particular checking that provisions with regard to in-water survey in lieu of dry-docking and extended dry-docking scheme are continuously complied with;
6. on-board survey of FSRU safety related items only: mooring, service records, life-saving appliances, fire and gas detection, fire-prevention and fire-fighting equipment, flare systems, personnel protective equipment, pollution prevention, equipment in hazardous zones and explosion protected equipment maintenance, escape routes, emergency shut-down systems, blow-down systems, emergency mooring release, security access control);
7. issuing of the Safety certificate for floating object;
8. survey and issuing of the International Ship Security Certificate.

**NOTE:** If some of above listed safety related items are already checked / surveyed / verified by the RO, CRS may omit physical survey and perform checking of appropriate documents / reports of the RO instead.



## ANNEX

### Conditions for allowing an in-water survey in lieu of dry-docking survey

(Refer to para 3.3.1.2 of this Circular also)

1. Before entering into service, a satisfactory review of plans/documents shall be done by the RO, including the following aspects, as applicable:
  - a) Markings on the underwater hull to identify location of bulkheads, watertight floors, tanks and sea suctions/discharges;
  - b) Details and arrangements for inspecting and servicing sea chests, sea inlet/discharge valves, other appendages and the underwater hull;
  - c) Details for servicing and maintenance programme for essential equipment and underwater fittings like echo-sounder, speed log, sea water temperature gauges, electronic draft gauges, shaft seals, CP propeller blade seals, sea chests, sea inlet discharge valves, etc.;
  - d) Means for blanking off all the openings likely to affect the watertight integrity, including those for side thruster;
  - e) Provisions for maintaining outer bottom hull markings including load line markings;
  - f) Corrosion protection: Details of increased scantling, cathodic protection, protective coating, etc., provided to account for the longer period of service without dry-docking. Corrosion prevention system for the bottom has to fulfil dry film thickness of coating of minimum of 250  $\mu\text{m}$ .  
Anodes are to be prepared for the duration of appropriate time period.  
If installed, an impressed current system is to be documented.  
The extended period so approved by the RO should be specified in the design documents and class certificates/records;
  - g) Details of protective coating applied to double bottom, wing tanks, ballast tanks, void spaces and spaces adjacent to shell and the maintenance scheme to keep these coatings in "Good" condition;
  - h) Details of hull protection system adequate for the extended period (cathodic protection or other equivalent arrangement) and procedures for maintenance/renewal in afloat condition;
  - i) Arrangements for underwater inspection and maintenance of propellers, thrusters and rudders; provision of efficient sealing/glands for stern tube and rudder including their renewal where required; arrangements for the measurement of wear in the stern tube bearings and rudder bush/bearings;
  - j) TBT free paints are to be applied;
  - k) Provisions for surveys and maintenance of thrusters/stabilisers including maintenance plan;
  - l) Any other condition, as stipulated by the RO.
2. Extended dry-docking scheme can be applied starting from the latest dry-docking.
3. The FSRU should have a clear history of hull damages and grounding.
4. In the case that the FSRU will be moored for prolonged period without navigation, the RO may propose reduced scope of tail shaft and rudder surveys.
5. Survey site should be in a protected location having appropriate depth (depth clearance) and with calm clear water providing good underwater visibility (at least 2 meters).