RUSSIAN MARITIME REGISTER OF SHIPPING

CIRCULAR LETTER **No.** 312-11-926c dated 08.08.2016

Re:

Introducing the requirements for bunkering ships of liquefied natural gas (LNG) to the Rules for the Classification and Construction of Sea-Going Ships, 2016, ND No. 2-020101-087-E

Item of supervision:

LNG bunkering ships

Implementation	from the date of publication
Valid: till	-
Validity period extended till	-
~~Cancels / amends / adds circular letter №~~	- dated -

Number of pages:	11
Appendices:	Text of the RS requirements for LNG bunkering ships

Director General Konstantin Palnikov

Amends Rules for the Classification and Construction of Sea-Going Ships, 2016, ND No. 2-020101-087-E

We hereby inform that new RS requirements for gas carriers engaged in transportation of liquefied natural gas (LNG) and intended to ensure the transfer of LNG to ships using LNG as fuel shall be introduced to the Rules for the Classification and Construction of Sea-Going Ships, 2016, ND No. 2-020101-087-E

Text of the requirements is specified in the Appendix.

It is necessary to do the following:

1. Familiarize surveyors of the RS Branch Offices and interested organizations in the area of the RS Branch Offices' activity with the content of the Circular Letter.
2. Apply the above RS requirements in practical activity.

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DMS THESIS № 16-187508

Appendix to the Circular Letter
No. 312-11-926c of 08.08.2016

RULES OF THE CLASSIFICATION AND CONSTRUCTION OF SEA-GOING SHIPS, 2016, ND NO. 2-020101-087

PART I. CLASSIFICATION

2.2 CLASS NOTATION OF A SHIP

Para 2.2.29 shall be amended to read:

"In compliance with the requirements of Section 11, Part XVII "Distinguishing Marks and Descriptive Notations in the Class Notation Specifying Structural and Operational Particulars of Ships", for Gas carriers engaged in transportation of liquefied natural gas (LNG) and intended to ensure the transfer of LNG to ships using LNG as fuel may be assigned an additional descriptive notation **LNG bunkering ship** after the descriptive notation **Gas carrier** to be added to the class notation.

When additional functions related to servicing of ships using LNG as a fuel are available on board the ship and when the ship meets the requirements stated in 11.13 of the abovementioned Part of the Rules, the distinguishing marks: **RE**, **IG-Supply**, **BOG** shall be added to the class notation of the ship.".

PART XVII. DISTINGUISHING MARKS AND DESCRIPTIVE NOTATIONS IN THE CLASS NOTATION SPECIFYING STRUCTURAL AND OPERATIONAL PARTICULARS OF SHIPS

New Section 11 shall be introduced as follows:

«11 REQUIREMENTS TO LNG BUNKERING SHIPS

11.1 GENERAL PROVISIONS AND SCOPE OF APPLICATION

11.1.1 These requirements apply to the gas carriers engaged in transportation of liquefied natural gas (LNG) and intended to ensure the transfer of LNG on board the ships using LNG as a fuel (hereinafter – LNG bunkering ships).

An additional descriptive notation and marks stated in 2.2.29, Part I "Classification" may be added to LNG bunkering ships complying with these requirements.

11.1.2 Descriptive notation and marks in class of notation of LNG bunkering ships.

For gas carrier complying the requirements of this Section, except Chapter 11.13, after the descriptive notation **Gas carrier** the descriptive notation **LNG bunkering ship** may be added to the class notation.
When additional functions related to servicing of ships using LNG as a fuel are available on board the ship and when the ship meets the requirements stated in 11.13, the following distinguishing marks may be added to the descriptive notation:

RE – where the ship is designed to receive LNG from a gas fuelled ship for which the LNG fuel tanks shall be emptied;
IG-Supply – where the ship is designed to supply inert gas and dry air, to ensure gas freeing and aeration in compliance with 6.10.4 of the International Code of Safety for Ships Using Gases or Other Low Flashpoint Fuels (IGF Code)
BOG – where the ship is designed to recover and manage the boil-off gas generated during the bunkering operation.

11.1.3 Definitions.

LNG bunkering station means room or space fitted with the following equipment:
hoses and piping connections used for liquid and vapour return lines, including the isolating valves and the emergency shut-down valves;
automation and alarms systems;
the drip tray with its draining arrangement and other arrangements intended for the ship structure protection;
the gas and LNG leak detection systems;
the associated firefighting installations.

LNG bunkering control room means a safe location with regards to bunkering operations and may be from the cargo control room. At this location, overfilling alarm, automatic and manual shutdown shall be indicated.

Emergency shutdown system (ESD) means a system that safely and effectively stops the transfer of LNG (and vapour as applicable) between the receiving ship and the bunkering ship in the event of an emergency during the bunkering operation, and puts the system in a safe condition.

Bunkering connections mean liquid and vapour connections between ships used for liquid product transfer to receiving ship and product vapour return to the bunker ship (i.e. manifold for a system with flexible hose and before the swivel for a system with transfer arm).

Emergency release coupling (ERC) means a coupling located on the receiving ship bunkering manifold or on the LNG transfer system, which separates at a predetermined section, when required, each separated section containing a self-closing shut-off valve, which seals automatically.

An emergency release coupling can be activated:
by maximal allowable forces applied to the predetermined section
by manual or automatic control, in case of emergency.

Quick connect/disconnect coupler (QCDC) means a manual or hydraulic mechanical device used to connect the LNG transfer system to the receiving ship manifold.

Sloshing means liquid oscillations effect at significant free surface in cargo and fuel tanks.

11.2 TECHNICAL DOCUMENTATION

11.2.1 In addition to technical documentation specified in 3.2, Part I “Classification” of these Rules and 6.1, Part I “Classification” of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk, the following technical documentation shall be submitted:

.1 general arrangement of the ship showing the location of LNG bunkering station and bunkering control station and escape routes;

.2 diagram and description of the cargo system/ Drawings of hose lines, swivels and transfer arms (where applicable);

.3 diagram and description of LNG vapour return transfer system. Documentation for the reliquefaction system (where applicable). Calculation of maximum bunkering flow and maximum pressure;

.4 technical documentation for ESD bunkering system;

.5 single line diagrams for all intrinsically safe circuits;

.6 electrical equipment in hazardous areas for electrical circuits related to bunker operations;

.7 technical documentation for fire and gas detection and alarm systems of the bunkering installation, including location of gas detectors, lines, valves and sampling points on board;

.8 technical documentation for measuring, alarm and pressure monitoring in the cargo spaces and piping;

.9 technical documentation for control and warning alarm system of cargo pumps.

11.2.2 The following operating documentation shall be submitted:

.1 risk analysis of LNG bunkering operations, including inerting and gas freeing as per IACS Recommendation No. 142 given in the Supplement to rules and guidelines of Russian Maritime Register of Shipping "IACS Procedural Requirements, Unified Interpretations and Recommendations" (published in electronic format as a separate edition). The analysis shall cover risks of hull members damage and failure of equipment due to the accident related to gas fuel freeing. The results of risk analysis shall be included in the ship's Operating manual;

.2 operating instructions containing the procedures of bunkering, interting, vapour return control as per IACS Recommendation No. 142.

11.3 ARRANGEMENT OF LNG BUNKERING SHIP

11.3.1 LNG bunkering ship shall comply with the requirements of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk and the International Code of Safety for Ships Using Gases or Other Low Flashpoint Fuels (IGF Code).

11.3.2 The LNG bunkering station shall be located on the open deck in the area with sufficient natural ventilation. Closed or semi-enclosed bunkering stations will be subject to special consideration. The LNG bunkering station shall be physically separated or structurally shielded from accommodation and control stations.

11.3.3 Bunker manifold area and escape routes shall have safe access for crew engaged in operation. It shall have unrestricted natural ventilation and be sufficiently illuminated.

11.3.4 The bunker connections shall be clearly visible from the navigation bridge and bunker operation control position where continuous watch is kept during the transfer. CCTV can be accepted as substitute for the direct view when it provides unobstructed view of the bunker connections.

11.3.5 Arrangement of work platforms in areas where liquid spill may occur shall exclude liquid spill accumulation at the platform surface. Gratings used in this location shall be suitable for low temperatures and correspond to boiling point of gas bunker. Area under the gratings shall be equipped with spill collecting trays with drainage arrangements suitable for draining the accumulated spill overboard. The drain shall be fitted with a valve.

11.3.6 Drip trays shall be fitted below the liquid bunkering connections and where leakage may occur which can cause damage to the ship structure. Thermal sensors shall be positioned in way of bunkering connections in the drip tray. The drip trays shall be made of stainless steel, and capable of being remotely drained over the ship's side without risk of damage to the ship structure and to the receiving ship.

11.3.7 When bunker boiling point is lower than design temperature of the hull steel, the hull in the manifold area shall be effectively protected from low temperature in case of a major bunker spill. Where water curtain is used for hull protection, the pumps shall be arranged with redundancy.

11.4 HULL AND STABILITY

11.4.1 The hull structure and stability of the LNG bunkering ship shall meet the requirements of Parts II "Gas Carrier Design" and III "Stability, Subdivision. Freeboard" of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk and the following additional requirements:

.1 Bunkering ship shall be able to abort bunkering operation at any stage in case of emergency. Cargo tanks on bunker ship therefore shall not have restrictions on intermediate filling;
.2 However, internal transfer between cargo tanks within short period of time to leave dangerous sloshing zone may be accepted upon special considerations.

11.5 FIRE PROTECTION

11.5.1 Structural fire protection of LNG bunkering ship shall meet the requirements of Part V "Fire Protection" of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk and the following additional requirements:

When applicable, the bunkering station shall be separated by class A-60 insulation towards other spaces, except
for spaces such as tanks, voids, auxiliary machinery spaces of no fire risk, sanitary and similar spaces where insulation standard may be reduced to class A-0.

11.5.2 Fire extinguishing systems of LNG bunkering ship shall meet the requirements of Part V "Fire Protection" of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases and the following additional requirements:

.1 The water spray system shall be fitted to protect the bunkering manifold, associated piping installations and the transfer area. The system capacity shall not be less than those stated in 3.3.2 of Part V "Fire Protection" of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk;

.2 In the bunkering station area a permanently installed dry chemical powder extinguishing system shall cover all possible leak points. The capacity shall be at least 3,5 kg/s for a maximum of 45 s discharges. The system shall be arranged for easy manual release from a safe location outside of the protected area;

.3 one portable dry powder extinguisher of at least 5 kg capacity shall be located near the bunkering station.

11.5.3 Exhaust gas system shall meet the requirements of Part VI "Systems and Piping" of these Rules, therewith, the outlets of the exhaust gas system of the internal combustion engines and boilers shall be provided with spark arresters.

11.5.4 Use of equipment for cargo vapor thermal oxidation not complying with the requirements of 4.3, Part VI "Systems and Piping" shall be prohibited during the bunkering operations.

11.6 CARGO SYSTEM

11.6.1 The following components shall be obligatory included in the cargo system:

bunkering hoses and/or loading arms;
quick release connection;

emergency release coupling;
electrical insulating joint.

11.6.2 Cargo system and the bunkering fuel transfer procedure shall be so designed .to avoid the release of gas or liquid to the atmosphere both from bunkering and receiving ships during bunkering.

11.6.3 Bunker transfer piping system for products with boiling point below -55°C shall be thermally insulated to minimise heat leaks to transferred gas bunker and protect personnel from direct contact with cold surfaces.

11.6.4 Bunkering hoses.

11.6.4.1 Bunkering hoses shall meet the requirements of 5.11.7 of the IGC Code, applicable requirements of 6.2, Part VI "Systems and Piping" and shall have Type Approval Certificate (CTO). In addition to the above requirements, the requirements given in 11.6.4.2 – 11.6.4.10 shall be complied with during the type testing.
11.6.4.2 All the applicable materials shall be compatible with each other and transported medium (LNG and LNG vapors). The end fittings shall be made of stainless steel and comply with the IGC Code requirements.

11.6.4.3 The following characteristics shall be defined by the designer and submitted to the Society:
• Extreme service temperature
• Maximum working load
• Maximum design pressure
• Minimum bend radius (MBR)
• Maximum allowable applied twist (MAAT).

11.6.4.4 Each hose type shall be subjected to a pressure cycle test at ambient temperature to demonstrate that the hose is capable of withstanding 2 000 pressure cycle test from zero to at least twice the specified maximum working pressure. The hose assembly is also to be subjected to a cryogenic temperature and pressure cycle test with a minimum of 200 combined test cycles. After the cycling test, the crushing test shall be carried out at the pressure at least 5 times exceeding the maximum working pressure at the minimum working pressure.

11.6.4.5 The hose assembly shall be subjected to a bending cycle fatigue test, at ambient and cryogenic temperature, with 400 000 cycles without failure. The fatigue bend radius shall be in accordance with manufacturer's recommendation.

11.6.4.6 The hose assembly shall be subjected to a crushing test at ambient temperature and cryogenic temperature without damage. The hose assembly shall be held between two rigid plates (an area equivalent to the diameter of the hose) and a force of 1000N shall be applied ten times at the same location in the middle of each flexible hose.

11.6.4.7 The hose assembly shall be subjected to a tensile test at ambient and cryogenic temperature to ensure that the hose is capable of withstanding the maximum working load.

11.6.4.8 Each hose type shall be subjected to a bending test at ambient and cryogenic temperature to ensure that the hose is capable of withstanding the maximum working pressure at minimum working bend radius (MBR). Hose should be gradually bent to the MBR and then pressurized to the maximum working pressure. Hose shall be examined for leaks whilst being held for 15 min at MBR and no damage should be evident on return pre-test conditions.

11.6.4.9 Each hose type shall be subjected to a tensile test at ambient and cryogenic temperature to ensure that the hose is capable of withstanding the maximum working load. The hose assembly shall be subjected to a ambient and cryogenic twist test to ensure that the hose is capable of withstanding its maximum working load whilst at MAAT. The hose assembly shall

be gradually twisted to the MAAT and then pressurized to the maximum working pressure. The hose shall be examined for leaks whilst being held for 15 min at MAAT and no damage should be evident on return pre-test conditions.
11.6.4.10 The hose assembly shall be subjected to an electrical test. The hose assembly shall be drained and supported above ground by non-conductive means and the resistance measured
between the two end fittings (connection face). Electrically continuous hoses shall have a resistance of less than 10 Ohm. Electrically discontinuous hoses shall have a resistance of not less than 25 kilohm.

11.6.5 Quick connect disconnect coupler (QCDC).

11.6.5.1 QCDC shall be type approved by the Society. The QCDC shall be subjected to a hydraulic pressure test, at ambient temperature, to a pressure not less than 1,5 times the design pressure, to demonstrate that the QCDC is capable of withstanding its pressure without leaking.

11.6.5.2 Controls of quick connect disconnect couplers (QCDC) shall be fitted with mechanical interlocking device to prevent unintended operation. In case of supply failure the quick connect disconnect couplers (QCDC) shall not change the position (shall remain in as-is position).

11.6.6 Emergency release coupling (ERC).

11.6.6.1 Emergency release coupling (ERC) or break-away coupling shall be provided in the bunkering line. Adequacy shall be observed regarding the compatibility with hoses and the maximum axial and shear forces likely to be exerted on the break-away or the ERC during the bunkering operations. Alternatively the manifold area may be suitably reinforced. Details of the manifold loads shall be submitted to the society for information. Emergency release coupling (ERC) or break-away coupling shall have Type Approval Certificate.

11.6.6.2 Emergency release couplings (ERC) used in bunker connection shall be of “dry-break” type and be capable to self-disconnect upon application of force at any direction of ship’s relative motion which exceeds design loads and at pressure surge exceeding the coupling design pressure. ERC fitted in lines for transfer of gas fuel shall be capable to break-away through the ice accumulated on the coupling during the transfer.

11.6.7 Emergency release system.

Each emergency release system shall be air tested. In this case the resistance shall be at least 10 kiloOhm. Resistance of each insulating flange shall be at least 1000 Ohm, but shall not exceed 1000 kiloOhm.

11.6.8 Cargo swivel.

11.6.8 Cargo swivel having Type Approval Certificate shall be provided in the bunkering line. Swivels shall be subject to static hydraulic pressure tests at the maximum working pressure. During the dynamic tests, at least two complete rotations in each direction shall be performed at normal conditions and minimum working temperature.

11.6.9 The bunkering line shall be suitably supported in such a way that to prevent the hose abrasion and to observe that the allowable bending radius is satisfied.

11.6.10 The QCDC shall be subjected in assembly to a hydraulic pressure test, at ambient temperature, to a pressure not less than 1,5 times the design pressure, to demonstrate that the QCDC is capable of withstanding its pressure without leaking.

11.6.11 All welds of cargo system and hose line items shall be made by full penetration welding with 100% inspection of welds by non-destructive examination.

11.6.12 The LNG velocity in the piping system shall not exceed 10m/s in order to avoid the generation of static electricity and to limit the heat transfer due to friction inside the pipes.

The maximum LNG transfer rate shall be justified, taking into consideration:

• The management of the BOG generated during bunkering operation;
• The temperature of the LNG supplied to the ship;
• Characteristics of the receiving tank;
• The maximum flow permitted by the ERC;
• The maximum flow permitted by the hose;
• The maximum flow permitted by the QCDC.

11.7 INERT GAS SYSTEM

11.7.1 Prior to the bunkering operations, the possibility shall be provided for tightness test of connections between the bunkering and receiving ships. The procedure thereof shall be specified in the ship's operating manual.

11.7.2 The relevant measures and procedures shall be provided for inerting the hose lines prior to filling them with bunkering fuel or LNG vapors, as well as inert-gas pressurization of bunkering fuel or LNG vapors upon completion of cargo operations prior to disconnection. The cargo residuals shall be leading back to the cargo tanks.

11.8 GAS DETECTION SYSTEM

11.8.1 Installed onboard gas detection system shall be capable to measure gas concentration in the manifold connections area in addition to arrangements described in Section 6, Part VIII "Instrumentation and Automation System" of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk and have arrangement to provide a remote gas detection point for receiving ship.

11.8.2 Gas detecting equipment at the manifold connection shall provide continuous monitoring and activate alarm when concentration of hydrocarbons reaches 30% of lower flammable limit (LFL).
11.8.3 Audible and visible alarm from the permanently installed gas detection equipment shall be located on the navigation bridge, in the bunkering operation control position and at the gas detector readout location.

11.9 ELECTRICAL EQUIPMENT

The requirements of this Chapter cover the electrical equipment of LNG bunkering ships and supplement the requirements of Part XI "Electrical Equipment" of these Rules and Part VII "Electrical Equipment" of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk.

11.9.1 The following systems of generation and distribution of electric energy are acceptable:

.1 direct current:
.1.1 two-wire insulated;
.2 alternating current переменного тока:
.2.1 single-phase, two-wire insulated;
.2.2 three-phase, three-wire insulated;
.2.3 three-phase, four-wire insulated.
11.9.1.3 In insulated distribution systems, no current carrying part is to be earthed, other than:
.1 through an insulation level monitoring device
.2 through components used for the suppression of interference.

11.9.2 Earthed systems with hull return.

11.9.2.1 Earthed systems with hull return are not permitted, with the following exceptions to the satisfaction of the Society:

.1 impressed current cathodic protective systems;
.2 limited and locally earthed systems, such as starting and ignition systems of internal combustion engines, provided that any possible resulting current does not flow directly through any hazardous area;
.3 insulation level monitoring devices, provided that the circulation current of the device does not exceed 30 mA under the most unfavourable conditions.
.4 earthed intrinsically safe circuits;

.5 power supplies, control circuits and instrumentation circuits in non-hazardous areas where technical or safety reasons preclude the use of a system with no connection to earth, provided the current in the hull is limited to not more than 5 A in both normal and fault conditions;

.6 limited and locally earthed systems, such as power distribution systems in galleys and laundries to be fed through isolating transformers with the secondary windings earthed, provided that any possible resulting hull current does not flow directly through any hazardous area.

11.9.3 Контроль сопротивления изоляции цепей во взрывоопасных зонах.

11.9.3.1 The devices intended to continuously monitor the insulation level of all distribution systems are also to monitor all circuits, other than intrinsically safe circuits, connected to apparatus in hazardous areas or passing through such areas.

11.9.3.2 An audible and visual alarm shall be given, at a manned position, in the event of an abnormally low level of insulation.

11.10 EMERGENCY SHUT-DOWN SYSTEM (ESD)

11.10.1 The requirements of Part VIII “Instrumentation and Automation System” of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk are applicable to emergency shut-down systems (ESD). Any activation of the ESD systems shall be implemented simultaneously on both bunkering facility and receiving ship.

11.10.2 Pendant with means of control for local manual activation position for the ESD system shall be provided on board the receiving ship. When a bunkering ship may connect on board ESD system to those of the receiving ship, no remote panel is required.

11.10.3 The ESD function shall be initiated in following circumstances:
.1 automatically, if the distance of connection on receiving ship from the connection on bunker ship exceeds safe operational envelope for transfer arrangement
.2 by activating manual ESD button on ESD pendant
.3 automatically at ERS activation.

11.10.4 Opening of main transfer valves shall not be possible unless ERS is re-assembled.

11.11 TRANSFER CONTROL SYSTEM

11.11.1 The transfer control system shall have provisions of automatic control of flow rate and limiting pressure in the transfer system. Parameters of the control system critical for the safe transfer shall have adjustable settings.

11.11.2 Deviations from set values mentioned in 11.11.1 shall activate audible and visual alarms at the bunker operations control position and on the navigation bridge.

11.11.3 The transfer control system for liquid shall automatically reduce the liquid transfer rate when set values for pressure in the vapour return/vapour recovery system is exceeded.

11.11.4 If the transfer rate exceeds a maximum value, alarm and automatic stop of transfer shall be activated and manifold valves closed.

11.11.5 The receiving ship shall have possibility to control transfer flow rate by means of a ship-to-ship link, e.g. flexible cable and pendant with means of control.

11.11.6 Alarms and safety actions required for the transfer system are given in Table 11.11.6.

Table 11.11.6

Alarms and safety actions required for the LNG transfer system

Parameters	Alarm	Activation of the ESD systems	Automatic activation of the emergency release coupling
Low pressure in the supply tank	X	X	
Sudden pressure drop at the transfer pump discharge	X	X	
High level in the receiving tank	X	X	
High pressure in the receiving tank	X	X	
LNG leak detection or vapour detection (anywhere)	X	X	
Gas detection around the bunkering lines	X	X	
Manual activation of the emergency release coupling	X		
Safe working envelope of the loading arm exceeded	X	X	X
Disconnection of the ERC	X	X	

11.12 COMMUNICATION SYSTEMS

11.12.1 A communication system with back-up shall be provided between the bunkering ship and the receiving ship.

11.12.2 Communications shall be maintained between the bunkering ship and the receiving ship at all times during the bunkering operation. In the event that communications cannot be maintained, bunkering shall be stopped and not resumed until communications are restored.

11.12.3 The components of the communication system located in hazardous and safety zones shall be of a suitable safe type.

11.13 ADDITIONAL SERVICE FEATURES RELATED TO SHIPS USING LNG AS FUEL

11.13.1 When the additional features related to ships servicing are provided on board the LNG bunkering ship using LNG as fuel and indicated by an additional descriptive notation **RE** in the class notation, the BOG handling system of the LNG bunkering ship shall be sized to handle the extra vapours generated during this operation taking into account the fact that the level in the receiving cargo tanks is increasing.

To confirm the ship compliance with the requirements applicable to ships with the additional descriptive notation **RE** the Bunkering procedure for LNG receiving from a gas fueled ship with the required calculations shall be submitted.

11.13.2 When the additional features related to ships servicing are provided on board the LNG bunkering ship using LNG as fuel and indicated by an additional descriptive notation **IG-Supply** in the class notation, the LNG bunkering ship shall be fitted with supply of inert gas and/or dry

air to ensure gas freeing and aeration of fuel tanks in compliance with 6.10.4 of the IGF Code. The lines used for the inert gas shall be independent from the liquid and vapour lines used for normal operation. To confirm the ship compliance with the requirements applicable to ships with the additional descriptive notation **IG-Supply**, a Diagram of the gas freeing system and Procedure for gas freeing shall be submitted.

11.13.3 When the additional features related to ships servicing are provided on board the LNG bunkering ship using LNG as fuel and indicated by an additional descriptive notation **BOG** in the class notation, the boil-off-gas system (BOG) generated during bunkering shall be provided . The LNG bunkering ship shall be capable of handling all or part of the boil-off gas from receiving ship, in addition to its own boil-off, generated during the LNG bunkering operation without release to the atmosphere. The boil-off gas handling capacity of the bunkering ship shall be indicated and justified by calculations.

Different ways to dispose of the BOG or their combination may be considered:
• liquefaction
• using gas a fuel in the ships dual-fuel engine or boilers
• combustion using gas flaring unit in compliance with 4.3, Part VI “Systems and Piping” of the of the Rules for the Classification and Construction of Ships Carrying Liquefied Gases in Bulk.
To confirm the ship compliance with the requirements applicable to ships with the additional descriptive notation **BOG**, the following documents shall be submitted:
Bunkering procedure for boil-off gas management indicating the operations.
Calculation of the maximum LNG vapour flow rate possible to be generated during the bunkering to be less than the capacity of boil-off gas unit specified in the Bunkering procedure.