



भारत सरकार / GOVERNMENT OF INDIA
पत्तन, पोत परिवहन और जलमार्ग मंत्रालय
MINISTRY OF PORTS, SHIPPING AND WATERWAYS

नौवहन महानिदेशालय, मुंबई
DIRECTORATE GENERAL OF SHIPPING, MUMBAI



Merchant Shipping Notice No. 06 of 2024

File No. 13-28/1/2024-ENGG - DGS

Date: 13.02.2024

Subject: The International Code of safety for ships using gases or other low-flashpoint fuels (IGF Code) and its applicability- Reg.

1. Background & Purpose:

- 1.1. The purpose of this MS Notice is to inform Owners/Operators, Recognized Organizations, Masters, and relevant stakeholders on the applicable procedures regarding the IGF Code and its amendments. The International Code of safety for ships using gases or other low-flashpoint fuels (IGF Code) was adopted by the Maritime Safety Committee of the IMO by Resolutions MSC. 391 (95) and MSC. 392 (95). The IGF Code is defined in SOLAS II-1/2.29, and through the new part G in Chapter II-1 of SOLAS Convention, the application and requirements to ships using low-flashpoint fuel is established (refer to SOLAS II-1/56 and 57).
- 1.2. The basic philosophy of the IGF Code considers the IMO goal-based approach (Refer to MSC.1/Circ.1394 and its amendments). Therefore, goals and functional requirements were specified for each section forming the basis for the design, construction and operation of ships using low-flashpoint fuel, as the main areas for consideration.
- 1.3. The current version of the Code includes regulations to meet the functional requirements for natural gas fuel. Regulations for other low-flashpoint fuels will be added to the IGF Code as, and when, they are developed by the Organization. In the meantime, for other low-flashpoint fuels, compliance with the functional requirements of the IGF Code must be demonstrated through alternative design procedures.

2. Application and Implementation

- 2.1. The code applies to vessels governed by part G of chapter II-1 of the International Convention for the Safety of Life at Sea (SOLAS); therefore, new ships using gases or other low-flashpoint fuels shall comply with the requirements of the IGF code, its mandatory provisions for the arrangement, installation, control and monitoring of machinery,

equipment and systems using low-flashpoint fuels, focusing initially on liquefied natural gas (LNG).

2.2. The IGF Code entered into force on 1 January 2017, and establishes an international standard for ships using gases or other low-flashpoint fuels for propulsion (Low-flashpoint fuel means gaseous or liquid fuel having a flashpoint lower than otherwise permitted under SOLAS regulation II-2/4.2.1.1). It contains mandatory provisions for the arrangement, installation, control and monitoring of machinery, equipment and systems using low-flashpoint fuels, focusing currently on LNG.

2.3. The IGF Code applies to ships using low-flashpoint fuels for which:

- 2.3.1. the building contract is placed on or after 1 January 2017,
- 2.3.2. the keels of which are laid or which are at a similar stage of construction on or after 1 July 2017 (in the absence of a building contract), or
- 2.3.3. the delivery of which is on or after 1 January 2021.

2.4. Ships which commence a conversion on or after 1 January 2017 to use low- flashpoint fuels (or use additional or different low-flashpoint fuels other than those for which the ship was originally certified) will also be required comply with the IGF Code (see SOLAS regulation II-1/56).

2.5. Upon completion of construction, a ship Classification Society, acting as a Recognized Organization (RO) for the Administration, shall issue either a Safety Construction Certificate for Passenger Ships, indicating that the ship complies with “part G of chapter II-1 of the Convention using “LNG” as fuel.

3. Definitions

Unless otherwise stated below, the following definitions are those from SOLAS chapter II-2:

- 3.1. Administration means The Directorate General of Shipping.
- 3.2. Bunkering means the transfer of liquid or gaseous fuel from land based or floating facilities into a ships' permanent tanks or connection of portable tanks to the fuel supply system.
- 3.3. Dual fuel engines means engines that employ fuel covered by this Code (with pilot fuel) and oil fuel. Oil fuels may include distillate and residual fuels.
- 3.4. Fuel containment system is the arrangement for the storage of fuel including tank connections. It includes where fitted, a primary and secondary barrier, associated insulation and any intervening spaces, and adjacent structure if necessary for the support of these elements. If the secondary barrier is part of the hull structure it may be a boundary of the fuel storage hold space.
- 3.5. Gas means a fluid having a vapour pressure exceeding 0.28 MPa absolute at a temperature of 37.8°C.

- 3.6. Hazardous area means an area in which an explosive gas atmosphere is or may be expected to be present, in quantities such as to require special precautions for the construction, installation and use of equipment.
- 3.7. High pressure means a maximum working pressure greater than 1.0 MPa.
- 3.8. LEL means the lower explosive limit.
- 3.9. LNG means liquefied natural gas
- 3.10. Loading limit (LL) means the maximum allowable liquid volume relative to the tank volume to which the tank may be loaded.
- 3.11. Low-flashpoint fuel means gaseous or liquid fuel having a flashpoint lower than otherwise permitted under paragraph 2.1.1 of SOLAS regulation II-2/4.
- 3.12. Risk is an expression for the combination of the likelihood and the severity of the consequences.
- 3.13. Unacceptable loss of power means that it is not possible to sustain or restore normal operation of the propulsion machinery in the event of one of the essential auxiliaries becoming inoperative, in accordance with SOLAS regulation II-1/26.3.

4. Design

- 4.1 Ships to which this MS Notice applies shall be designed in accordance with the applicable requirements of the IGF Code.
- 4.2 The design shall be approved by a Recognized Organisation.

5. Construction

- 5.1 Ships to which this Notice applies shall be constructed in accordance with the applicable requirements of the IGF Code.
- 5.2 Construction shall be approved and supervised by a Recognized Organisation.
- 5.3 Upon completion of construction, the Recognized Organization , shall issue applicable Safety Construction Certificate, indicating that the ship complies with “part G of chapter II-1 of the Convention using “LNG” as fuel.”

6. Alternative design.

- 6.1. The Code contains functional requirements for all appliances and arrangements related to the usage of low-flashpoint fuels.
- 6.2. Fuels, appliances and arrangements of low-flashpoint fuel systems may either:
 - 6.2.1 deviate from those set out in this Code, or
 - 6.2.2 be designed for use of a fuel not specifically addressed in this Code.
 - 6.2.3 Such fuels, appliances and arrangements can be used provided that these meet the intent of the goal and functional requirements concerned and provide an equivalent level of safety of the relevant chapters.

6.3. The equivalence of the alternative design shall be demonstrated as specified in SOLAS regulation II-1/55 and approved by Recognized Organizations authorized by the Administration in line with DGS order 6 of 2013. However, the Administration shall not allow operational methods or procedures to be applied as an alternative to a particular fitting, material, appliance, apparatus and item of equipment, or type thereof which is prescribed by the Code.

7. Operating Requirements

7.1 Every ship covered by this Notice shall carry a copy of the IGF Code on board. Electronic versions are acceptable.

7.2 Maintenance procedures and information for all gas related installations shall be available on board and shall include all areas and systems that may be subject to gas leaks and their associated hazards.

7.3 Each ship shall be provided with a suitably detailed fuel handling manual, to ensure that trained personnel can safely operate the fuel bunkering, storage, and transfer systems. The contents of this fuel handling manual are more fully described in paragraph 8.4 of this Notice.

7.4 Each ship shall be provided with suitable emergency procedures, covering all aspects of the fuel handling systems. In addition, emergency procedures shall be in place to provide for the emergency shutdown (ESD) of any equipment that has the potential to become hazardous under certain abnormal conditions.

8. Bunkering Operations

8.1 Before any bunkering operation commences, the Master of the receiving ship or their designated representative, and the representative of the bunkering source (Persons In Charge (PIC)) shall:

8.1.1 agree in writing to the transfer procedure, including cooling down and if necessary, gassing up, the maximum transfer rate at all stages, and volume to be transferred;

8.1.2 agree in writing action to be taken in an emergency; and

8.1.3 complete and sign the bunkering safety checklist.

8.2 In accordance with paragraph 6.8.1 of the IGF Code, the storage tanks for liquefied gas shall not be filled to more than a volume equivalent to 98% full at the reference temperature during the bunkering operations.

8.3 Upon completion of bunkering operations, the ship PIC shall receive and sign a Bunker Delivery Note for the fuel delivered, containing at least the information specified in Annex I to this Notice, completed and signed by the bunkering source PIC.

8.4 The fuel handling manual required by paragraph 7.3 of this Notice shall be part of the vessel's Safety Management System (SMS) and shall include, but not be limited to:

8.4.1 overall operation of the ship from dry-dock to dry-dock, including procedures for system cool down and warm up, bunker loading and, where appropriate, discharging, sampling, inerting, and gas freeing;

8.4.2 bunker temperature and pressure control, alarm, and safety systems;

- 8.4.3 system limitations, cool down rates, and maximum fuel storage tank temperatures prior to bunkering, including minimum fuel temperatures, maximum tank pressures, transfer rates, filling limits, and sloshing limitations;
 - 8.4.4 operation of inert gas systems;
 - 8.4.5 firefighting and emergency procedures, including the operation and maintenance of firefighting systems, and the use of extinguishing agents;
 - 8.4.6 specific fuel properties and special equipment needed for the safe handling of the particular fuel;
 - 8.4.7 fixed and portable gas detection operation and maintenance of equipment;
 - 8.4.8 emergency shutdown and emergency release systems, where fitted;
 - 8.4.9 a pro forma bunkering safety checklist, a copy of which is to be reviewed, completed, and signed during each bunkering operation; and
 - 8.4.10 a description of the procedural actions to be taken in an emergency situation, such as leakage, fire or potential fuel stratification resulting in rollover.
- 8.5 Documentation of successful verification shall be indicated by the mutually agreed and executed bunkering safety checklist signed by both PICs.
- 8.6 PICs shall have direct and immediate communication with all personnel involved in the bunkering operation, and such communication shall be maintained between both PICs at all times during the bunkering operations.
- 8.7 Communication devices used in bunkering shall comply with recognized standards for such devices acceptable to the Administration. The ship shore link (SSL) or equivalent means to a bunkering source provided for automatic ESD communications, shall be compatible with the receiving ship and the delivering facility ESD system.
- 8.8 Hoses, transfer arms, piping, and fittings provided by the delivering facility used for bunkering shall be electrically continuous, suitably insulated, and shall provide a level of safety compliance with recognized standards⁵.
- 8.9 Warning signs shall be posted at the access points to the bunkering area listing fire safety precautions during fuel transfer.
- 8.10 During the transfer operations, personnel in the bunkering manifold area shall be limited to essential staff only. All staff engaged in duties or working in the vicinity of the operations shall wear appropriate personal protective equipment (PPE). A failure to maintain the required conditions for transfer shall be cause to stop operations, and transfer shall not be resumed until all required conditions are met.

9 Maintenance Requirements

- 9.1 All maintenance and repair procedures shall include considerations for tank locations and adjacent spaces, taking into account the safe operation and other hazards that may be relevant to the ship.
- 9.2 An inspection/survey plan for the liquefied gas fuel containment system shall be developed and approved by RO acting on behalf of the Administration. The inspection/survey plan shall identify aspects to be examined and/or validated during surveys throughout the life of the liquefied gas fuel containment system. It shall also identify any necessary in-service survey, maintenance, and testing that was assumed when selecting liquefied gas fuel containment system design parameters. All in-service survey, maintenance, and testing of the fuel containment system must be carried out in accordance with that plan.

9.3 The procedures and information shall include maintenance of electrical equipment that is installed in explosion hazardous spaces. The inspection and maintenance of electrical installations in explosion hazardous spaces shall be performed in accordance with a recognized standard.

10 Enclosed Space Entry

10.1 Under normal operational circumstances, personnel shall not enter fuel tanks, fuel storage hold spaces, void spaces, tank connection spaces, or other enclosed spaces where gas or flammable vapours may accumulate. Personnel may enter these enclosed spaces only if the gas content of the atmosphere in such space is determined by means of fixed or portable equipment to ensure oxygen sufficiency and absence of an explosive atmosphere.

10.2 Personnel entering any space designated as a hazardous area shall not introduce any potential source of ignition into the space unless it has been certified gas-free and maintained in that condition.

11 Risk Assessment

11.1 A risk assessment shall be conducted to ensure that risks arising from the use of low-flashpoint fuels affecting persons on board, the environment, the structural strength or the integrity of the ship are addressed. Consideration shall be given to the hazards associated with physical layout, operation and maintenance, following any reasonably foreseeable failure.

11.2 For ships to which part A-1 applies, the risk assessment required by 4.2.1 need only be conducted where explicitly required by paragraphs 5.10.5, 5.12.3, 6.4.1.1, 6.4.15.4.7.2, 8.3.1.1, 13.4.1, 13.7 and 15.8.1.10 as well as by paragraphs 4.4 and 6.8 of the annex.

11.3 The risks shall be analyzed using acceptable and recognized risk analysis techniques, and loss of function, component damage, fire, explosion and electric shock shall as a minimum be considered. The analysis shall ensure that risks are eliminated wherever possible. Risks which cannot be eliminated shall be mitigated as necessary. Details of risks, and the means by which they are mitigated, shall be documented to the satisfaction of the Administration.

12 Drills And Emergency Exercises

12.1 Drills and emergency exercises on board shall be conducted at regular intervals.

12.2 Such gas-related exercises could include for example:

- Tabletop exercise;
- Review of fueling procedures based in the fuel handling manual required by 18.2.3;
- Responses to potential contingences;

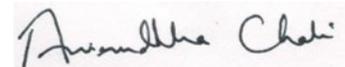
- Tests of equipment intended for contingency response; and Reviews that assigned seafarers are trained to perform assigned duties during fuelling and contingency response.

12.3. Gas related exercises may be incorporated into periodical drills required by SOLAS Convention.

13 Training

Companies shall ensure that seafarers on board ships using gases or other low-flashpoint fuels shall be qualified and certificated in accordance with the new training requirements as detailed in DGS Circular (NT/ENG) 03 of 2021 for service on board ships subject to the IGF Code (Regulation V/3), having successfully completed approved training and provided evidence of meeting seagoing service and experience requirements and the training requirements for service on board liquefied gas tankers and completed training as mentioned in DGS STCW 2010 CIRCULAR NO. 13 OF 2019 and DGS STCW 2010 CIRCULAR NO. 14 OF 2019 to attain the abilities that are appropriate to the capacity to be filled and duties and responsibilities to be taken up, taking into account the provisions given in the STCW Convention and Code, as amended, and hold an appropriate certificate.

This is issued with the approval of the Director-General of Shipping and comes into effect from the date of issue of this notice.



(Aniruddha Chaki)

E&SS-cum-DDG(Tech.)

Encl. as above

To,

1. The Principal Officer/ Mercantile Marine Department, Mumbai/Kolkata/ Chennai/ Kandla/Kochi.
2. The Surveyor-in-charge, Mercantile Marine Department, Goa/Jamnagar/Port Blair /Visakhapatnam /Tuticorin /Noida /Haldia/ Paradip /Mangalore.
3. All Recognised Organizations.
4. CS/NA/Dy.CSS
5. Hindi Cell with request to provide Hindi translation.
6. Computer Cell with request to upload on DGS website

LNG-BUNKER DELIVERY NOTE*
LNG AS FUEL FOR

SHIP NAME: _____ **IMO NO.:** _____

Date of delivery: _____ **Port** _____

1. LNG-Properties

Methane number "	-	
Lower calorific (heating) value	MJ/kg	
Higher calorific (heating) value	MJ/kg	
Wobbe Indices Ws / Wi	MJ/m ³	
Density	kg/m ³	
Pressure	MPa (abs)	
LNG temperature delivered	°C	
LNG temperature in storage tank(s)	°C	
Pressure in storage tank(s)	MPa (abs)	

2. LNG-Composition

Methane, CH ₄	% (kg/kg)	
Ethane, C ₂ H ₆	% (kg/kg)	
Propane, C ₃ H ₈	% (kg/kg)	
Isobutane, i C ₄ H ₁₀	% (kg/kg)	
N-Butane, n C ₄ H ₁₀	% (kg/kg)	
Pentane, C ₅ H ₁₂	% (kg/kg)	
Hexane; C ₆ H ₁₄	% (kg/kg)	
Heptane; C ₇ H ₁₆	% (kg/kg)	
Nitrogen, N	% (kg/kg)	
Sulphur, S	% (kg/kg)	
negligible < 5ppm hydrogen sulphide, hydrogen, ammonia, chlorine, fluorine, water		

3. Net Total delivered: _____ t, _____ MJ _____ m³
Net Liquid delivery: _____ GJ

4. Signature(s):

Supplier Company Name, contact details: _____

Signature: _____ Place/Port _____ date: _____

Receiver: _____

* The LNG properties and composition allow the operator to act in accordance with the known properties of the gas and any operational limitations linked to that.

** Preferably above 70 and referring to the used methane number calculation method in DIN EN 16726. This does not necessarily reflect the methane number that goes into the engine.