Sjøfartsdirektoratet
Norwegian Maritime Authority

Circular - Series R

Circular Series R (Regulations) supersedes previous Series F.
In the new Series R, relevant legal amendments and amendments to conventions are also published.

Circular recipients: (check box)

- ☐ Sdir : Norwegian Maritime Authority
- ☐ A: 16 specially authorised employment offices
- ☐ U: Selected Foreign Service stations
- ☐ P: Equipment manufacturers, any subgroups
- ☐ OFF: Offshore companies/OIM/operators
- ☒ Hov: Main organizations
- ☐ H.i. Bodies or agencies for their comments
- ☐ Others:

No.:	**RSR 18-2016**
Date:	27 December 2016
Journal No.:	2016/63533-36/avi
Supersedes:	Regulations 2005/1218 and Regulations 2002/644
Reference to:	Excerpts from passenger and cargo ships, etc. 2016 p. 1215 and 1269

The Circular should be entered into a special diagram or as appropriate in the latest editions of relevant NMA publications and kept until the next editions.

Regulations on ships using fuel with a flashpoint of less than 60°C and amendments to Regulations on the construction of ships and amendments to other regulations (on construction, on qualifications, on fire protection and on safety management systems) – implementation of the IGF Code

1. Introduction

The Norwegian Maritime Authority has laid down new Regulations on ships using fuel with a flashpoint of less than 60°C. In the following, the term LFF (Low-Flashpoint Fuels) will be used for fuel with a flashpoint of less than 60°C.

Concurrent with the adoption of the new Regulations on ships using LFF, the NMA has laid down amendments to the:

- Regulations of 1 July 2014 No. 1072 on the construction of ships;
- Regulations of 1 July 2014 No. 1099 on fire protection on ships;
- Regulations of 22 December 2011 No. 1523 on qualifications and certificates for seafarers; and
- Regulations of 5 September 2014 No. 1191 on a safety management system for Norwegian ships and mobile offshore units.

The new Regulations on ships using fuel with a flashpoint of less than 60°C repeal and replace the Regulations of 17 June 2002 No. 644 on cargo ships with natural gas fuelled internal combustion engines (Regulations 2002/644) and the Regulations of 9 September 2015 No. 1218 on the construction and operation of gas-fuelled passenger ships (Regulations 2005/1218).

2. Consultation

The proposed regulations were circulated for comments between 25 August and 25 November 2016. The NMA received a total of ten consultative statements. Three of the consultative bodies made comments related to training and the requirement for a certificate of proficiency for seafarers serving on ships using LFF.

3. The background for the new Regulations on ships using LFF and other regulatory amendments

The International Code of Safety for Ships Using Gases or other Low-Flashpoint Fuels (IFG Code), adopted by IMO Res. MSC.391(95), enters into force on 1 January 2017 and will be phased in over a period of time, cf. IMO Res. MSC.392(95) (MSC.392(95)), which stipulates amendments to the International Convention for the Safety of Life at Sea, 1974, (SOLAS), including a new Part G in chapter II-1.

SOLAS chapter II-1 has been implemented into Norwegian legislation through section 3 of the Regulations on the construction of ships. As a result of Norway's obligations as a party to the SOLAS Convention, the NMA has laid down amendments to the Regulations on the construction of ships, which entail that the IGF Code will be implemented and phased into Norwegian legislation from 1 January 2017. The IGF Code will thus become mandatory for passenger ships engaged on foreign voyages and for cargo ships of 500 gross tonnage and upwards engaged on foreign voyages, when such ships are using LFF. These ships are required to hold international safety certificates.

The new Regulations on ships using LFF continue current legislation for ships using liquefied natural gas (LNG) as fuel. Other ship types, such as new high-speed craft and new fishing vessels constructed to use LFF, are also covered by the requirements of the new Regulations on ships using LFF.

The new Regulations on ships using LFF are phasing in the requirements of the IGF Code and will also apply to ships not required to hold international safety certificates, when such ships:

a) have a building contract placed on or after 1 January 2017;
b) or, in the absence of a building contract, the keels are laid or the ships are at a similar stage of construction on or after 1 July 2017;
c) are delivered on or after 1 January 2021.

MSC.392(95) also lays down amendments to SOLAS chapter II-2. These amendments enter into force on 1 January 2017. The amendments to SOLAS chapter II-1 are laid down partly as a consequence of the entry into force of the IGF Code.

SOLAS chapter II-2 has been implemented in Norwegian legislation through section 2 of the Regulations on fire protection on ships. As a result of the amendments to SOLAS chapter II-2, as set out in MSC.392(95), and for the same reason as given above, the NMA has also laid down amendments to the Regulations on fire protection on ships.

Furthermore, new requirements for qualification and certification for workers on board ships using LFF have been set. The new qualification and certification requirements follow from IMO Res. MSC.396(95) (MSC.396(95)), which amends the STCW Convention, and IMO Res. MSC.397(95) (MSC.397(95)), which amends Part A of the STCW Code, respectively.

The STCW Convention and Part A of the STCW Code have been implemented into Norwegian legislation through the Regulations on qualifications for seafarers, which have been amended accordingly as a result of the IGF Code.

The NMA has also laid down amendments to the Regulations on safety management systems. These amendments are explained in point 8 below.

4. Details on the IGF Code

The IGF Code is based on MSC.285(86), which are guidelines on safety for engine installations on board ships using LNG. The guidelines were adopted on 1 June 2009 in order to minimise the risk to the ship, its crew and to the environment. The basic idea behind the IGF Code is that it, based

on the properties of LFF, establishes mandatory provisions for the arrangement, installation, control and monitoring of machinery, equipment and systems using LFF.

The IGF Code addresses and specifies requirements for all areas that need special consideration for the usage of LFF. The guidelines set out in MSC.1/Circ.1394[1] were a starting point for the work related to the IGF Code. As a result of this work and as a basis for the design, construction and operation of installations and systems for the care and use of LFF, objectives and functional requirements are specified for each chapter of the IGF Code.

Part A-1 of the IGF Code contains prescriptive requirements for meeting the functional requirements laid down for the use of liquefied natural gas (LNG) as fuel, cf. chapter 3 of the IGF Code. It follows from the preamble of the IGF Code that rules may be established for other types of LFF than LNG at a later date.

In the following, the NMA comments on the new Regulations on ships using LFF.

5. Notes on the new Regulations on ships using fuel with a flashpoint of less than 60°C

5.1. The Regulations in general

The Regulations implement the IGF Code into Norwegian legislation. The requirements set out the IGF Code will apply to ships required to hold international safety certificates, but also to new ships constructed to use LFF and required to hold national safety certificates. The term «new ships» means ships for which the building contract is placed on or after 1 January 2017, or, in the absence of a building contract, the keel of which is laid on or after 1 July 2017. Ships that use LFF and are delivered on or after 1 January 2021, shall, irrespective of the date of construction or keel-laying, meet the new requirements of the IGF Code.

The Regulations are divided into parts A to D. Part A includes the scope of application, applicable sets of technical construction requirements depending on the date of construction or keel-laying, and general rules on documentation etc. Parts B and C apply to ships constructed before 1 January 2017, or for which the building contract is placed before 1 January 2017, or, in the absence of a building contract, the keels of which are laid before 1 July 2017, or the delivery of which is before 1 January 2021. Parts B and C continue the requirements provided by regulations 2002/644 and 2005/1218. Part D includes common provisions on exemptions and entry into force and repeal of regulations 2002/644 and 2005/1218.

5.2. Special notes on separate sections of new Regulations on ships using LFF

In the following, the Norwegian Maritime Authority comments on individual sections of the Regulations on ships using fuel with a flashpoint of less than 60°C. If otherwise not specified, current law, as provided by Regulations 2002/644 and the Regulations 2005/1218, is continued.

To *section 1 Scope of application*

Section 1 first paragraph specifies which types of ships and vessels are covered by the Regulations. Common to all types of ships and vessels is that they are required to hold statutory certificates issued by the Norwegian Maritime Authority or by an organisation delegated supervisory authority pursuant to section 41 of the Ship Safety and Security Act.

The Regulations not only apply to cargo and passenger ships, but also to high-speed craft and fishing vessels which are to use LFF.

The second paragraph exempts gas carriers using cargo boil-off as fuel, from the Regulations. Gas carriers are cargo ships transporting certain gas cargoes, and shall thus be constructed and

[1] http://www.imo.org/en/OurWork/Safety/SafetyTopics/Documents/1394.pdf

operated in accordance with the requirements of the IGC Code[2]. The exemption corresponds to the exemptions laid down in SOLAS regulation II-1/56.4 and 56.5.

The third paragraph specifies that the term "vessel" refers either to fishing vessels or to high-speed craft. The point is that when such vessels are using LFF and are required to hold statutory safety certificates, the requirements of the new Regulations also apply to such vessels.

To *section 2 Technical and operational requirements*

A common requirement for ships within the scope of the Regulations is that design, construction, arrangements and systems for the use and care of LFF shall comply with a recognised classification society's rules for the use and care of LFF. This requirement continues current law.

Section 2 second paragraph specifies that the requirements of the IGF Code, attached to the Regulations as Annex 1, shall apply to ships as referred to in section 1 first paragraph (a) to (e) when such ships have a building contract placed on or after 1 January 2017, cf. section 2 second paragraph (a).

In the absence of a building contract, the IGF Code will apply as regulation when the keel of a ship has been laid on or after 1 July 2017. The stage of construction equivalent to keel-laying is the stage where the construction identifiable with a specific ship begins, and where the assembly of the ship has commenced comprising at least 50 tonnes or 1% of the estimated mass of all structural material, whichever is less, cf. section 2 second paragraph (b).

Irrespective of the conditions that otherwise follow from section 2 second paragraph (a) and (b), ships pursuant to section 1 (a) to (e) which are delivered on or after 1 January 2021 shall meet the requirements of the IGF Code, cf. section 2 second paragraph (c).

The IGF Code will also apply to ships referred to in section 1 first paragraph (a) to (e), which on or after 1 January 2017 are modified to use LFF, cf. section 2 second paragraph (d).

As for Class A passenger ships, cf. section 1 first paragraph (f), the requirements of the IGF Code are, where appropriate, made applicable for new Class A passenger ships using LFF, by section 8 second paragraph (a) of the Regulations of 28 March 2000 No. 305 on surveys, construction and equipment of passenger ships engaged on domestic voyages, cf. the amendments to SOLAS as laid down in MSC.392(95).

The IGF Code applies to passenger and cargo ships required to hold international safety certificates, for which the building contract is placed, the keels of which are laid, or which are delivered as referred to in section 2 second paragraph, due to the fact that the Regulations on construction implements MSC.392(95) as from 1 January 2017, and thus phases in the IGF Code, making it binding as Norwegian regulation by reference (the amendments to the Regulations on construction are presented below).

Section 2 third paragraph applies to ships delivered before 1 January 2021, when the construction contract was placed on or after 1 June 2009, but before 1 January 2017, cf. third paragraph (a), or in the absence of a building contract, the keels of which are laid between 1 December 2009 and 1 July 2017, cf. third paragraph (b).

[2] The IGC Code is "The International Code of the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk" adopted by MSC.5(48), as last amended by MSC.370(93).

Section 2 third paragraph furthermore allows for the application of IMO's preliminary guidelines for the use of LFF (MSC.285(86)) as an alternative to the construction and equipment requirements contained in Part B of the Regulations (which continues the Regulations 2002/644 or 2005/1218). This option was presented in the NMA's guidance circular RSV 14-2010. The option that section 2 third paragraph allows for, thus continues current law. The preliminary MSC.285(86) guidelines are attached to these Regulations as Annex 2.

Section 2 fourth paragraph continues current law for ships using LFF and not covered by the provisions of the second and third paragraphs. Such vessels shall satisfy the requirements of Part B of these Regulations.

Section 2 fifth paragraph refers to ships covered by the third or fourth paragraph. Such ships shall also comply with Part C of the Regulations. The provisions of Part C will be applicable when the NMA has not yet completed the initial survey in connection with the issue of the certificates referred to in section 1 first paragraph.

To *section 6 Risk analysis*

In section 6, the term «*risk analysis*» is used. The meaning of the term shall be equivalent to «*formal safety analysis»*, as this expression was used in section 8 second paragraph of the Regulations 2002/644.

To *section 7 Classification of hazardous areas*

Until now, the terms «*room*» and «*area*» have both been used in connection with «hazardous». The term «*area*» is used throughout the Regulations on ships using LFF. The term «area» includes both areas which are physically shielded and may be closed, i.e. rooms, and areas which are not necessarily physically shielded and thus cannot be closed. The deciding factor for the area classification is whether an explosion may arise from an uncontrolled release of fuel. Whether the explosion hazard refers to a room or a zone that could be defined as an area, is not of importance. The NMA consider it easier to relate to the term «area», not having to decide whether the space in question is a «room» or an «area», and that it is an accurate term in the context where it is used.

To *section 8 Access*

The NMA has placed all provisions related to access to areas with a potentially explosive atmosphere in a separate section.

To *section 10 Emergency source of power*

The requirement for an emergency source of power is now laid down in the regulations on the construction[3] of cargo and passenger ships. The additional requirements for electricity for valve control and ventilation are thus the only ones which are continued in the new Regulations on ships using LFF.

---

[3] See section 47 of the Regulations of 19 December 2014 No. 1853 on the construction and supervision of small cargo ships and section 8 second paragraph of the Regulations of 28 March 2000 No. 305 on surveys, construction and equipment of passenger ships engaged on domestic voyages, cf. Annex I regulation II-1/D/3.1, cf. section 8 second paragraph (c) (1) of the same Regulations.

To *section 12 Bunkering stations*

Pursuant to section 10 fourth paragraph of the Regulations 2002/644, the bunkering station should be located on the open deck. Section 12 third paragraph of the new Regulations does not continue the requirement for placing the bunkering station on the "open deck", but requires that it shall be physically shielded from accommodation, cargo/working deck and control stations.

Section 12 fourth paragraph continues the requirement for earthing the connection between the bunkering station and the shore-based bunkering facility. Instead of specifically stating that the potential shall be equalised by means of an earth cable, the requirement is now based on function. The reason for this amendment is that there are other ways of equalising any differences in electrical potential than using a cable as earthing connection.

To *section 29 Special provisions for maintenance and repair work*

Section 29 sixth paragraph continues current law, but the template for the permit required pursuant to this provision, cf. section 29 seventh paragraph of the Regulations 2005/1218 with further reference to Annex 2 of the same Regulations, will not be continued. The NMA presupposes that the requirement for a safety management system, cf. section 7 of the Ship Safety and Security Act, implies that normative documents and document templates for maintenance and repair activities related to the fuel system on board ships using LFF are reflected in the safety management system.

To *section 30 Equivalents and exemptions*

The Norwegian Maritime Authority may permit other solutions than those required by the new Regulations on ships using LFF, when it is established that such solutions are equivalent to the requirements of the Regulations.

The provisions of section 30 first paragraph signal that alternative solutions upon written application may be considered equivalent to the requirements of the Regulations. The wording "when it is established" means that the applicant must convince the NMA that the proposed solution provides a level of safety equivalent to the level achieved by the prescriptive requirements of the Regulations. Documentation showing the achievement of an adequate level of safety may, for instance, be based on completed tests of such alternative solutions.

The wording of section 30 second paragraph gives the NMA a legal basis to make decisions on exemptions from the requirements of the Regulations.

An exemption requires that the company submit a written application containing information and justification, which the NMA will then assess, taking into account the considerations and interests that the applicable requirements are meant to look after. Whether a decision is made exempting the company from certain commitments, is decided following a concrete assessment. Companies applying for exemptions are not entitled to have these granted even if the terms of the exemption provision are met.

The starting point is that the requirements of the Regulations shall be met. Only in extraordinary cases, where warranted by valid grounds, will there be an opening for making a decision to exempt. There are two possibilities for granting exemptions, cf. (a) and (b). Pursuant to (a) the criteria are as follows: «it is established that the requirement is not essential and that the exemption is justifiable in terms of safety». That the requirement is not essential means that the requirement concerned is considered to be less essential when compared to the extraordinary

reasons forming the basis for an exemption. In the processing of such applications it is also possible that considerations related to social economy may be taken into account. An exemption pursuant to (a) may only be granted if a waiver of the requirement concerned will still provide a solution considered overall justifiable in terms of safety. The exemption pursuant to (a) will also be relevant in the particular cases where, due to the general wording of the requirements, it is difficult to make the regulatory requirement applicable to the ship in question. With regard to the term *"justifiable in terms of safety"*, assessments must take into account the safety of life and health, environment and material values. Pursuant to (b) the criteria are as follows: «*it is established that compensating measures will maintain the same level of safety as the requirement of these Regulations*» The term *"compensating measures"* is relatively wide, and may include a number of measures, including innovative measures. The compensating measures shall ensure a level of safety equivalent to the level achieved by compliance with the prescriptive requirements of the Regulations.

6. Notes on the amendments to the Regulations on the construction of ships

To *section 3 Requirements for construction, stability and outfitting of cargo ships and passenger ships engaged on foreign voyages*

The amendments to section 3 first paragraph of the Regulations on the construction of ships, implement MSC.392(95) by reference (incorporation).

The amendments ensuing from MSC.392(95) concern SOLAS regulation II-1/2 and new paragraph 29, which defines the IGF Code. Furthermore, the same SOLAS regulation gets a new definition characterising the term «Low-Flashpoint Fuels» (LFF) with reference to SOLAS regulation II-2/2.4.1.1.

SOLAS regulation II-1/55 subparagraphs 1 to 3 are amended so that the storage and distribution systems for LFF, as an alternative to the requirements resulting from the new Part G in SOLAS chapter II-1, may be designed and arranged in accordance with the requirements of SOLAS regulation II- 1/55.3.

MSC.392(95) also lays down a new Part G in SOLAS chapter II-1. This new Part G requires that the IGF Code shall apply to ships using LFF, for which the building contract is placed on or after 1 January 2017, or, in the absence of a building contract, the keels of which are laid or which are at a similar stage of construction on or after 1 July 2017, or which are delivered on or after 1 January 2021. With reference to the new SOLAS regulations II-1/56.4 and 56.5, the IGF Code does not apply to gas carriers using cargo boil-off[4] as fuel, or to gas carriers having storage and distribution systems for LFF which meet the requirements of the IGC Code.[5]

With the exception of the gas carriers referred to above, the new SOLAS regulation II-1/57 requires that ships using LFF shall comply with the IGF Code.

7. Notes on the amendments to the Regulations on fire protection on ships

To *section 2 Fire protection on ships engaged on foreign voyages*

[4] Boil-off is a result of cooled gas at constant pressure being heated by the surroundings and emitting gas, which may be used as fuel.

[5] The IGC Code "The International Code of the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk" adopted by MSC.5(48)

MSC.392(95) also lays down amendments to SOLAS chapter II-2, which has been implemented in section 2 of the Regulations on fire protection on ships.

The amendments to SOLAS chapter II-2 concern, inter alia, regulation 4, which allows for the use of oil fuel having a flashpoint of less than 60°C. The conditions for the use of such fuel oil are that the fuel is not stored in machinery spaces, and that the entire installation has been accepted by the Norwegian Maritime Authority. The purpose of the amendment is that only *fuel oil* may be used. If other types of fuel with a flashpoint of less than 60°C are used, for example LNG or methanol, the requirements of the new Part G in SOLAS chapter II-1 are applicable, cf. new subparagraph 5 of SOLAS regulation II-2/4.2.1.

MSC.392(95) also lays down amendments to SOLAS regulation II-2/4.5.3.2.2. The amendments introduce requirements for tankers constructed on or after 1 January 2017 to have P/V[6] valves for the passage of large amounts of vapour, air or inert gas mixtures during cargo loading and ballasting or during discharging in accordance with SOLAS regulation II-2/11.6.1.2.

As a consequence of the amendments to SOLAS regulation II-2/4.5.3.2.2, there are also amendments to SOLAS regulations II-2/11.6.2 and 11.6.3.

SOLAS regulation II-2/20 on ventilation systems is amended in order to achieve better and safer ventilation and thus increased protection of enclosed vehicle spaces, special category spaces and ro-ro spaces. The purpose of the amendments is to ensure that the ventilation systems are operated in such a way that the replacement of air required by SOLAS regulation II-2/20.3.1.1, is achieved.

New provisions have also been added in SOLAS regulation II-2/20.3.1.2 new subparagraph 4. The amendment applies to ships with ventilation systems designed and operated in accordance with MSC/Circ.1515[7]. When such systems are used, fewer replacements are allowed. Nevertheless, relaxations from the new rules do not apply to spaces referred to in SOLAS regulation II-2/20.3.2.2 and where there is a fixed number of air replacements per hour.

8. Notes on amendments to the Regulations on safety management systems

To *section 1 Scope of application*

Section 5 of the Regulations 2005/1218 required that gas-fuelled passenger ships should have a safety management system «...*which complies with the requirements of the Regulations currently in force concerning safety management systems for passenger ships*». According to the same section second paragraph, the company should establish and maintain a safety management system and request the required audits. The Regulations on safety management systems should apply to ships which are or should be required to have a safety management system in compliance with the requirements of the ISM Code.

The current Regulations on safety management systems also apply, inter alia, to passenger ships. In order to continue current law, cf. section 5 of Regulations 2005/1218, the NMA has therefore amended the Regulations on safety management systems so that all ships using LFF and certified to carry more than twelve passengers have been included in subparagraph (b) of the provision on the scope of application. Former subparagraphs (b) to (f) become subparagraphs (c) to (g).

[6] P/V valves = pressure vacuum valves
[7] Revised design guidelines and operational recommendations for ventilation systems in ro-ro cargo spaces (MSC/Circ.1515)

To *section 3 Requirements for certificates* and section 4 *Certification and audit*

Permanently moored mobile offshore units, such as FPSOs, are now exempt from the requirements of section 3 *Requirements for certificates* and section 4 *Certification and audit* of the Regulations on safety management systems.

Although the requirements for certificates and audits lapses, a safety management system is still required. The NMA presupposes that the requirements of sections 3 and 4 of the Regulations on safety management systems do not contribute to improved safety on permanently moored installations.

Permanently moored installations on the Norwegian continental shelf are mobile offshore units which are at all times covered by the Norwegian shelf regulations. The Norwegian shelf regulations set out a requirement for a [safety] management system in section 17 of the Regulations relating to health, environment and safety in the petroleum activities[8], and supplementary rules are found in the Regulations relating to management in the petroleum activities.[9] It is more convenient and resource-efficient, both for the industry and for the supervisory authority, that the NMA and the Norwegian Petroleum Safety Authority cooperate on supervision in this area, instead of continuing separate and individual inspection and certification regimes.

9. Notes on the amendments to the Regulations on qualifications for seafarers

9.1. General comments

The amendments to the STCW Convention, as set out in MSC.396(95), and to Part A of the STCW Code, as set out in MSC.397(95), are, as mentioned above, adopted as a result of the entry into force of the IGF Code and will be phased in from 1 January 2017. The amendments introduce, inter alia, requirements for new certificates of proficiency in basic or advanced training for service on ships which are constructed and equipped in accordance with the requirements of the IGF Code, and which use LFF.

The NMA has compared Norwegian training requirements already applicable for seafarers working on board ships using LFF with the training requirements imposed by the new tables A-V/3-1 (basic training) and A-V/3-2 (training for management) in Part A of the STCW Code. The result of the comparison indicates no significant differences between the Norwegian training requirements and the training requirements which shall apply to persons working on board ships subject to the IGF Code.

There are already around 50 Norwegian ships using LFF. This group of ships include both cargo and passenger ships. It follows from current law that seafarers working on board such ships shall have basic training – referred to as "A training". Masters, deck officers and chief engineer officers are required to have advanced training, referred to as "B training" and "C training", respectively. The training is provided in the form of courses at maritime schools or taken as internal training at companies with a training program approved by the NMA.

Ships already using LFF, such as LNG, will not be covered by the material requirements of the IGF Code. The NMA nevertheless feels that the training requirements which shall apply to seafarers working on board ships required to comply with the IGF Code, should also apply to seafarers

[8] Regulations of 12 February 2010 No. 158 relating to health, safety and environment in the petroleum activities and at certain onshore facilities

[9] Regulations of 29 April 2010 No. 611 relating to management and the duty to provide information in the petroleum activities and at certain offshore facilities

with duties and responsibilities for the use and care of LFF on board existing ships using LFF. The training requirements of the new tables A-V/3-1 and A-V/3-2 and subsequent courses thus apply to those who shall hold a certificate of proficiency in order to work on board new or existing ships using LFF. Seafarers who can document training as required by Regulations 2002/644 or Regulations 2005/1218 and have relevant seagoing service on board ships using LFF, may be issued with a certificate of proficiency. The transitional arrangement follows from section 69 fifth paragraph and section 69a fifth paragraph.

MSC.397(95) section 3 allows for the possibility of exempting cargo ships of less than 500 gross tonnage from parts of the training requirements set out in the resolution. Section 12 first paragraph of the Regulations 2002/644 required that the operational crew of a cargo ship, irrespective of trade area and gross tonnage, must have the necessary training in gas-related safety, operation and maintenance before commencement of service on board. According to the second paragraph of the same provision, the part of the crew directly responsible for the operation of gas-related equipment on board, was also to receive special training. These training requirements are continued in sections 69 and 69a of the Regulations on the qualifications for seafarers. Exemptions from requirements for training are therefore limited to fishing vessels and non-seagoing ships, cf. section 91 of the Regulations on the qualifications for seafarers.

9.2. Special notes on the amendments to the Regulations on qualifications for seafarers

To *section 19 Renewal of certificates of competency and certificates of proficiency*

In order to avoid duplicate requirements, the NMA has amended section 19 sixth paragraph of the Regulations on qualifications for seafarers, which now only implements general and common requirements for the renewal of certificates of proficiency. The specific requirements, for example concerning training and relevant seagoing service required to renew the different certificates of proficiency, are given in the sections of the Regulations on qualifications for seafarers where requirements for the renewal of the certificate of proficiency are laid down, see e.g. sections 56, 58 and 60 of the Regulations on qualifications for seafarers.

To *section 69 Requirements for training and qualifications for seafarers assigned specific duties on ships using fuel with a flashpoint of less than 60°C*

The first and second paragraph: The training required pursuant to the second paragraph of the amended section 69 is equivalent to the training pursuant to section 12 first paragraph of Regulations 2002/644 or section 69 of the Regulations on the qualifications for seafarers, respectively, cf. Annex IX to the same Regulations.

As a consequence of the amendments to section 69 of the Regulations on the qualifications for seafarers, the basic training requirements related to the use and care of LFF apply to seafarers assigned specific duties and responsibilities related to the use and care of fuel on board ships using LFF. The training requirements are common, whether the service shall be carried out on board new ships which are constructed and equipped in accordance with the requirements of the IGF Code, or on board existing ships. The training requirements which shall be met in order to be issued a certificate of proficiency in basic training are equivalent to the requirements set out in the new regulation STCW V/3 and the new regulations in Part A-V of the STCW Code.

As proof of the skills required to perform certain duties or other specific responsibilities associated with the use and care of LFF, the NMA has decided that no later than 1 July 2018 a certificate of proficiency in basic training for service on board ships using LFF is required. The certificates of proficiency are issued by the NMA upon application and documentation.

The third paragraph: The provisions implement Part A, new rule A-V/3 No. 1.1.2 of the STCW Code. A new table A-V/3-1 is added to Annex IX to the Regulations on the qualifications for seafarers. The new table includes requirements relating to competence, the content of the associated skills, further methods which shall be used to demonstrate the skills, and criteria for the subsequent evaluation. The pattern used in table A-V/3-1 is equal to the patterns used in other tables in annexes to the Regulations on the qualifications for seafarers that determine the competence and skill requirements according to the STCW Convention and Part A of the STCW Code.

The fourth paragraph equates the skills required pursuant to section 57 or 58 of the Regulations on the qualifications for seafarers, with the skills required by the new section 69 first paragraph. This means that employees on ships holding certificates of proficiency which prove they are trained to perform certain duties and responsibilities relating to cargo or cargo equipment on board gas carriers, have the necessary skills required to perform certain duties and responsibilities on board ships using LFF.

The fifth paragraph: Current law requires documented training of seafarers working on board ships using LFF. Employees on ships who can document sufficient training and have at least three months of seagoing service on board ships which have used or are using LFF during the period 1 January 2013 to 31 December 2017, may upon application be issued with a STCW certificate of proficiency in basic training. This provision recognises the documented qualifications and skills gained when seafarers have three months of relevant seagoing service on board ships using LFF over the last five years. Any person who can document seagoing service and training according to the requirements of section 12 first paragraph of the Regulations 2002/644 or section 69 of the Regulations on the qualifications for seafarers, respectively, cf. Annex IX of the same Regulations, may upon application be issued with a STCW certificate of proficiency in basic training. A certificate of proficiency is required on or after 1 July 2018.

The sixth paragraph contains provisions on renewal of certificates of proficiency. A renewal requires documentation of the completion of a specially arranged refresher course or three months of seagoing service and relevant service on board ships using LFF.

To *new section 69a Requirements for training and qualifications for seafarers with immediate responsibility for the care and use of fuels with a flashpoint of less than 60°C*

The first and second paragraph: In the new section 69a, like in section 69 first paragraph, requirements are laid down concerning a certificate of proficiency in advanced training of masters, engineer officers and other personnel with immediate responsibility for the care and use of LFF. Immediate responsibility means persons on board who have decision-making powers and the right and duty to organise the work. Like section 69 first paragraph, the requirement for a certificate of proficiency for any person with immediate responsibility for the care and use of LFF, will be mandatory from 1 July 2018. The certificates of proficiency are issued by the NMA upon application and documentation.

The training requirements for certificates of proficiency are laid down in section 69a second paragraph. The NMA presupposes that the advanced training required in order to be issued with a certificate of proficiency, is equivalent to the training required pursuant to section 12 first paragraph of the Regulations 2002/644 or section 69 of the Regulations on the qualifications for seafarers, cf. Annex IX of the same Regulations. The training requirements for the issue of a

certificate of proficiency in advanced training are equivalent to the requirements set out in the new rule STCW-V/3 and new rules of Part A-V of the STCW Code.

The third paragraph: This provision implements Part A, new regulation A-V/3 No. 2.1.2 of the STCW Code. A new table A-V/3-2 is added to Annex IX to the Regulations on the qualifications for seafarers. The new table of Annex IX includes requirements concerning competence and the content of the associated skills, further methods to be used to demonstrate skills, and criteria for the subsequent evaluation. The pattern used in table A-V/3-2 is equal to the patterns used in other tables in annexes to the Regulations on the qualifications for seafarers that determine the competence and skill requirements according to the STCW Convention and Part A of the STCW Code.

The fourth paragraph: The provision of the fourth paragraph is based on the skills required by section 58. This means that masters, engineer officers and other personnel holding certificates of proficiency in advanced training for gas carrier cargo operations have the necessary skills to ensure that the immediate responsibility for the care and use of LFF on board ships using such fuels, is provided for.

The fifth paragraph has provisions equivalent to section 69 fifth paragraph. The provisions of the fifth paragraph imply that any person who is covered by section 69a, who can document satisfactory training, i.e. A+B or A+C courses, and who has at least three months of seagoing service on board ships which have used or are using LFF between 1 January 2013 and 31 December 2017, may upon application be issued with a STCW certificate of proficiency for advanced training on board ships using LFF. Like the provisions of section 69 fifth paragraph, cf. first paragraph, the requirement for a certificate of proficiency will be mandatory as from 1 July 2018.

The sixth paragraph contains provisions on renewal of certificate of proficiency. A renewal requires documentation of the completion of a specially arranged refresher course or three months of seagoing service and relevant service on board ships using LFF over the last five years.

Annex I to the Regulations on the qualifications for seafarers has been amended so that table B-1/2, which provides an overview of certificates or documentary evidence required under the STCW Convention and the Regulations on the qualifications for seafarers, has a new row indicating that it is required to register the certificates of proficiency issued pursuant to sections 69 first paragraph and 69a first paragraph, and also that certificates of proficiency must be renewed every five years.

Annex IX to the Regulations on the qualifications for seafarers has been amended so that the existing requirements have been replaced by two new tables, cf. section 69 second and third paragraphs and table A-V/3-1 for basic training and section 69a second and third paragraphs and table A-V/3-2 for advanced training on boards ships using LFF.

10. Economic and administrative consequences

As referred to above, there are already requirements that apply to all gas-fuelled cargo and passenger ships registered in a Norwegian ship register. The Norwegian requirements are partly based on the particular rules set by recognised classification societies for ships constructed to use LFF. Moreover, RSV 14-2010 allowed for the application of the preliminary guidelines

established in MSC.285(86) as an alternative to the construction and equipment requirements of Regulations 2002/644 or 2005/1218.

The IGF Code largely reflects the recognised classification societies' standards and rules for the design of the tank, bunkering and distribution arrangements on board ships constructed to use LFF, and the guidelines of MSC.285(86). It is thus the NMA's assessment that when the IGF Code is implemented as regulation for new ships constructed to use LFF, this will make a positive contribution to the development of law and increased harmonization of standards and safety at sea for ships using LFF.

It is clear enough that ships which are gas-fuelled at the time of the entry into force of the IGF Code, are not covered by the IGF requirements, i.e. they continue as before.

10.1. Consequences for the different participants

For **companies**, the construction and outfitting of ships using LFF will most likely lead to higher investment costs.

Since low-flashpoint fuels, such as LNG, contain less energy per unit volume than e.g. diesel, this may cause a loss of volume on board that could otherwise be used for goods and cargo, equipment and tools. Increased gross tonnage of ships is another possible consequence of the fact that LFF requires greater storage capacity.

Compared to the use of oil-based fuel, LNG is currently proportionately more expensive than e.g. HFO. It is nevertheless expected that LNG will become a cheaper alternative. If emitting NO_x and SO_x becomes more expensive, the difference in price between HFO and alternatives such as LFF will most likely be further reduced.

The new training requirements of the STCW Convention and STCW Code apply to seafarers on board ships using LFF. The training will be divided into a basic course and an advanced course, just as before the entry into force of the new Regulations. Currently, efforts are made to prepare model courses based on the competences required by the new STCW regulation V/3 and related tables of the STCW Code A-V/3-1 and 3-2. The NMA has no information as to when the new courses may be offered, but presupposes that they will be available before the first ships constructed in accordance with the requirements of the IGF Code are placed in service.

As specified above, the NMA believes that any differences between the current requirements for training for seafarers on board ships using LFF and the requirements stipulated in the STCW amendments, are not considerable. Furthermore, it is the NMA's assessment that the time spent and costs related to the completion of the training being prepared in the new model courses, will be approximately equal compared to the time spent and costs pursuant to current law.

A company that chooses gas-fuelled operation for its ships does so from a cost-benefit perspective, where e.g. LNG, with all conditions taken into account, is considered the most profitable option among several alternatives (HFO, diesel, battery, fuel cell, etc.). Whether a shipowner chooses to use gas or other comparable fuels, is thus a question of the scope and quality of the information available, on which the participants' assessments are based.

Marine engineers design ships and systems used on board ships. The IGF Code's standards for the construction of ships using LNG or other types of low-flashpoint fuels will require up-to-date knowledge. The contra-entry of the training costs will be business development and increased income.

Shipyards specialising in solutions for ships using gas or other low-flashpoint fuels will have to bear the costs of acquiring the knowledge needed to design and complete the arrangements required by the IGF Code. The contra entries will be revenues.

Engine and equipment manufacturers who can or want to offer products required on board ships using LFF must invest in research and development to keep up with their competitors. The use of low-flashpoint fuels requires special engine installations and a related infrastructure for storage and distribution of such fuels. Manufacturers who are not capable of changing in order to deliver products that meet the needs of the industry, risk a loss of market share and consequences thereof.

Educational institutions will be able to offer additional certificate courses. The expense side will be linked to the internal need for training and development and quality assurance of curricula required to meet the requirements of the STCW Convention and Part A of the STCW Code. The contra entry will be revenue generated by training activities.

Crew members engaged on ships using LFF are required to hold a certificate which proves that they have the skills required to serve on such ships.

The NMA has established a transitional arrangement under which seafarers who can document training and relevant seagoing service on board ships using LFF, upon application may be issued with a certificate of proficiency covering all the competence requirements according to the STCW Code AV/3-1 and 3-2.

Given the premise that the qualifications are required in order to serve on board ships using LFF, and lead to proportionality between the responsibility taken on by the person(s) involved and the work remuneration received, the training costs will be neutral.

Classification societies charge for classifying ships according to their own regulations. Classification societies must invest (costs) in order to develop a set of rules for hull and machinery for ships using e.g. LNG as fuel. Furthermore, case handlers and surveyors must receive instructions as to how the rules are to be applied. The associated costs must be covered by service charges, licensing and consultants' fees, if any.

Provided that the safety level for ships using LFF is equivalent to the safety level on ships using fuels with a flashpoint of 60°C or more, the casualty statistics are expected to remain the same. For the **insurance industry**, the consequences of the implementation of the IGF Code into Norwegian legislation are therefore assumed to be neutral, both with respect to premium income and loss payouts.

Port owners with ports regularly visited by e.g. gas-fuelled ships will have to invest in infrastructure that contributes to effective ports of call. The investments could be necessary in order to be able to offer competitive services. The contra entry will be revenue generated as a result of the use of the infrastructure. With a growing number of ports offering LFF bunkering, the number of ships using such fuels is also likely to increase.

Manufacturers of LNG may by increased use of LNG as marine fuel develop the market and grow at the expense of manufacturers offering HFO and distillates for ships.

Oil refineries and **distillate manufacturers** may expect reduced demand for marine distillates. The demand for land transportation is expected to increase due to the growth in population. Any reduction in the demand for marine distillates may therefore be consumed by the land transport sector's increased demand for e.g. diesel.

10.2. Competition aspects – distortion of competition

Through more than ten years of experience with use of LNG as fuel on Norwegian ships, Norway is a pioneer in the use of liquefied natural gas in internal combustion engines on ships. This is partly due to national incentives built around tax policy and the establishment of the NO_x fund that provides grants for measures to reduce NO_x emissions, such as the installation of engines and systems using LNG as fuel.

Norway's experience with gas as fuel is partly based on DNV GL's rules on storage and distribution of liquefied natural gas on board ships. The NMA has been an important supplier of terms with regard to establishing a satisfactory level of safety. The IGF Code largely reflects the Norwegian regulations. The amendments to the STCW Convention and Part A of the STCW Code are inspired by Norwegian experience with requirements for training of personnel who are to operate ships using LFF.

An international standard contributes to equal conditions of competition for the industry and may contribute to an increased number of gas-fuelled ships. A growing market for gas-fuelled ships will most likely be beneficial for parts of the Norwegian maritime value chain.

10.3. Consequences for the environment

The IGF Code includes supplementing requirements for chapter II-1 and partly chapter II-2 of SOLAS. SOLAS establishes minimum requirements for constructing and operating ships in a safe and reliable way. Compared to oil-based fuels (HFO, gas oil, diesel), the use of e.g. LNG for ship propulsion will reduce the emissions of carbon dioxide (CO_2) by 25 percent, nitrogen oxides by 85 percent and sulphur by 100 percent. From a national and international health and climate perspective, an increased use of gas as fuel on board ships and a simultaneous reduction in the use of traditional fuels will be considered positive.

Emissions from Norwegian ships are included in the Norwegian climate accounts. A common international standard providing equal conditions of competition for the industry may contribute to greater use of fuels with a smaller environmental footprint than today. Such increased use will be positive both for the Norwegian and international climate accounts.

11. Total costs compared to benefits

In principle, the use of LFF on board ships is voluntary. Emissions from ships may also be reduced in other ways than by using LFF. Based on available knowledge and analyses of advantages and disadvantages associated with the various types of fuel, the individual industry player may estimate the total costs of implementing and using the measure.

A common standard for training of seafarers working on board ships using LFF will contribute to flexibility and transparency. The certificate of proficiency itself is proof that the person has the necessary training required pursuant to the Regulations on the qualifications for seafarers. The requirement for certificate of proficiency thus replaces the requirement that the company, pursuant to current law, must document the necessary training. Today, an application for certificate of proficiency costs NOK 442, but it will ease the administrative burdens on both seafarers, heads of department on board and companies.

Repealing the requirement for a safety management certificate and requirements for related audits for permanently moored mobile offshore units, cf. the amendments stipulated in sections 3 and 4 of the Regulations on safety management systems, will reduce the total costs of

following up DOC[10] and SMC[11], both for the company and the Norwegian Maritime Authority, and will thus be resource-efficient, both for the industry and for the supervisory authority. Moreover, the proposed amendment will not lead to reduced safety nor have other negative consequences, neither for the industry, nor for the public.

Lars Alvestad
Acting Director General of Navigation and Shipping

Bjørn E. Pedersen
Head of Department

This document has been electronically approved, and therefore does not contain handwritten signatures.

Attachments:

- Regulations of 27 December 2016 on ships using fuel with a flashpoint of less than 60°C
- Regulations of 27 December 2016 concerning amendments to Regulations on the construction of ships and amendments to other regulations

[10] Document of Compliance
[11] Safety Management Certificate