RULES
FOR THE CLASSIFICATION OF SHIPS

Part 33 – SHIPS USING GASES OR OTHER LOW-FLASHING FUEL
July 2022

Amendments No. 2
July 2023

CROATIAN REGISTER OF SHIPPING

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By the decision of the General Committee of Croatian Register of Shipping,

Amendments No. 2 to the

RULES FOR THE CLASSIFICATION OF SHIPS

Part 33 – SHIPS USING GASES OR OTHER LOW-FLASHING FUELS

have been adopted on 26th June 2023 and shall enter into force on 1st July 2023

GENERAL TERMS AND CONDITIONS

(March 2022)

Article 1
GENERAL

1.1 CROATIAN REGISTER OF SHIPPING (hereinafter: the *Register*) shall at all times remain an independent contractor and neither the *Register* nor any of its officers, surveyors, auditors, inspectors, agents, appointers, officers or managers shall act as an employee, servant or agent of any other party in the performance of the Services rendered by the *Register*.

1.2 The *Register* acts as a service provider. The Services provided by the *Register* cannot be construed as a commitment by the *Register* to achieve any result or as a warranty.

1.3 The provision of Services is subject to these General Terms and Conditions. No other terms and conditions shall apply, either expressly or by implication, unless expressly agreed in writing between the Parties.

1.4 These General Terms and Conditions shall be incorporated into, or referred to in any Contract and shall prevail over and exclude any other terms and conditions that the Client may wish to impose.

Any amendments to and/or deviations from these General Terms and Conditions, as well as any additional terms and conditions of the Client, shall be binding or valid only if set forth in writing and duly signed by the authorised representatives of both Parties.

1.5 The invalidity of one or more provisions of these General Terms and Conditions shall not affect the remaining provisions.

1.6 The Client acknowledges that the latest version of these General terms and Conditions and the latest version of applicable Rules apply to the Services provided by the *Register*.

1.7 Definitions in these General Terms and Conditions take precedence over other definitions that may appear in other documents issued by the *Register*.

1.8 The Client should at all times be aware of the provisions of these General Terms and Conditions, as they may be further amended, with their latest up to date version available on the web site of the *Register*.

Article 2
DEFINITIONS

2.1 **Certificate** means either a class certificate or statutory certificate, statement, attestation, statement of compliance, and a report following the Services provided by the *Register*.

2.2 **Certification** means the activity of certification in application of international and national standards and international industry practice provided by the *Register*.

Certification is an appraisement given by the *Register* to the Client and cannot be construed as an implied or express warranty of safety, fitness for purpose, seaworthiness of the vessel or its value for sale, insurance or chartering.

The purpose of Certification is to provide classification and statutory services and assistance to the maritime industry, Flag State Administrations, and regulatory authorities relating to maritime safety and pollution prevention.

2.3 **Classification** includes all activities and Services provided by the *Register* in accordance with the Rules. Classification may or may not be accompanied by the issuance of a Certificate of class with reference to the Rules.

Certificate of class is valid only if issued by the *Register*.

However, Certificate of class should not be construed as a guarantee of the safety, fitness for purpose or seaworthiness of the vessel. It is merely an attestation that the vessel complies with the Rules developed and published by the *Register*.

In addition, the *Register* is not a guarantee of the safety of life or property at sea or the seaworthiness of a vessel because, although the classification of a vessel is based on the assumption that the vessel will be properly loaded, operated, and maintained by competent and qualified personnel, the *Register* has no control over how a vessel is operated and maintained between the periodic surveys it conducts.

2.4 **Statutory certification** means certification made by the *Register* on behalf of the Flag State Administrations when and to the extent that the *Register* has been authorised to do so by the respective Flag State.

Statutory certification and services include the assessment of vessels registered by the Flag State and/or ship management companies to determine whether such ships/companies comply with the applicable requirements of international conventions, codes and national legislation, and the issuance of, or assistance in the issuance of, the appropriate certificates and documents.

Statutory certification includes, but is not limited to, certification, survey, and issuance of statutory certificates on behalf of the Flag State.

In cases where the *Register* acts on behalf of Flag State Administrations, the *Register* shall follow guidance issued by IMO (Resolutions, Circulars, etc.) or by IACS through Unified Interpretations (UI), unless otherwise directed by the Flag State.

2.5 **Client** means the shipowner, company, shipyard and/or party requesting Services or taking ownership of a classed vessel. In cases where shipowners have authorized another party to operate the vessel on their behalf, that party shall be considered as the company.

In addition to the above the Client means the person and/or entity that has requested Services from the *Register* and that has entered into a Contract or an agreement for Services with the *Register*.

2.6 **Parties** means the *Register* and Client together.

2.7 **Party** means the *Register* or the Client.

2.8 **Contract** means the contract in the form of a written agreement between the Client and the *Register* requesting Services, including these General Terms and Conditions and the Rules.

The provisions related to the Contract in these General Terms and Conditions shall apply even if there is no written agreement between the Client and the *Register*.

The Client may request the *Register* in writing to make a change to the contracted Services. However, the *Register* shall not be obligated to accept or execute any such change until a written agreement has been signed with the Client regarding the compensation and the possible impact of the change on the schedule as an addendum to the originally contracted Services.

2.9 **Services** shall mean the services specified in 2.2. 2.3 and 2.4, but also other services related to certification, classification and statutory certification, such as, but not limited to: ISM Code certification, ISPS Code, MLC 2006 certification, fuel oil consumption reporting, IHM certification, approval of manufacturers and service providers, certification of materials and products, training activities, conformity assessment, and any other relevant activities such as third party inspections, testing, shore and shipboard trials.

The Services provided by the *Register* are performed on a random basis and in no case include a full inspection of all items.

The *Register* shall provide the Services in accordance with related Contract(s), the provisions of these General Terms and Conditions, Rules, the international and national standards, the international conventions, the EU Regulations, the Flag State requirements and the industry practices applicable to the particular Service and always assuming that the Client is aware of these standards and the industry practices.

When providing Services, the *Register* does not guarantee the accuracy of the information or advice provided.

In providing Services, the *Register* does not assess compliance with standards other than the Rules, international and national standards, international conventions, EU regulations, Flag State requirements and industry practice, to the extent agreed in writing or specified in the Contract.

2.10 The ***Register*** means the Croatian Register of Shipping, an entity organized and existing under Croatian law, which, according to the Law on the Croatian Register of Shipping (Official Gazette No. 1996/81, 2013/76 and 2020/62) and the Charter of the *Register*, is an independent, not-for-profit, but public welfare oriented, public foundation that performs tasks:

- classification of sea-going ships,
- statutory certification of sea-going ships on behalf of the Flag State Administrations,
- classification of inland navigation vessels,
- statutory certification of inland navigation vessels,
- statutory certification of recreational crafts,
- certification of materials and products,
- conformity assessment of recreational crafts,
- conformity assessment of marine equipment,
- conformity assessment of pressure vessels,
- certification/registration of quality management systems.

2.11 **Vessel** means a ship, vessel, unit or offshore structure of any kind, whether or not connected to the shore or sea/river bed, located at sea or in inland waters and intended for transportation or special operations on the water, as decided by the *Register*.

2.12 **Rules** means the Rules for the classification, guidelines, instructions, or other documented evidence of the *Register* related to the Services provided.

The competent interpretation of the requirements specified in the Rules or other regulations published by the *Register* shall be the exclusive responsibility of the *Register's* Head Office, notwithstanding any possible different interpretations by other parties.

In cases where the Rules do not contain detailed requirements, the specific approval by the *Register* shall be based on the principles of the Rules and shall ensure a safety standard equivalent to that of the Rules.

Article 3
RESPONSIBILITIES

3.1 It is the Client's responsibility to ensure that all surveys required for vessel's class maintenance are conducted in a timely manner and in accordance with the Rules.

3.2 The *Register* may suspend or withdraw the vessel's existing Certificate of class in the event of serious deficiencies and replace it with a new Certificate of class with a shortened period of validity during which the deficiencies are to be rectified.

In addition, the *Register* shall suspend or withdraw a vessel's Certificate of class if the deficiencies are of such a magnitude as to endanger the class of the vessel, its safety and integrity, the safety of the crew, passengers, or the marine environment, and shall require that the vessel is to be inspected at the first port of call where the necessary repairs are to be carried out.

3.3 The Client should inform the *Register*:

(i) in the event of a change in the intended use of a vessel, a conversion and alteration of the hull, machinery installations and other equipment affecting the Class of the vessel assigned by the *Register*. Conversions and alterations must be made under the supervision of the *Register* and must comply with the requirements of the Rules and/or additional requirements of the *Register*,

(ii) in cases where the vessel has been damaged to such an extent that the Class of the vessel is likely to be affected and the safety and integrity of the vessel is likely to be compromised. In such cases, the vessel must be surveyed at the first port of call or as further directed by the *Register*. The survey shall be to the extent deemed necessary by the *Register*, by taking into account the extent of the damage.

(iii) in cases where class-related deficiencies and/or defects are found as a result of a Flag State inspection or Port State Control. Should the Client fail to notify the *Register* of the detention of the vessel by Port State Authorities due to class related deficiencies, the *Register* reserves the right to suspend or withdraw the Certificate of class.

3.4 The *Register* shall have full control over Certificates issued and may suspend or withdraw a Certificate at any time in its sole discretion if the Client fails to comply with the following requirements set forth in the *Rules for the Classification of Ships, Part 1 - General Requirements, Chapter 1 - General Information*, as applicable:

(i) para. 5.3 - *Maintenance of the validity of Certificate of Class*,
(ii) para. 5.4 - *Period of Validity*,
(iii) para. 5.5 - *Extension of the Period of Validity*,
(iv) para. 5.6 - *Suspension and Reinstatement of Class in the Case of Overdue Surveys*, and
(v) para. 5.7 - *Withdrawal of Class*.

3.5 The *Register* may suspend or withdraw a Certificate at any time in its sole discretion if the Client fails to comply with the following requirements set forth in the *Rules for the Classification of Inland Navigation Vessels, Part 1 - Classification and Surveys, Chapter I - Principles of Classification*, as applicable:

(i) para. 2.8 - *Maintenance of the Validity of the Certificate of Class*,
(ii) para. 2.9 - *Extension of validity of the Certificate of Class*,

and following requirements set forth in the *Rules for the Classification of Inland Navigation Vessels, Part 1 - Classification and Surveys, Chapter II - Classification*, as applicable:

(iii) para. 2.1 – *Suspension of Class*,
(iv) para. 2.2 – *Withdrawal of Class*.

3.6 In addition to clauses 3.2, 3.4 and 3.5 of this Article, the *Register* reserves the right to terminate the Services and related Contract in the event of a breach of the provisions of these General Terms and Conditions.

3.7 If the Client fails to provide the *Register* with the required access or information at the agreed times or fails to prepare for the Service in a timely manner, the *Register* may suspend the provision of the Service until it receives the Client's instructions for access and/or the required information.

The *Register* shall not be liable for the consequences of such suspension, and the Client shall be responsible for the *Register's* additional fees and other unnecessary costs and expenses incurred by the *Register*.

3.8 The Client is obliged to perform timely payments of the invoices for provided Services. However, the *Register* may retain or withhold any Service or Certificate to the Client in the case of outstanding payments, whether mutually related or not, arising out of the entire business relationship with the Client.

Article 4
HEALTH, SAFETY AND ENVIRONMENT

4.1 Both the *Register* and the Client shall apply reasonable standards to promote safety, health, and environmental protection and to provide a safe working environment for their personnel.

4.2 The Client shall provide the *Register* with all access and information necessary for the safe and efficient performance of the requested Services as required by the Rules.

4.3 During the survey, personnel of the *Register* should have secure access to all work that directly or indirectly affects the Service.

4.4 The *Register* has the right to refuse to conduct an activity or visit an area or site if the *Register* in its sole discretion, believes that relevant risks are unacceptable or are not adequately addressed, contained, or otherwise mitigated. Such a decision shall suspend the obligations of both Parties under the Contract without incurring any liability or penalty until the Parties agree on how to proceed.

Article 5
THIRD PARTIES AND SUBCONTRACTORS

5.1 Each specific Contract, including any Certificates issued, relates specifically to the Client, and no rights, obligations, interests, claims, benefits or Certificates issued shall extend to any third party without the prior written consent of the *Register*.

5.2 The Client shall not be entitled to grant any right to use the Certificates to any third party without the prior written consent of the *Register*.

5.3 The Client shall not without *Register's* consent, cede, assign, transfer, subcontract or deal in any manner with all or any of its rights or obligations under any Service and related Contract.

5.4 With regard to third party rights to access information and Certificates under confidentiality clause reference is to be made to Article 9.

Article 6
TAXES

6.1 Each Party shall be responsible for and shall bear all taxes, duties or similar governmental charges levied or imposed on any activity of that Party.

6.2 Prices, fees, rates, or remuneration are exclusive of any form of sales tax, value added tax, administrative fees and services tax and/or other similar taxes, including any surcharges. If any such indirect tax is or becomes applicable to the Services provided under the Contract, the Client shall be responsible for the payment of such indirect taxes.

Article 7
PAYMENT OF INVOICES

7.1 The provision of Services by the *Register*, whether complete or not, shall include payment of fees thirty (30) days after issuance of the invoice for the portion of the Services performed.

7.2 In the event that the Client fails to meet the requirements for payment in accordance with the instalments and terms of payment contained herein, the *Register* reserves the right to charge the Client with the interest rate in accordance with the applicable laws of the Republic of Croatia.

7.3 If the Client disputes an invoice or part of an invoice, the Client shall notify *Register* thereof in writing without undue delay. If no notification is received by the due date, Client shall be deemed to have accepted the invoice in full. If only part of an invoice is disputed, the undisputed amount must be paid by the due date.

Consequently, no disputes arising between the *Register* and the Client shall interfere with prompt payment of invoices by the Client. Any rights of lien or retention in favour of the Client or otherwise, are hereby excluded.

7.4 In the event of cancellation of all or part of the Services prior to their final completion, the Client shall pay all costs incurred by the *Register* on pro-rata basis for the portion of the Services provided to date. In such event, the *Register* will not claim the Client for loss of profit or reduced income. All reasonable costs directly attributable to the early termination and all amounts due to the *Register* at that time shall become immediately due and payable.

7.5 In the event of termination of the Service and related Contract, the *Register* shall be entitled to retain any payments, deposits or prepayments of fees made by the Client prior to the date of termination up to the amount to which the *Register* is entitled.

Article 8
TERMINATION

8.1 The Parties shall have the right to terminate the Services and the related Contract(s) by written notice to the other Party, and without prejudice to Article 7, in the following cases:

(i) if the other Party commits a material breach of these General Terms and Conditions and/or the Contract and fails to rectify such breach in accordance with clause 8.4 of this Article,
(ii) if the other Party becomes insolvent, is unable to pay its debts as they become due, or becomes subject to bankruptcy proceedings, administration, receivership, dissolution, liquidation, winding up or otherwise ceases to carry on its business; or
(iii) for convenience, after giving the other Party thirty (30) days' prior written notice of termination.

8.2 The Classification issued for the relevant vessel and the Certificates previously issued shall remain valid until the effective date of termination or, in the event of such termination, immediately, subject to compliance with Article 3 and Article 7.

8.3 If, in the reasonable opinion of the *Register*, the Client breaches or is suspected of breaching Article 14 or Article 15, the *Register* shall have the right to terminate the Service and related Contract with immediate effect.

8.4 Notwithstanding the provisions of clause 8.1 of this Article, the Party intending to terminate Services for non-compliance or breach of the provisions of these General Terms and Conditions shall notify the other Party of the non-compliance or violation of the provisions of these General Terms and Conditions and set a reasonable deadline of 15 (fifteen) days for the other Party to remedy the breaches of the provisions of these General Terms and Conditions.

If the Party fails to remedy the breaches of the provisions of these General Terms and Conditions within the aforementioned period, the other Party shall have the right to terminate Services without further notice.

8.5 Termination of the Service and related Contract pursuant to the provisions of these General Terms and Conditions shall not give either Party the right to claim any additional compensation, indemnity or reimbursement from the other Party as a result of such termination, but such termination shall not affect any rights or remedies available to a Party at the time the termination becomes effective or any obligations or liabilities incurred by a Party.

Article 9
CONFIDENTIALITY

9.1 The Parties agree to keep confidential all facts, data, information, etc. related to the other Party's business that they have learned in the course of providing Services. Such information and data shall not be disclosed by the Parties to any third party and shall not be used or misused to the detriment of the other Party.

9.2 The *Register* will keep confidential any data, plans or other technical information received from the Client and will not disclose it to any third party outside the *Register*, unless authorised by the Client. This obligation shall continue to apply after termination of the Services. This obligation shall not apply to any data, plans or other technical information that was in the possession of the *Register* prior to being disclosed to the *Register* by or on behalf of the Client, or that becomes publicly available through no fault of the *Register*, or is otherwise provided to the *Register* by an independent source that is under no obligation of confidentiality to the *Register*.

9.3 Certificates issued by the *Register* to the Client as a result of the Services provided shall not be covered by the confidentiality Article.

Notwithstanding the foregoing, the Client shall be entitled to disclose any data to its affiliates involved in the transactions related to the Services or the Client's core activities.

9.4 Notwithstanding clause 9.1 and clause 9.2 of this Article, the *Register* shall have the right to disclose the Confidential Information to the following parties if required by regulations of:

(i) authorised representatives of the Flag State Administration,
(ii) authorised audit teams (i.e., accreditation body or EC auditors),
(iii) the International Association of Classification Societies (IACS),
(iv) a court of competent jurisdiction, government agency, or other relevant public authority, in accordance with applicable law, court order, or other public regulation.

9.5 The Client acknowledges that the *Register* is required to provide access to information to the EU Commission or any person acting on its behalf in accordance with applicable EU requirements and that the Client shall give the EU Commission with unrestricted access to the vessels for the purpose of inspection.

9.6 The obligations in this Article shall survive the conclusion of the Service or the termination of related Contract and shall continue for as long as the relevant information remains confidential.

Article 10
INTELLECTUAL PROPERTY

10.1 Each Party shall be the sole owner of all rights to its Intellectual Property created before or after the effective date of these General Terms and Conditions, whether or not associated with any Contract between the Parties.

10.2 The Intellectual Property developed by the *Register* for the provision of the Services, including but not limited to drawings, calculations and reports, shall remain the exclusive property of the *Register*.

Article 11
PROFESSIONAL ETHICS

11.1 Each of the Parties warrants that, with respect to the matters contemplated herein, neither it nor its affiliates has made or will make, directly or indirectly, any offer, payment, gift or authorization of money to any government official or employee, political party, public official or candidate for the benefit or advantage thereof.

11.2 In providing the Services, the *Register* shall strictly adhere to the requirements of its Code of Ethics relating to business activities.

Article 12
FORCE MAJEURE

12.1 For the purposes of these General Terms and Conditions, the term "Force Majeure" includes any event that directly or indirectly prevents the Parties from fulfilling their obligations due to events beyond their control, such as: strikes, wars, riots, piracy, civil commotion, malicious damage, pandemic, compliance with laws or government orders, rules, regulations or directives, sanctions and embargoes, accidents, defects of plants or machinery, seizures, fires, floods, storms and the like.

12.2 If either Party is prevented or delayed from performing its obligations by Force Majeure, such Party shall promptly notify the other Party in writing of the circumstances of the Force Majeure and its influence and, after such notification, shall not be liable for performance of any obligations prevented by the influence of the Force Majeure during its duration. Upon termination of the influence of the Force Majeure, the same Party should proceed with the planned activities in order to fulfil its obligations.

12.3 If one of the Parties is prevented by Force Majeure in its activities and fulfilment of its obligations and this event lasts continuously for three (3) months, the other Party shall be entitled to terminate the Service and related Contract without liability.

12.4 Neither of the Parties shall be liable for non-compliance with these General Terms and Conditions due to Force Majeure. If one of the Parties is prevented from fulfilling its obligations under these General Terms and Conditions due to Force Majeure, it shall immediately notify the other Party in writing within a reasonable period of time, stating the reasons for the Force Majeure and providing relevant evidence, if any.

Article 13
INDEMNIFICATIONS

13.1 Each Party shall indemnify the other Party against all claims arising out of the performance of the Services in respect of bodily injury, illness or death of any of its employees or other representatives and in respect of loss of or damage to the Party's property.

This provision shall apply whether or not the damage is caused or contributed to by the negligence of the other Party. Both Parties are obliged to take out separate insurances for these liabilities.

13.2 The Client shall indemnify the *Register* from and against all claims arising from the Client's violation of the provisions of these General Terms and Conditions and from the misuse of the Certificates issued by the *Register*.

13.3 The Client shall indemnify the *Register* against any financial responsibility or amounts arising from non-payment, late payment or payment of withholding taxes to the non-relevant tax authority or any other relevant governmental body.

13.4 Each Party shall notify the other Party without undue delay as soon as it becomes aware of any incident that could give rise to a claim against the other Party in respect of the Service provided and related Contract.

Article 14
ANTI-CORRUPTION

14.1 Each Party agrees that in performing its obligations under any Service, it will ensure that its affiliates, employees and/or agents, subsidiaries, subcontractors, consultants, and any other persons providing Services will:

(i) comply with all applicable anti-bribery and anti-corruption laws (collectively, Anti-Bribery Laws) and, in particular, do not, directly or indirectly, offer, promise, grant, authorise the payment of, or confer any financial or other benefit on any public or government official:
- to a public or governmental official to obtain or retain business with the intent to influence such official in his or her capacity as an official, if such official is not permitted or required by written law to be influenced by the offer, promise or gift; or
- to another person with the intent to induce or reward the improper performance of a function or activity or for any other illegal purpose,

(ii) maintain adequate systems and procedures designed to prevent activities, practises, or conduct in connection with services that would constitute an offence under an anticorruption law; and
(iii) take reasonable steps to prevent similar acts by customers, contractors, subcontractors, agents and other third parties, persons under its control or influence.

14.2 Any failure by a Party to comply with or ensure compliance with its obligations under this Article shall, notwithstanding anything to the contrary in these General Terms and Conditions, be deemed a breach of these General Terms and Conditions which shall entitle the other Party to suspend and/or terminate the Services by notice in writing with immediate effect without further liability to the other Party except for any liability which may have arisen prior to the date of termination or suspension (as the case may be).

14.3 If a Party elects to suspend the provision of Services under these General Terms and Conditions pursuant to this Article, it shall have the sole and absolute discretion to determine:

(i) when it will resume performance (if at all); and
(ii) extend the period for performance of its obligations under the Services in its sole discretion.

Article 15
SANCTIONS

15.1 Each Party shall conduct all activities in compliance with all laws, statutes, rules, economic and trade sanctions (including, but not limited to, U.S. sanctions and EU sanctions) and regulations applicable to such Party, including, but not limited to: child labour, forced labour, collective bargaining, discrimination, abuse, working hours and minimum wages, anti-bribery, anti-corruption, copyright and trademark protection, personal data protection.

15.2 Each Party hereby represents and warrants that it is not or will not be subject to any economic or trade sanctions ("Sanctions") imposed by the United States of America, the European Union, the United Kingdom, any EU Member State, or the United Nations with respect to any country and/or by any sanction giver with respect to any company/individual.

15.3 Each Party represents and warrants that it will strictly comply with all Sanctions.

15.4 Nothing in these General Terms and Conditions shall be construed as causing or obligating either Party to act or refrain from acting in a manner inconsistent with, punishable by, or prohibited by any Sanctions.

15.5 Neither Party shall be obligated to perform any obligation arising under these Terms and Conditions (including, without limitation, the obligation to):

(i) perform, deliver, accept, sell, purchase, pay or receive any funds to, from or through any person or entity; or
(ii) engage in any other action whatsoever,

if doing so violates or is inconsistent with sanctions and/or recommendations of international (intergovernmental) organisations to combat the financing of terrorism and other criminal activities and/or money laundering or exposes such Party to investigation or penalties.

15.6 In the event that a Party breaches any Sanctions or the Party's Business and/or Transactions arising out of or in connection with these General Terms and Conditions breach any Sanctions or otherwise violate the recommendations of one or more international (intergovernmental) organisations for combating the financing of terrorism and other criminal activities and/or money laundering, the other Party shall be entitled to terminate these General Terms and Conditions by written notice with immediate effect without incurring any liability to the other Party, except for liabilities (if any) incurred prior to the date of termination.

Article 16
LIABILITY

16.1 The *Register* is not, and cannot be considered as, an underwriter, consulting engineer, naval architect, shipbuilder, shipowner, or ship management company, nor can it assume the obligations and responsibilities associated with such functions, although the *Register's* experience may enable it to respond to inquiries about matters not covered by its Rules, policies, instructions, or other documented evidence.

16.2 The practices and procedures of the *Register* shall be selected by the *Register* in its sole and absolute discretion based on its experience and knowledge and in accordance with generally accepted professional standards in the relevant field of classification societies.

16.3 Nothing herein contained shall release any designer, naval architect or engineer, shipbuilder or manufacturer, shipyard, vendor, supplier, contractor or subcontractor, repairer or owner, from any information, report, certificate or similar document issued in connection with the provision of Services by the *Register*, operator, manager or other person or entity from any express or implied warranty or other contractual obligation or responsibility, or from any negligent act, error or omission of any kind whatsoever, nor shall they create any right, claim or benefit for any third party.

16.4 The *Register* shall exercise due care in the selection or appointment of its surveyors and all other employees whose presence and work is necessary for the provision of the Services.

16.5 If any person or entity using the Services of the *Register* suffers any loss, damage or expense that is or is shown to have been caused by a negligent act, omission or error of the *Register's* officers, surveyors, auditors, inspectors, agents, appointers, officers or managers, or those purporting to act in the name of and on behalf of the *Register*, or a negligent inaccuracy, advice, report or evidence given by or in the name of or/and on behalf of the *Register*, then the liability of the *Register* is limited in respect of any direct or indirect claim shall be limited to an amount not exceeding five times the fee charged or to be charged by the *Register* for the relevant Service.

16.6 Any liability for consequential damages is expressly excluded.

For purposes of this clause, consequential damages include, without limitation:

(i) indirect or consequential damages,
(ii) loss and/or delay of production, loss of products, loss of use, loss of bargain, loss of revenue, loss of profit or anticipated profit, loss of business and business interruption, in each case directly or indirectly.

16.7 The Parties are not entitled to assign the performance of obligations under these General Terms and Conditions or parts thereof to third parties without the prior written consent of the other Party.

16.8 If during the term of the Contract, there is a transfer of function due to change of status (merger, acquisition, division, etc.), all obligations and rights under these General Terms and Conditions and associated Contract will be transferred to the legal successor of the Party concerned.

Article 17
GOVERNING LAW AND RESOLVING OF DISPUTES

17.1 These General Terms and Conditions and any dispute or claim between the Parties arising from or in connection with it, or the Services provided hereunder, will be governed and interpreted in accordance with the English law.

17.2 The Parties shall use their reasonable efforts to resolve any claim or dispute arising in relation to rendered Service by negotiations within a reasonable time.

17.3 Should the Parties fail to resolve any claim or dispute by negotiations, the dispute shall be exclusively subject to the jurisdiction of the Permanent Arbitration Court with the Croatian Chamber of Economy in Zagreb, Republic of Croatia.

17.4 The Parties agree to keep the any arbitration proceedings confidential.

17.5 Notwithstanding the above, any claim not presented within three (3) months of the completion of the particular Services, or within three (3) months of from the date when the events which are relied on were first discovered by the Client, shall be deemed waived and absolutely time barred.

17.6 Any objections against the line adopted by any of the *Register's* servants in fulfilling their duties or against the conclusions reached are to be raised to the *Register* by the Party as soon as possible.

If the Party is not satisfied with the final conclusions and interpretations by the *Register* the arbitration lays upon the Commission for appeal for Classification and Statutory certification of ships, which is to be formed according to the Regulation 39 of the Charter of the *Register*.

INTRODUCTORY NOTES

These amendments shall be read together with the requirements in the Rules for the Classification of Ships, Part 33 – Ships using gases or other low-flashing fuel, edition July 2022, as amended by Amendments No. 1, edition January 2023.

Table 1 contains review of amendments, where items changed or added in relating to previous edition are given, with short description of each modification or addition. All major changes throughout the text are shaded.

TABLE 1 – REVIEW OF AMENDMENTS

This review comprises amendments in relation to the Rules for the Classification of Ships, Part 33 – Ships using gases or other low-flashing fuel, edition July 2022, as amended by Amendments No. 1, edition January 2023.

ITEM	*DESCRIPTION OF THE AMENDMENTS*
Section 1 – PREMISE OF THE RULES	
Head 1.2 - PREAMBLE	Item 1.2.5 has been amended as a consequence of introducing methyl/ethyl alcohol as fuel in accordance with the requirements of IMO Circ. MSC.1/Circ.1621 - Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel.
PART A, Section 2 - GENERAL	
Head 2.1 – APPLICATION	Text has been amended as a consequence of introducing the requirements of IMO Circ. MSC.1/Circ.1621 - Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel.
Head *C2.1 – APPLICATION*,	Text has been amended as a consequence of introducing methyl/ethyl alcohol as fuel in accordance with the requirements of IMO Circ. MSC.1/Circ.1621 - Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel..
Head 2.2 – DEFINITIONS	Item C2.2.10 has been amended as a consequence of introducing methyl/ethyl alcohol as fuel in accordance with the requirements of IMO Circ. MSC.1/Circ.1621 - Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel
ANNEX 5	
ANNEX 5	New ANNEX 5 added after text of ANNEX 4 as a consequence of introducing the requirements of IMO Circ. MSC.1/Circ.1621 - Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel..

This Part of the Rules includes the requirements of the following international Organisations:

International Maritime Organization (IMO)

Conventions: International Convention for the Safety of Life at Sea, 1974 (SOLAS 74) and all subsequent and applicable amendments adopted up to MSC 106
Protocol of 1988 relating to the International Convention for the Safety of Life at Sea, 1974, as amended (SOLAS PROT 1988)

Codes: International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels (IGF Code)" as adopted by MSC.391(95), as amended by MSC.422(98) and MSC.458(101)

Circulars: MSC.1/Circ.1394 (Rev.2, July 2019), MSC.1/Circ.1647, MSC.1/Circ.1621

International Association of Classification Societies (IACS)

Unified Requirements (UR):
M78 (Rev.1, Feb 2021), W1 (Rev.4, Apr 2021)

Unified Interpretations:
GF1 (Jan 2017), GF2 (Sep 2017) GF3 (Dec 2017), GF4 (Dec 2017), GF5 (Dec 2017), GF6 (Dec 2017), GF7 (Dec 2017), GF8 (Dec 2017), GF9 (Dec 2017), GF10 (Dec 2017), GF11 (Dec 2017), GF12 (Dec 2017), GF13 (July 2018), GF14 (July 2018), GF15 (July 2018), GF16 (Nov 2018), GF17 (Dec 2018), GF18 (Feb 2019),

Recommendations (Rec.):
No.142 (June 2016), No.146 (Aug 2016), No.148 (Rev.1 Mar 2020)

1 PREMISE OF THE RULES

■ **Head 1.2 PREAMBLE,** item 1.2.5 has been amended and should be read as follows:

The current version of IGF Code and this Rules includes regulations to meet the functional requirements for natural gas fuel. Regulations for other low-flashpoint fuels will be added to IGF Code and in this Rules as, and when, they are developed by the Organization.

The use of methyl/ethyl alcohol as fuel is covered presently by IMO Circ. MSC.1/Circ.1621 - *Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel.* (see Part A, 2.1.2 of this Rules).

In the meantime, for other low-flashpoint fuels, compliance with the functional requirements of IGF Code and these Rules must be demonstrated through alternative design.

PART A

2 GENERAL

▪ **Head 2.1 APPLICATION** has been amended and should be read as follows:

Unless expressly provided otherwise, these Rules apply to ships to which part G of SOLAS, Chapter II-1 applies.

2.1.1 With regard to criteria for the arrangement and installation of fuel cell power installations, providing delivery of electrical and/or thermal energy, regardless of the specific fuel cell type, refer to IMO Circ. MSC.1/Circ.1647 - *Interim guidelines for the safety of ships using fuel cell power installations*. These Interim Guidelines apply to ships to which part G of SOLAS chapter II-1 applies.

Also, these Interim Guidelines are related to the goals and functional requirements of the IGF Code. In particular, the following applies:

.1 The safety, reliability and dependability of the systems should be equivalent to that achieved with new and comparable conventional oil-fuelled main and auxiliary machinery installations, regardless of the specific fuel cell type and fuel.
.2 The probability and consequences of fuel-related hazards should be limited to a minimum through arrangement and system design, such as ventilation, detection and safety actions. In the event of gas leakage or failure of the risk reducing measures, necessary safety actions should be initiated.
.3 The design philosophy should ensure that risk reducing measures and safety actions for the fuel cell power installation do not lead to an unacceptable loss of power.
.4 Hazardous areas should be restricted, as far as practicable, to minimize the potential risks that might affect the safety of the ship, persons on board and equipment.
.5 Equipment installed in hazardous areas should be minimized to that required for operational purposes and should be suitably and appropriately certified.
.6 Fuel cell spaces should be configured to prevent any unintended accumulation of explosive, flammable or toxic gas concentrations.
.7 System components should be protected against external damages.
.8 Sources of ignition in hazardous areas should be minimized to reduce the probability of explosions.
.9 Piping systems and overpressure relief arrangements that are of suitable design, construction and installation for their intended application should be provided.
.10 Machinery, systems and components should be designed, constructed, installed, operated, maintained and protected to ensure safe and reliable operation.
.11 Fuel cell spaces should be arranged and located such that a fire or explosion in either will not lead to an unacceptable loss of power or render equipment in other compartments inoperable.
.12 Suitable control, alarm, monitoring and shutdown systems should be provided to ensure safe and reliable operation.
.13 Fixed leakage detection suitable for all spaces and areas concerned should be arranged.
.14 Fire detection, protection and extinction measures appropriate to the hazards concerned should be provided.
.15 Commissioning, trials and maintenance of fuel systems and gas utilization machinery should satisfy the goal in terms of safety, availability and reliability.
.16 The technical documentation should permit an assessment of the compliance of the system and its components with the applicable rules, guidelines, design standards used and the principles related to safety, availability, maintainability and reliability.
.17 A single failure in a technical system or component should not lead to an unsafe or unreliable situation.
.18 Safe access should be provided for operation, inspection and maintenance.

The application of the requirements of these Interim Guidleines, including approval and criteria for the arrangement and installation of fuel cell power installations on board ships, is subject to prior agreement with the Flag State.

2.1.2 With regard to criteria for the use of methyl/ethyl alcohol as fuel, refer to IMO Circ. MSC.1/Circ.1621 - *Interim guidelines for the safety of ships using methyl/ethyl alcohol as fuel* (see Aannex 5 of this Rules).

■ **Head C2.1 APPLICATION,** has been amended and should be read as follows:

Application to existing ships is subject to the decision by the Register to the extent it deems necessary.

For the application of this Rules for nonconventional size ships or ships having GT less than 500, the technical and safety requirements are to be formulated by the Register in agreement with the Maritime Administration of the Government of the State whose flag the ship is entitled to fly (hereinafter referred to as the Administration.

This Rules are covering the gas or methyl/ethyl alcohol fuel-related installations of the ship, including bunkering system in extent installed on the ship only.

■ **Head 2.2 DEFINITIONS,** item C.2.2.10 has been amended and should be read as follows:

C2.2.10 *NOTE: Dual fuel engines are usually defined by engine manufacturers as the engines that can burn natural gas or methyl/ethyl alcohol as fuel simultaneously with liquid diesel fuel, either as pilot oil (dual fuel mode or gas mode) or bigger amount of liquid diesel fuel with fuel sharing (specified dual fuel mode), and also has the capability of running on liquid diesel fuel oil only (Diesel mode, or fuel oil mode).*

ANNEX 5 INTERIM GUIDELINES FOR THE SAFETY OF SHIPS USING METHYL/ETHYL ALCOHOL AS FUEL (MSC.1/Circ.1621)

■ New **ANNEX 5 – INTERIM GUIDELINES FOR THE SAFETY OF SHIPS USING METHYL/ETHYL ALCOHOL AS FUEL (MSC.1/CIRC.1621)** has been added and should be read as follows:

1 INTRODUCTION

1.1 The purpose of these Interim Guidelines is to provide an international standard for ships using methyl/ethyl alcohol as fuel.

1.2 The basic philosophy of these Interim Guidelines is to provide provisions for the arrangement, installation, control and monitoring of machinery, equipment and systems using methyl/ethyl alcohol as fuel to minimize the risk to the ship, its crew and the environment, having regard to the nature of the fuels involved.

1.3 Throughout the development of these Interim Guidelines it was recognized that the provisions therein must be based on sound naval architectural and engineering principles and the best understanding available of current operational experience, field data and research and development. These Interim Guidelines address all areas that need special consideration for the use of methyl/ethyl alcohol as fuel.

1.4 These Interim Guidelines follow the goal-based approach (MSC.1/Circ.1394/Rev.2) by specifying goals and functional requirements for each section forming the basis for the design, construction and operation of ships using methyl/ethyl alcohol as fuel.

1.5 The current version of these Interim Guidelines includes provisions to meet the functional requirements for methyl/ethyl alcohol as fuel.

2 GENERAL

2.1 Application

Unless expressly provided otherwise, these Interim Guidelines apply to ships to which part G of SOLAS chapter II-1 applies.

2.2 Definitions

For the purpose of these Interim Guidelines, the terms used have the meanings defined in the following paragraphs. Terms not defined have the same meaning as in SOLAS chapter II-2 and the IGF Code.

2.2.1 *Bunkering* means the transfer of fuel from land-based or floating facilities into ships' permanent tanks or connection of portable tanks to the fuel supply system.

2.2.2 *Fuel* means methyl/ethyl alcohol fuels, containing allowable additives or impurities, suitable for the safe operation on board ships, complying with an international standard.

2.2.3 *Fuel tank* is any integral, independent or portable tank used for storage of fuel. The spaces around the fuel tank are defined as follows:

.1 *Fuel storage hold space* is the space enclosed by the ship's structure in which a fuel tank is situated. If tank connections are located in the fuel storage hold space, a fuel storage hold space should also be considered as tank connection space. Integral fuel tanks do not have a fuel storage hold space;

.2 *Cofferdam* is a structural space surrounding a fuel tank which provides an added layer of gas and liquid tightness protection against external fire, and toxic and flammable vapours between the fuel tank and other areas of the ship; and

.3 *Tank connection space* is a space surrounding all tank connections and tank valves that is required for tanks with such connections in enclosed spaces.

2.2.4 *Fuel preparation space* means any space containing equipment for fuel preparation purposes, such as fuel pumps, fuel valve train, heat exchangers and filters.

2.2.5 *Gas freeing* is the process carried out to achieve a safe tank atmosphere. It includes two distinct operations:

.1 purging the hazardous tank atmosphere with an inert gas or other suitable medium (e.g. water) to dilute the hazardous vapour to a level where air can be safely introduced; and

.2 replacing the diluted inert atmosphere with air.

2.2.6 *Independent tanks* are self-supporting, do not form part of the ship's hull and are not essential to the hull strength.

2.2.7 *Integral tank* means a fuel-containment envelope tank which forms part of the ship's hull and which may be stressed in the same manner and by the same loads which stress the contiguous hull structure and which is normally essential to the structural completeness of the ship's hull.

2.2.8 *Portable tank* means an independent tank being able to be:
.1 easily connected and disconnected from ship systems; and
.2 easily removed from ship and installed on board ship.

2.2.9 *Single failure* is where loss of intended function occurs through one fault or action.

2.2.10 *Single fuel engine* means an engine capable of operating on a fuel defined as in 2.2.2 only.

2.3 Alternative design

2.3.1 These Interim Guidelines contain functional requirements for all appliances and arrangements related to the usage of methyl/ethyl alcohol fuels.

2.3.2 Appliances and arrangements of methyl/ethyl alcohol fuel systems may deviate from those set out in these Interim Guidelines, provided such appliances and arrangements meet the intent of the goal and functional requirements concerned and provide an equivalent level of safety to the relevant sections.

2.3.3 The equivalence of the alternative design should be demonstrated as specified in SOLAS regulation II-1/55 and approved by the Administration. However, the Administration should not allow operational methods or procedures to be applied as an alternative to a particular fitting, material, appliance, apparatus, item of equipment or type thereof which is prescribed by these Interim Guidelines.

3 GOAL AND FUNCTIONAL REQUIREMENTS

3.1 Goal

The goal of these Interim Guidelines is to provide for safe and environmentally friendly design, construction and operation of ships and in particular their installations of systems for propulsion machinery, auxiliary power generation machinery and/or other purpose machinery using methyl/ethyl alcohol as fuel.

3.2 Functional requirements

3.2.1 The safety, reliability and dependability of the systems should be equivalent to that achieved with new and comparable conventional oil-fuelled main and auxiliary machinery.

3.2.2 The probability and consequences of fuel-related hazards should be limited to a minimum through arrangement and system design, such as ventilation, detection and safety actions. In the event of fuel leakage or failure of the risk reducing measures, necessary safety actions should be initiated.

3.2.3 The design philosophy should ensure that risk-reducing measures and safety actions for the fuel installation do not lead to an unacceptable loss of power.

3.2.4 Hazardous areas should be restricted, as far as practicable, to minimize the potential risks that might affect the safety of the ship, persons on board and equipment.

3.2.5 Equipment installed in hazardous areas should be minimized to that required for operational purposes and should be suitably and appropriately certified.

3.2.6 Unintended accumulation of explosive, flammable or toxic vapour and liquid concentrations should be prevented.

3.2.7 System components should be protected against external damage.

3.2.8 Sources of ignition in hazardous areas should be minimized to reduce the probability of fire and explosions.

3.2.9 Safe and suitable fuel supply, storage and bunkering arrangements should be provided, capable of receiving and containing the fuel in the required state without leakage.

3.2.10 Piping systems, containment and overpressure relief arrangements that are of suitable design, material, construction and installation for their intended application should be provided.

3.2.11 Machinery, systems and components should be designed, constructed, installed, operated, maintained and protected to ensure safe and reliable operation.

3.2.12 Suitable control, alarm, monitoring and shutdown systems should be provided to ensure safe and reliable operation.

3.2.13 Fixed fuel vapour and/or leakage detection suitable for all spaces and areas concerned should be arranged.

3.2.14 Fire detection, protection and extinction measures appropriate to the hazards concerned should be provided.

3.2.15 Commissioning, trials and maintenance of fuel systems and fuel utilization machinery should satisfy the goal in terms of safety, availability and reliability.

3.2.16 The technical documentation should permit an assessment of the compliance of the system and its components with the applicable rules, guidelines, design standards used, and the principles related to safety, availability, maintainability and reliability.

3.2.17 A single failure in a technical system or component should not lead to an unsafe or unreliable situation.

4 GENERAL PROVISIONS

4.1 Goal

The goal of this section is to ensure that the necessary assessments of the risks involved are carried out in order to eliminate or mitigate any adverse effect on the persons on board, the environment or the ship.

4.2 Risk assessment

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

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

4.3 Limitation of explosion consequences

An explosion in any space containing any potential sources of release [1] and potential ignition sources should not:

.1 cause damage to or disrupt the proper functioning of equipment/systems located in any space other than that in which the incident occurs;

[1] *Double wall fuel pipes are not considered as potential sources of release.*

.2 damage the ship in such a way that flooding of water below the main deck or any progressive flooding occur;

.3 damage work areas or accommodation in such a way that persons who stay in such areas under normal operating conditions are injured;

.4 disrupt the proper functioning of control stations and switchboard rooms necessary for power distribution;

.5 damage life-saving equipment or associated launching arrangements;

.6 disrupt the proper functioning of fire-fighting equipment located outside the explosion-damaged space;

.7 affect other areas of the vessel in such a way that chain reactions involving, inter alia, cargo, gas and bunker oil may arise; or

.8 prevent persons' access to life-saving appliances (LSA) or impede escape routes.

5 SHIP DESIGN AND ARRANGEMENT

5.1 Goal

The goal of this section is to provide for safe location, space arrangements and mechanical protection of power generation equipment, fuel storage system, fuel supply equipment and refuelling systems.

5.2 Functional requirements

This section is related to functional requirements 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.12, 3.2.14 and 3.2.16. In particular, the following applies:

.1 the fuel tank(s) should be located in such a way that the probability of the tank(s) being damaged following a collision or grounding is reduced to a minimum taking into account the safe operation of the ship and other hazards that may be relevant to the ship;

.2 fuel containment systems, fuel piping and other fuel release sources should be located and arranged such that released fuel, either as vapour or liquid, is led to safe locations;

.3 the access or other openings to spaces containing potential sources of fuel release should be arranged such that flammable, asphyxiating or toxic vapours or liquids cannot escape to spaces that are not designed for the presence of such substances;
.4 fuel piping should be protected against mechanical damage;
.5 the propulsion and fuel supply system should be designed such that safety actions after any fuel leakage do not lead to an unacceptable loss of power; and
.6 the probability of a fire or explosion in a machinery space as a result of a fuel release should be minimized in the design, with special attention to the risk of leakage from pumps, valves and connections.

5.3 General provisions

5.3.1 Tanks containing fuel should not be located within accommodation spaces or machinery spaces of category A.

5.3.2 Integral fuel tanks should be surrounded by protective cofferdams, except on those surfaces bound by shell plating below the lowest possible waterline, other fuel tanks containing methyl/ethyl alcohol, or fuel preparation space.

5.3.3 The fuel containment system should be abaft of the collision bulkhead and forward of the aft peak bulkhead.

5.3.4 Fuel tanks located on open decks should be protected against mechanical damage.

5.3.5 Fuel tanks on open decks should be surrounded by coamings and spills should be collected in a dedicated holding tank.

5.3.6 Special consideration should be given to chemical tankers using methyl/ethyl alcohol cargoes as fuel.

5.4 Independent fuel tanks

5.4.1 Independent tanks may be accepted on open decks or in a fuel storage hold space.

5.4.2 Independent tanks should be fitted with:
.1 mechanical protection of the tanks depending on location and cargo operations;
.2 if located on an open deck, drip tray arrangements for leak containment and water spray systems for emergency cooling; and
.3 if located in a fuel storage hold space, the space should meet the provisions of sections 11 and 13.

5.4.3 Independent fuel tanks should be secured to the ship's structure. The arrangement for supporting and fixing the tanks should be designed for the maximum expected static, dynamic inclinations and accidental loads as well as the maximum expected values of acceleration, taking into account the ship characteristics and the position of the tanks.

5.5 Portable tanks

5.5.1 Portable fuel tanks should be located in dedicated areas fitted with:
.1 mechanical protection of the tanks depending on location and cargo operations;
.2 if located on an open deck, drip tray arrangements for leak containment and water spray systems for emergency cooling; and
.3 if located in a fuel storage hold space, the space should meet the provisions of sections 11 and 13.

5.5.2 Portable fuel tanks should be secured to the deck while connected to the ship systems. The arrangement for supporting and fixing the tanks should be designed for the maximum expected static and dynamic inclinations, as well as the maximum expected values of acceleration, taking into account the ship characteristics and the position of the tanks.

5.5.3 Consideration should be given to the ship's strength and the effect of the portable fuel tanks on the ship's stability.

5.5.4 Connections to the ship's fuel piping systems should be made by means of approved flexible hoses suitable for methyl/ethyl alcohol or other suitable means designed to provide sufficient flexibility.

5.5.5 Arrangements should be provided to limit the quantity of fuel spilled in case of inadvertent disconnection or rupture of the non-permanent connections.

5.5.6 The pressure relief system of portable tanks should be connected to a fixed venting system.

5.5.7 Control and monitoring systems for portable fuel tanks should be integrated in the ship's control and monitoring system. A safety system for portable fuel tanks should be integrated in the ship's safety system (e.g. shutdown systems for tank valves, leak/vapour detection systems).

5.5.8 Safe access to tank connections for the purpose of inspection and maintenance should be ensured.

5.5.9 When connected to the ship's fuel piping system:
.1 each portable tank should be capable of being isolated at any time;
.2 isolation of one tank should not impair the availability of the remaining portable tanks; and

.3 the tank should not exceed its filling limits.

5.6 Provisions for machinery space

5.6.1 A single failure within the fuel system should not lead to a release of fuel into the machinery space.

5.6.2 All fuel piping within machinery space boundaries should be enclosed in gas and liquid tight enclosures in accordance with 9.4.

5.7 Provisions for location and protection of fuel piping

5.7.1 Fuel pipes should not be located less than 800 mm from the ship's side.

5.7.2 Fuel piping should not be led directly through accommodation spaces, service spaces, electrical equipment rooms or control stations as defined in the SOLAS Convention.

5.7.3 Fuel pipes led through ro-ro spaces, special category spaces and on open decks should be protected against mechanical damage.

5.7.4 Fuel piping should comply with the following:

.1 Fuel piping that passes through enclosed spaces in the ship should be enclosed in a pipe or duct that is gas and liquid tight towards the surrounding spaces with the fuel contained in the inner pipe. Such double walled piping is not required in cofferdams surrounding fuel tanks, fuel preparation spaces or spaces containing independent fuel tanks as the boundaries for these spaces will serve as a second barrier.

.2 All fuel pipes should be self-draining to suitable fuel or collecting tanks in normal condition of trim and list of the ship. Alternative arrangements for draining the piping may be accepted by the Administration.

5.8 Provisions for fuel preparation spaces design

Fuel preparation spaces should be located outside machinery spaces of category A.

5.9 Provisions for bilge systems

5.9.1 Bilge systems installed in areas where methyl/ethyl alcohol can be present should be segregated from the bilge system of spaces where methyl alcohol or ethyl alcohol cannot be present.

5.9.2 One or more holding tanks for collecting drainage and any possible leakage of methyl/ethyl alcohol from fuel pumps, valves or from double walled inner pipes located in enclosed spaces should be provided. Means should be provided for safely transferring contaminated liquids to onshore reception facilities.

5.9.3 The bilge system serving the fuel preparation space should be operable from outside the fuel preparation space.

5.10 Provisions for drip trays

5.10.1 Drip trays should be fitted where leakage and spill may occur, in particular, in way of single wall pipe connections.

5.10.2 Each tray should have a sufficient capacity to ensure that the maximum amount of spill according to the risk assessment can be handled.

5.10.3 Each drip tray should be provided with means to safely drain spills or transfer spills to a dedicated holding tank. Means for preventing backflow from the tank should be provided.

5.10.4 Drip trays for leakage of less than 10 litres may be provided with means for manual emptying.

5.10.5 The holding tank should be equipped with a level indicator and alarm, and should be inerted at all times during normal operation.

5.11 Provisions for arrangement of entrances and other openings in enclosed spaces

5.11.1 Direct access should not be permitted from a non-hazardous area to a hazardous area. Where such openings are necessary for operational reasons, an airlock which complies with the provisions of section 5.12 should be provided.

5.11.2 Fuel preparation spaces should have independent access direct from open deck. Where a separate access from open deck is not practicable, an airlock complying with section 5.12 should be provided.

5.11.3 Fuel tanks and surrounding cofferdams should have suitable access from the open deck, where practicable, for gas freeing, cleaning, maintenance and inspection.

5.11.4 Without direct access to open deck, an entry space to fuel tanks or surrounding cofferdams should be provided and comply with the following:

.1 be fitted with an independent mechanical extraction ventilation system, providing a minimum of six air changes per hour; a low oxygen alarm and a gas detection alarm should be fitted;
.2 have sufficient open area around the fuel tank hatch for efficient evacuation and rescue operation;
.3 not be an accommodation space, service space, control station or machinery space of category A; and
.4 a cargo space may be accepted as an entry space, depending upon the type of cargo, if the area is cleared of cargo and no cargo operation is undertaken during entry to the space.

5.11.5 The area around independent fuel tanks should be sufficient to carry out evacuation and rescue operations.

5.11.6 For safe access, horizontal hatches or openings to or within fuel tanks or surrounding cofferdams should have a minimum clear opening of 600 mm x 600 mm that also facilitates the hoisting of an injured person from the bottom of the tank/cofferdam. For access through vertical openings providing main passage through the length and breadth within fuel tanks and cofferdams, the minimum clear opening should not be less than 600 mm x 800 mm at a height of not more than 600 mm from bottom plating unless gratings or footholds are provided. Smaller openings may be accepted provided evacuation of an injured person from the bottom of the tank/cofferdam can be demonstrated.

5.12 Provisions for airlocks

5.12.1 An airlock is a space enclosed by gastight bulkheads with two gastight doors spaced at least 1.5 m and not more than 2.5 m apart. Unless subject to the requirements of the International Convention on Load Lines, the door sill should not be less than 300 mm in height. The doors should be self-closing without any hold-back arrangements.

5.12.2 Airlocks should be mechanically ventilated at an overpressure relative to the adjacent hazardous area or space.

5.12.3 Airlocks should have a simple geometrical form. They should provide for free and easy passage and should have a deck area not less than 1.5 m2. Airlocks should not be used for other purposes, for instance as storerooms.

5.12.4 An audible and visual alarm system to give a warning on both sides of the airlock should be provided to indicate if more than one door is moved from the closed position.

5.12.5 For non-hazardous spaces with access from hazardous spaces below deck where the access is protected by an airlock, upon loss of underpressure in the hazardous space access to the space should be restricted until the ventilation has been reinstated. Audible and visual alarms should be given at a manned location to indicate both loss of pressure and opening of the airlock doors when pressure is lost.

5.12.6 Essential equipment required for safety should not be de-energized and should be of a certified safe type. This may include lighting, fire detection, gas detection, public address and general alarms systems.

5.12.7 Electrical equipment which is not of the certified safe type for propulsion, power generation, manoeuvring, anchoring and mooring equipment as well as the emergency fire pumps should not be located in spaces to be protected by airlocks.

6 FUEL CONTAINMENT SYSTEM

6.1 Goal

The goal of this section is to provide for a fuel containment system where the risk to the ship, its crew and to the environment is minimized to a level that is at least equivalent to a conventional oil-fuelled ship.

6.2 Functional requirements

6.2.1 This section refers to functional requirements 3.2.1, 3.2.2, 3.2.5 and 3.2.8 to 3.2.16 of these Interim Guidelines.

6.2.2 The fuel tanks should be designed such that a leakage from the fuel tank or its connections does not endanger the ship, persons on board or the environment. Potential dangers to be avoided include:

.1 flammable fuels spreading to locations with ignition sources;
.2 toxicity potential and risk of oxygen deficiency or other negative impacts on crew health due to fuels and inert gases;
.3 restriction of access to muster stations, escape routes or LSAs; and
.4 reduction in availability of LSAs.

6.2.3 The fuel containment system and the fuel supply system should be designed such that safety actions after any leakage, irrespective of in liquid or vapour phase, do not lead to an unacceptable loss of power.

6.2.4 If portable tanks are used for fuel storage, the design of the fuel containment system should be equivalent to permanent installed tanks as described in this section.

6.3 Provisions for fuel tanks venting and gas freeing system

6.3.1 The fuel tanks should be fitted with a controlled tank venting system.

6.3.2 A fixed piping system should be arranged to enable each fuel tank to be safely gas freed, and to be safely filled with fuel from a gas-free condition.

6.3.3 The formation of gas pockets during the gas freeing operation should be avoided by considering the arrangement of internal tank structure and location of gas freeing inlets and outlets.

6.3.4 Pressure and vacuum relief valves should be fitted to each fuel tank to limit the pressure or vacuum in the fuel tank. The tank venting system may consist of individual vents from each fuel tank or the vents from each individual fuel tank may be connected to a common header. Design and arrangement should prevent flame propagation into the fuel containment system. If pressure relief valves (PRVs) of the high velocity type are fitted to the end of the vent pipes, they should be certified for endurance burning in accordance with MSC/Circ.677. If PRVs are fitted in the vent line, the vent outlet should be fitted with a flame arrestor certified for endurance burning in accordance with MSC/Circ.677.

6.3.5 Shut-off valves should not be arranged either upstream or downstream of the PRVs. Bypass valves may be provided. For temporary tank segregation purposes (maintenance) shut-off valves in common vent lines may be accepted if a secondary independent over/underpressure protection is provided to all tanks as per 6.3.7.

6.3.6 The fuel tank-controlled venting system should be designed with redundancy for the relief of full flow overpressure and/or vacuum. Pressure sensors fitted in each fuel tank, and connected to an alarm system, may be accepted in lieu of the secondary redundancy requirement for pressure relief. The opening pressure of the PRVs should not be lower than 0.007 MPa below atmospheric pressure.

6.3.7 PRVs should vent to a safe location on open deck and should be of a type which allows the functioning of the valve to be easily checked.

6.3.8 The fuel tank vent system should be sized to permit bunkering at a design loading rate without over-pressurizing the fuel tank.

6.3.9 The fuel tank vent system should be connected to the highest point of each tank and vent lines should be self-draining under all normal operating conditions.

6.4 Inerting and atmospheric control within the fuel storage system

6.4.1 All fuel tanks should be inerted at all times during normal operation.

6.4.2 Cofferdams should be arranged either for purging or filling with water through a non-permanent connection. Emptying the cofferdams should be done by a separate drainage system, e.g. bilge ejector.

6.4.3 The system should be designed to eliminate the possibility of a flammable mixture atmosphere existing in the fuel tank during any part of the atmosphere change operation, gas freeing or inerting by utilizing an inerting medium.

6.4.4 To prevent the return of flammable liquid and vapour to the inert gas system, the inert gas supply line should be fitted with two shutoff valves in series with a venting valve in between (double block and bleed valves). In addition, a closable non-return valve should be installed between the double block and bleed arrangement and the fuel system. These valves should be located inside hazardous spaces.

6.4.5 Where the connections to the inert gas piping systems are non-permanent, two non-return valves may substitute the valves required in 6.4.4.

6.4.6 Blanking arrangements should be fitted in the inert gas supply line to individual tanks. The position of the blanking arrangements should be immediately obvious to personnel entering the tank. Blanking should be via removable spool piece.

6.4.7 Fuel tank vent outlets should be situated normally not less than 3 m above the deck or gangway if located within 4 m from such gangways. The vent outlets are also to be arranged at a distance of at least 10 m from the nearest air intake or opening to accommodation and service spaces and ignition sources. The vapour discharge should be directed upwards in the form of unimpeded jets.

6.4.8 Vapour outlets from fuel tanks should be provided with devices tested and type approved to prevent the passage of flame into the tank. Due attention should be paid in the design and position of the PRVs with respect to blocking and due to ice during adverse weather conditions. Provision for inspection and cleaning should be arranged.

6.4.9 The arrangements for gas freeing and ventilation of fuel tanks should be such as to minimize the hazards due to the dispersal of flammable vapours to the atmosphere and to flammable gas mixture in the tanks. The ventilation system for fuel tanks should be exclusively for ventilating and gas freeing purposes. Connection between fuel tank and fuel preparation space ventilation will not be accepted.

6.4.10 Gas freeing operations should be carried out such that vapour is initially discharged in one of the following ways:

.1 through outlets at least 3 m above the deck level with a vertical efflux velocity of at least 30 m/s maintained during the gas freeing operation;
.2 through outlets at least 3 m above the deck level with a vertical efflux velocity of at least 20 m/s which are protected by suitable devices to prevent the passage of flame; or
.3 through outlets underwater.

6.4.11 In designing a gas freeing system in conformity with 6.3.2 due consideration should be given to the following:
.1 materials of construction of system;
.2 time to gas free;
.3 flow characteristics of fans to be used;
.4 the pressure losses created by ducting, piping, fuel tank inlets and outlets;
.5 the pressure achievable in the fan driving medium (e.g. water or compressed air); and
.6 the densities of the fuel vapour/air mixture.

6.5 Inert gas availability on board

6.5.1 Inert gas should be available permanently on board in order to achieve at least one trip from port to port considering maximum consumption of fuel expected and maximum length of trip expected, and to keep tanks inerted during 2 weeks in harbour with minimum port consumption.

6.5.2 A production plant and/or adequate storage capacities might be used to achieve the availability target defined in 6.5.1.

6.5.3 Fluid used for inerting should not modify the characteristics of the fuel.

6.5.4 The production plant, if fitted, should be capable of producing inert gas with oxygen content at no time greater than 5% by volume. A continuous-reading oxygen content meter should be fitted to the inert gas supply from the equipment and should be fitted with an alarm set at a maximum of 5% oxygen content by volume. The system should be designed to ensure that if the oxygen content exceeds 5% by volume, the inert gas should be automatically vented to atmosphere.

6.5.5 The system should be able to maintain an atmosphere with an oxygen content not exceeding 8% by volume in any part of any fuel tank.

6.5.6 An inert gas system should have pressure controls and monitoring arrangements appropriate to the fuel containment system.

6.5.7 Where a nitrogen generator or nitrogen storage facilities are installed in a separate compartment outside of the engine-room, the separate compartment should be fitted with an independent mechanical extraction ventilation system, providing a minimum of six air changes per hour. If the oxygen content is below 19% in the separate compartment, an alarm should be given. A minimum of two oxygen sensors should be provided in each space. Visual and audible alarms should be placed at each entrance to the inert gas room.

6.5.8 Nitrogen pipes should only be led through well ventilated spaces. Nitrogen pipes in enclosed spaces should:
.1 have only a minimum of flange connections as needed for fitting of valves and be fully welded; and
.2 be as short as possible.

6.5.9 Notwithstanding the provisions of section 6.5, inert gas utilized for gas freeing of tanks may be provided externally to the ship.

7 MATERIAL AND GENERAL PIPE DESIGN

7.1 Goal

The goal of this section is to ensure the safe handling of fuel, under all operating conditions, to minimize the risk to the ship, personnel and to the environment, having regard to the nature of the products involved.

7.2 Functional requirements

This section relates to functional requirements 3.2.1, 3.2.6, 3.2.8, 3.2.9 and 3.2.10 of these Interim Guidelines. In particular, all materials used should be suitable for the fuel under the maximum working pressure and temperature.

7.3 Provisions for general pipe design

7.3.1 The design pressure for any section of the fuel piping system is the maximum gauge pressure to which the system may be subjected in service, taking into account the highest set pressure on any relief valve on the system.

7.3.2 The wall thickness of pipes made of steel should not be less than:

$t = (t_0 + b + c) / (1 - a/100)$ mm

where:

t_0 = theoretical thickness, mm $t0 = PD / (2Ke + P)$ mm

P = system design pressure, but not less than the design pressure given in 7.3.1, MPa

D = outside pipe diameter

K = allowable stress N/mm^2 (see 7.3.3)

e = efficiency factor equal to 1.0 for seamless pipes and for longitudinally or spirally welded pipes, delivered by approved manufacturers of welded pipes, which are considered equivalent to seamless pipes when non-destructive testing on welds is carried out in accordance with recognized standards. In other cases, an efficiency factor less than 1.0, in accordance with recognized standards, may be required depending upon the manufacturing process

b = allowance for bending (mm). The value for b should be chosen so that the calculated stress in the bend, due to internal pressure only, does not exceed the allowable stress. Where such justification is not given, b should not be less than: $b = Dt_0 / 2.5r$ where: r = mean radius of the bend (mm)

c = corrosion allowance (mm). If corrosion or erosion is expected, the wall thickness of piping should be increased over that required by the other design provisions

a = negative manufacturing tolerance for thickness (%)

7.3.3 For pipes made of steel the allowable stress K to be considered in the formula for t_0 in 7.3.2 is the lower of the following values:

R_m / A or R_e / B where:

R_m = specified minimum tensile strength at ambient temperature (N/mm^2)

R_e = specified minimum yield stress at ambient temperature (N/mm^2). If stress-strain curve does not show a defined yield stress, the 0.2% proof stress applies

The values of A and B should be at least A = 2.7 and B = 1.8

7.3.4 Where necessary for mechanical strength to prevent damage, collapse, excessive sag or buckling of pipes due to superimposed loads, the wall thickness should be increased over that required by 7.3.2 or, if this is impracticable or would cause excessive local stresses, these loads should be reduced, protected against or eliminated by other design methods. Such superimposed loads may be due to supports, ship deflections, liquid pressure surge during transfer operations, the weight of suspended valves, reaction to loading arm connections or otherwise.

7.3.5 For pipes made of materials other than steel, the allowable stress should be considered by the Administration.

7.3.6 High pressure fuel piping systems[2] should have sufficient constructive and fatigue strength. This should be confirmed by carrying out stress analysis and taking into account:

.1 stresses due to the weight of the piping system;
.2 acceleration loads when significant; and
.3 internal pressure and loads induced by hog and sag of the ship.

[2] *Whether a fuel system should be considered as a high-pressure system for the purpose of these Guidelines depends on the design and arrangement of the specific system. Accordingly, the stress analysis should be waived or done to the satisfaction of the Administration.*

7.3.7 Fuel pipes and all the other piping needed for safe and reliable operation and maintenance should be colour marked in accordance with a standard at least equivalent to those acceptable to the Administration.

7.3.8 All fuel piping and independent fuel tanks should be electrically bonded to the ship's hull. Electrical conductivity should be maintained across all joints and fittings. Electrical resistance between piping and the hull should be maximum 10^6 Ohm.

7.3.9 Piping other than fuel supply piping and cabling may be arranged in the double wall piping or duct provided that it does not create a source of ignition or compromise the integrity of the double pipe or duct. The double wall piping or duct should only contain piping or cabling necessary for operational purposes.

7.3.10 Filling lines to fuel tanks should be arranged to minimize the possibility for static electricity, e.g. by reducing the free fall into the fuel tank to a minimum.

7.3.11 The arrangement and installation of fuel piping should provide the necessary flexibility to maintain the integrity of the piping system in the actual service situations, taking potential for fatigue into account. Expansion bellows should not be used.

7.3.12 Piping fabrication and joining details

7.3.12.1 The inner piping, where a protective duct is required, is to be full penetration butt-welded and fully radiographed. Flange connections in this piping are to only be permitted within the tank connection space and fuel preparation space or similar;

.1 during the use of the fuel piping, all doors, ports and other openings on the corresponding superstructure or deckhouse side should normally be kept closed; and

.2 the annular space in the double walled fuel piping should be segregated at the engine-room bulkhead; this implies that there should be no common ducting between the engine-room and other spaces.

7.3.12.2 Piping for fuel should be joined by welding except:
.1 for approved connections to shut-off valve and expansion joints, if fitted; and
.2 for other exceptional cases specifically approved by the Administration.

7.3.12.3 The following direct connections of pipe length without flanges may be considered:
.1 butt-welded joints with complete penetrations at the root;
.2 slip-on welded joints with sleeves and related welding having dimensions in accordance with recognized standards should only be used in pipes having an external diameter of 50 mm or less; the possibility for corrosion is to be considered; and
.3 screwed connections, in accordance with recognized standards, should only be used for piping with an external diameter of 25 mm or less.

7.3.12.4 Welding, post-weld heat treatment, radiographic testing, dye penetrating testing, pressure testing, leakage testing and non-destructive testing should be performed in accordance with recognized standards. Butt welding should be subject to 100% non-destructive testing, while sleeve welds should be subject to at least 10% liquid penetrant testing (PT) or magnetic particle testing (MT).

7.3.12.5 Where flanges are used, they should be of the welded-neck or slip-on type. Socket welds are not to be used in nominal sizes above 50 mm.

7.3.12.6 Expansion of piping should normally be allowed for by the provision of expansion loops or bends in the fuel piping system. Use of expansion joints used in high pressure[3] fuel systems should be approved by the Administration. Slip joints should not be used.

[3] *Whether a fuel system should be considered as a high-pressure system for the purpose of these Guidelines depends on the design and arrangement*

7.3.12.7 Other connections: Piping connections should be joined in accordance with 7.3.12.2, but for other exceptional cases the Administration may consider alternative arrangements.

7.4 Provisions for materials

Due consideration should be taken with respect to the corrosive nature of fuel when selecting materials of the specific system.

8 BUNKERING

8.1 Goal

The goal of this section is to provide for suitable systems on board the ship to ensure that bunkering can be conducted without causing danger to persons, the environment or the ship.

8.2 Functional requirements

8.2.1 This section relates to functional requirements 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.7, 3.2.8, 3.2.9, 3.2.10, 3.2.11, 3.2.13, 3.2.14, 3.2.15 and 3.2.16 of these Interim Guidelines. In particular, the following applies:

8.2.1.1 The piping system for transfer of fuel to the fuel tank should be designed such that any leakage from the piping system cannot cause danger to the persons on board, the environment or the ship.

8.3 Provisions for bunkering station

8.3.1 General provisions

8.3.1.1 The bunkering station should be located on open deck so that sufficient natural ventilation is provided. Closed or semi-enclosed bunkering stations should be subject to special consideration with respect to provisions for mechanical ventilation. The Administration may require special risk assessment.

8.3.1.2 Entrances, air inlets and openings to accommodation, service and machinery spaces and control stations should not face the bunkering station.

8.3.1.3 Closed or semi-enclosed bunkering stations should be surrounded by gas and liquid-tight boundaries against enclosed spaces.

8.3.1.4 Bunkering lines should not be led directly through accommodation, control stations or service spaces. Bunkering lines passing through non-hazardous areas in enclosed spaces should be double walled or located in gastight ducts.

8.3.1.5 Arrangements should be made for safe management of fuel spills. Coamings and/or drip trays should be provided below the bunkering connections together with a means of safely collecting and storing spills. This could be a drain to a dedicated holding tank equipped with a level indicator and alarm. Where coamings or drip trays are subject to rainwater, provision should be made to drain rainwater overboard.

8.3.1.6 Showers and eye wash stations for emergency usage are to be located in close proximity to areas where the possibility for accidental contact with fuel exists. The emergency showers and eye wash stations are to be operable under all ambient conditions.

8.3.2 Ships' bunker hoses

8.3.2.1 Bunker hoses carried on board are to be suitable for methyl/ethyl alcohol. Each type of bunker hose, complete with end-fittings, should be prototype-tested at a normal ambient temperature, with 200 pressure cycles from zero to at least twice the specified maximum working pressure. After this cycle pressure test has been carried out, the prototype test should demonstrate a bursting pressure of at least 5 times its specified maximum working pressure at the upper and lower extreme service temperature. Hoses used for prototype testing should not be used for bunker service.

8.3.2.2 Before being placed in service, each new length of bunker hose produced should be hydrostatically tested at ambient temperature to a pressure not less than 1.5 times its specified maximum working pressure, but not more than two fifths of its bursting pressure. The hose should be stencilled, or otherwise marked, with the date of testing, its specified maximum working pressure and, if used in services other than ambient temperature services, its maximum and minimum service temperature, as applicable. The specified maximum working pressure should not be less than 1 MPa gauge.

8.3.2.3 Means should be provided for draining any fuel from the bunkering hoses upon completion of operation.

8.3.2.4 Where fuel hoses are carried on board, arrangements should be made for safe storage of the hoses. Hoses should be stored on the open deck or in a storage room with an independent mechanical extraction ventilation system, providing a minimum of six air changes per hour.

8.4 Provisions for manifold

The bunkering manifold should be designed to withstand the external loads during bunkering. The connections at the bunkering station should be of dry-disconnect type equipped with additional safety dry break-away coupling/self-sealing quick release. The couplings should be of a standard type.

8.5 Provisions for bunkering system

8.5.1 Means should be provided for draining any fuel from the bunkering lines upon completion of operation.

8.5.2 Bunkering lines should be arranged for inerting and gas freeing. When not engaged in bunkering, the bunkering lines should be free of gas, unless the consequences of not gas freeing is evaluated and approved.

8.5.3 A ship-shore link (SSL) or an equivalent means for automatic and manual ESD communication to the bunkering source should be fitted.

8.5.4 In the bunkering line, as close to the connection point as possible, there should be a manually operated stop valve and a remotely operated shutdown valve arranged in series. Alternatively, a combined manually operated and remote shutdown valve may be provided. It should be possible to operate this remotely operated valve from the bunkering control station.

8.5.5 Where bunkering lines are arranged with a cross-over, suitable isolation arrangements should be provided to ensure that fuel cannot be transferred inadvertently to the ship side not in use for bunkering.

9 FUEL SUPPLY TO CONSUMERS

9.1 Goal

The goal of this section is to ensure safe and reliable distribution of fuel to the consumers.

9.2 Functional requirements

This section is related to functional requirements 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.8, 3.2.9, 3.2.10, 3.2.11 and 3.2.13 to 3.2.17 of these Interim Guidelines.

9.3 General provisions for fuel supply system

9.3.1 The fuel piping system should be separate from all other piping systems.

9.3.2 The fuel supply system should be arranged such that the consequences of any release of fuel will be minimized, while providing safe access for operation and inspection. The causes and consequences of release of fuel should be subject to special consideration within the risk assessment in 4.2.

9.3.3 The piping system for fuel transfer to the consumers should be designed in a way that a failure of one barrier cannot lead to a leak from the piping system into the surrounding area causing danger to the persons on board, the environment or the ship.

9.3.4 Fuel lines should be installed and protected so as to minimize the risk of injury to persons on board in case of leakage.

9.4 Provisions for fuel distribution

9.4.1 The outer pipe or duct should be gas and liquid tight.

9.4.2 The annular space between inner and outer pipe should have mechanical ventilation of underpressure type with a capacity of minimum 30 air changes per hour and be ventilated to open air. Appropriate means for detecting leakage into the annular space should be provided. The double wall enclosure should be connected to a suitable draining tank allowing the collection and the detection of any possible leakage.

9.4.3 Inerting of the annular space might be accepted as an alternative to ventilation. Appropriate means of detecting leakage into the annular space should be provided. Suitable alarms should be provided to indicate a loss of inert gas pressure between the pipes.

9.4.4 The outer pipe in the double walled fuel pipes should be dimensioned for a design pressure not less than the maximum working pressure of the fuel pipes. As an alternative the calculated maximum built-up pressure in the duct in the case of an inner pipe rupture may be used for dimensioning of the duct.

9.5 Redundancy of fuel supply

Propulsion and power generation arrangements, together with fuel supply systems, should be arranged so that a failure in fuel supply does not lead to an unacceptable loss of power.

9.6 Safety functions of the fuel supply system

9.6.1 All fuel piping should be arranged for gas freeing and inerting.

9.6.2 Fuel tank inlet and outlet valves should be as close to the tank as possible. Valves required to be operated under normal operation, such as when fuel is supplied to consumers or during bunkering, should be remotely operated if not easily accessible.

9.6.3 The main fuel supply line to each consumer or set of consumers should be equipped with an automatically operated master fuel valve. The master fuel valve(s) should be situated in the part of the piping that is outside the machinery space containing methyl/ethyl alcohol-fuelled consumer(s). The master fuel valve(s) should automatically shut off the fuel supply in accordance with section 15.2.1.2 and table 1 in section 15.

9.6.4 Means of manual emergency shutdown of fuel supply to the consumers or set of consumers should be provided on the primary and secondary escape routes from the consumer compartment, at a location outside consumer space, outside the fuel preparation space and at the bridge. The activation device should be arranged as a physical button, duly marked and protected against inadvertent operation and operable under emergency lighting.

9.6.5 The fuel supply line to each consumer should be provided with a remotely operated shut-off valve.

9.6.6 There should be one manually operated shutdown valve in the fuel line to each consumer to ensure safe isolation during maintenance.

9.6.7 Valves should be of the fail-safe type.

9.6.8 When pipes penetrate the fuel tank below the top of the tank a remotely operated shut-off valve should be fitted to the fuel tank bulkhead. When the fuel tank is adjacent to a fuel preparation space, the valve may be fitted on the tank bulkhead on the fuel preparation space side.

9.7 Provisions for fuel preparation spaces and pumps

9.7.1 Any fuel preparation space should not be located within a machinery space of category A, should be gas and liquid tight to surrounding enclosed spaces and vented to open air.

9.7.2 Hydraulically powered pumps that are submerged in fuel tanks should be arranged with double barriers preventing the hydraulic system serving the pumps from being directly exposed to methyl/ethyl alcohol. The double barrier should be arranged for detection and drainage of eventual methyl/ethyl alcohol leakage.

9.7.3 All pumps in the fuel system should be protected against running dry (i.e. protected against operation in the absence of fuel or service fluid). All pumps which are capable of developing a pressure exceeding the design pressure of the system should be provided with relief valves. Each relief valve should be in closed circuit, i.e. arranged to discharge back to the piping upstream of the suction side of the pump and to effectively limit the pump discharge pressure to the design pressure of the system.

10 POWER GENERATION INCLUDING PROPULSION AND OTHER ENERGY CONVERTERS

10.1 Goal

To provide safe and reliable delivery of mechanical, electrical or thermal energy.

10.2 Functional requirements

10.2. This section is related to functional requirements 3.2.1, 3.2.11, 3.2.13, 3.2.14, 3.2.15, 3.2.16 and 3.2.17 of these Interim Guidelines. In particular, the following applies:

.1 the exhaust system should be designed to prevent any accumulation of unburnt fuel; and

.2 each fuel consumer should have a separate exhaust system.

10.2.2 One single failure in the fuel system should not lead to an unacceptable loss of power.

10.3 General

10.3.1 All engine components and engine-related systems should be designed in such a way that fire and explosion risks are minimized.

10.3.2 Engine components containing methyl/ethyl alcohol fuel should be effectively sealed to prevent leakage of fuel into the machinery space.

10.3.3 For engines where the space below the piston is in direct communication with the crankcase, a detailed evaluation regarding the hazard potential of fuel gas accumulation in the crankcase should be carried out and reflected in the safety concept of the engine.

10.3.4 A means should be provided to monitor and detect poor combustion or misfiring. In the event that it is detected, continued operation may be allowed, provided that the fuel supply to the concerned cylinder is shut off and provided that the operation of the engine with one cylinder cut-off is acceptable with respect to torsional vibrations.

10.4 Provision for dual-fuel engines

10.4.1 In case of shut-off of the methyl/ethyl alcohol supply, the engines should be capable of continuous operation by oil fuel only without interruption.

10.4.2 An automatic system should be fitted to change over from methyl/ethyl alcohol fuel operation to oil fuel operation with minimum fluctuation of the engine power. Acceptable reliability should be demonstrated through testing. In the case of unstable operation on engines when methyl/ethyl alcohol firing, the engine should automatically change to oil fuel mode. There should also be the possibility for manual changeover.

10.4.3 In case of an emergency stop or a normal stop, the methyl/ethyl alcohol fuel should be automatically shut off not later than the pilot oil fuel. It should not be possible to shut off the pilot oil fuel without first or simultaneously closing the fuel supply to each cylinder or to the complete engine.

10.5 Provision for single fuel engines

In case of a normal stop or an emergency shutdown, the methyl/ethyl alcohol fuel supply should be shut off not later than the ignition source. It should not be possible to shut off the ignition source without first or simultaneously closing the fuel supply to each cylinder or to the complete engine.

11 FIRE SAFETY

11.1 Goal

The goal of this section is to provide fire protection, detection and fighting for all systems related to storing, handling, transfer and use of methyl/ethyl alcohol as fuel.

11.2 Functional requirements

This section is related to functional requirements 3.2.1, 3.2.2, 3.2.4, 3.2.5, 3.2.12, 3.2.14 and 3.2.16 of these Interim Guidelines.

11.3 General provisions

The provisions in this section are additional to those given in SOLAS chapter II-2.

11.4 Provision for fire protection

11.4.1 For the purposes of fire protection, fuel preparation spaces should be regarded as machinery space of category A. Should the space have boundaries towards other machinery spaces of category A, accommodation, control station or cargo areas, these boundaries should not be less than A-60.

11.4.2 Any boundary of accommodation up to navigation bridge windows, service spaces, control stations, machinery spaces and escape routes, facing fuel tanks on open deck should have A-60 fire integrity.

11.4.3 For fire integrity, the fuel tank boundaries should be separated from the machinery spaces of category A and other rooms with high fire risks by a cofferdam of at least 600 mm, with insulation of not less than A-60 class.

11.4.4 The bunkering station should be separated by A-60 class divisions towards machinery spaces of category A, accommodation, control stations and high fire risk spaces, except for spaces such as tanks, voids, auxiliary machinery spaces of little or no fire risk, sanitary and similar spaces where the insulation standard may be reduced to class A-0.

11.5 Provision for fire main

When the fuel storage tank is located on the open deck, isolating valves should be fitted in the fire main in order to isolate damaged sections of the fire main. Isolation of a section of fire main should not deprive the fire line ahead of the isolated section from the supply of water.

11.6 Provision for fire fighting

11.6.1 Where fuel tanks were located on open deck, there should be a fixed fire-fighting system of alcohol-resistant foam type, as set out in chapter 17 of the IBC Code and, where appropriate, chapter 14 of the FSS Code.

11.6.2 The alcohol-resistant foam type fire-fighting system should cover the area below the fuel tank where a spill of fuel could be expected to spread.

11.6.3 The bunker station should have a fixed fire-extinguishing system of alcohol resistant foam type and a portable dry chemical powder extinguisher or an equivalent extinguisher, located near the entrance of the bunkering station.

11.6.4 Where fuel tanks are located on open deck, there should be a fixed water spray system for diluting eventual spills, cooling and fire prevention. The system should cover exposed parts of the fuel tank.

11.6.5 A fixed fire detection and fire alarm system complying with Fire Safety System Code should be provided for all compartments containing the methyl/ethyl alcohol fuel system.

11.6.6 Suitable detectors should be selected based on the fire characteristics of the fuel. Smoke detectors should be used in combination with detectors which can more effectively detect methyl/ethyl alcohol fires.

11.6.7 Means to ease detection and recognition of methyl/ethyl alcohol fires in machinery spaces should be provided for fire patrols and for fire-fighting purposes, such as portable heat-detection devices.

11.7 Provision for fire extinguishing of engine-room and fuel preparation space

11.7.1 Machinery space and fuel preparation space where methyl/ethyl alcohol-fuelled engines or fuel pumps are arranged should be protected by an approved fixed fire-extinguishing system in accordance with SOLAS regulation II-2/10 and the FSS Code. In addition, the fire-extinguishing medium used should be suitable for the extinguishing of methyl/ethyl alcohol fires.

11.7.2 An approved alcohol-resistant foam system covering the tank top and bilge area under the floor plates should be arranged for machinery space category A and fuel preparation space containing methyl/ethyl alcohol.

12 EXPLOSION PREVENTION AND AREA CLASSIFICATION

12.1 Goal

The goal of this section is to provide for the prevention of explosions and for the limitation of effects of a fire and explosion.

12.2 Functional requirements

This section is related to functional requirements 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.2.6, 3.2.8 and 3.2.11 to 3.2.17 of these Interim Guidelines. The probability of explosions should be reduced to a minimum by:

.1 reducing the number of sources of ignition;
.2 reducing the probability of formation of ignitable mixtures; and
.3 using certified safe type electrical equipment suitable for the hazardous zone where the use of electrical equipment in hazardous areas is unavoidable.

12.3 General provisions

12.3.1 Hazardous areas on open deck and other spaces not addressed in this section should be analysed and classified based on a recognized standard.[4] The electrical equipment fitted within hazardous areas should be according to the same standard.

[4] *Refer to IEC standard 60092-502:1999, part 4.4: Tankers carrying flammable liquefied gases, as applicable*

12.3.2 All hazardous areas should be inaccessible to passengers and unauthorized crew at all times.

12.4 Area classification

12.4.1 Area classification is a method of analysing and classifying the areas where explosive gas atmospheres may occur. The object of the classification is to allow the selection of electrical apparatus able to be operated safely in these areas.

12.4.2 In order to facilitate the selection of appropriate electrical apparatus and the design of suitable electrical installations, hazardous areas are divided into zones 0, 1 and 2, according to 12.5. In cases where the prescriptive provisions in 12.5 are deemed to be inappropriate, area classification according to IEC 60079-10-1:2015 should be applied with special consideration by the Administration.

12.4.3 Ventilation ducts should have the same area classification as the ventilated space.

12.5 Hazardous area zones

12.5.1 Hazardous area zone 0

This zone includes, but is not limited to, the interiors of methyl/ethyl fuel tanks, any pipework for pressure-relief or other venting systems for fuel tanks, pipes and equipment containing methyl/ethyl fuel.

12.5.2 Hazardous area zone 1

This zone includes, but is not limited to:

.1 cofferdams and other protective spaces surrounding the fuel tanks;
.2 fuel preparation spaces;
.3 areas on open deck, or semi-enclosed spaces on deck, within 3 m of any methyl/ethyl fuel tank outlet, gas or vapour outlet, bunker manifold valve, other methyl/ethyl fuel valve, methyl/ethyl fuel pipe flange, methyl/ethyl fuel preparation space ventilation outlets;

.4 areas on open deck or semi-enclosed spaces on deck in the vicinity of the fuel tank P/V outlets, within a vertical cylinder of unlimited height and 6 m radius centred upon the centre of the outlet and within a hemisphere of 6 m radius below the outlet;
.5 areas on open deck or semi-enclosed spaces on deck, within 1.5 m of fuel preparation space entrances, fuel preparation space ventilation inlets and other openings into zone 1 spaces;
.6 areas on the open deck within spillage coamings surrounding methyl/ethyl fuel bunker manifold valves and 3 m beyond these, up to a height of 2.4 m above the deck;
.7 enclosed or semi-enclosed spaces in which pipes containing methyl/ethyl fuel are located, e.g. ducts around methyl/ethyl fuel pipes, semi-enclosed bunkering stations; and
.8 a space protected by an airlock is considered as a non-hazardous area during normal operation, but will require equipment to operate following loss of differential pressure between the protected space and the hazardous area to be certified as suitable for zone 1.

12.5.3 Hazardous area zone 2

This zone includes, but is not limited to:
.1 areas 4 m beyond the cylinder and 4 m beyond the sphere defined in 12.5.2.1.4;
.2 areas within 1.5 m surrounding other open or semi-enclosed spaces of zone 1 defined in 12.5.2.1; and
.3 airlocks.

13 VENTILATION

13.1 Goal

The goal of this section is to provide for the ventilation required for safe working conditions for personnel and the safe operation of machinery and equipment where methyl/ethyl alcohol is used as fuel.

13.2 Functional requirements

This section is related to functional requirements 3.2.1, 3.2.2, 3.2.4, 3.2.6 and 3.2.11 to 3.2.17 of these Interim Guidelines.

13.3 Provisions – General

13.3.1 Ventilation inlets and outlets for spaces required to be fitted with mechanical ventilation should be located such that according to the International Convention on Load Lines they will not be required to have closing appliances.

13.3.2 Any ducting used for the ventilation of hazardous spaces should be separate from that used for the ventilation of non-hazardous spaces. The ventilation should function at all temperatures and environmental conditions the ship will be operating in.

13.3.3 Electric motors for ventilation fans should not be located in ventilation ducts for hazardous spaces unless the motors are certified for the same hazard zone as the space served.

13.3.4 Design of ventilation fans serving spaces where vapours from fuels may be present should fulfil the following:
.1 ventilation fans should not produce a source of vapour ignition in either the ventilated space or the ventilation system associated with the space; ventilation fans and fan ducts, in way of fans only, should be of non-sparking construction defined as:
  .1 impellers or housings of non-metallic material, due regard being paid to the elimination of static electricity;
  .2 impellers and housings of non-ferrous metals;
  .3 impellers and housings of austenitic stainless steel;
  .4 impellers of aluminium alloys or magnesium alloys and a ferrous (including austenitic stainless steel) housing on which a ring of suitable thickness of non-ferrous materials is fitted in way of the impeller, due regard being paid to static electricity and corrosion between ring and housing; or
  .5 any combination of ferrous (including austenitic stainless steel) impellers and housings with not less than 13 mm tip design clearance;
.2 in no case should the radial air gap between the impeller and the casing be less than 0.1 of the diameter of the impeller shaft in way of the bearing but not less than 2 mm; the gap need not be more than 13 mm; and
.3 any combination of an aluminium or magnesium alloy fixed or rotating component and a ferrous fixed or rotating component, regardless of tip clearance, is considered a sparking hazard and should not be used in these places.

13.3.5 Ventilation systems required to avoid any vapour accumulation should consist of independent fans, each of sufficient capacity, unless otherwise specified in these Interim Guidelines. The ventilation system should be of a mechanical exhaust type, with extraction inlets located such as to avoid accumulation of vapour from leaked methyl/ethyl alcohol in the space.

13.3.6 Air inlets for hazardous enclosed spaces should be taken from areas that, in the absence of the considered inlet, would be non-hazardous. Air inlets for non-hazardous enclosed spaces should be taken from non-hazardous areas at least 1.5 m away from the

boundaries of any hazardous area. Where the inlet duct passes through a more hazardous space, the duct should be gastight and have over-pressure relative to this space.

13.3.7 Air outlets from non-hazardous spaces should be located outside hazardous areas.

13.3.8 Air outlets from hazardous enclosed spaces should be located in an open area that, in the absence of the considered outlet, would be of the same or lesser hazard than the ventilated space.

13.3.9 The required capacity of the ventilation plant is normally based on the total volume of the room. An increase in required ventilation capacity may be necessary for rooms having a complicated form.

13.3.10 Non-hazardous spaces with entry openings to a hazardous area should be arranged with an airlock and be maintained at overpressure relative to the external hazardous area. The overpressure ventilation should be arranged according to the following:

.1 during initial start-up or after loss of overpressure ventilation, before energizing any electrical installations not certified safe for the space in the absence of pressurization, it should be required to:
  .1 proceed with purging (at least five air changes) or confirm by measurements that the space is non-hazardous; and
  .2 pressurize the space;

.2 operation of the overpressure ventilation should be monitored and in the event of failure of the overpressure ventilation:
  .1 an audible and visual alarm should be given at a manned location; and
  .2 if overpressure cannot be immediately restored, automatic or programmed, disconnection of electrical installations according to a recognized standard[5] should be required.

[5] *Refer to IEC 60092-502:1999 Electrical Installations in Ships – Tankers – Special Features, table 5*

13.3.11 Non-hazardous spaces with entry openings to a hazardous enclosed space should be arranged with an airlock and the hazardous space should be maintained at underpressure relative to the non-hazardous space. Operation of the extraction ventilation in the hazardous space should be monitored and in the event of failure of the extraction ventilation:

.1 an audible and visual alarm should be given at a manned location; and

.2 if underpressure cannot be immediately restored, automatic or programmed, disconnection of electrical installations according to recognized standards in the non-hazardous space should be required.

13.3.12 Double bottoms, cofferdams, duct keels, pipe tunnels, hold spaces and other spaces where methyl/ethyl fuel may accumulate should be capable of being ventilated to ensure a safe environment when entry into the spaces is necessary.

13.4 Provisions for fuel preparation spaces

13.4.1 Fuel preparation spaces should be provided with an effective mechanical forced ventilation system of extraction type. During normal operation the ventilation should be at least 30 air changes per hour.

13.4.2 The number and power of the ventilation fans should be such that the capacity is not reduced by more than 50% if a fan with a separate circuit from the main switchboard or emergency switchboard or a group of fans with common circuit from the main switchboard or emergency switchboard is inoperable.

13.4.3 Ventilation systems for fuel preparation spaces and other fuel handling spaces should be in operation when pumps or other fuel treatment equipment are working.

13.5 Provisions for bunkering station

Bunkering stations that are not located on open deck should be suitably ventilated to ensure that any vapour being released during bunkering operations will be removed outside. If the natural ventilation is not sufficient, the bunkering stations should be subject to special consideration with respect to provisions for mechanical ventilation. The Administration may require special risk assessment.

13.6 Provisions for ducts and double wall pipes

13.6.1 Ducts and double wall pipes containing fuel piping fitted with a mechanical ventilation system of the extraction type should be provided with a ventilation capacity of at least 30 air changes per hour.

13.6.2 The ventilation system for double wall piping and ducts should be independent of all other ventilation systems.

13.6.3 The ventilation inlet for the double wall piping or duct should always be located in a non-hazardous area, in open air, away from ignition sources. The inlet opening should be fitted with a suitable wire mesh guard and protected from ingress of water.

14 ELECTRICAL INSTALLATIONS

14.1 Goal

The goal of this section is to provide for electrical installations that minimize the risk of ignition in the presence of a flammable atmosphere.

14.2 Functional requirements:

This section is related to functional requirements 3.2.1, 3.2.2, 3.2.3, 3.2.5, 3.2.8, 3.2.11, 3.2.13, 3.2.15, 3.2.16 and 3.2.17 of these Interim Guidelines.

14.3 Provisions – General

14.3.1 Electrical installations should comply with a recognized standard[6] at least equivalent to those acceptable to the Organization.

[6] *Refer to IEC 60092:2018 series standards, as applicable.*

14.3.2 Electrical equipment or wiring should not be installed in hazardous areas unless essential for operational purposes or safety enhancement.

14.3.3 Where electrical equipment is installed in hazardous areas as provided in 14.3.2, it should be selected, installed and maintained in accordance with IEC standards or other standards at least equivalent to those acceptable to the Organization.

14.3.4 The lighting system in hazardous areas should be divided between at least two branch circuits. All switches and protective devices should interrupt all poles or phases and should be located in a non-hazardous area.

14.3.5 The onboard installation of the electrical equipment units should be such as to ensure the safe bonding to the hull of the units themselves.

15 CONTROL, MONITORING AND SAFETY SYSTEMS

15.1 Goal

The goal of this section is to provide for the arrangement of control, monitoring and safety systems that support an efficient and safe operation of the fuel installations as covered in the other sections of these Interim Guidelines.

15.2 Functional requirements

This section is related to functional requirements in 3.2.1, 3.2.2, 3.2.3, 3.2.9, 3.2.10, 3.2.11, 3.2.13, 3.2.14 and 3.2.17 of these Interim Guidelines. In particular, the following applies:

.1 the control, monitoring and safety systems of the methyl/ethyl alcohol installations should be arranged such that there is not an unacceptable loss of power in the event of a single failure;

.2 a fuel safety system should be arranged to close down the fuel supply system automatically, upon failure in systems as described in table 1 and upon other fault conditions which may develop too fast for manual intervention;

.3 the safety functions should be arranged in a dedicated fuel safety system that is independent of the fuel control system in order to avoid possible common cause failures; this includes power supplies and input and output signal;

.4 the safety systems including the field instrumentation should be arranged to avoid spurious shutdown, e.g. as a result of a faulty vapour detector or a wire break in a sensor loop; and

.5 where two fuel supply systems are required to meet the provisions, each system should be fitted with its own set of independent fuel control and safety systems.

15.3 General provisions

15.3.1 Suitable instrumentation devices should be fitted to allow a local and a remote reading of essential parameters to ensure safe management of the whole fuel equipment including bunkering.

15.3.2 Liquid leakage detection should be installed in the protective cofferdams surrounding the fuel tanks, in all ducts around fuel pipes, in fuel preparation spaces, and in other enclosed spaces containing single walled fuel piping or other fuel equipment.

15.3.3 The annular space in a double walled piping system should be monitored for leakages and the monitoring system should be connected to an alarm system. Any leakage detected should lead to shutdown of the affected fuel supply line in accordance with table 15.1.

15.3.4 At least one bilge well with a level indicator should be provided for each enclosed space, where an independent storage tank without a protective cofferdam is located. A high-level bilge alarm should be provided. The leakage detection system should trigger an alarm and the safety functions in accordance with table 15.1.

15.3.5 For tanks not permanently installed in the vessel, a monitoring system equivalent to that provided for permanent installed tanks should be provided.

15.4 Provisions for bunkering and fuel tank monitoring

15.4.1 Level indicators for fuel tanks

Each fuel tank should be fitted with closed level gauging devices, arranged to ensure a level reading is always obtainable and unless any necessary maintenance can be carried out while the fuel tank is in service, two devices should be installed.

15.4.2 Overflow control

15.4.2.1 Each fuel tank should be fitted with a visual and audible high-level alarm. This should be able to be function tested from the outside of the tank and can be common with the level gauging system (configured as an alarm on the gauging transmitter),but should be independent of the high-high-level alarm.

15.4.2.2 An additional sensor (high-high-level) operating independently of the high liquid level alarm should automatically actuate a shut-off valve to avoid excessive liquid pressure in the bunkering line and prevent the tank from becoming liquid full.

15.4.2.3 The high and high-high-level alarm for the fuel tanks should be visual and audible at the location at which gas freeing by water filling of the fuel tanks is controlled, given that water filling is the preferred method for gas freeing.

15.5 Provisions for bunkering control

15.5.1 Bunkering control should be from a safe remote location. At this safe remote location:

.1 tank level should be capable of being monitored;

.2 the remote-control valves required by 8.5.3 should be capable of being operated from this location; closing of the bunkering shutdown valve should be possible from the control location for bunkering and from another safe location; and

.3 overfill alarms and automatic shutdown should also be indicated at this location.

15.5.2 If the ventilation in the ducting enclosure or annular spaces of the double walled bunkering lines stops, an audible and visual alarm should be activated at the bunkering control location.

15.5.3 If fuel leakage is detected in ducting enclosure or the annular spaces of the double walled bunkering lines, an audible and visual alarm and emergency shutdown of the bunkering valve should automatically be activated.

15.6 Provisions for engine monitoring

In addition to the instrumentation provided in accordance with SOLAS chapter II-1, part C, indicators should be fitted on the navigation bridge, the engine control room and the manoeuvring platform for:

.1 operation of methyl/ethyl alcohol fuel engines; and

.2 operation and mode of operation of the engine in the case of dual fuel engines.

15.7 Provisions for gas detection

15.7.1 Permanently installed gas detectors should be fitted in:

.1 all ventilated annular spaces of the double walled fuel pipes;

.2 machinery spaces containing fuel equipment or consumers;

.3 fuel preparation spaces;

.4 other enclosed spaces containing fuel piping or other fuel equipment without ducting;

.5 other enclosed or semi-enclosed spaces where fuel vapours may accumulate;

.6 cofferdams and fuel storage hold spaces surrounding fuel tanks;

.7 airlocks; and

.8 ventilation inlets to accommodation and machinery spaces, if required, based on the risk assessment required in 4.2.

15.7.2 The number and placement of detectors in each space should be considered taking into account the size, layout and ventilation of the space. Gas dispersal analysis or a physical smoke test should be used to find the best arrangement.

15.7.3 Fuel vapour detection equipment should be designed, installed and tested in accordance with a recognized standard.[7]

[7] *Refer to IEC 60079-29-1:2016 – Explosive atmospheres – Gas detectors – Performance requirements of detectors for flammable gases.*

15.7.4 An audible and visible alarm should be activated at a fuel vapour concentration of 20% of the lower explosion limit (LEL). The safety system should be activated at 40% of LEL at two detectors. Special consideration should be given to toxicity in the design process of the detection system.

15.7.5 For ventilated ducts and annular spaces around fuel pipes in the machinery spaces containing methyl/ethyl alcohol-fuelled engines, the alarm limit should be set to 20% of LEL. The safety system should be activated at 40% of LEL at two detectors.

15.7.6 Audible and visible alarms from the fuel vapour detection equipment should be located on the navigation bridge, in the continuously manned central control station, safety centre and at the control location for bunkering as well as locally.

15.7.7 Fuel vapour detection required by this section should be continuous without delay.

15.8 Provisions for fire detection

Fire detection in machinery space containing methyl/ethyl alcohol engines and fuel storage hold spaces should give audible and visual alarms on the navigation bridge and in a continuously manned central control station or safety centre as well as locally.

15.9 Provisions for ventilation

Any loss of the required ventilating capacity should give an audible and visual alarm on the navigation bridge, and in a continuously manned central control station or safety centre as well as locally.

15.10 Provisions on safety functions of fuel supply systems

15.10.1 If the fuel supply is shut off due to activation of an automatic valve, the fuel supply should not be opened until the reason for the disconnection is ascertained and the necessary precautions taken. A readily visible notice giving instruction to this effect should be placed at the operating station for the shut-off valves in the fuel supply lines.

15.10.2 If a fuel leak leading to a fuel supply shutdown occurs, the fuel supply should not be operated until the leak has been found and dealt with. Instructions to this effect should be placed in a prominent position in the machinery space.

15.10.3 A caution placard or signboard should be permanently fitted in the machinery space containing methyl/ethyl-fuelled engines stating that heavy lifting, implying danger of damage to the fuel pipes, should not be done when the engine(s) is running on methyl/ethyl.

15.10.4 Pumps and fuel supply should be arranged for manual remote emergency stop from the following locations as applicable:

.1 navigation bridge;
.2 cargo control room;
.3 onboard safety centre;
.4 engine control room;
.5 fire control station; and
.6 adjacent to the exit of fuel preparation spaces.

Table 15.1
Monitoring of methyl/ethyl alcohol supply system to engines

Parameter	**Alarm**	**Automatic shutdown of tank valve** (valve(s) referred to in 9.6.2)	**Automatic shutdown of master fuel valve** (valve(s) referred to in 9.6.3)	**Automatic shutdown of bunkering valve**	**Comments**
High-level fuel tank	X			X	See 15.4.2.1
High-high-level fuel tank	X			X	See 15.4.2.2 and 15.5.1
Loss of ventilation in the annular space in the bunkering line	X			X	See 15.5.2
Gas detection in the annular space in the bunkering line	X			X	See 15.5.3
Loss of ventilation in ventilated areas	X				See 15.9
Manual shutdown				X	See 15.5.1
Liquid methyl/ethyl alcohol detection in the annular space of the double walled bunkering line	X			X	See 15.5.3
Vapour detection in ducts around fuel pipes	X				See 15.7.1.1
Vapour detection in cofferdams surrounding fuel tanks. One detector giving 20% of LEL	X				See 15.7.5
Vapour detection in airlocks	X				See 15.7.1.7
Vapour detection in cofferdams surrounding fuel tanks. Two detectors giving 40% of LEL, 1)	X	X		X	See 15.7.1.6
Vapour detection in ducts around double walled pipes, 20% of LEL	X				See 15.7.7
Vapour detection in ducts around double walled pipes, 40% of LEL, 1)	X	X	X		See 15.7.7. Two gas detectors to give min. 40% of LEL before shutdown
Liquid leak detection in annular space of double walled pipes	X	X	X		See 15.3.3
Liquid leak detection in engine-room	X	X			See 15.3.2
Liquid leak detection in fuel preparation space	X	X			See 15.3.2
Liquid leakage detection in protective cofferdams surrounding fuel tanks	X				See 15.3.2

16 TRAINING, DRILLS AND EMERGENCY EXERCISES

16.1 The goal of this section is to ensure that seafarers on board ships to which these Interim Guidelines apply are adequately qualified, trained and experienced.

16.2 Methyl/ethyl alcohol fuel-related drills and exercises should be incorporated into the schedule for periodical drills.

16.3 Such drills and exercises related to methyl/ethyl alcohol fuels could include for example:

.1 tabletop exercise;
.2 review of fuelling procedures based on the fuel handling manual required by 17.2.3;
.3 responses to potential contingencies;
.4 tests of equipment intended for contingency response; and
.5 reviews that assigned seafarers are trained to perform assigned duties during fuelling, operation and contingency response.

16.4 The response and safety system for hazards and accident control should be reviewed and tested.

16.5 The company should ensure that seafarers on board ships using methyl/ethyl alcohol fuels should have completed training to attain the abilities that are appropriate to the capacity to be filled, and duties and responsibilities to be taken up.

16.6 The master, officers, ratings and other personnel on ships using methyl/ethyl alcohol fuels should be trained and qualified in accordance with regulation V/3 of the STCW Convention and section A-V/3 of the STCW Code, taking into account the specific hazards of the methyl/ethyl alcohol used as fuel.

17 OPERATION

17.1 Goal

The goal of this section is to ensure that operational procedures for the loading, storage, operation, maintenance and inspection of systems for methyl/ethyl alcohol fuels minimize the risk to personnel, the ship and the environment, and are consistent with practices for a conventional oil-fuelled ship whilst taking into account the nature of these fuels.

17.2 Functional requirements

This section relates to the functional provisions 3.2.1 to 3.2.3, 3.2.9, 3.2.11, 3.2.14, 3.2.15 and 3.2.16 of these Interim Guidelines. In particular, the following applies:

.1 a copy of these Interim Guidelines, or national regulations incorporating the provisions of the same, should be on board every ship covered by these Interim Guidelines;
.2 maintenance procedures and information for all methanol/ethanol related installations should be available on board;
.3 the ship should be provided with operational procedures including a suitably detailed fuel handling manual, such that trained qualified personnel can safely operate the fuel bunkering, storage and transfer systems; and
.4 the ship should be provided with suitable emergency procedures.

17.3 Provisions for maintenance

17.3.1 Maintenance and repair procedures should include considerations with respect to the fuel containment system and adjacent spaces. Special consideration should be given to the toxicity of fuel.

17.3.2 The procedures and information should include maintenance of electrical equipment that is installed in explosion hazardous spaces and areas. The inspection and maintenance of electrical installations in explosion hazardous spaces should be performed in accordance with recognized standards.

17.4 Provisions for bunkering operations

17.4.1 Responsibilities

17.4.1.1 Before any bunkering operation commences, the master of the receiving ship or their representative and the representative of the bunkering source (persons in charge (PIC)) should:

.1 agree in writing the transfer procedure including the maximum transfer rate at all stages and volume to be transferred;
.2 agree in writing action to be taken in an emergency; and
.3 complete and sign the bunker safety checklist.

17.4.1.2 Upon completion of bunkering operations, the ship PIC should receive and sign documentation containing a description of the product and the quantity delivered.

17.4.2 Overview of control, automation and safety systems

17.4.2.1 The fuel handling manual required by 17.2.3 should include but not be limited to:

.1 overall operation of the ship from dry dock to dry dock, including procedures for bunker loading and, where appropriate, discharging, sampling, inerting and gas freeing;
.2 operation of inert gas systems;
.3 fire-fighting and emergency procedures: operation and maintenance of fire-fighting systems and use of extinguishing agents;
.4 specific fuel properties and special equipment needed for the safe handling of the particular fuel;
.5 fixed and portable gas detection operation and maintenance of equipment;
.6 emergency shutdown systems, where fitted; and
.7 a description of the procedural actions to take in an emergency situation, such as leakage, fire or poisoning.

17.4.2.2 A fuel system schematic/piping and instrumentation diagram (P&ID) should be reproduced and permanently displayed in the ship's bunker control station and at the bunker station.

17.4.3 Pre-bunkering verification

17.4.3.1 Prior to conducting bunkering operations, pre-bunkering verification including, but not limited to, the following should be carried out and documented in the bunker safety checklist:

.1 all communications methods, including ship shore link (SSL), if fitted;
.2 operation of fixed fire detection equipment;
.3 operation of portable gas detection equipment;
.4 readiness of fixed and portable fire-fighting systems and appliances;
.5 operation of remote-controlled valves; and
.6 inspection of hoses and couplings.

17.4.3.2 Documentation of successful verification should be indicated by the mutually agreed and executed bunkering safety checklist signed by both PICs.

17.4.4 Ship bunkering source communications

17.4.4.1 Communications should be maintained between the ship PIC and the bunkering source PIC at all times during the bunkering operation. In the event that communications cannot be maintained, bunkering should stop and not resume until communications are restored.

17.4.4.2 Communication devices used in bunkering should comply with recognized standards for such devices acceptable to the Administration.

17.4.4.3 PICs should have direct and immediate communication with all personnel involved in the bunkering operation.

17.4.4.4 The SSL or equivalent means to a bunkering source provided for automatic ESD communications should be compatible with the receiving ship and the delivering facility ESD system.[8]

[8] *Refer to ISO 28460:2010, Petroleum and natural gas industries – installation and equipment for liquefied natural gas – Ship*-to-shore interface and port operations

17.4.5 Electrical bonding

Consideration should be given to the electrical insulation between ship and shore.