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Guidelines for systems and installations for supply of LNG as fuel to ships

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National foreword

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A list of organizations represented on this committee can be obtained on request to its secretary.

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**Guidelines for systems and installations
for supply of LNG as fuel to ships**

*Lignes directrices pour les systèmes et installations de distribution de
gaz naturel liquide comme carburant pour navires*



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ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

The committee responsible for this document is ISO/TC 67, *Materials, equipment and offshore structures for the petroleum, petrochemical and natural gas industries*.

Introduction

The properties, characteristics, and behaviour of LNG differ significantly from conventional marine fuels, such as heavy fuel oils and distillate fuels as marine diesel oil (MDO) or marine gas oil (MGO).

For these reasons, it is essential that all LNG bunkering operations are undertaken with diligence and due attention is paid to prevent leakage of LNG liquid or vapour and to control all sources of ignition. Therefore, it is necessary that throughout the LNG bunkering chain, each element is carefully designed and has dedicated safety and operational procedures executed by trained personnel.

It is important that the basic requirements laid down in this Technical Specification are understood and applied to each operation in order to ensure the safe, secure, and efficient transfer of LNG as a fuel to the ship.

The objective of this Technical Specification is to provide guidance for the planning and design of the following and thereby ensuring that an LNG fuelled ship can refuel with a high level of safety, integrity, and reliability regardless of the type of bunkering facility:

- bunkering facility;
- ship/bunkering facility interface;
- procedures for connection and disconnection;
- monitoring procedures during bunkering;
- emergency shutdown interface;
- LNG bunkering process control.

The LNG bunkering interface comprises the area of LNG transfer and includes manifold, valves, safety and security systems and other equipment, and the personnel involved in the LNG bunkering operations.

This Technical Specification is based on the assumption that the receiving ships and LNG supply facilities are designed according to the relevant applicable codes, regulations, and guidelines such as the International Maritime Organization (IMO), ISO, EN, and NFPA standards and the Society of International Gas Tankers and Terminal Operators (SIGTTO), the Oil Companies International Marine Forum (OCIMF), and other recognized documents during LNG bunkering. Relevant publications by these and other organizations are listed in the Bibliography.

It has to be recognized that in cases where the distance to third parties is too close and the risk exceeds acceptance criteria, the bunkering operation is not to be considered.

It is not necessary that the provisions of this Technical Specification are applied retroactively. It is recognized that national/local laws and regulations take precedence when they are in conflict with this Technical Specification.

Guidelines for systems and installations for supply of LNG as fuel to ships

1 Scope

This Technical Specification gives guidance on the minimum requirements for the design and operation of the LNG bunkering facility, including the interface between the LNG supply facilities and receiving ship as shown in [Figure 1](#).

This Technical Specification provides requirements and recommendations for operator and crew competency training, for the roles and responsibilities of the ship crew and bunkering personnel during LNG bunkering operations, and the functional requirements for equipment necessary to ensure safe LNG bunkering operations of LNG fuelled ships.

This Technical Specification is applicable to bunkering of both seagoing and inland trading vessels. It covers LNG bunkering from shore or ship LNG supply facilities, as shown in [Figure 1](#) and described in [Clause 4](#), and addresses all operations required such as inerting, gasing up, cooling down, and loading.

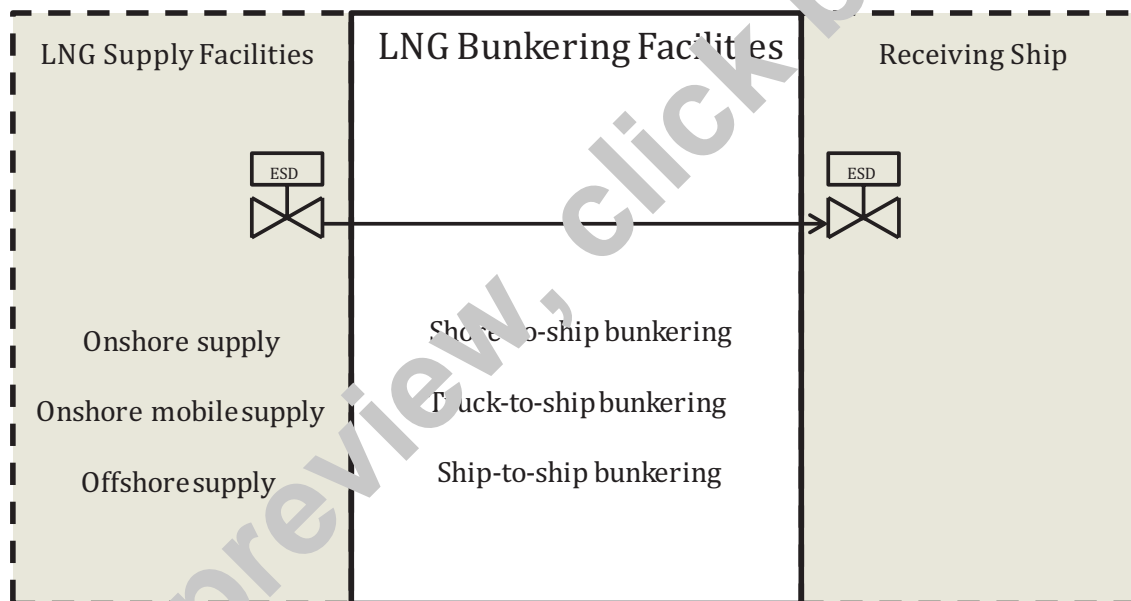


Figure 1 — Interfaces between bunkering facility and supply/receiving facilities

The use of portable storage tanks such as containers, trailers, or similar to load and store LNG on board ships to be used as fuel is not part of this Technical Specification.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC Guide 73, *Risk management — Vocabulary — Guidelines for use in standards*

ISO/TS 16901, *Guidance on performing risk assessments in the design of onshore LNG installations including the ship/shore interface*