

This is a preview of "ISO/TS 18683:2015". [Click here to purchase the full version from the ANSI store.](#)

First edition
2015-01-15

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*



Reference number
ISO/TS 18683:2015(E)

© ISO 2015



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

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
Web www.iso.org

Published in Switzerland

This is a preview of "ISO/TS 18683:2015". [Click here to purchase the full version from the ANSI store.](#)

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms, definitions, and abbreviated terms	2
3.1 Terms and definitions	2
3.2 Abbreviated terms	5
4 Bunkering scenarios	5
5 Properties and behaviour of LNG	7
5.1 General	7
5.2 Description and hazards of LNG	7
5.3 Potential hazardous situations associated with LNG transfer	8
5.4 Composition of LNG as a bunker fuel	8
6 Safety	8
6.1 Objectives	8
6.2 General safety principles	8
6.3 Approach	8
7 Risk assessment	8
7.1 General	8
7.2 Qualitative risk assessment	11
7.2.1 Main steps	11
7.2.2 Study basis	11
7.2.3 HAZID	12
7.2.4 Determination of safety zones	15
7.2.5 Determination of security zones	15
7.2.6 Reporting	16
7.3 Quantitative risk assessment	16
7.3.1 Main steps	16
7.3.2 HAZID	16
7.3.3 Establish study basis	16
7.3.4 Quantitative risk assessment	17
7.3.5 Frequency analysis	17
7.3.6 Risk assessment	17
7.3.7 QRA report	18
8 Functional requirements for LNG bunkering system	18
8.1 General	18
8.2 Design and operation basis	18
8.3 Compatibility between supplier and ship	19
8.4 Prevention of releases of LNG or natural gas to the atmosphere	19
8.5 Safety	19
8.5.1 General	19
8.5.2 Functional requirements to reduce risk of accidental release of LNG and natural gas	19
8.5.3 Requirements to contain hazardous situations	21
8.5.4 Emergency preparedness	22
9 Requirements to components and systems	22
9.1 General	22
9.2 Available standards for relevant components	22
9.3 Presentation flange and connection	24
10 Training	25

This is a preview of "ISO/TS 18683:2015". Click [here](#) to purchase the full version from the ANSI store.

11	Requirements for documentation	26
11.1	General	26
11.2	Compliance statements	26
11.3	Design, fabrication, and commissioning documentation	26
11.4	Operational documentation	26
11.5	Maintenance documentation	27
11.6	Emergency response documentation	27
11.7	Training documentation	27
11.8	Delivery documentation of LNG properties and quantity	28
11.9	Retention of documentation	28
Annex A	(normative) Risk acceptance criteria	29
Annex B	(informative) Determination of safety zones	31
Annex C	(informative) Functional requirements	36
Annex D	(informative) Sample ship supplier checklist	38
Annex E	(informative) Sample LNG delivery note	44
Annex F	(informative) Arrangement and types of presenting connection	45
Annex G	(informative) Dry disconnect coupling	46
Bibliography		48

This is a preview of "ISO/TS 18683:2015". [Click here to purchase the full version from the ANSI store.](#)

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 and 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 location 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.