

TECHNICAL REFERENCE

LNG bunkering

– Part 1 : General introduction

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CSC set up the Technical Committee on LNG Bunkering to oversee the preparation of this standard. The Technical Committee consists of the following members:

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	Mr Yao Yikai	<i>Maritime and Port Authority of Singapore</i>
	Mr Zheng Huijian	<i>Energy Market Authority</i>

The Technical Committee set up the following three Working Groups to prepare this standard. The Working Groups consists of the following experts who contribute in their individual capacity:

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Mr Wu Meng Hsien
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The organisations in which the experts of the Working Group are involved are:

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Emerson Process Management Marine Solutions Singapore Pte Ltd
Endress+Hauser (S.E.A.) Pte Ltd
Enterprise Singapore
ExxonMobil Research and Engineering Company
FueLNG Pte Ltd
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National Metrology Centre
Pavilion Energy Singapore Pte Ltd
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China Classification Society
FueLNG Pte Ltd
Gas Technology Development Pte Ltd
Gaztransport & Technigaz
Jurong Port Singapore
Keppel Smit Towage Pte Ltd
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Pavilion Energy Singapore Pte Ltd
PSA Marine (Pte) Ltd
Shell International Eastern Trading Co
Sinanju Marine Services Pte Ltd
Singapore Civil Defence Force
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Shell Eastern Trading (Pte) Ltd
Sinanju Tanker Pte Ltd
Singapore Maritime Academy, Singapore Polytechnic
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Foreword

~~This~~ This Technical Reference (TR) ~~comes in a series of four parts and~~ was prepared by ~~three~~ the Working ~~Groups (WGs) appointed~~ Group on LNG Bunkering Specification, Working Group on LNG Bunkering Procedures and Safety Distances and Working Group on LNG Bunkering Crew Training set up by the Technical Committee on LNG Bunkering under the ~~direction~~ purview of CSC.

TR 56 consists of the ~~Chemical Standards Committee (CSC). The CSC endorsed the TR on 13 January 2017.~~ following parts under the generic title “LNG bunkering”:

~~This TR is a provisional standard made available for application over a period of three years. The aim is to use the experience gained to update the TR so that it can be adopted as a Singapore Standard. Users of the TR are invited to provide feedback on its technical content, clarity and ease of use. Feedback can be submitted using the form provided in the TR. At the end of the three years, the TR will be reviewed, taking into account any feedback or other considerations, to further its development into a Singapore Standard if found suitable.~~

- Part 1: General introduction
- Part 2: Requirements for custody transfer
- Part 3: Procedures and safety distances
- Part 4: Competency requirements for personnel

In this revision, new terms and definitions were included.

In preparing this TR, reference was made to the following documents:

1. DNVGL-RP-G105 ~~: 2015~~ Development and operation of liquefied natural gas bunkering facilities
2. ISO 9000 Quality management systems – Fundamentals and vocabulary
3. ISO/IEC Guide 99 International vocabulary of metrology – Basic and general concepts and associated terms (VIM)
4. ISO/TS 18683 ~~: 2015~~ Guidelines for systems and installations for supply of LNG as fuel to ships
- ~~3. — SGMF Bunkering of Ships with Liquefied Natural Gas (LNG) — Competency Guidelines (2016)~~
- ~~4. — SGMF Quality and Quantity — Contractual Guidelines (2015)~~
5. ~~TR 48 : 2015 Technical Reference~~ SS 648 Code of practice for bunker mass flow metering
6. SGMF Training and competency guidelines
7. SGMF Quality and quantity – contractual guidelines
8. SGMF Recommendation of controlled zones during LNG bunkering

Some of the definitions in Clause 3 were reproduced from the above publications with permission from the respective organisations as indicated in brackets after the definitions. Clause 5 of ISO/TS 18683 was adapted as Clause 4 in this Part of the TR. All rights are reserved by the respective organisations.

Acknowledgement is made for the use of information from the above publications.

Acknowledgement is also made to The Society for Gas as a Marine Fuel (SGMF) for their kind assistance in the development of this ~~series of standards on LNG bunkering~~ Technical Reference and for their permission to reproduce/adapt the works from the following SGMF Guidelines:

~~SGMF LNG Bunkering Safety Guidelines~~ — ISBN — ~~978-0-9933164-0-1~~

~~SGMF Training and Competency Guidelines~~ — ISBN — ~~978-0-9933164-3-2~~

~~SGMF Quality and Quantity Contractual Guidelines~~ — ISBN — ~~978-0-9933164-1-8~~

- SGMF Quality and Quantity – Contractual Guidelines (definitions into TR 56: Part 1: 2020 and clause 5.4 into TR 56: Part 2: 2020)
- SGMF LNG Bunkering Safety Guidelines (clauses 4.1.1 and 4.2 into TR 56: Part 3: 2020)
- SGMF Training and Competency Guidelines (definitions into TR 56: Part 1: 2020 and clauses 4.1 to 4.8 and clause 5 into TR 56: Part 4: 2020)
- SGMF Recommendation of Controlled Zones during LNG Bunkering (clause 4 controlled zones definitions into TR 56: Part 1: 2020)

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This TR is expected to be used by all stakeholders involved in the LNG bunker supply chain including LNG bunker suppliers, bunker tanker owners/operators, LNG fuel receiving vessels, ship owners/operators, training institutions, third party agencies and relevant authorities.

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