

TECHNICAL REFERENCE

LNG bunkering

– Part 3 : Procedures and safety distances

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The content of this Technical Reference was approved on 31 March 2020 by the Chemicals Standards Committee (CSC) under the purview of the Singapore Standards Council.

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CSC consists of the following members:

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Secretary	: Ms Elane Ng	<i>Standards Development Organisation @ Singapore Chemical Industry Council</i>
	Ms Rosmalinda Tay	<i>Standards Development Organisation @ Singapore Chemical Industry Council</i>
Members	: Mr Goh Tiak Boon	<i>Individual Capacity</i>
	Prof Alfred Huan	<i>Individual Capacity</i>
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	Mr Seah Khen Hee	<i>Individual Capacity</i>
	A/Prof Timothy Ta	<i>Nanyang Technological University</i>
	Dr Teo Tang Lin	<i>Chemical Metrology Division, Health Sciences Authority</i>
	Mr Yao Yikai	<i>Maritime and Port Authority of Singapore</i>
	Ms Suzanna Yap	<i>National Environment Agency</i>
Co-opted Members	: Ms Christina Loh	<i>Individual Capacity</i>
	Mr Pitt Kwan Wah	<i>Individual Capacity</i>

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

	Name	Representation
Chairman	: Mr Goh Tiak Boon	<i>Individual Capacity</i>
Secretary	: Ms Elane Ng	<i>Standards Development Organisation @ Singapore Chemical Industry Council</i>
Members	: Dr Khorshed Alam	<i>Singapore Shipping Association</i>
	Dr Giulio Gennaro/ Mr Foo Nan Cho	<i>Society of Naval Architects and Marine Engineers Singapore</i>
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	Mr Sandeep Mahawar	<i>Singapore LNG Corporation Pte Ltd</i>
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	Mr Alex Tang	<i>The International Bunker Industry Association</i>
	Capt Satinder Singh Viridi	<i>Singapore Maritime Academy</i>
	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 Working Group on LNG Bunkering Procedures and Safety Distances to prepare this standard. The Working Group consists of the following experts who contribute in their *individual capacity*:

	Name
Co-Convenors	: Mr Julien Boulland Ms Shanice Koh
Members	: Capt. Andy Chew Kian Kwee Mr Aw Teck Leong Ms Marion During Ms Ina Foo Mr Gan Shaowei Mr Jeremy Lee Mr Rajesh Mahesan Mr Stephane Maillard Mr Subhendu Mukherjee Capt Tomoyoshi Nasuno

Members : LTA Shavithiya Shanmugam
Mr Siah Poh Chiang
Capt. Anthony Sim
Mr So Kah Meng
Mr Yang Zhan Ming

The organisations in which the experts of the Working Group are involved are:

Bureau Veritas Marine (Singapore) Pte Ltd
China Classification Society
FueLNG Pte Ltd
Gas Technology Development Pte Ltd
Gaztransport & Technigaz (GTT)
Jurong Port Singapore
Keppel Smit Towage Pte Ltd
Lloyd's Register Singapore Pte Ltd
Maritime and Port Authority of Singapore
Mitsui O.S.K. Lines
Pavilion Energy Singapore Pte Ltd
PSA Marine (Pte) Ltd
Shell International Eastern Trading Co
Sinanju Marine Services Pte Ltd
Singapore Civil Defence Force
Total Marine Fuels Singapore

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Foreword

~~This~~ This Technical Reference (TR) for liquefied natural gas (LNG) was prepared by the Working Group on LNG bunkering ~~comes in a series~~ procedures and safety distances set up by the Technical Committee on LNG bunkering under the purview of ~~four~~ CSC.

TR 56 consists of the following parts under the generic title “LNG bunkering”:

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

~~This Part of the TR was prepared by the Working Group (WG) on LNG Bunkering Procedures and Safety Distances appointed by the Technical Committee on LNG bunkering under the direction of the Chemical Standards Committee (CSC). The CSC endorsed the TR on 13 January 2017.~~

~~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.~~

In this revision, the following changes were made:

- Enhancement of SIMOPS requirements under Clause 7 and SIMOPS examples listed in new Annex F;
- Inclusion of responsibility matrix for bunkering stakeholders in new Annex B;
- Better clarity on controlled zones under Clause 5.6;
- Amendments to LNG bunkering checklists with experience gained from truck-to-ship mode.

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

1. BV Guidelines on LNG Bunkering (NI 618 – July 2014)
2. DNVGL-RP-G105 Development and operation of liquefied natural gas bunkering facilities (2015)
3. IAPH LNG bunker checklists (2019)
4. ISO 17776: 2000 – Petroleum and natural gas industries – Offshore production installations – Guidelines on tools and techniques for hazard identification and risk assessment
5. ISO 31010: 2009 – Risk Management – Risk assessment techniques
6. ISO/TS 16901: 2015 – Guidance on performing risk assessment in the design of onshore LNG installations including the ship/shore interface
7. ISO/TS 18683: 2015 – Guidelines for systems and installations for supply of LNG as fuel to ships

8. ~~SGMF LNG Bunkering Safety Guidelines (2015)~~ OCIMF Mooring equipment guidelines, 4th edition 2018, MEG4
9. SGMF LNG Bunkering Safety Guidelines (2015)
10. SIGTTO ESD Arrangements & Linked Ship/Shore Systems for Liquefied Gas Carriers (2009)
11. SIGTTO LNG Transfer Arms and Manifold Draining, Purging and Disconnection Procedure (2012)

Annex B of ISO 20519 was adapted and Table D.1 of ISO/TS 18683:~~2015~~ was reproduced as in Annex ~~C~~D of this TR, and the IAPH LNG bunker checklists were adapted as Annex A of this TR with the permission of the International Organization for Standardization and the International Association of Ports and Harbors respectively.

Acknowledgement is made for the use of information from the ~~above~~ following 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~~

~~In this Part of the TR, Clauses 4.1.1, 4.2 and 6 of the SGMF LNG Bunkering Safety Guidelines were adapted as Clauses 5.4.2, 5.5.1 and 7 in this TR.~~

- 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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