gas as a marine fuel

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training & competence

environmental

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safety

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bunkering

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IAPH International Association of Ports and Harbors

IACS International Association of Classification Societies

M/S Harvey Energy the first gas powered ship in North America. © Harvey Gulf.

Foreword

Martial Claude Pierre – BV

LNG as fuel has become a reality in our everyday life.

I have been involved with LNG as a marine fuel for some 15 years now and it all started during a previous professional life in a shipyard constructing the first Duel Fuelled gas carriers. Much has changed since and now we have LNG as a fuel for both cargo and passenger ships with more than 100 gas fuelled vessels in operation and as many again on order.

Uptake of the fuel by our industry has for the most part been driven by environmental regulations targeting low air emissions for all ship types. We have seen both conversions to gas as fuel and new buildings, and these ships are no longer limited to operation only within Emission control areas (ECA) but also outside. The most recent example of this has been the cruise sector with many large cruise vessel orders specifying LNG as fuel. There is no doubt that increasing environmental regulation in North America, Europe and China, together with most recently IMO adopting a global sulphur cap of 0.5% by 2020, will generalize LNG as the natural choice as a marine fuel for many years to come.

M/S Engie Zeebrugge, a 5100[m^3] capacity LNG bunkering vessel. © Engie.

On the regulatory side, the International Code of Safety for Ships using Gases or other Low-flashpoint Fuels (IGF Code), entered into force on 1 January 2017, providing a binding regulation for design and construction.

Whilst this process of change for the industry has been on going there have been many regulatory gaps to fill with a clear demand from the industry for a comprehensive benchmark on the LNG bunkering operation itself.

I have been the chair on both in the IACS team and this latest SGMF revision having recognised from my industry and class societies colleagues the same major concerns of safety and clarity in how we carry this out and the sharing of that knowledge and experience has been absolutely key to the success of this publication.

In the spirit of this collaboration, these new revised SGMF Safety Guidelines completely incorporate both the IACS and IAPH work and provide us with a primary reference document for the LNG Bunkering operation. We hope this answers the demand from the Industry for common and harmonized guidelines covering technical, operational, safety, security and of course the ever-important environmental aspects of LNG bunkering.

M/S Engie Zeebrugge. © Engie.

We all know how regulations and guidelines play an important role in today's complex shipping world. SGMF safety guidelines are unique references in the safe use of LNG as marine fuel. It is vital that these guidelines are not only understood and referenced, but most importantly implemented.

Remember — safety first.

Martial CLAUDEPIERRE
LNG as fuel Development Manager
Bureau Veritas Marine

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Originally published in 2014 by the Society with contributions from many of its members, this document has been augmented by combining it with IACS Rec 142 (June 2016) following extensive consultation with its members and Industry association. Original work done by IAPH is further included in this revision as a prime example of best practice of the philosophies prescribed in the guidelines.

This document was produced by SGMF's working Group 7 and acknowledges the significant participation of the following individuals and companies in its development.

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Contents

Foreword I

1. Introduction 1
1.2. Purpose and Scope 3
1.3. Typical Ship Bunkering Arrangements 4

2. Risk 11
2.1. General 11
2.2. Risk Assessment Approach 11
2.3. Risk Assessment Minimum Scope for LNG Bunkering 13
2.4. Risk Criteria 14
2.5. Guidance on a Typical Risk Assessment for LNG Bunkering Operations 15
2.6. Risk Assessment for Simultaneous Operations (SIMOPS) 17

3. Hazardous Areas, Safety Zones, Security Zones and Simultaneous Operations 19
3.1. General 19
3.2. Hazardous Area Classification 21
3.3. Safety Zones 23
3.4. Monitoring and Security Area 25

4. Responsibilities 27
4.1. Responsibilities During the Planning Stage 27
4.2. Responsibilities during Bunkering Operations 35
4.3. Crew and Personnel Training and LNG Awareness 41

5. Technical Requirements 43
5.1. General 43
5.2. Loading Arms and Hose Arrangements 43
5.3. Coupling and Connecting Flanges 47
5.4. Leakage Detection 49
5.5. Emergency Shut Down (ESD) Systems 50
5.6. Emergency Release System 52
5.7. Bunkering Transfer Rate 53
5.8. Vapour Return Line 54
5.9. Cryogenic Protection 55

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6. Procedures 56
6.1. LNG Bunkering Process — General 56
6.2. Pre-Bunkering Phase 57
6.3. Connection of the Transfer System 71
6.4. Bunkering Phase 72
6.5. Bunkering Completion Phase 77
6.6. Specific Requirements for Different Types of Bunker Operations 79

7. Appendix A: The Physical Properties of LNG 84

8. Appendix B: Definitions and Abbreviations 86

9. Appendix C: Standards and Rules 93

10. Appendix D: Incident Reporting Form 97

11. Appendix E: Bunkering Checklist 98

12. Appendix F 122
12.1 HAZID for LNG Bunkering 122
12.2 HAZOP for LNG Bunkering Operations 125

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1. Introduction

1.1. Introduction

This publication provides guidance to all the parties directly involved in the bunkering of ships with liquefied natural gas (LNG). It aims to ensure that natural gas-fuelled ships are re-fuelled with the highest levels of safety, integrity and reliability.

LNG's cryogenic nature and volatility, its properties, characteristics and behaviour differ significantly from conventional marine fuels — thus making it potentially more hazardous. However, the experience of the LNG marine transport industry shows that, when LNG is handled professionally, the risks can be mitigated and avoided.

These guidelines recognise that there are potential differences in culture and understanding between suppliers and users of natural gas as a marine fuel that do not exist in the wider LNG transportation industry. They have therefore been formulated as the basis for operational regulation of procedures by:

- maritime administrations
- port authorities
- local and national authorities
- ship owners
- suppliers of gas as a marine fuel (Bunker Organisation) and
- other relevant parties, including bunker facility personnel and the relevant members of the receiving ship's crew

While the use of natural gas as fuel has significant advantages for air quality — particularly in reducing emissions of sulphur oxides (SO_X) and particulates — methane, the main constituent of natural gas, has a global warming potential (GWP) of at least 20 times that of carbon dioxide (CO_2), therefore all LNG bunkering operations must be undertaken with the utmost diligence and should not allow the venting of natural gas during normal operations. Attention must be paid to the safe handling of liquid gas and vapour and to the control of all potential sources of ignition.

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Throughout the LNG bunkering chain, each element must be carefully designed and constructed, and dedicated safety, operational and maintenance procedures should be in place to be executed by trained personnel.

These guidelines assume that receiving ships and LNG supply facilities are designed according to the relevant and applicable codes, regulations and guidelines. Known publications from these and other relevant organisations are listed in Appendix C. They are based on the most currently available information. Whilst every effort has been made to ensure that the information is correct, neither the authors nor SGMF can accept any responsibility for any errors or omissions or for any consequences of following the Safety Guidelines, which are intended as guidance to be used at the operator's risk.

These guidelines do not consider commercial or contractual aspects of the bunker transfer between the two parties nor Bunker Delivery Notes or measurement of quantity or quality of LNG.

LNG bunkering is a developing industry and it is strongly recommended that incidents and lessons learned are reported and shared so that future editions of this document can incorporate any valuable experience. In the event of a near miss, accident or mistake, it is recommended that the reporting form in Appendix D is used and that the confidential reporting mechanism and procedure noted there is followed.

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