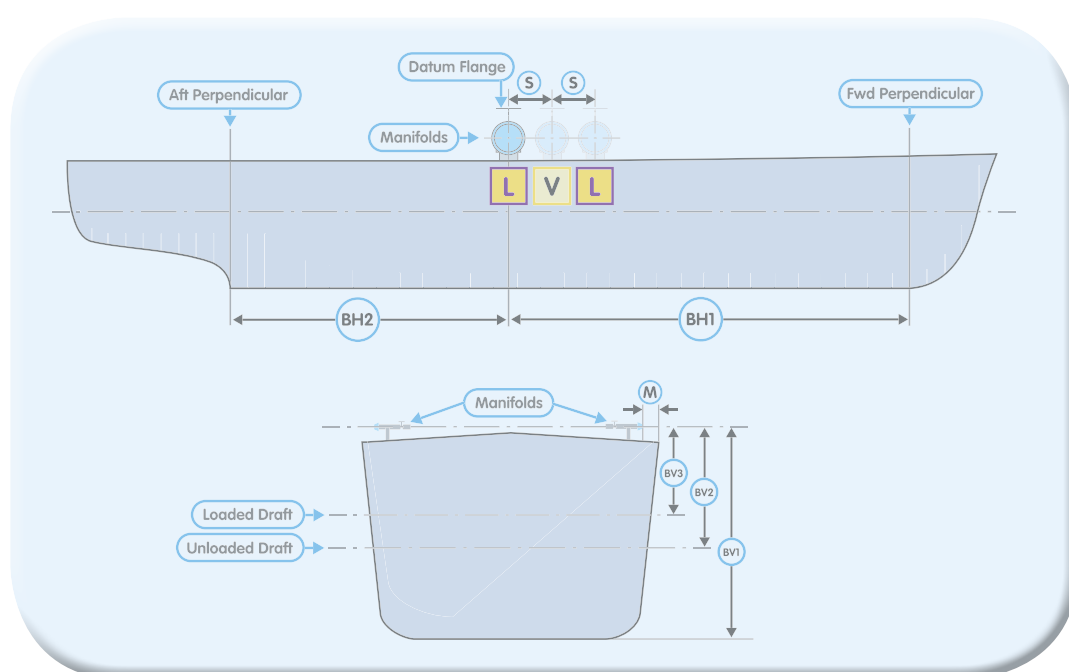


gas as a marine fuel

Bunker Station Location: Considerations and Recommendations





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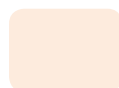
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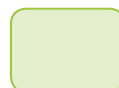
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Reader key



Clarifications and
qualifications



Case studies/examples/
lessons learned

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Purpose

This Technical Guidance Note (TGN) addresses the industry requirement for guidelines for the location of bunkering manifolds and/or bunker stations installed on gas-fuelled vessels (GFVs) subject to the IGF Code.

It has been prepared with the aid of operators of LNG-fuelled vessels, naval architects, designers and classification societies. It complements the existing SGMF guidelines, TGN 06-04 Ver1.0 – Manifold Arrangements for Gas-Fuelled Vessels, which were published in 2019 to address the manifold layout and fitting arrangements onboard GFVs.

Application of this TGN will promote development of standardised and safe practices during the deployment of compatible GFV bunkering operations with differing bunkering facilities and installations.

Notes:

1. This document provides a set of recommendations only. They do not constitute a detailed technical specification and apply only to the use of liquefied natural gas (LNG) onboard GFVs.
2. The guidance, recommendations and provisions are intended as generic and may or may not be applicable to a specific vessel or design. Applicability should be ascertained on a case-by-case basis. All advice is based on interpretation of existing design requirements and vessel designs, good practices and lessons learned.
3. This guidance is based on information made available to SGMF. No responsibility is accepted by SGMF – nor by any person, company or organisation related to SGMF – for any consequences resulting directly or indirectly from compliance with, or adoption of, any of this TGN's recommendations or guidance.

1 Introduction

These guidelines suggest a common approach to follow when selecting the optimal location for the LNG bunker station of a GFV. They consist of recommendations and considerations that address the needs of shipowners, ship designers and shipyards involved in the planning, design and build of GFVs covered by the IGF Code.

In developing this guidance, a set of design aspects and considerations were developed to aid users when considering GFV bunker manifold arrangements:

1. the safety of people, assets and the environment
2. gas handling, process operation and design
3. bunkering scenarios: mobile-to-ship, ship-to-ship, shore-to-ship
4. LNG bunkering operations: connection, transfer and disconnection procedures
5. marine operations, including SIMOPS (mooring, cargo transfer, crew access, maintenance, emergency response, and so on)
6. implementation of controlled zones – (for example, the safety zone)
7. compatibility between receiving ship and supplier facility – (for example, port and starboard location)
8. LNG bunker manifold arrangement and layout

This TGN 06-07 Ver1.0 document specifically addresses the location of the bunker station to ensure safe and efficient bunkering operations. The reader should refer to the recommendations provided in the SGMF publication *Manifold Arrangements for Gas-Fuelled Vessels – TGN 06-04 Ver1.0* for guidance regarding the layout, dimensions and overall arrangement of the bunker station, which should be defined before a location is selected onboard the GFV.

1.1 Applicability and Limitations

This TGN and its recommendations are intended to apply to any LNG bunkering scenario. It addresses the specific requirements for natural gas used as a marine fuel; with appropriate limitations it may be used as a reference for some other low-flashpoint fuels and systems.

1.2 Reference and Further Reading

This document refers to the following standards and guidelines:

IMO codes:

- *IGF Code: International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels*

International Standards:

- *ISO 20519:2017 Ships and Marine Technology – Specification for Bunkering of Liquefied Natural Gas-Fuelled Vessels*
- *ISO/TS 18683: 2015 – Minimum Requirements on Design & Operations for Safe LNG Bunkering [Seagoing & Inland Navigation Vessels]*
- *ISO 21593:2019 Ship and Marine Technology – Technical Requirements for Liquefied Natural Gas Bunkering Dry-Disconnect/Connect Coupling*

Industry Guidelines:

- *SGMF: Manifold Arrangements for Gas-Fuelled Vessels – TGN 06-04 Ver1.0*
- *SGMF: Safety Guidelines – Bunkering – FP07-01 Ver2.0*
- *SGMF: Recommendation of Controlled Zones During LNG Bunkering – FP02-01 Ver1.0*



- SGMF: Simultaneous Operations (SIMOPS) During LNG Bunkering – FP08-01 Ver1.0
- SGMF: LNG Bunkering with Hose Bunker Systems: Considerations and Recommendations – TGN 06-06 Ver1.0
- OCIMF: Recommendations for Oil and Chemical Tanker Manifolds and Associated Equipment

Notes:

Every effort has been made by the SGMF to avoid discrepancies between the recommendations in this TGN and the statutory requirements in international standards and class rules. If discrepancies arise, the statutory requirements shall take precedence.

1.3 Definitions

The following definitions are used throughout this document:

Bunkering Facility/Supplier – The bunkering facility – also referred to as the “Supplier” – is any technology or system designed to be used to transfer/bunker liquefied gas as fuel to a gas-fuelled vessel. It may consist of a floating, shore-based, fixed or mobile fuel-supply facility, such as a bunker vessel, road tanker or terminal.

Bunker Station – The location(s) on board a vessel where fuel is loaded from and discharged to a bunkering facility.

In the context of bunker station, this document refers to:

- the **Bunker Station Location**: the actual position of the bunker station on the gas-fuelled vessel
- the **Bunker Station Layout**: the arrangement of the manifolds within an open-deck, semi-enclosed or enclosed bunker station.
- **Open-Deck Bunker Station Layout**: a bunker station located on an open-deck. *“Open deck means a deck having no significant fire risk that at least is open on both ends/sides, or is open on one end and is provided with adequate natural ventilation that is effective over the entire length of the deck through permanent openings distributed in the side plating or deckhead”* Ref: IGF § 2.2.34.
- **Semi-Enclosed and Enclosed Bunker Station Layouts**: a bunker station which is located in a Semi Enclosed or Enclosed space.
“Semi-enclosed space means a space where the natural conditions of ventilation are notably different from those on open deck due to the presence of structure such as roofs, windbreaks and bulkheads and which are so arranged that dispersion of gas may not occur” Ref: IGF § 2.2.38 –
“Enclosed space means any space within which, in the absence of artificial ventilation, the ventilation will be limited and any explosive atmosphere will not be dispersed naturally” Ref: IGF § 2.2.21.

Notes:

In this document, the term “enclosed bunker station” refers to both semi-enclosed and enclosed bunker station layouts.

- The **Manifold Arrangement**: the physical spacing and sizing of the bunker manifolds
- **Bunker Station Operational Clearances**: The area directly outboard, forward and aft of the bunker station that should, by design, be kept clear of obstructions, including temporary ones such as bunker barge mooring lines.

Gas-Fuelled Vessel (GFV)/Receiver – The gas-fuelled vessel – also referred to as the “Receiver” – is an IGF-compliant vessel using gas as marine fuel.

Hazardous Area/Zone – The three-dimensional space where there is a defined probability that a flammable atmosphere is present. The probability is defined by national regulations and both the IGF and IGC codes.

Mobile-to-Ship – An LNG bunkering operation to a gas-fuelled vessel from a mobile bunkering facility located onshore. Mobile bunkering facilities can consist of a truck, rail car or other mobile device (including portable tanks) used to bunker LNG. (see Figure 1)

Safety Zone – A three-dimensional envelope of distances inside which the majority of leak events occur and where, in exceptional circumstances, there is a recognised potential to harm life or damage equipment/ infrastructure in the event of a leak of gas and/or LNG.

Shore-to-Ship – An LNG bunkering operation to a gas-fuelled vessel from a fixed bunkering facility or terminal (see Figure 1).

Ship-to-Ship – An LNG bunkering operation to a gas-fuelled vessel from a floating storage or bunker vessel (see Figure 1).

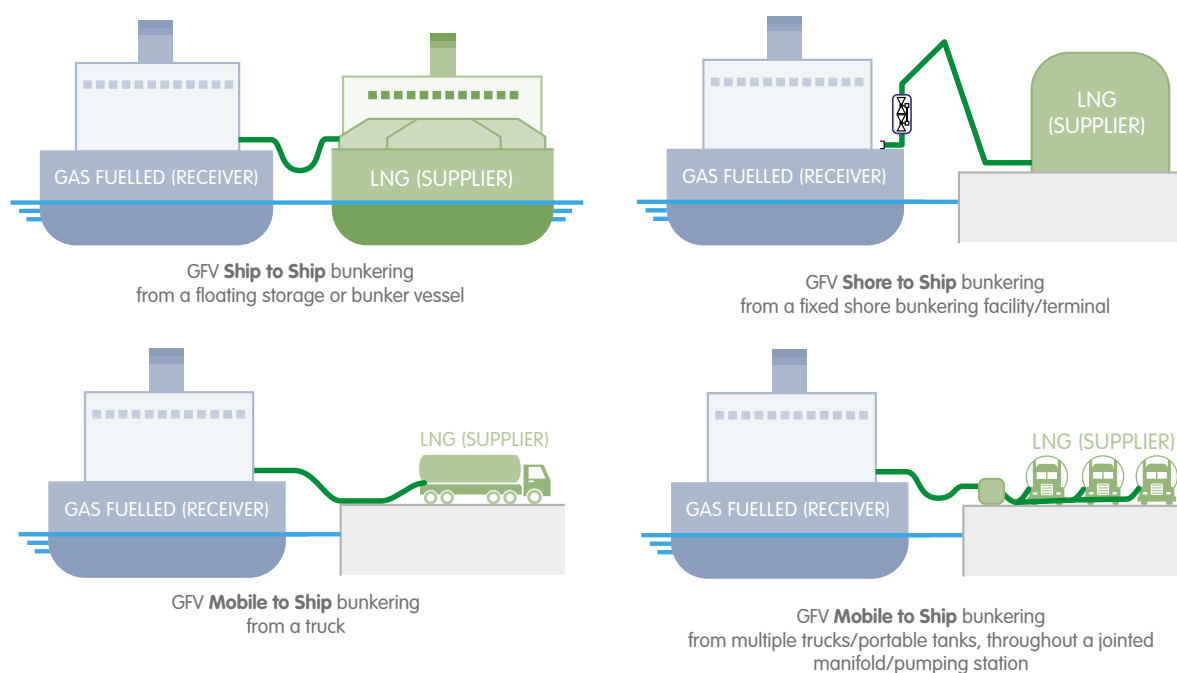


Figure 1: Typical bunkering supply scenarios

1.4 Abbreviations

The following abbreviations are used in this document:

GFV – Gas Fuelled Vessel

IGF Code – International Code of Safety for Ships Using Gases or Other Low-Flashpoint Fuels

IMO – International Maritime Organization

LBV – LNG Bunker Vessel

LNG – Liquefied Natural Gas

OCIMF – Oil Companies International Marine Forum

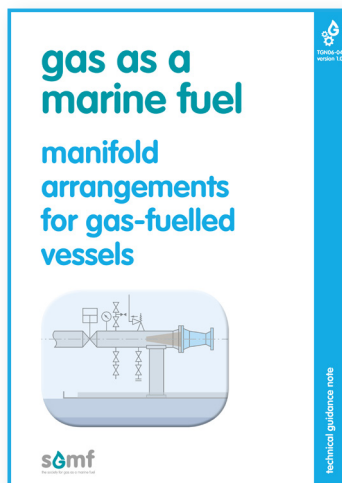
SIMOPS – SIMultaneous OPerationS

SWL – Safe Working Load

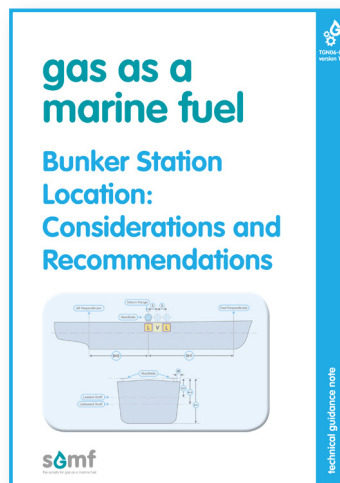
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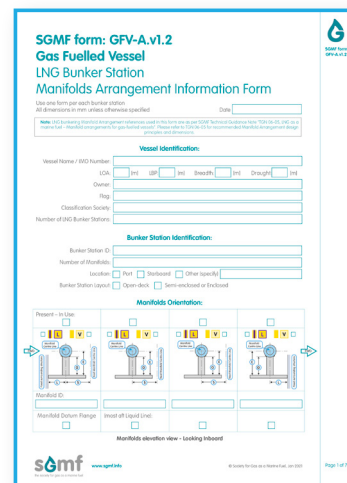
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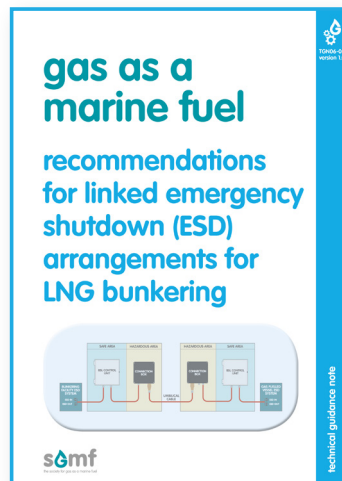
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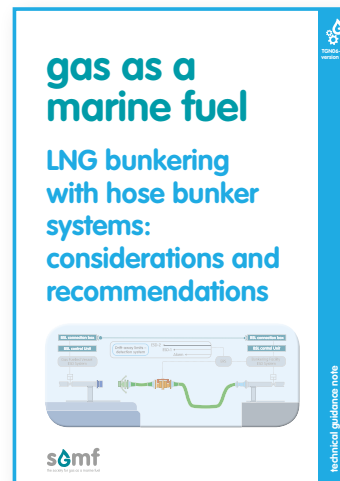
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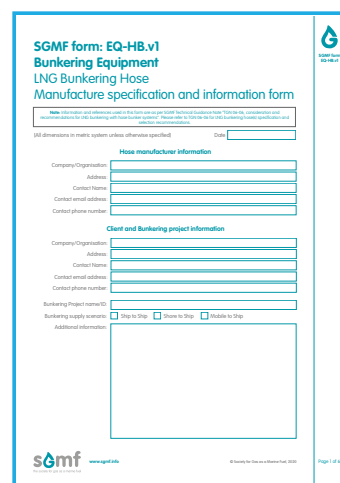
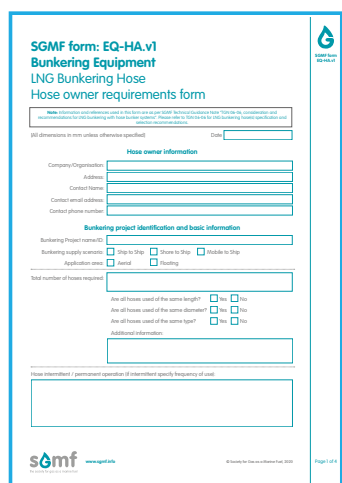
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