

Third expert meeting on LNG as bunker fuel in relation to the Sustainable Waterborne Transport Toolbox

Brussels, 2012-12-04



European Maritime Safety Agency

Agenda

- 09:00 – 09:30 Registration and opening (DG MOVE)
- 09:30 – 09:45 State-of-play of tender for a study on rules and standards for LNG bunkering (EMSA)
- 09:45 – 10:30 Presentation of Task 1 and 2 of the EMSA tender (GL)**
- 10:30 – 11:00 Coffee Break
- 11:00 – 12:00 Discussion regarding Task 1 and 2
- 12:00 – 12:30 Presentation of Task 3 of the EMSA tender (GL)

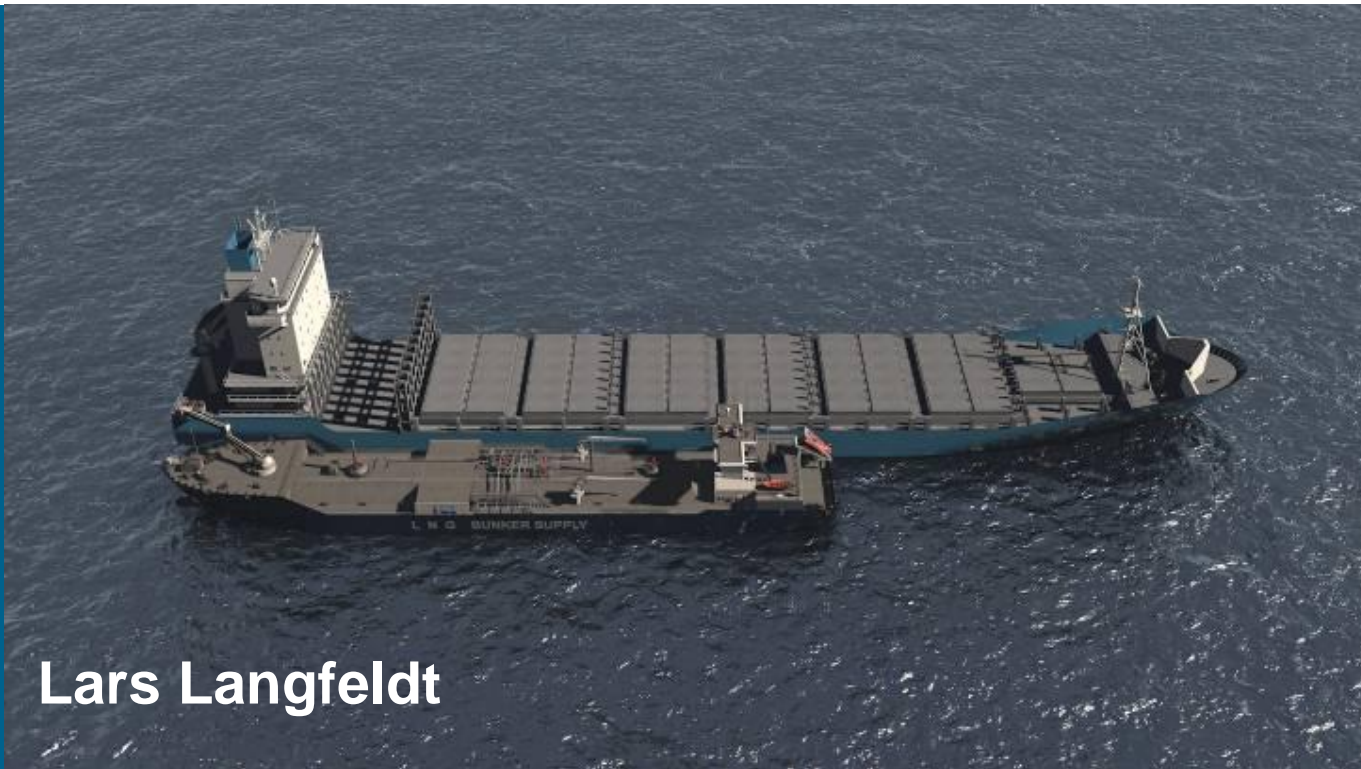


Germanischer Lloyd

Standards and rules for bunkering of gas fuelled ships

- Task 2: Gap analysis -

Brussels, 2012-12-04



Lars Langfeldt

Outline

- Gaps in the on-going rule development:
 - Seagoing and Inland vessels
 - Onboard and fuel handling procedures (sampling and measurement)
 - Onshore regulations (Ports and bunker facilities)
 - Crew trainings
 - Gas quality and sulphur content
 - Environmental aspects
- Summing up gap analysis



What is a gap?



Gap's within the regulatory frame work:

- *All unregulated items within the existing rule framework regarding bunkering gas fuelled ships*
- Including items already in discussion but not yet finalized (e.g. crew training already in discussion by the STW)

What kind of gaps have been identified?

Regulatory gaps in all categories have been identified (Abstract)

- **Principals:**

- The bunkering process is not regulated and not defined
- Specifications of LNG as fuel are missing

- **Safety requirements:**

- No construction requirements for Inland tanker defined
- No standard for ship/LNG bunker facility link available

- **Operational procedures**

- No guidelines for safe sampling, connection of portable tanks etc.

- **Training**

- No crew training items defined



Gaps in the on-going rule developments

Application of existing guidelines

- Existing guidelines are based on the LNG cargo transfer and handling taking place
 - In dedicated, separated areas like special harbours for tanker
 - By trained crews and personal
 - Without simultaneous cargo operation
 - Without impact of third parties like passengers



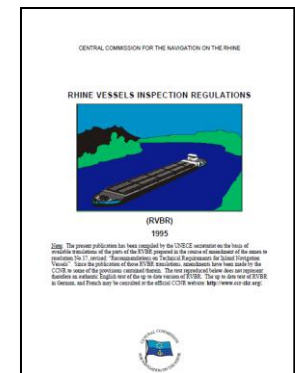
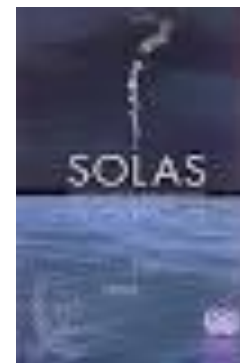
- Existing guidelines are Not applicable for bunkering LNG
- Could give guidance for functional and safety requirements

Gaps in the on-going rule developments

Principals

- The use of gas as fuel is prohibited by the SOLAS convention and the RVIR
- The existing rule frame work is based on the LNG cargo transfer and handling
- No international regulatory instrument or text is into force defining safety, design, permission or training requirements for bunkering LNG as fuel

Gap 1 - The LNG bunkering procedure is not regulated by IMO requirements and standards



Gaps in the on-going rule developments

Principals

- Integrated regulation of the ***LNG bunkering process is not scope of the IGF Code***
- Due to missing experience the ISO TC 67 WG 10 decide to develop guidelines in form of a Technical Report
- For the time being neither existing legal binding standards or Codes nor rules under development reference on this guidelines

Gap 2 – LNG bunkering guidelines under development do not have a legal binding character

Gaps in the on-going rule development

Principals

- The Draft IGF Code defines: *Bunkering means the transfer of liquid or gaseous fuel from land based or floating facilities into a ships' permanent tanks*
- Due to different permission processes a clear conceptual delineation of LNG cargo transfer and bunkering LNG as fuel is necessary
- The definition of start and procedure of the bunkering process are missing

Gap 3 - No definitions of the bunkering process and the division of responsibilities for bunkering LNG as fuel are provided

Gap 4 - A conceptual delineation between transfer of LNG as cargo and bunkering of LNG as fuel is missing

Seagoing and Inland vessels

Portable LNG fuel tanks



- The use of portable LNG tank container avoid refilling on board of the receiving vessel by changing emptied with loaded container
- The transport to the receiving vessel and transfer onboard is defined as cargo handling and regulated by the IMDG Code and the ADR
- Regarding the Draft IGF Code the connection and disconnection process is part of the bunkering process
- Apart from general requirements for the mobile tank no further guidance is available

Gap 5 - The connection and disconnection process of portable LNG fuel tanks is not defined

Seagoing and Inland vessels

Transport of LNG as Cargo

Seagoing vessels

- packed good is regulated by the IMDG Code
- bulk is regulated by the IGC Code

Inland vessels

- packed good is regulated by the ADN
- bulk is NOT regulated; as well no training requirements available

Gap 6 – The transport of LNG in bulk on European inland waterways is not regulated

Gap 10 – Crew training requirements for LNG carrying or fuelled inland vessels and barges are not existing



Seagoing and Inland vessels

LNG as fuel



Seagoing vessels

- The Interim Guideline MSC.285(86) of the IMO gives guidance for the construction of LNG fuelled vessels
- The IGF Code will cover the construction requirements in form of a international agreed legal binding document

Inland vessels

- Acc. to Article 8.01 (3) of the Rhine Vessel Inspection Regulations, the use of fuels with a flash point that is less than 55°C is prohibited

Gap 7 - The use of LNG as fuel is not permitted on inland waterway vessels in general and is only possible by exemptions by the CCNR

Seagoing and Inland vessels

Link between delivering facility and receiving vessel

- The equipment for the connection of communication devices and process monitoring is not standardized
- Existing guidelines like the SIGTTO “ESD Arrangements & Linked Ship / Shore Systems for Liquefied Gas Carriers” are only valid for links between fixed installations and LNG gas carrier

Gap 14 - The equipment for the link between the LNG delivering facility and the receiving gas fuelled vessel is not standardized.



Onboard and fuel handling procedures



Procedures and equipment for sampling of LNG as fuel

- The Draft IGF Code addresses within chapter 19 “operational requirements” a detailed fuel transfer manual including sampling procedures
- The need for a delivery notification of LNG Quantity and Quality is addressed within the Draft ISO LNG bunker guidelines
- No sampling procedures are described

Gap 13 - A standard for the safe sampling of LNG as fuel is missing

Onboard and fuel handling procedures

Quantity measuring equipment of the LNG transferred

- The need for a delivery notification of LNG Quantity and Quality is addressed within the Draft ISO LNG bunker guidelines
- No requirements for the safe measurement of the amount of LNG are stated



Gap 15 - Procedures and equipment for gas measurement are missing

- Commercial not as a safety or environmental issue
- Not relevant for a safety standard

Onshore regulations (Ports and bunker facilities)

LNG bunker stations

- The permission process is based on Council Directive 96/82/EC (Seveso directive)
- Typically, standards, guidelines or best practice guidance are used to assess the safety measures applied
- In comparison to LNG (cargo) terminals for LNG bunker facilities no specific standard, rules or best practice guidance are available
- A number of countries started to develop own guidelines



Gap 8 – Despite the large varieties in terms of national legislation, further guidance or standard for LNG bunkering stations is necessary

Onshore regulations (Ports and bunker facilities)

Common port regulations

- Despite various industry driven initiatives common guidelines for port rules on LNG bunkering procedures are not yet available:
 - Common criteria for the ***risk assessment approach and risk acceptance criteria*** for LNG bunker procedures are missing (Gap 9.1)
 - Common ***safety distances*** and identification of LNG bunkering processes are currently missing (Gap 9.2)
 - Common safety ***accreditation criteria*** for LNG bunker companies are missing (Gap 9.3)
 - Additional measures for LNG bunker operations within ***emergency plans*** should be considered (Gap 9.4)

Gas quality and sulphur content

Gas quality

- The properties and behaviour of LNG are described in various standards
- The specification regarding the composition and methane number are not defined although these items affect on the safe and economic operation of the engines

Gap 11 - No international standards for the specification of LNG as marine fuel are available



Gas quality and sulphur content

Sulphur content of LNG

- LNG must fulfil the requirements of MARPOL Annex VI chapter 3 regulation 14
- No guidance for the measurement of the sulphur content are stated at the current rules under development

Gap 12 - For the measurement of the sulphur content of LNG as fuel no requirements and guidelines are available.

Environmental Aspects

Release of methane during normal bunker operations

- The draft ISO bunkering guidelines defines minimum requirements to reduce a possible methane release during normal bunkering operations
- Specific guidelines for all kind of bunkering operations are not available

Gap 16 – Operational guidelines to reduce potential methane release during normal bunker operations need to be developed



Summing up gap analysis

Item	Standards / rules	Responsibility	Sufficient regulated?	Comment
Onshore regulations				
Transport of NG (liquid and vapour)	EN 1474	CEN	YES	-
LNG storage, pressurization, liquefaction	EN 1473	CEN	YES	-
LNG Terminal	EN 1473	CEN	YES	-
LNG cargo transport (onshore)	ADR	UINECE	YES	-
LNG cargo transfer (onshore)	ISO 28460 EN 1474	ISO CEN	YES	-
LNG ship to shore operations (Cargo)	ISO 28460	ISO	YES	-
Back loading from LNG terminal	EN 1474	CEN	YES	-
LNG bunker station	EN 13645	CEN	YES	-
Risk analysis procedure for LNG bunker stations	ISO 31010 ISO 17776	ISO	No	Common procedures missing
LNG port operations	Port Bye-Law	Ports	No	No common procedures defined
Training onshore personal	EN 1474	CEN	YES	-



Summing up gap analysis

Item	Standards / rules	Responsibility	Sufficient regulated?	Comment
<i>Maritime regulations</i>				
LNG Cargo Transport (Seagoing ship)	IGC Code	IMO	YES	-
LNG Cargo Transport (Inland Vessels)	ADN	CCNR	NO	Transport of LNG not regulated
LNG Cargo Transfer	ISO 28460	ISO	YES	-
LNG transfer systems	ISO 28460 EN 1474	ISO CEN	YES	-
LNG fuelled vessels (seagoing)	MSC.285(86) IGF Code	IMO	NO	IGF Code not finalised
LNG fuelled vessels (Inland)	RVIR	CCNR	NO	LNG as fuel not regulated
Crew training Gas tanker (seagoing)	IGC Code STCW Code	IMO	YES	-
Crew training Gas tanker (Inland vessel)	ADN RVIR	CCNR	NO	Not regulated for LNG as cargo
Crew training gas fuelled vessel (seagoing)	IGF Code STCW Code	IMO	NO	IGF Code not finalised Scope of STW under discussion
Crew training gas fuelled vessel (Inland)	RVIR	CCNR	NO	LNG as fuel not regulated

Summing up gap analysis

Item	Standards / rules	Responsibility	Sufficient regulated?	Comment
Bunkering regulations				
LNG bunkering procedures	ISO TC 67 WG 10 Guidelines	ISO TC 67 WG 10	NO	Guidelines under development Not planned as international standard
LNG marine fuel quality	-	ISO TC 28	NO	Specifications not defined
LNG sulphur content	MARPOL Annex VI	IMO	NO	Procedures not defined
Sampling procedures	ISGOTT ISGINTT	SIGTTO	NO	Procedures for gas fuelled ships not defined Guidelines but no standard available
Ship to delivering facility interfaces (bunkering)	IGF Code ISO TC 67 WG 10 Guidelines	IMO ISO	NO	No standards defined
Safety Distances	-	-	NO	Common safety distances are not defined
Risk assessment and risk acceptance criteria (LNG bunker procedures)	ISO TC 67 WG 10	ISO	NO	ISO Guidelines not finalized
Accreditation criteria	-	-	NO	Criteria not defined
Methane release during bunkering	-	-	NO	Procedures not defined

Many thanks for your attention!

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Summing up – overview Gasp analysis

1. The LNG bunkering procedure is not regulated by IMO requirements and standards
2. LNG bunkering guidelines under development do not have a legal binding character
3. No definitions of the bunkering process and the division of responsibilities for bunkering LNG as fuel are provided
4. A conceptual delineation between transfer of LNG as cargo and bunkering of LNG as fuel is missing
5. The connection and disconnection process of portable LNG fuel tanks is not defined
6. The transport of LNG in bulk on European inland waterways is not regulated

Summing up – overview Gasp analysis

- 7. The use of LNG as fuel is not permitted on inland waterway vessels in general and is only possible by exemptions by the CCNR
- 8. Despite the large varieties in terms of national legislation, further guidance or standard for LNG bunkering stations is necessary
 - 9.1 Common criteria for the risk assessment approach and risk acceptance criteria for LNG bunker procedures are missing
 - 9.2 Common safety distances and identification of LNG bunkering processes are currently missing
 - 9.3 Common safety accreditation criteria for LNG bunker companies are missing
 - 9.4 Additional measures for LNG bunker operations within emergency plans should be considered

Summing up gap analysis

10. Crew training requirements for LNG carrying or fuelled inland vessels and barges are not existing
11. No international standards for the specification of LNG as marine fuel are available
12. For the measurement of the sulphur content of LNG as fuel no requirements and guidelines are available.
13. A standard for the safe sampling of LNG as fuel is missing
14. The equipment for the link between the LNG delivering facility and the receiving gas fuelled vessel not standardized.
15. Procedures and equipment for gas measurement are missing
16. Operational guidelines to reduce potential methane release during normal bunker operations need to be developed