

# 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)



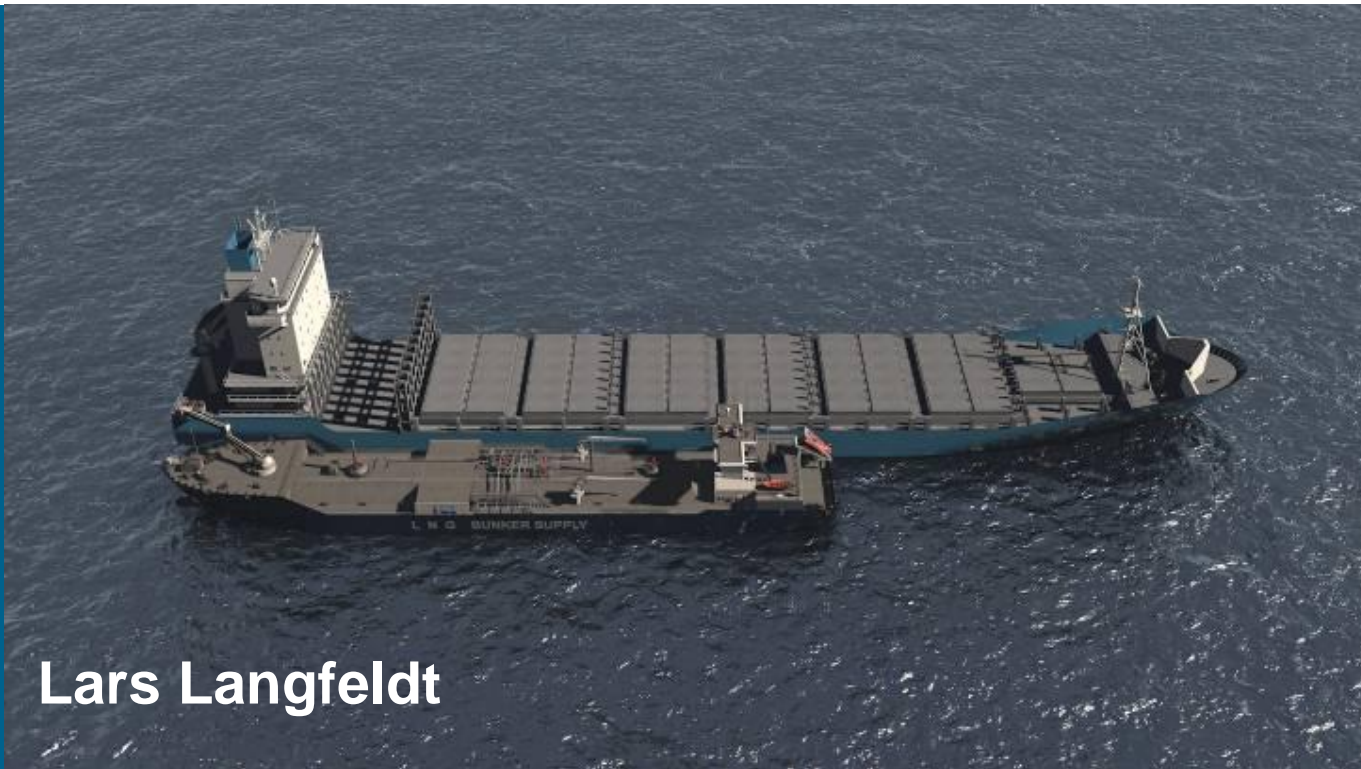


**Germanischer Lloyd**

**Standards and rules for bunkering of gas fuelled ships**

**- Task 1: Existing rule framework and current developments -**

**Brussels, 2012-12-04**



**Lars Langfeldt**

# Outline

- LNG bunkering: Status and challenges
- Categorisation of the bunkering process
- Relevant standardization committees
- Status of current regulations
- Summary of rules and regulations

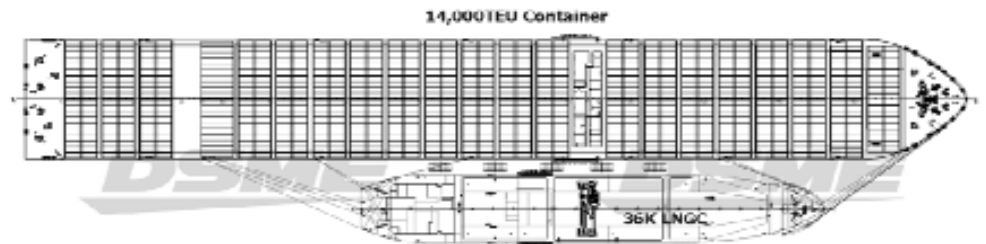
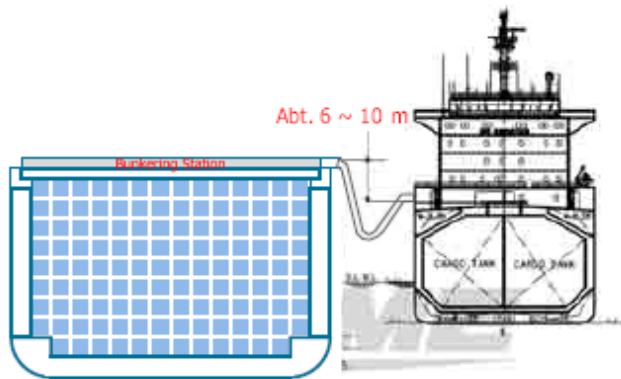


# LNG bunkering: Status and challenges

- Today's LNG Bunkering of existing gas fuelled vessel is a transfer from shore to ship:
- The transfer rates of this refuelling procedure are limited to approx 100 m<sup>3</sup>/h
- LNG cargo transfer and existing LNG bunkering taking place in separated areas  
→ a general approach for bunkering is missing
- Bunkering of LNG should be economical and safe *within normal port limits and during normal harbour operation of the vessel* to be bunkered
  - During cargo loading and unloading
  - During passenger embarking and disembarking
  - At each conventional bunker location
- ***Different kinds of bunker procedures*** and refilling modes (mobile tanks) will be provided



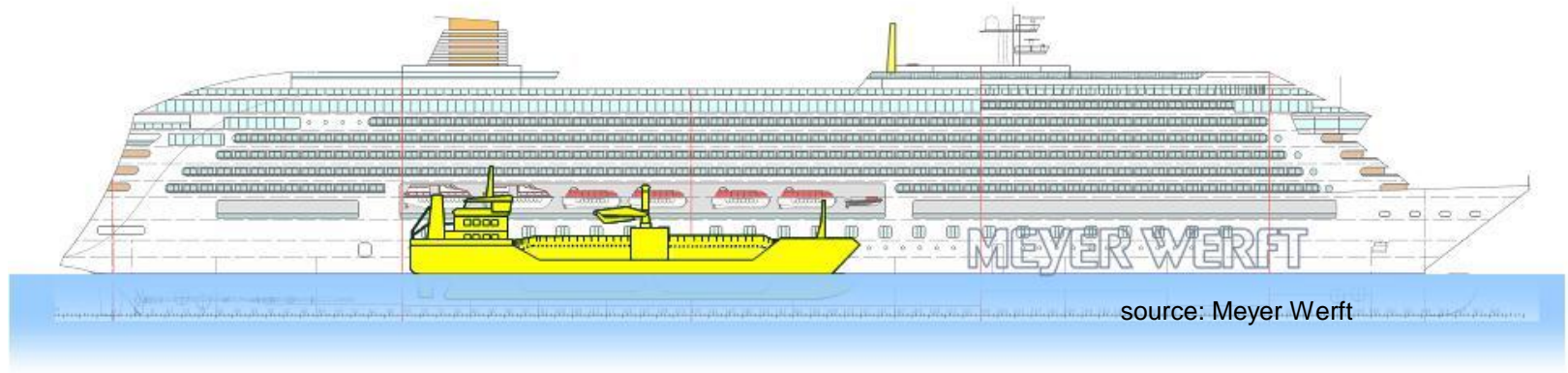
# LNG bunkering: Status and challenges



source: DSME; Gas-fuelled Ships Conference – 20 Oct. 2010, Hamburg, Germany

# LNG bunkering: Status and challenges

## Safety related aspects regarding bunkering LNG



**A release of LNG must be prevented** by technical and organizational solutions to establish a reliable technology:

- Volume limitation of possible gas releases
- Reduction of failure frequency
- Training of crew

# Categorisation of the bunkering process

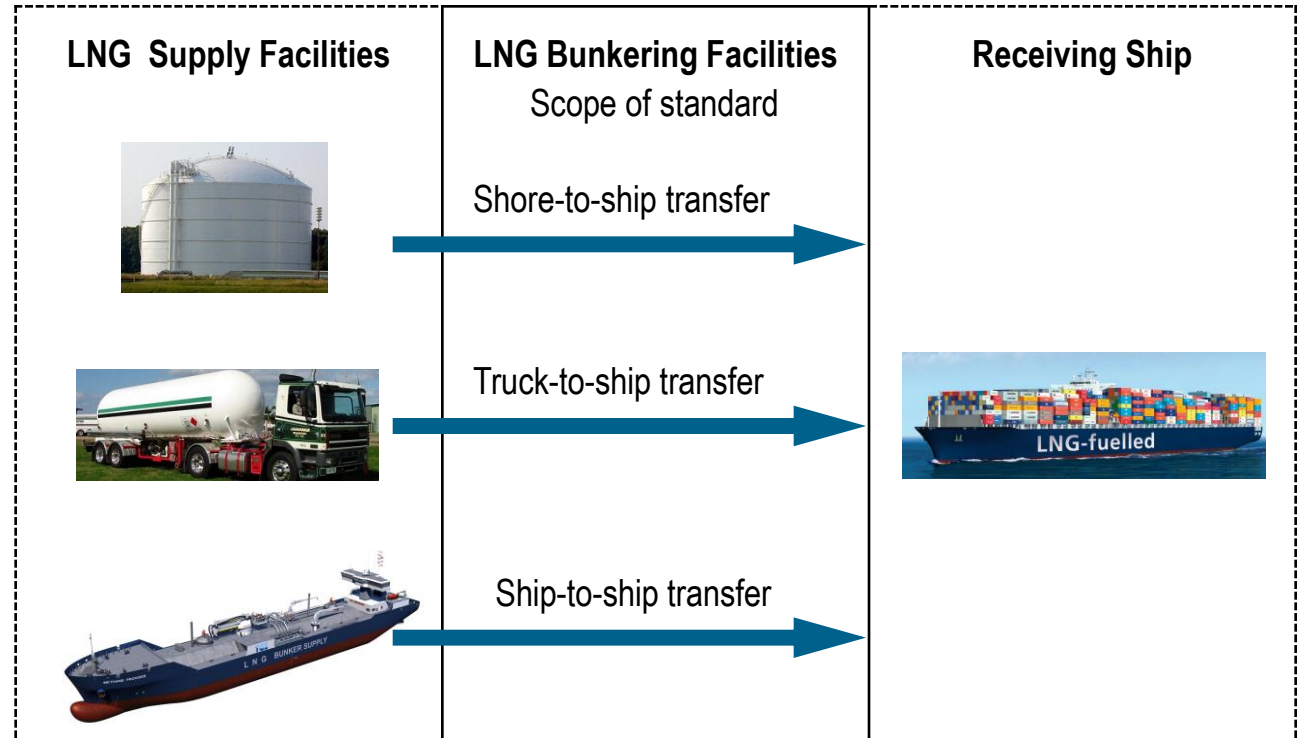
## Shore LNG Supply Facilities

- Onshore permanent installation

- Onshore mobile installation

## Offshore LNG Supply Facilities

- LNG bunkering vessel/barge
- LNG offshore storage



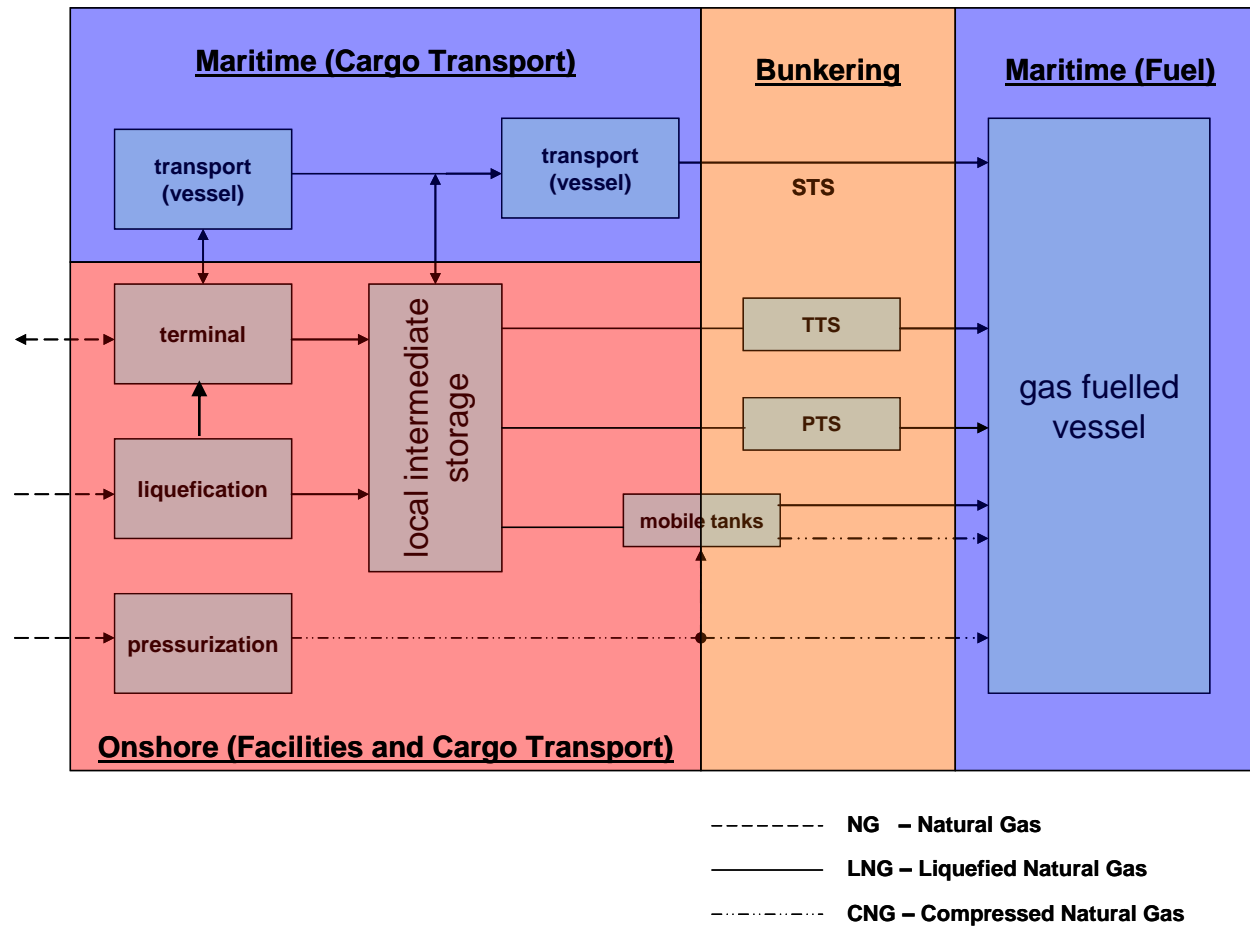
Basically LNG storage facilities, trailers, containers shall be governed by specific standards or national and/or local laws. If necessary, this standard defines additional requirements.

Basically receiving ships shall be governed by specific standards. If necessary, this standard defines additional requirements.

Source: ISO TC 67 WG 10



# Categorisation of the bunkering process



# Relevant standardization committees

## International Committees

- International Maritime Organization, the „IMO“
- International Organization for Standardization, the „ISO“
- International Electrotechnical Commission, the „IEC“
- United Nations Economic Commission for Europe, the „UNECE“

## European Committees

- European Committee for Standardization, the „CEN“
- European Commission, the „EUC“
- Central Commission for the Navigation on the Rhine, the CCNR

# Relevant standardization committees

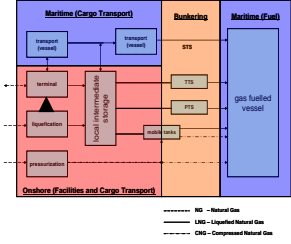
## National Committees

- British Standards Institution, the „BSI“
- Deutsches Institut für Normung, the „DIN“
- Netherlands Standardization Institute, the „NEN“
- National Fire Protection Association, the „NFPA“
- American Petroleum Institute, the „API“

# Relevant standardization committees

## Other relevant societies

- Society of International Gas Tanker & Terminal Operator, the „SIGTTO“
- Oil Companies international Gas Tanker & Terminal Operators, the „OCIMF“
- International Association of Ports and Harbours, the „IAPH“
- International Group of Liquefied Gas Importers, the „GIIGNL“
- International Gas Union, the „IGU“

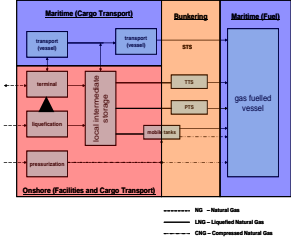


# Status of onshore regulations

## Storage and production facilities

- Different International and European Standards for the construction and design available
- Permission process regulated by the „Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances” (Seveso II directive)
- Regulations available for some dedicated aspects, e.g. shore interfaces ISO 28460:2010
  - In principal the legislative framework is available
  - Further more detailed guidelines could speed up the permission process



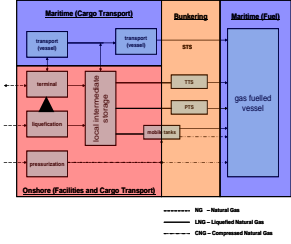


# Status of onshore regulations

## Transport via road vehicle

- The transport of LNG via trucks are regulated by the European Agreement concerning the International Carriage of Dangerous Goods by Road, the “ADR”

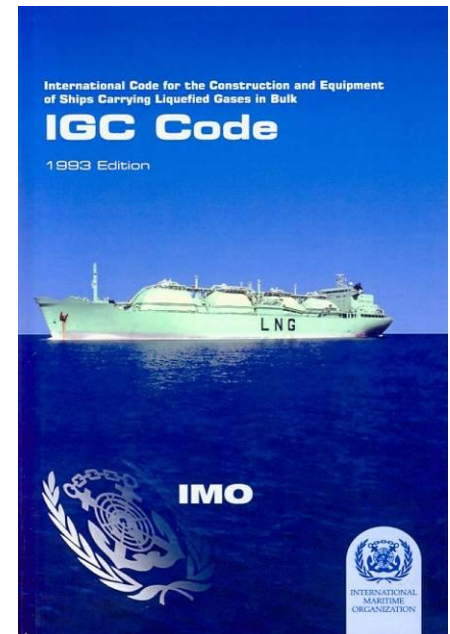


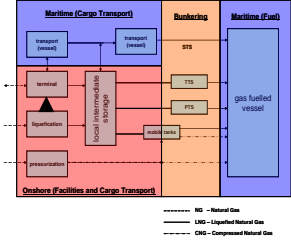


# Status of maritime regulations

## Transport via seagoing vessels

- Design and construction requirements are defined within the IGC Code
- Detailed training and qualification requirements are stated within the STCW
- The IGC Code is also applicable for the design and construction requirements of seagoing LNG bunker vessels

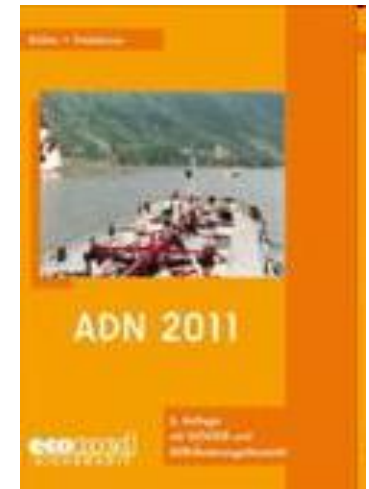


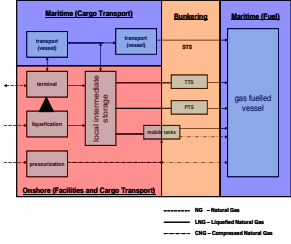


# Status of maritime regulations

## Transport via Inland waterway vessels

- In principal, the ADN regulates the transport of dangerous goods on inland waters
- Due to missing listing of LNG as cargo within the cargo list Annex C of the ADN a transport in bulk by inland tankers is not allowed
- As well training requirements are not defined
- **Gas fuelled Inland vessels**
  - according 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
  - No training requirements defined



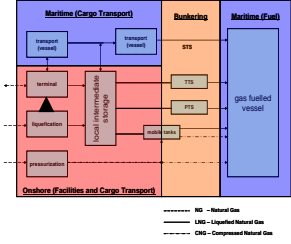


# Status of maritime regulations

## Gas fuelled seagoing vessels

- Development of an international Code for the use of gas as ship fuel „IGF-Code“
- Target date for finalisation: next SOLAS revision in 2014, in force probably 2016
- Is intended to address natural gas as fuel and also other low flashpoint fuels e.g. butane, hydrogen, propane, methanol etc.
  - Will cover the energy conversion systems of relevance (low and high pressure ICE, gas turbines, boilers, fuel cells)
  - Should revoke the interim guidelines and Chapter 16 of the IGC Code
  - Will address requirements for bunker station

will not address requirements for the bunker boat itself nor for the bunkering process

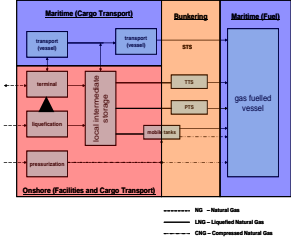


# Status of LNG bunker regulations

## Rules for bunkering and related activities

- International standard for the bunkering on LNG under development „ISO TC 67 WG 10“, Scheduled target date in 2014
- The IAHP develops own bunker guidelines
- Scandinavian Ports developed their own regulations e.g. Port of Gothenburg



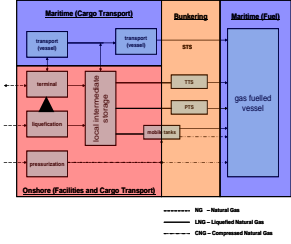


# Status of LNG bunker regulations

## Scope of ISO Guideline

- General principles and bunker scenarios
- Properties and behaviour of LNG
- Safety: Main safety philosophy, Risk reduction measures , Risk Assessment Approach
- Functional requirements for LNG bunker systems
- Requirements to components and systems
- Training requirements (referenced to shore regulations and STCW)
- Requirements for documentation
- Materials

→ **Technical Report; not a legal binding International standard!**



# Status of LNG bunker regulations

## National and port regulations

- The current status of national regulation is based of two items
  - Reference of the Interim guidelines MSC.285(86) within national law
  - Implementation of Seveso Directive in national law
- Norwegian regulations:
  - For the permission of LNG bunker procedures an own process has been established
  - No common approach available; each bunker procedure must be reviewed again
- Swedish regulations: The port of Gothenburg developed own LNG bunker guidelines
- Dutch regulations: The NEN is developing dutch guidelines for the permission process

# Summary of Rules and Regulations

- An International Code for the use of gas as ship fuel is under development
- The handling, transport, storage and transfer of liquid gases as dangerous cargo is regulated by International, European and national regulations for seagoing vessels
- The bunkering of liquefied gases as fuel has to be further regulated
  - Requirements for the receiving vessel will be defined within the IGF code
  - Guidance for a safe bunkering will be defined within ISO TC 67 LNG bunkering guidelines
  - A number of maritime regulations of SIGTTO and OCMF are available to give further input
- The use of gas as fuel and the transport of LNG via Inland tankers are not permitted

**Many thanks for your attention!**

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# Status of LNG bunker regulations

## Scope of IGF Code

- Should provide ***safety measures for ships*** using gases as fuel including liquefied gas tankers.
- Is intended to ***address natural gas fuel and other gas fuel*** types, such as butane, hydrogen, propane.
- Will cover the energy conversion systems of relevance (low and high pressure ICE, gas turbines, boilers, fuel cells)
- Should only address issues not already covered by SOLAS and serve as an addition to SOLAS.
- Should revoke the interim guidelines and Chapter 16 of the IGC Code.
- Was planned to be set into force with SOLAS 2014
- Will address ***requirements for bunker station***



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# To be used for reference? Suitable for permissions?

- Seveso II Directive EU Directive 96/82/EC
- ISO 28460 LNG Ship-shore interface and port operations
- EN 1473 design of Onshore LNG terminals
- EN 1474: part 1 LNG Transfer arms, part 2 LNG Hoses
- BS EN 13645 Installations and equipment for LNG – Design of onshore installations with a storage capacity between 5 & 200 tonnes
  
- SIGTTO LNG STS Transfer guide
- IMO “Recommendations on the Safe Transport of Dangerous Cargoes and Related activities in Port Areas”.
- SIGTTO - Liquefied Gas Handling Principles
- NFPA 59A Storage and Production of LNG
- OCIMF/IAPH/ICS International Oil Tanker Terminal Safety Guide (ISGOTT)
- OCIMF Mooring Equipment Guidelines