

17th INTERNATIONAL CONFERENCE & EXHIBITION ON LIQUEFIED NATURAL GAS (LNG 17)



International guidelines for Bunkering LNG as a Marine fuel

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International Organizers



Host Association



Content of presentation

■ Background

- New environmental regulations for the Marine Industry; LNG as a clean option
- Regulatory basis for the use of LNG
- Stakeholder's positions

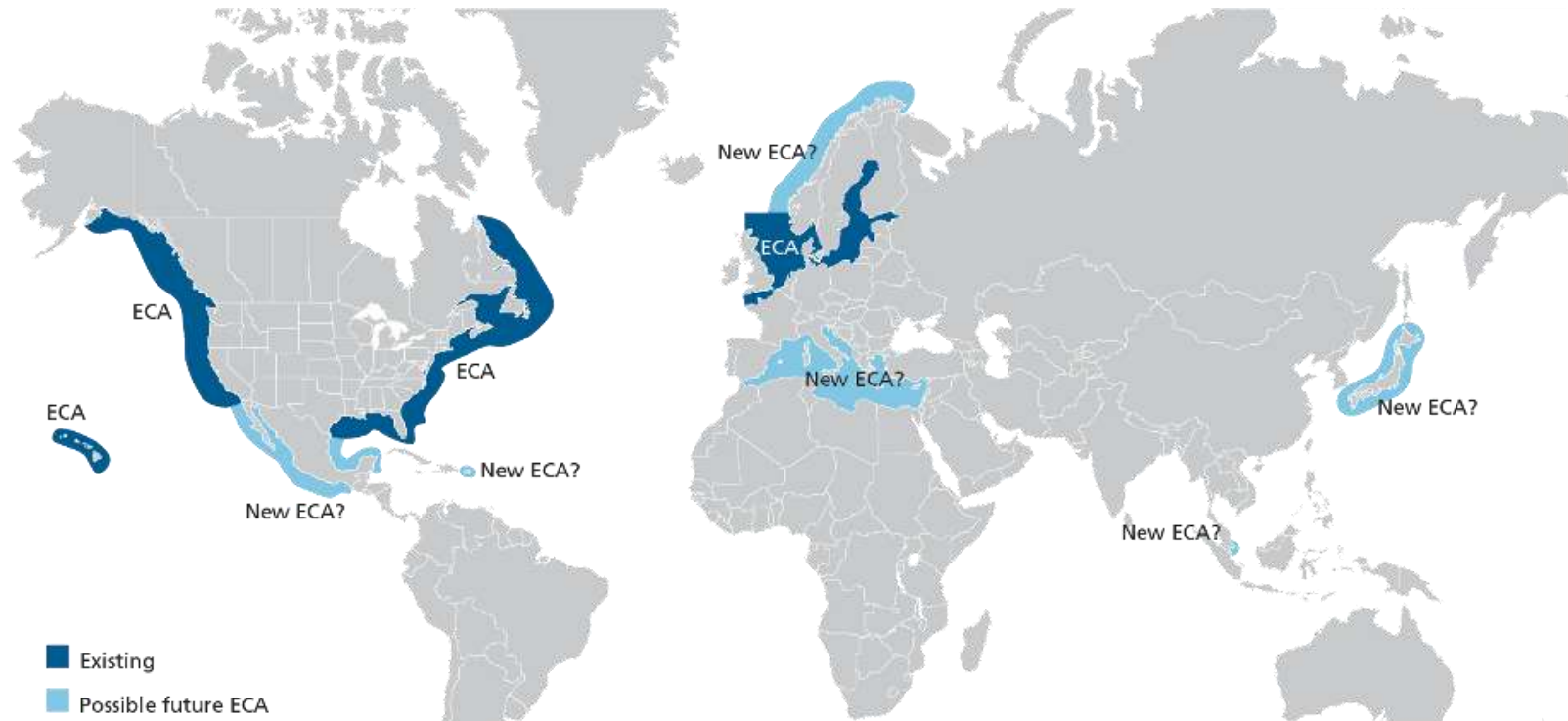
■ The initiative

- Objective
- Scope
- Organisation of the work

■ Contents of the draft document

■ Status

Marine Industry facing new, demanding emission controls



Existing fleet

Requirement

2010: SO_x < 1,0%
2015: SO_x < 0,1%

Compliance option

- HFO + scrubber
- Distillate fuels
- LNG

Newbuilds

Requirement

2011: NO_x Tier 2
2016: NO_x Tier 3

Compliance option

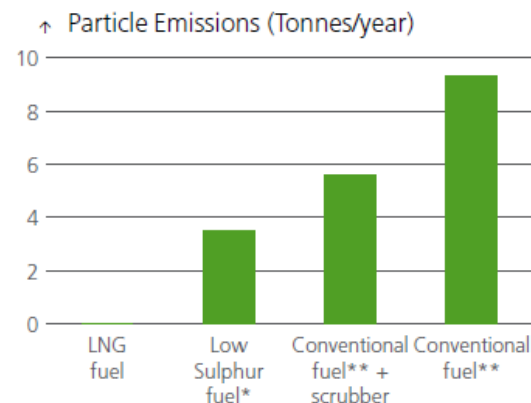
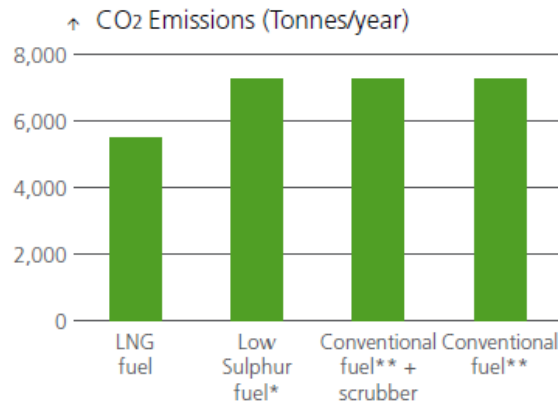
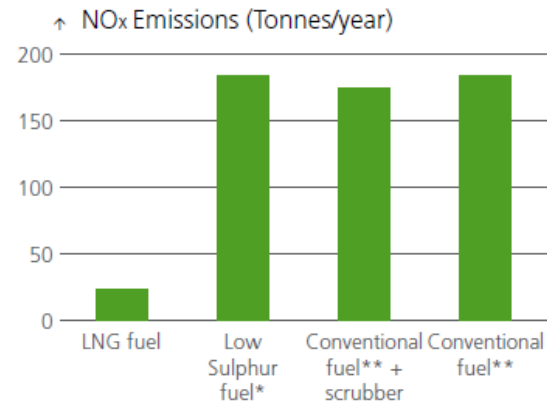
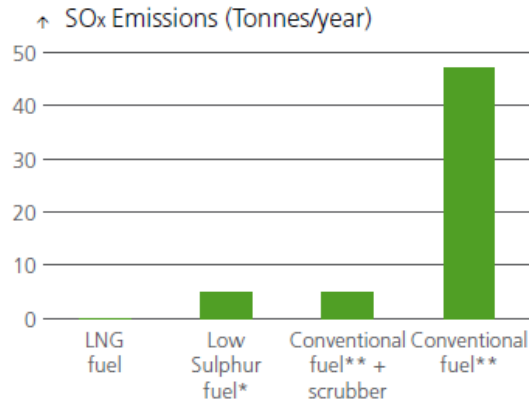
- Scrubber + SCR
- LNG

Decisions need to be made



Clear environmental benefits of natural gas

Environmental emissions for alternative concepts for a typical baltic sea cargo ship



The regulatory basis for LNG as fuel

IMO - IGC Code

Rules for the bunker boat,

IMO - IGF Code

Rules for the receiving ship, the ship using LNG as fuel

SIGTTO and OCIMF

Guidelines for LNG transfer and Port Operation

Port regulations

USCG, local authorities

Onshore regulations

EU, NFPA, FERC.....

Fuel supply infrastructure

?????



Proposal to ISO TC67WG10 (October 2010)

- Establish a new project team (PT1) with the aim to develop a new ISO document addressing:

Guidelines for systems and installations for supply of LNG as fuel to ships.

- The aim shall be to provide guidance on how to
 - Meet safety requirements.
 - Establish operational and control procedures to ensure safe, practical and aligned operations in different ports.
 - Identify requirements to components to ensure safety equipment compliance
- The focus shall be
 - The safety aspects of the bunkering operations
 - To define the interface between the ship and the fuel supply facilities, to ensure that a LNG fuelled ship can refuel safely in ports with LNG fuel supply facilities



Status

- ISO TC67 approved the proposal provided that more than 5 countries supported the initiative
- It was concluded in March 2011 that sufficient numbers of participants had signed up.
- The Kick off meeting was arranged in June 2011 in Total's offices in Paris with 14 participants.
- Till now the group has met in Paris, Oslo, Dubai, Portsmouth, Washington DC, London, Brussels and Stockholm.
- Today the work group comprise 30+ participants representing
 - 15 countries.
 - 8 oil, gas and energy companies
 - 2 regulators
 - 3 shipping companies
 - 7 equipment providers
 - Sigtto and 3 class societies
- Draft document in final stage



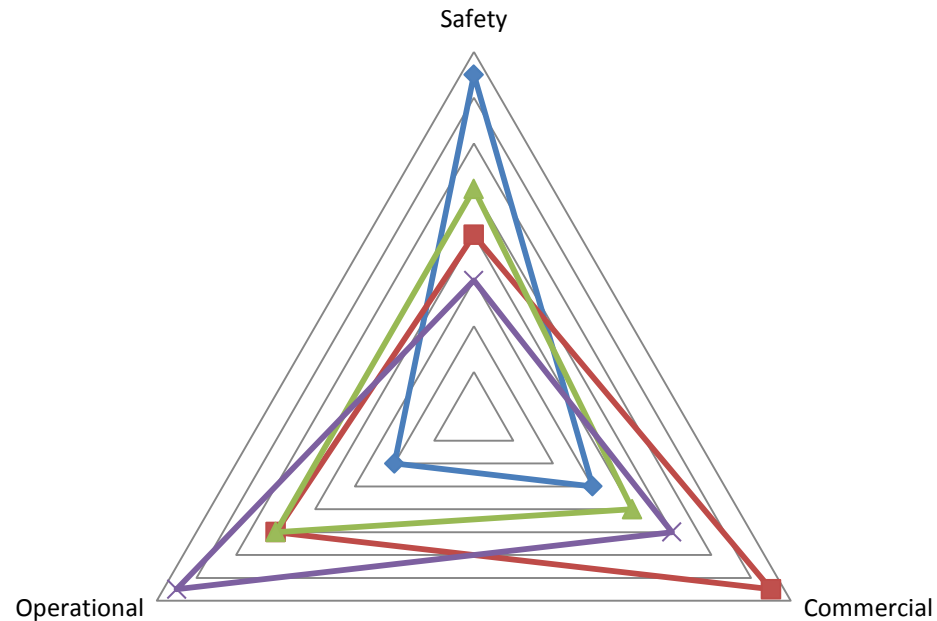
Different Stakeholders, different priorities.

Shipping industry
Streamlined, fast and economic solutions
to face new environmental regulations
Safety for people and assets

LNG providers
Safety for people and assets
Protection of LNG industry reputation
Business in new downstream market

Ports
Provision of services effectively
aligned with existing operations.

Bunker operators
Safety
Maintain business
Minimum interruptions



Document philosophy

- The document will be a ISO Technical Specification, i.e. a normative document. When more experience is gained this can serve as the basis for an ISO standard.
- The guideline will be a high level document outlining main principles and functional requirements.
- The document will define the procedures to design, to install, to operate and to maintain the bunkering loading facility with regard to safety aspects and environmental conditions
- The document shall promote standardisation of the interface between the LNG supplier and the ship both with regard to operations and hardware as an effective safety measure
- The document will give guidance for the use of risk assessment as part of the design and planning process.

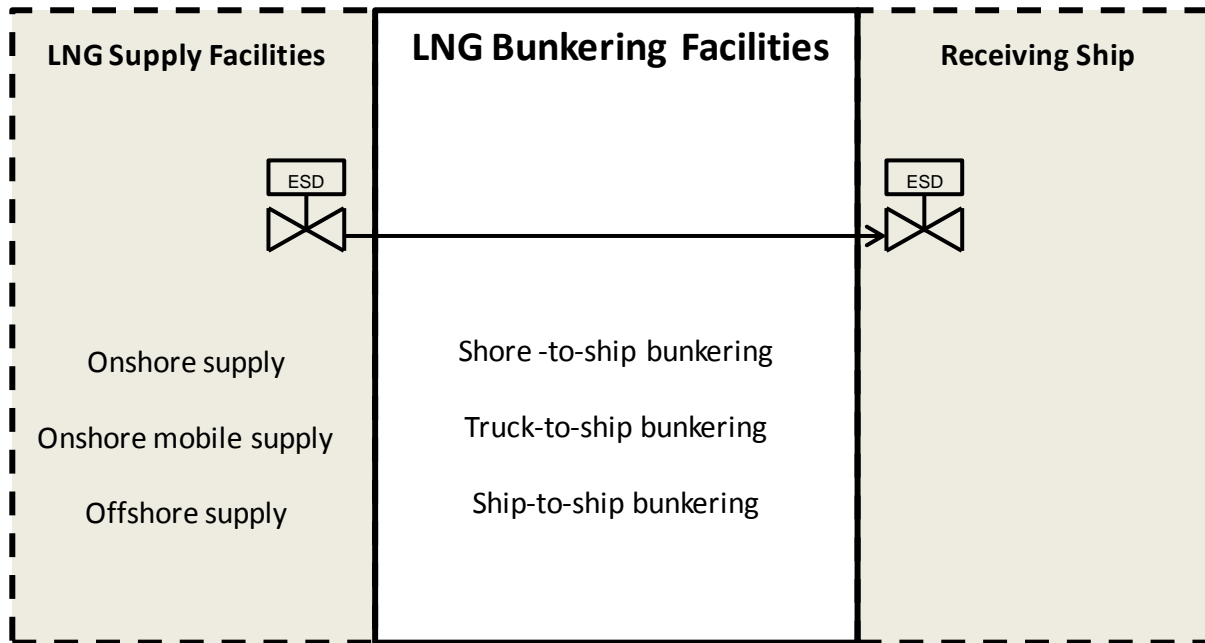


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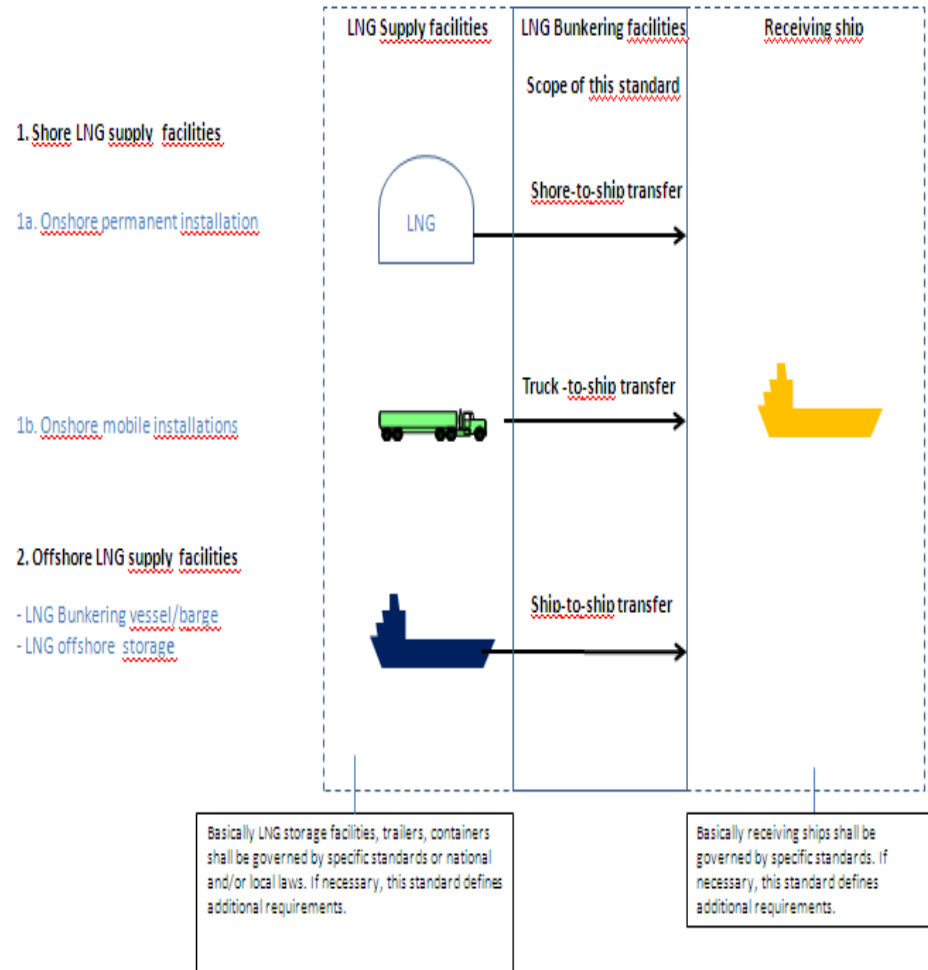
Scope

- Bridge shore and ship regulation
- Focus on safety and align with normal operations



General principles and bunkering scenarios

- **Base Case**
Three main configurations:
 - Tank to ship,
 - Truck to ship,
 - Ship to ship.
- For base case no other cargo operation and no passengers in agreement with ISO Instruments.



LNG Characteristics

- Differences between LNG and other Marine fuels



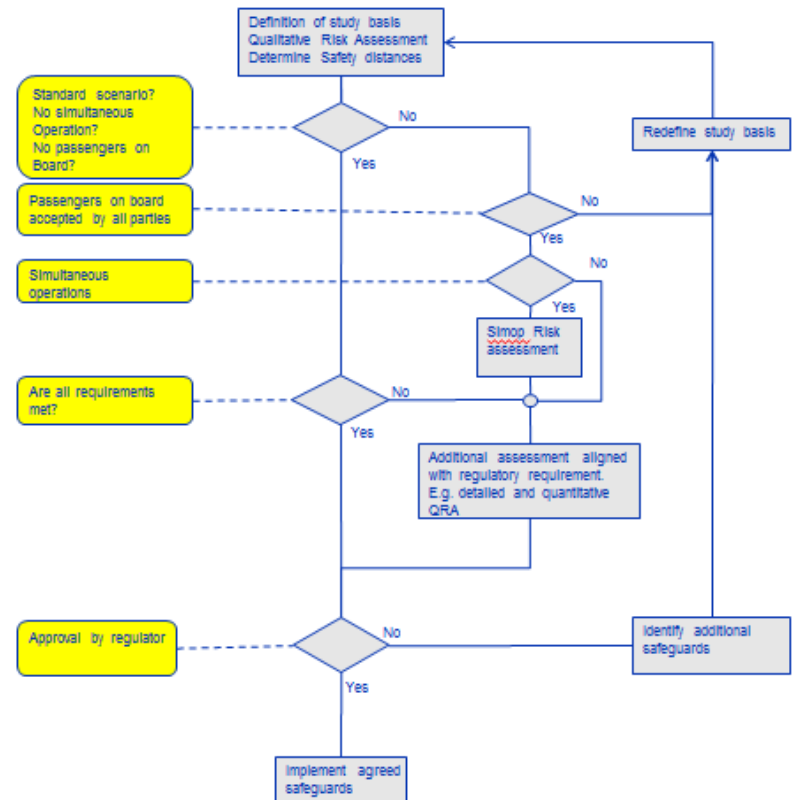
Safety

- Main Priority
- Criteria aligned with regulator requirements
- Listed functional requirements
- Deviations to be specially addressed



Risk assessment

- Hazid mandatory
- Determination of safety zone
- Special attention for other scenarios or deviations from functional requirements

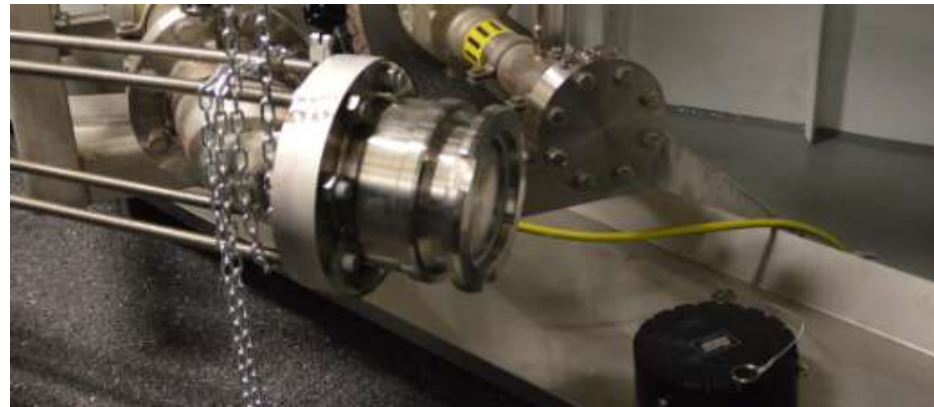


Functional requirements for the LNG Bunkering system

- Capabilities to transfer the required amount of fuel
- Minimise operational releases to environment
- Safety
 - 1st line of defence: Prevent releases of HC.
 - 2nd line of defence: Contain a hazardous situation
 - 3rd line of defence: Minimise consequences

Functional requirements (1st line of defence)

- The **compatibility** check between supplier and ship prior to bunkering operations.
- No planned **release of LNG or natural gas** to the atmosphere.
- **Connected and leak tested** before LNG transfer is started
- **Project specific design**
- **Connect and disconnect without NG.**
- **No liquid locks.**
- **Operating procedures.**
- **Maintenance and testing.**
- **Organizational plan**



Functional requirements (2nd line of defence)

- Minimise the likelihood of **igniting** potential LNG releases.
- Effective **detection** of release of LNG and natural gas.
- **ESD**.
- **ERS or Break away coupling** shall be provided to minimise damage to the transfer system in case of ships drift or vehicle movement.
- **Cryogenic protection**.
- Personnel shall use **PPE** (Personnel protective equipment)
- A **safety zone** shall be implemented around the bunkering operation into which only essential personnel shall have access

Functional requirements (3rd line of defence)

- **Security Zone. Activities** in the area adjacent to the bunkering operation shall be monitored and controlled to reduce possible ignition sources
- An **emergency response plan** shall be in place outlining the requirements for fire fighting, evacuation, first aid and ambulances, communication to authorities.
- **The emergency response plan shall be communicated** to all parties involved in the bunkering operation including the planned emergency response team and be part of the training program.



Training

- The depth of training reflecting the roles and responsibilities of the personnel and the complexity of the operation and facilities.
- Bunkering personnel need to know:
 - Basics of LNG Handling
 - Use of Equipment
 - Port specific operations

Documentation

- Requirements to documentation
 - Design documentation
 - Permits
 - Operational plan
 - Emergency preparedness
 - Checklists and procedures
 - Training records
 - Maintenance records
 - Certification of delivered quantity and quality.

Status

- The needs in the industry are urgent and driven by project commitments and ECA deadlines.
- The urgent need has triggered numerous parallel activities:
 - ISO TC67 WG10 PT1
 - EMSA (European Maritime Safety Agency) funded project.
 - SIGTTO committee on development of safe practices for LNG as fuel
 - Several port specific initiatives and JIP projects.
- It is crucial that ongoing activities are coordinated and aligned to provide industry guidance as soon as possible with a minimum of confusion.
- ISO TC67WG10PT1 has responded and has now a nearly finalised committee draft. This will most likely be available 2nd quarter 2013.

Thank you for your attention

