U.S. Coast Guard
Sector San Diego

AAPA Cruise Seminar – San Diego 2017

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Agenda

- Why LNG?
- The U.S. Fleet
- LNG: How is it used as a Fuel
- USCG: How we are involved
- Guidance: Liquefied Gas Industry
Assist in the capacity of Liquefied Gas qualified SMEs as a specialized force multiplier for inspections, incidents and investigations.

Bolster inspector and technical capacity with workforce tracking, workforce development, and training opportunities

Provide consultation & technical advice to both the Marine Industry and the Coast Guard on matters concerning the Liquefied Gas Industry.

Reinvigorate industry partnerships

- LNG Fuel Workshop
- Senior Executive Forum
- Webinars
- COCs
- COIs
- Visits
- Ship Rides
- Industry Training
Sulfur oxides (SOx) forms sulfuric acid, and thus acid rain

Nitrogen oxides (NOx) is one of the most prominent ozone depleting air pollutants that causes brown haze or smog over cities.

Carbon monoxide is a greenhouse gas.

Particulate matter is linked to health hazards such as heart disease, altered lung function and lung cancer.
Other emission control areas established under MARPOL Annex VI are: the Baltic Sea area & the North Sea area.

This action brings these waters into an international control program for the emission of nitrogen oxides (NOx), sulfur oxides (SOx), and particulate matter (PM) from ships.

The ECA is expected to reduce emissions of NOx by 27 percent, PM2.5 by 86 percent, and SOx by 96 percent, below levels in 2020 absent the ECA.

The area of the U.S. Caribbean ECA includes waters adjacent to coasts of the Commonwealth of Puerto Rico and the U.S. Virgin Islands, up to roughly 50 nautical miles (nm) from the territorial sea baselines of the included islands.

The area of the North American ECA includes waters adjacent to the Pacific coast, the Atlantic/Gulf coast and the eight main Hawaiian Islands.1. It extends up to 200 nautical miles from coasts of the United States, Canada and the French territories.
Tote
Class: Orca Class LNG Conversion (X2)
Vessel Type: Ro/Ro
Engine: Medium speed Wartsila
Route: Tacoma – Alaska
Conversion: Vancouver, CA

Crowley
Class: Commitment class (X2)
Vessel Type: Container/RoRo
Engine: Slow Speed MAN
Route: Jacksonville – Puerto Rico
Construction: Pascagoula MS

Harvey Gulf
Class: vessels (X6)
Vessel Type: OSV
Engine: Medium Speed Wartsila
Route: Gulf of Mexico – Port Fourchon
Construction: Gulfport MS

Crowley
Class: Marlin (X2)
Vessel Type: Container
Engine: Slow Speed MAN
Route: Jacksonville – Puerto Rico
Construction: San Diego CA
Worlds First LNG Passenger Vessel

Powered by Wartsila – Dual Fuel Engines

**MS Viking Grace** is a [cruiseferry](#) constructed at [STX Europe Turku Shipyard, Finland](#) for the [Finland-based ferry company Viking Line](#). The ship was delivered to her owners on 10 January 2013, and took service on 13 January 2013. It is the first large scale passenger ferry to be powered by [liquefied natural gas](#) (LNG). [5]

In 2016 the vessel completed its 1,000th LNG bunkering.

180 cubic meters / 47k gallons each
• Runs on Methane, Liquefied gas compressed of 600 parts to 1 (Liquid changed to Methane Gas)
- Methane with Diesel fuel (ECA Compliant) injected for ignition source.
Dual Fuel – How it works
Dual Fuel – How it works
The bunker connection coupling provides a safe and quick way to connect to the bunker station or LNG truck.

The cryogenic break-away coupling is used to prevent against pull away accidents. The coupling has a diverted breaking point set at a determined break-load. When the coupling breaks the internal valves in the coupling will close automatically on both sides.


The safety break-away valve consists of two halves, each with a valve that has an O-ring seal. When the safety break-away couplings separate, it allows the valves to close. The two valves close rapidly, minimizing exposure to personnel and the environment.

Safety break-away couplings have three external break bolts. In the case of axial
tension all of the bolts take up the force corresponding to the break force on the hose with a safety margin.
Additional Systems

• Water Curtain


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Marine Cryogenic Break-away Couplings are designed to only release by inline pull and used between two strings of hose.

https://www.dixonvalve.com/product/MSBC500SSMNPT

How it works
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Additional Systems

- Deluge System

LNG is approx. -260°F
-160°C
Additional Systems

- Dry Powder
Additional Systems

- Emergency Shutdown Device (ESD)
Additional Systems

- Training
A lot of office and a lot of units that are involved with LNG gas Industry

These are the most prominent

Almost 200 office in HQ
There are Four Vessel Inspection NCOE offices

Outer Continental Shelf (OSC NCOE)

Towing Vessel (TV NCOE)

Cruise Ship (CS NCOE)

Liquefied Gas Carriers (LGC NCOE)
We work for the USCG’s Chief Traveling Inspector, Captain Flaherty

Field works for District who works for the Area who works for Headquarters

Those offices I have listed are those most commonly associated with liquefied gases

The NCOE has the ability to serve as a direct line of communication for the field and industry, on project coordination and to serve as an advisor on technical issues.
Guidance for Using Liquefied Gases

**LNG as Fuel:**

- LNG Fueled Vessel

- LNG Bunker Facility
  - Ship to Ship
  - Shore to Ship
  - Truck to Ship
Guidance for Using Liquefied Gases

**LNG FUELED VESSEL GUIDANCE**

- International Gas and Low Flash Point Fuel (IGF) Code
- CG-521 Policy Letter 01-12: Equivalency Determination; Design Criteria for Natural Gas Fueled Systems
- CG-OES Policy Letter 01-15: Guidelines for LNG Fuel Transfer Operations and Training of Personnel
- MSRO Policy Letter 07-13: “LNG fueled vessels and LNG bunkering operations do not require an escort”
Guidance for Using Liquefied Gases

LNG SHORETO SHIP BUNKER GUIDANCE

- 33 CFR 127: Waterfront Facilities Handling LNG
- CG-OES Policy Letter 02-15: Guidelines for Vessels and Waterfront Facilities Conducting LNG Marine Fuel Transfer Ops
- MSRO Policy Letter 07-13: “LNG fueled vessels and LNG bunkering operations do not require an escort”
Guidance for Using Liquefied Gases

**LNG SHIPTO SHIP BUNKER GUIDANCE**

- CG-ENG Policy Letter 02-15; Design Standards for US Barges Intending to Carry LNG in Bulk
- CG-OES Policy Letter 02-15: Guidelines for Vessels and Waterfront Facilities Conducting LNG Marine Fuel Transfer Ops
- MSRO Policy Letter 07-13: “LNG fueled vessels and LNG bunkering operations do not require an escort”
LGC NCOE Roles and Services

- LNG as Fuel Workforce Development Committee (LNGFWDC)
  - Checklists
  - Qualification Standards
  - Inspection Processes
  - Classroom Training
Announcements

- **NCOE Field Notice 01-15 CH 1; LNG Bunkering Recommendations**
  - LNG system drawings/plans
    - approved prior to bunkering ops
  - Crew
    - familiarity with LNG system.
  - Procedures
    - inerting, purging, cool down, loading, and testing of Emergency Shut Down (ESD)
    - approved prior to bunkering ops
Announcements

- LNG Bunkering Shore to Ship Job Aid
  - Transfer Procedures
  - Emergency and Ops Manuals
  - Designated/Qualified PIC
  - Communications
  - Safety/Hazardous Zones
  - Warning Signs
  - Lighting
  - Piping
  - Cargo Temp/Pressure
  - Gas Detection
  - ESD
Announcements

• Domestic Vessel LNG Fuel Systems Job Aid
  • Documentation
  • Instrumentation
  • Bunkering Manifold
  • Air Locks
  • Semi-Enclosed Spaces
  • Fuel Tanks
  • Cargo Pumps
  • Cold Box/Vaporizer/Compressor Room
  • Gas Piping
  • Gas Detection
  • Nitrogen Generation
  • Gas Interlocks
  • Electrical
  • PPE
SIMOPS: Risk assessment that ops on vsl and surrounding vsl will be safe.
Finding the information

- Navigating website:
Finding the information

- Navigating website:
- Contacts
Finding the information

- Navigating website:

- Liquefied Gas Carriers
Finding the information

- Navigating website:

- Liquefied Gas as Fuel
Finding the information

- Navigating website:

- Liquefied Gas Bunkering
Finding the information

- Navigating website:

- Liquefied Gas Facilities
Instructor Notes:

Some additionally regulatory aspect for operators.

Only facilities/vessels that are compliant with the regulations above can supply LNG bunkers to LNG-fueled ships in the US.
Come Early – Come Often

Questions