U.S. Coast Guard

Maritime Transport of LNG
Presentation to the National Academies' LNG-by-Rail Committee: Waterfront Facility and LNG Carrier Regulatory Overview

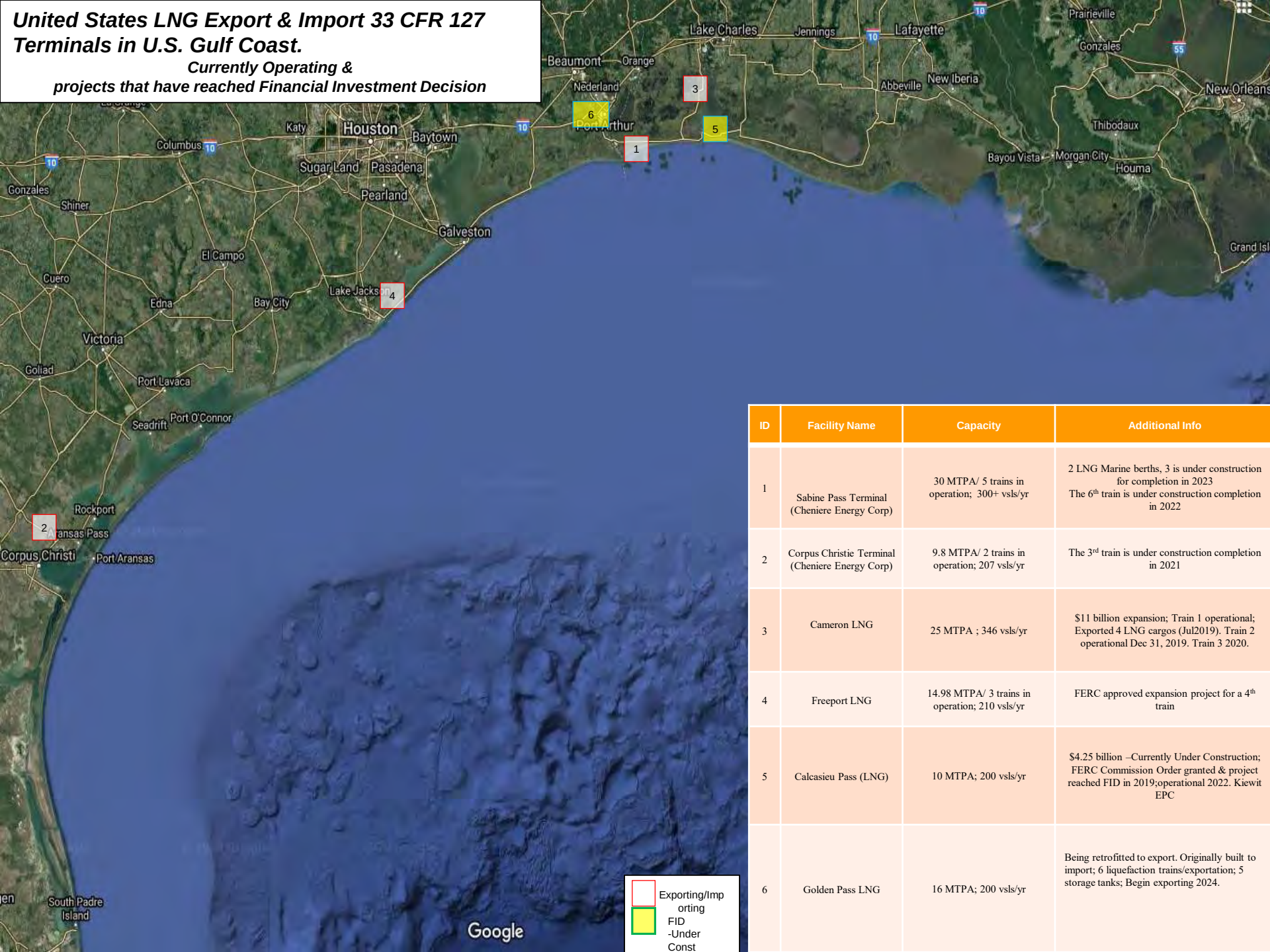
Date: 21 Sept 2021

Objectives

- The State of the U.S. LNG Import and Export Industry.
- USCG Authority over Waterfront Facilities Handling LNG.
- Key Regulations for Waterfront Facilities Handling LNG.
- USCG Cooperating Agency Role during Project Permitting.
- LNG Carrier Regulations.

United States LNG Export & Import 33 CFR 127 Terminals in U.S. Gulf Coast.

Currently Operating & projects that have reached Financial Investment Decision



ID	Facility Name	Capacity	Additional Info
1	Sabine Pass Terminal (Cheniere Energy Corp)	30 MTPA/ 5 trains in operation; 300+ vsls/yr	2 LNG Marine berths, 3 is under construction for completion in 2023 The 6th train is under construction completion in 2022
2	Corpus Christie Terminal (Cheniere Energy Corp)	9.8 MTPA/ 2 trains in operation; 207 vsls/yr	The 3rd train is under construction completion in 2021
3	Cameron LNG	25 MTPA ; 346 vsls/yr	$11 billion expansion; Train 1 operational; Exported 4 LNG cargos (Jul2019). Train 2 operational Dec 31, 2019. Train 3 2020.
4	Freeport LNG	14.98 MTPA/ 3 trains in operation; 210 vsls/yr	FERC approved expansion project for a 4th train
5	Calcasieu Pass (LNG)	10 MTPA; 200 vsls/yr	$4.25 billion –Currently Under Construction; FERC Commission Order granted & project reached FID in 2019;operational 2022. Kiewit EPC
6	Golden Pass LNG	16 MTPA; 200 vsls/yr	Being retrofitted to export. Originally built to import; 6 liquefaction trains/exportation; 5 storage tanks; Begin exporting 2024.

United States LNG Export & Import 33 CFR 127 Terminals. U.S. East Coast, Puerto Rico & Alaska.

Currently Operating & projects that have reached Financial Investment Decision

Exporting/Importing
FID -Under Const

US East Coast, PR and Alaska October 2020

ID	Facility Name	Capacity	Additional Info
7	Southern LNG Elba Island, GA	2.45 MTPA; 10 trains in operation; 34 vsls/yr	Project is supported by a 20-year contract w/ Shell LNG NA, LLC; subscribed to 100% of the liquefaction capacity.
8	Old Dominion Cove Point, MD	12.6 MTPA; 176 vsls/yr	
9	Boston, MA Everett LNG	4.9 MTPA; 69 vsls/yr	Storage of 3.4 Bcf.
10	Puerto Rico	1.2 MTPA; 24 vsls/yr	FERC approved expansion to increase yearly tanker loads from 24 to 40; regasified LNG sendout increase from 186 to 279 MMcfd
11	Kenai, Alaska	0.2 Bcfd	Trans-Foreland.

USCG Authority over Waterfront Facilities Handling LNG

The Marine Transfer Area of any waterfront facility handling LNG capable of transferring LNG to and from a vessel:

- Waterfront Facility Safety Regulations.
  - 33 CFR 127
- Security Requirements for Facilities Subject to 33 CFR 127.
  - 33 CFR 105

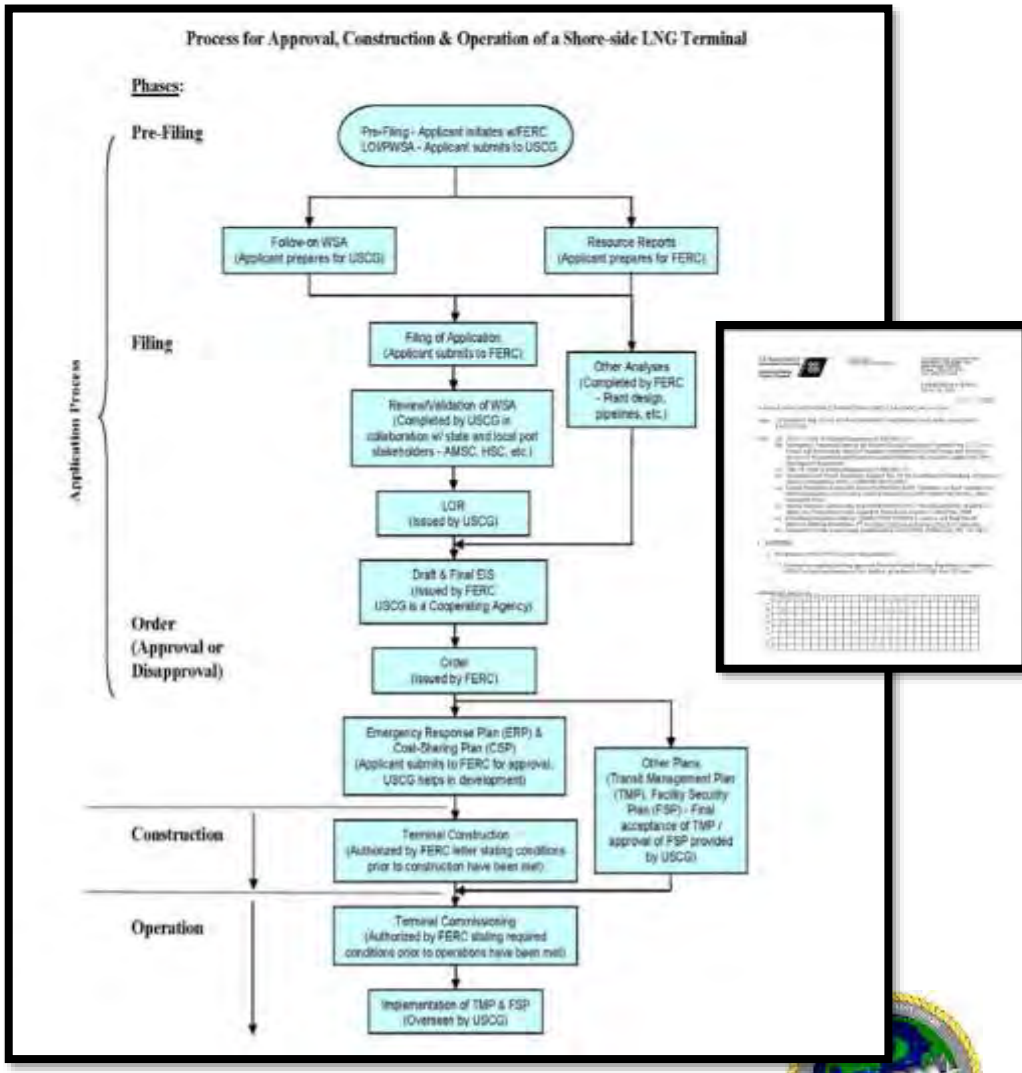
code of federal regulations

Key Regulations for Waterfront Facilities Handling LNG

- Letter of Intent, Preliminary Waterway Suitability Assessment & Follow-on Waterway Suitability Assessment.
  - 33 CFR 127.007
  - NVIC 01-2011
- General Design & Construction of the MTA
  - NFPA 59A
- Person in charge of shore side transfer operations: Qualifications and certification
  - 33 CFR 127.301
- Operations Manual Examined by USCG
  - 33 CFR 127.305
- Emergency Manual Examined by USCG
  - 33 CFR 127.307
- Declaration of Inspection
  - 33 CFR.127

Letter of Intent & Waterway Suitability Assessment

- USCG serves as Navigation SME as a cooperating agency.
- Letter of Intent submitted to the USCG Captain of the Port.
- Preliminary WSA submitted with Letter of Intent:
  - Provides an overview of Port, LGC route, safety and security risk assessments, risk mitigation strategies and resources needs.
- Follow-on WSA due when submitting application to FERC or at least 180 days before transferring LNG or LHG.



Letter of Intent & Waterway Suitability Assessment (cont)

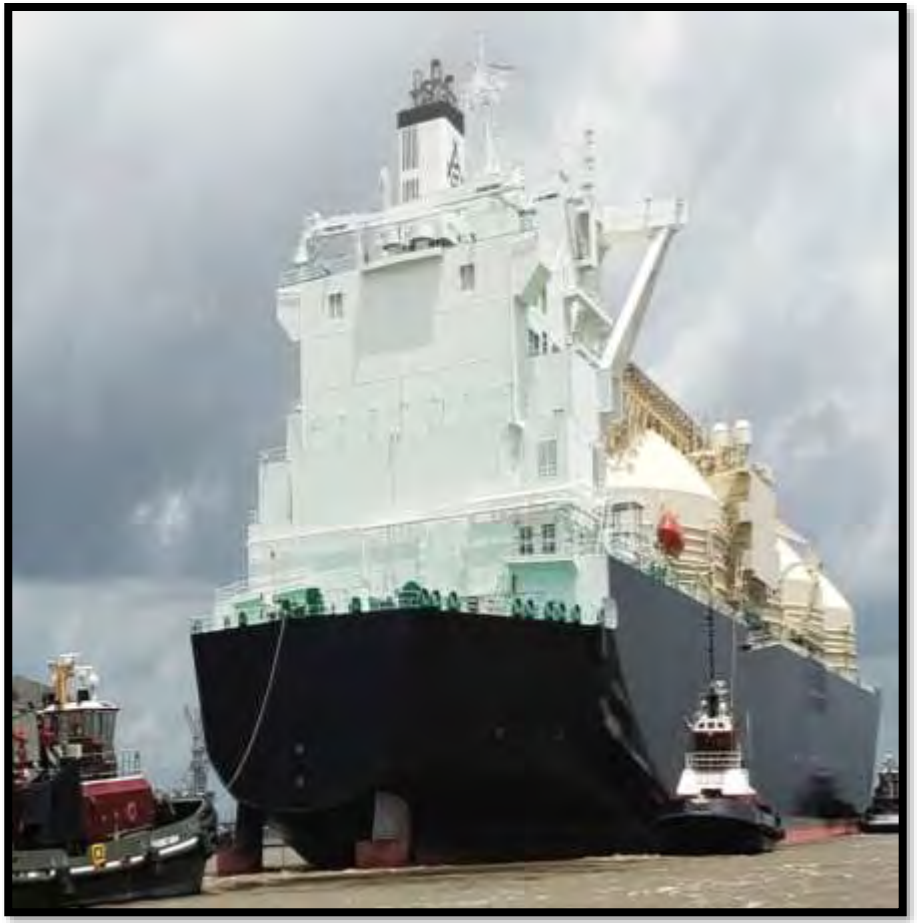
- The 2004 Sandia Labs Report:

"Zones of Concern" for intentional spills from LNGCs with cargo capacity of 265,000 m3.

- Description of the Hazard Zones:
  - ZONE 1: This is the area with the most severe consequences around the LNG Carrier (0.3 miles).
  - ZONE 2: This is an area with less severe consequences than Zone 1 and is considered to extend from 500 m (0.3 miles) to 1,600 m (1 mile).
  - ZONE 3: This is an area with the least likelihood of severe consequences. 1 mile to 2.2 miles.

Waterway Suitability Assessment Review and Validation

- Critical infrastructure.
- Population density.
- Credible safety and security scenarios have been considered and risk management strategies.
- The impact of those risk management strategies on other port stakeholders.
- Necessary resources.
- The USCG Captain of the Port issues Letter of Recommendation to the FERC once review and validation is completed.
- WSA is updated annually until the project commences operations.



LNG Carrier Safety Regulations

U.S. and International Gas Carrier Regulatory Overview

Regulatory Compliance

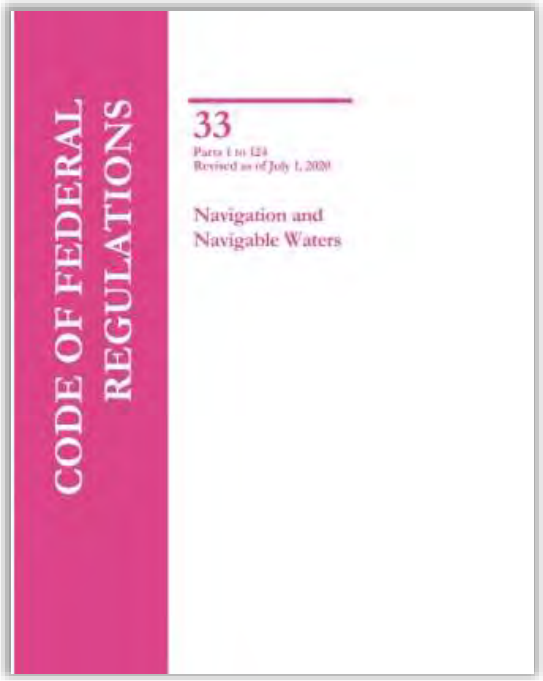
Foreign tank vessels, including gas carriers, operating in U.S. waters must comply with the following regulations:

- Notice of arrival regulations
  - 33 CFR Part 160
- Regulations pertaining to bulk liquefied gases
  - 46 CFR Part 154
- Pollution prevention regulations
  - 33 CFR Part 151
- Navigation safety regulations
  - 33 CFR Part 164
- International Maritime Organization Conventions and Codes
  - SOLAS, IGC Code, MARPOL, STCW, and the like.

Code of Federal Regulations

Notice of arrivals (33 CFR 160):

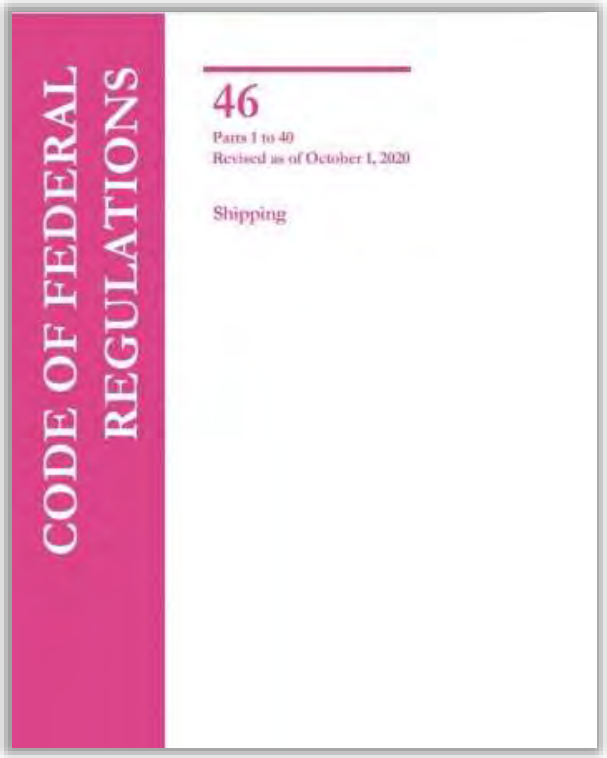
- Vessel particulars
- Voyage information
- Cargo information
- Information for each person on board
- Operational condition of equipment
- Safety management system documentation
- Security



Code of Federal Regulations

Safety Standards for Self-Propelled Vessels Carrying Bulk Liquefied Gases (46 CFR 154)

- U.S. & Foreign Flag Certificate regulations.
- Procedures for having the USCG examine a vessel for a COC.
- Design, Construction, and Equipment Standards.
- Special Design and Operating Requirements.
- Operations.
  - Methane as fuel



Safety of Life at Sea (SOLAS)

SOLAS – Generally regarded as the most important of IMO's key conventions

- First adopted in 1914, in response to the sinking of the *Titanic*
- Its primary objective is to specify minimum standards for the construction, equipment, and operation of ships
  - Subdivisions
  - Main and vertical fire zones
  - Life-saving appliances
  - Radio equipment for rescue
  - Navigation safety services
    - meteorological services
    - ice patrol services
    - search and rescue
  - Carriage of dangerous goods
  - Safety Management Systems
  - Security

Maritime Pollution (MARPOL)

MARPOL – Primary international convention covering pollution prevention Sets the requirements for the pollution of:

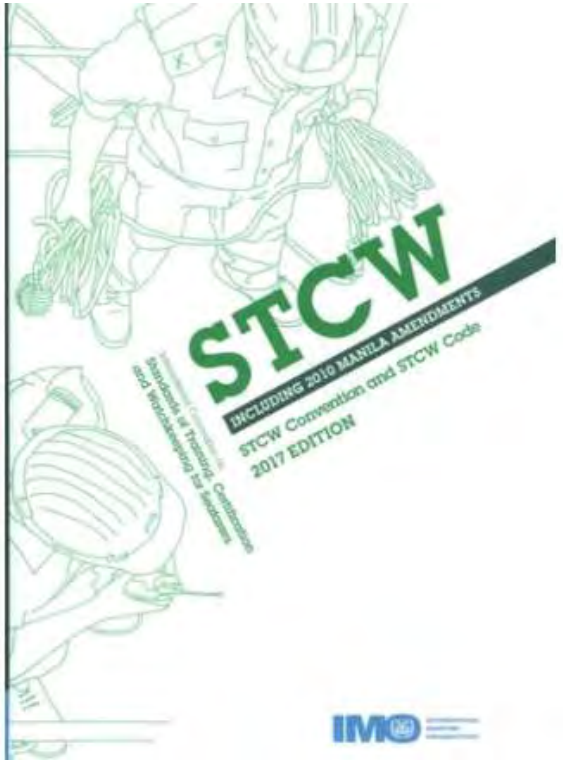
- Oil
- Noxious Liquid Substances
- Sewage
- Garbage
- Air pollution

M/T *Argo Merchant*

Training and Certification

In 1978, the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) was developed to standardize training across the globe.

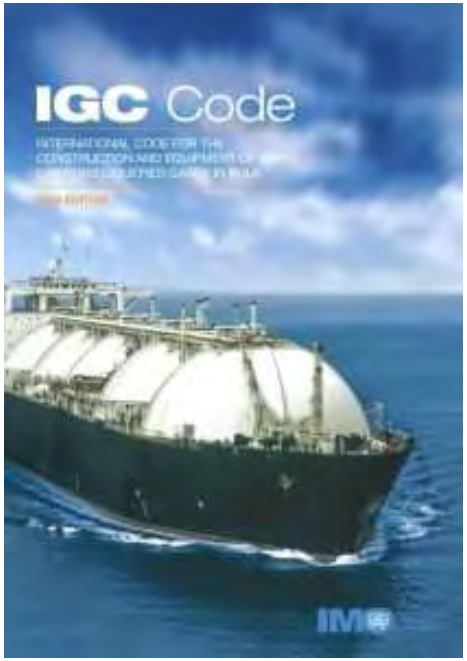
- Originally standards for officers and ratings aboard vessels were developed by their respective country
- Countries must provide detailed information to the IMO detailing how their system complies with the regulations found in the STCW.



Gas Carrier Code (IGC Code)

The IGC Code aims to provide an international standard for the safe carriage of liquefied gases at sea.

- The IGC Code has been mandatory under SOLAS since July 1st, 1986
- Due to the potential severity of collisions or stranding's, the design standards are based on minimizing the risk to the ship, its crew, and the environment
- The gas carrier fleet is constantly evolving and subject to change, the Code allows for new designs as long as they meet similar criteria as set forth in the Code.
- The latest amendments to the gas carrier code entered into force July 1st, 2016.



Questions?