



CLEAN JACKSONVILLE – General Overview

2019

ALWAYS SAFE. ALWAYS READY.

TOTE PROJECTS



GTT Video



How it works



Foss Innovation



LNG SAFETY

Regulations

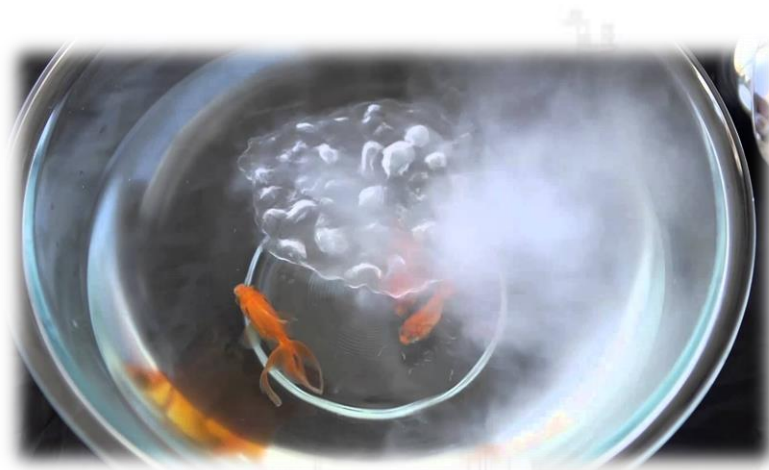
- Coast Guard determines the suitability of a waterway to transport LNG safely
- Federal Energy Regulatory Commission (FERC)
- U.S. Department of Transportation
- International Maritime Organization
- Class Societies (DNV/ABS/BV)

Industry Standards

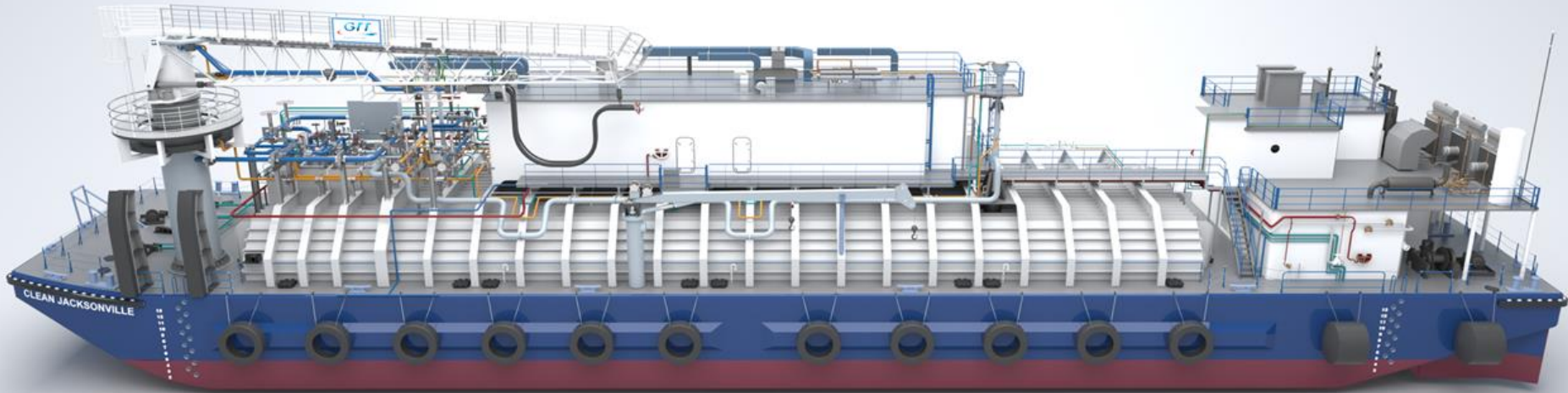
- Internationally recognized standards ISO/EN
- SIGTTO & Society of Gas as a Marine Fuel

Design

- Design Basis- Approved by USCG
- International Gas Carrier Code
- Double-hulled & membrane dual-barrier containment
- Leak detection technology, emergency shutdown systems, fire protection



Fire and Safety Equipment



Fixed Gas Detection

Flame/Heat/Smoke Detection

Fixed CO2 Protected Spaces

ESD System / TPS

Fire Pumps

Water Curtain / Water Spray

Nitrogen Smothering

Fixed Powder (350lbs) w/100ft Hose

Emergency Anchor

TOTE's LNG Projects

Marlin Class Ships:
Jacksonville



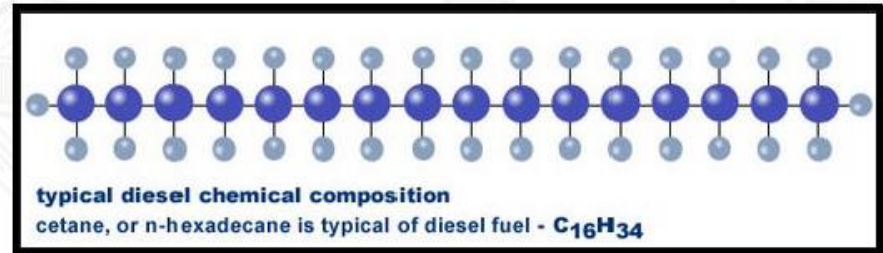
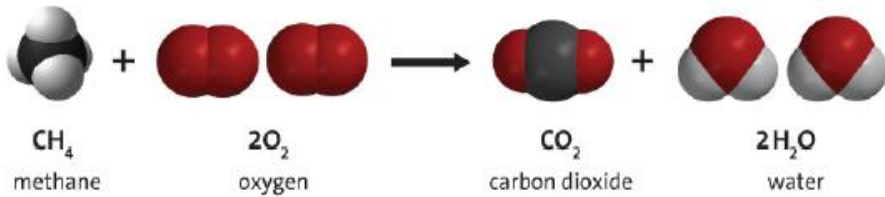
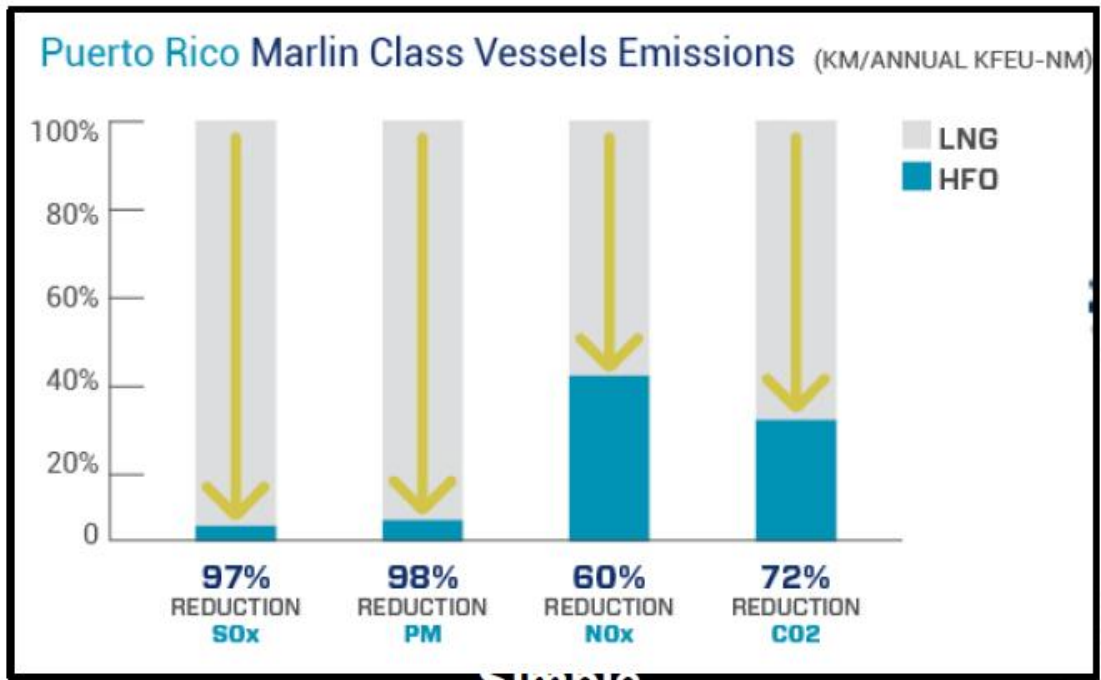
LNG Bunker Barge:
Jacksonville



Orca Class Ships:
Tacoma



Why LNG?

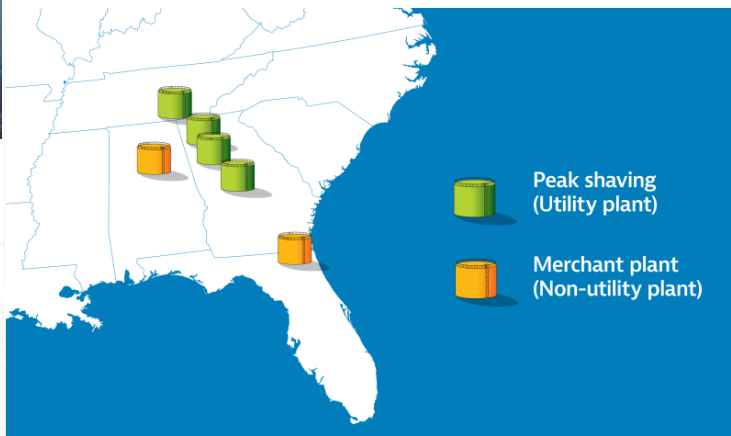


LNG Bunkering Skid



- Requirement is to load about 250,000 LNG gallons from trucks in 5 hours while simultaneously discharging and loading container cargo.
- Applied Cryogenic Technologies (ACT) developed skid and built tanks.
- Pivotal LNG supplies LNG from JAXLNG Facility and other
- Genox provides safe trucking

LNG SUPPLY



Video

Special thanks to our friends at:





- All-fast and connections made in 30 minutes
- 1,500 m³ LNG transferred in under 6 hours
- Cool Down 45 minutes, Warm up 90 minutes





BEWARE OF
PROPELLER

E/A

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LIFTING

CLEAN JACKSONVILLE 101

Cryo-coolers



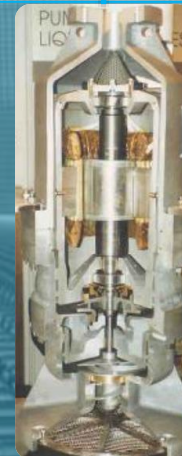
Vaporizer

Vapor generated



Bunker Mast

-160° C
Methane is constantly boiling.

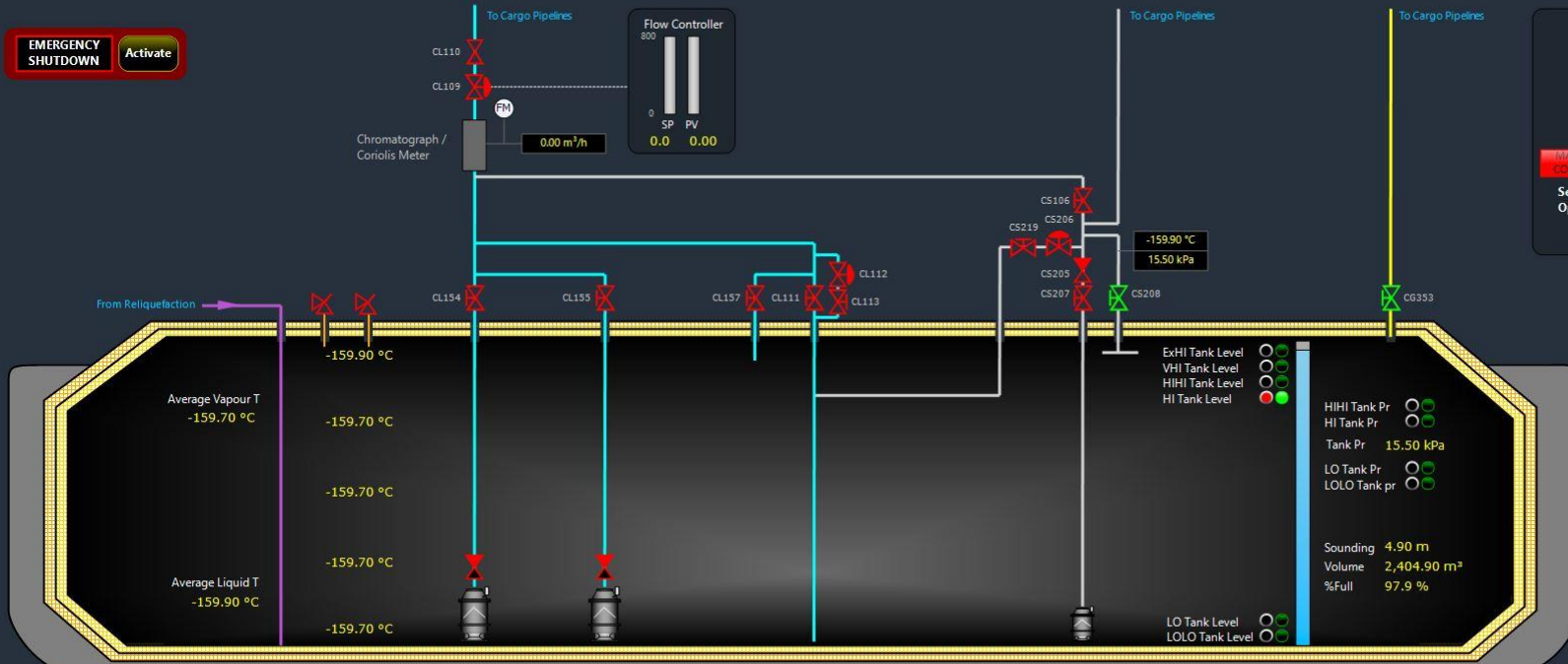


Pump

LNG Team in Training



EMERGENCY SHUTDOWN Activate



TOP FILLING CONTROL

FLOW CONTROL: Reqd Flow m³/hr (0.0 to 600)

PRESSURE CONTROL: Reqd Pr bar (0.0 to 10)

MANUAL CONTROL: Select Option (MANUAL CONTROL, LOADING)

TEMPERATURE CONTROL

Upper T Set Pt m³/hr (-150.0 to 150)

Lower T Set Pt m³/hr (-150.0 to 150)

PORT CARGO PUMP

Operation by? AUTOMATIC SEQUENCE SEQUENCE ACTIVE

MANUAL CONTROL

Pump Start: POWER ON, Available, START

SP 450, PV 0, Disch Pr 35.00, Stop Level 0.00

STBD CARGO PUMP

Operation by? AUTOMATIC SEQUENCE SEQUENCE ACTIVE

MANUAL CONTROL

Pump Start: POWER ON, Available, START

SP 0, PV 0, Disch Pr 35.00, Stop Level 0.00

SPRAY PUMP

Operation by? AUTOMATIC SEQUENCE SEQUENCE ACTIVE

MANUAL CONTROL

Pump Start: POWER ON, Available, START

SP 0.0, PV 0, Spray Hdr Pr 0.00, Disch Pr 15.50

Barge Specific Simulator

CARGO OVERVIEW

CARGO SYSTEM1

CARGO SYSTEM2

ESDS

MACHINERY SYSTEM

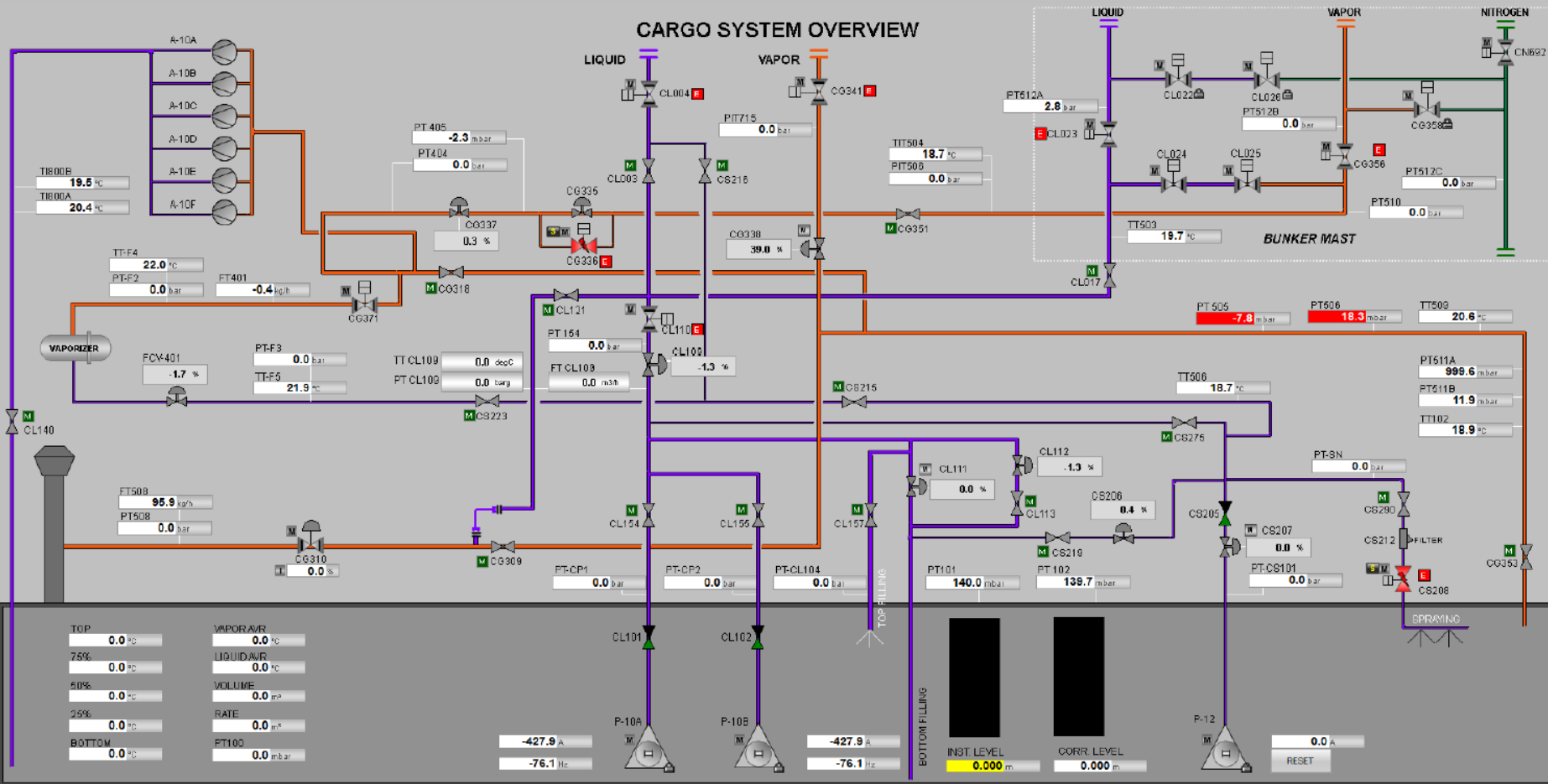
ELECTRIC SYTEM

CONTROL SYSTEM

BARGE CONTROL MODE

TUG CONTROL MODE

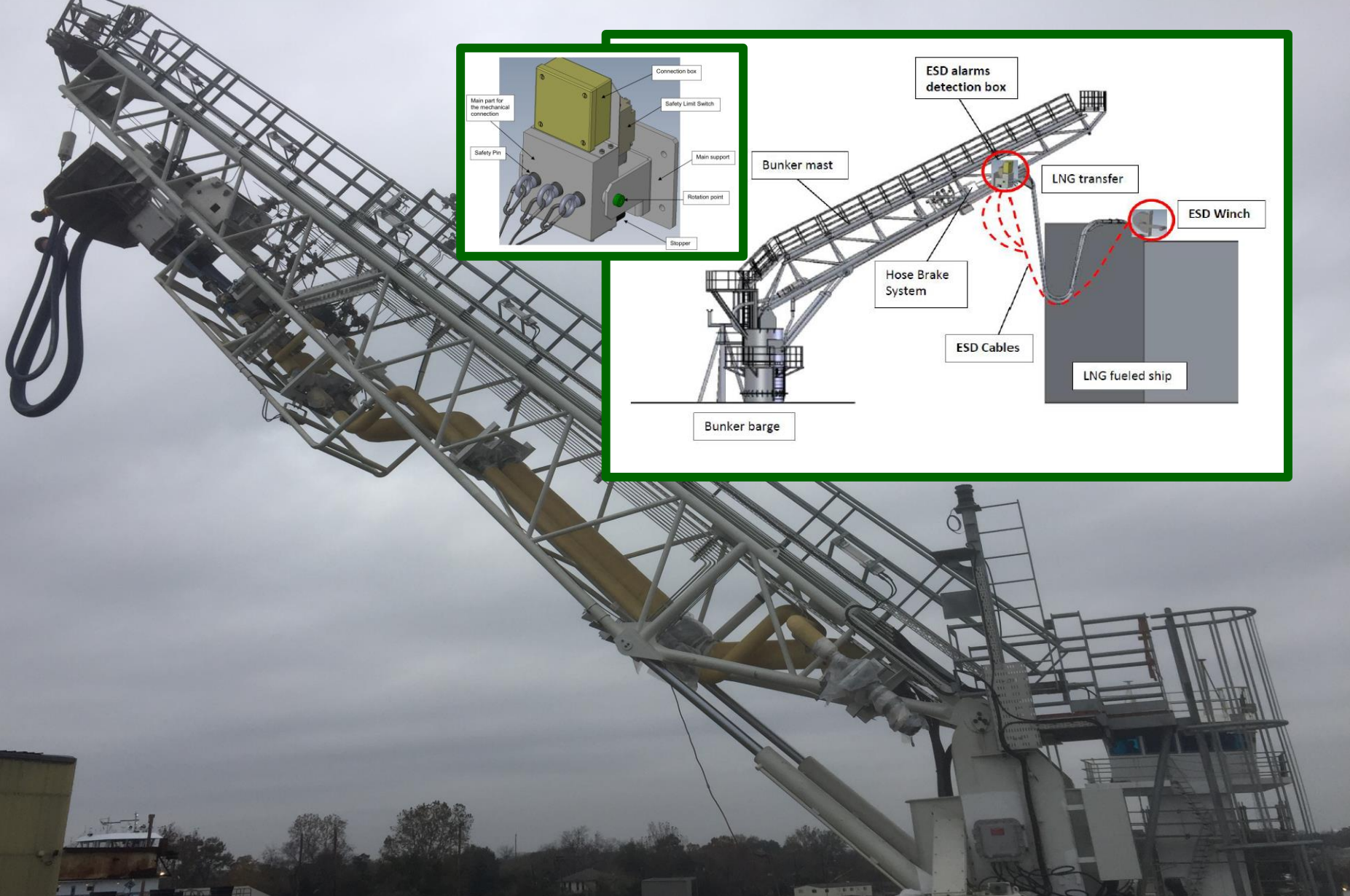
CARGO SYSTEM OVERVIEW



Siemens CAMS Automation

Cryocooler System





The Barge – Bunker Mast:

Foss Innovation - Delta Mariner



Foss Innovation- Punta Lima Wind Farm

- Ocean Towing
- Project Cargo & Logistics
- Naval Architecture & Marine Engineering



Foss Innovation- Bunkering & Emissions Control



- Bunker & Petroleum Transportation
- Regional Towing
- Project Management

- Foss transports 1.4 million barrels of fuel oil safely every month
- As barges are loaded, displaced vapors are pushed through a carbon absorption system to mitigate emissions



As part of the initial small-scale LNG bunkering infrastructure in the United States, the TOTE and Foss teams have worked from design through construction for the development of the vessel, the creation of a vessel specific training program, and established the Foss team that will operate the barge.

We have the strength of our ownership group, Saltchuk Resources, who is the largest private employer in Washington State.

Let us know how Foss can serve you.

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