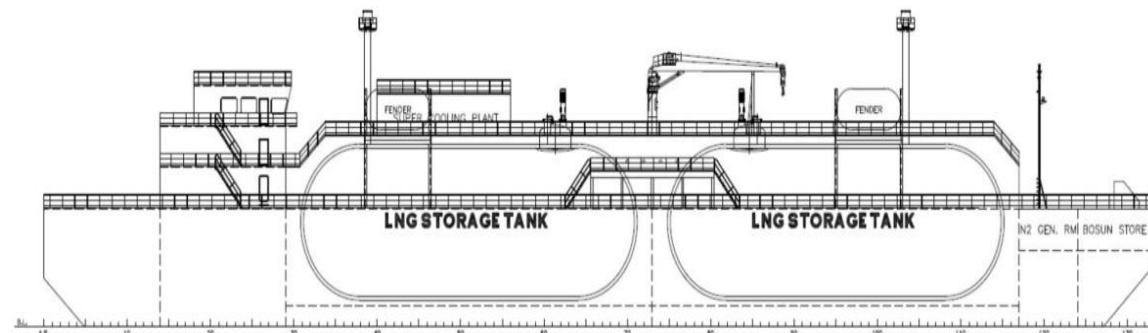


LNG BUNKERING BARGES

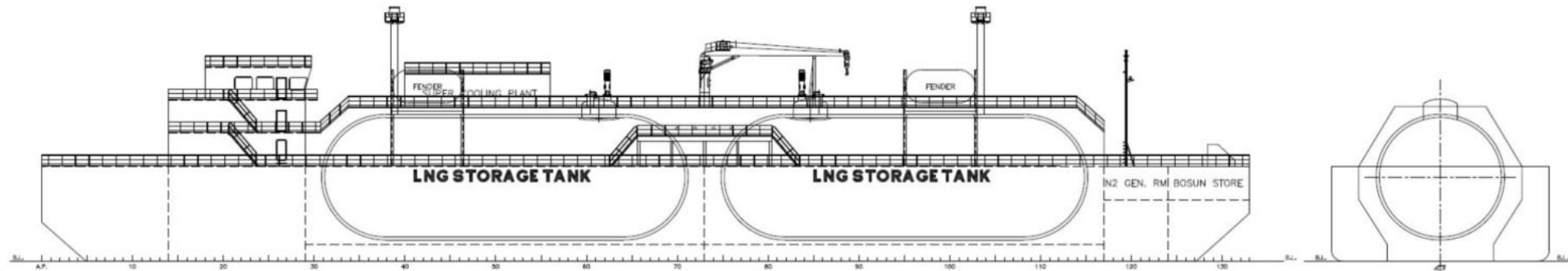
Type C Tanks

Cargo Handling Systems



LNG BUNKERING BARGE

- Jones Act built w/ Chinese and Korean LNG tanks, pumps & piping modules
- 100% Chinese/Korean Built, for non-domestic trades, self propelled or pusher



MAIN PARTICULARS

Length over all	Apprx. 106.40 m
Breadth, moulded	19.20 m
Depth, moulded	8.50 m

CARGO TANKS

Q'ty/Type	2 sets, IMO type C
Capacity	2,550m ³ per tank
Max Design Press.	5.0 bar.g
MARVS	6.0 bar.g
SRV	2 sets / tank
Min. design temp.	-163 °C
Material	AISI 304L or 9% Nickel
Insulation	Foam insulation

CARGO PIPING SYSTEM

Design pressure	10 bar.g
Min design temp.	-163 °C
Material	AISI 304L
Manifold	L-V-L (P&S)
Insulation	Double wall vacuum insulated
	Single wall insulated in tank domes
Vent riser	2 sets

CARGO PUMP

Q'ty	4 sets (100% x 2 sets / tank)
Type	Submersible or Deep well (VFD),
Capacity	500m ³ /h x 140 MLC (S.G: 0.5)

SUPER COOLING PLANT

Q'ty	1 set
Type/ Model	Turbo-Brayton cycle TBF-350 (Air Liquide)
Capacity	0.5 ton/h

NITROGEN GENERATOR

Q'ty	1 set
Type	Membrane or PSA
Capacity	425Nm ³ /h
Dew point	-50 °C
Discharge pressure	6 bar.g

FIRE FIGHTING SYSTEM

Water spray system
Dry chemical powder system

TANK MONITORING SYSTEM

Custody Transfer System	Radar type (2 sensor / tank)
Temperature sensor	4 sensor / tank
Pressure sensor	1 sensor / tank
Hi-hi level & over fill alarm	1 radar type / tank

AUTOMATION SYSTEM

Fully integrated process-based Automation System.	
PMS and Valve remote control system to be integrated.	
Workstation	2 sets in Cargo Control Room
I/O	about 1200HW + 1000Serial bus

SAFETY SYSTEM

Gas detection unit	1 set, Catalytic sampling type
ESD & Data Transfer	Trelleborg, Universal Safety Link

METERING SYSTEM

Flowmeter & Totalizer	2 sets, Coriolis type
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VALVE REMOTE CONTROL SYSTEM

Actuator	Hydraulic type
HPU	1 set
Valve control to be integrated into Automation System	

LNG MARINE SOLUTIONS

LNG TANKS & PROCESS

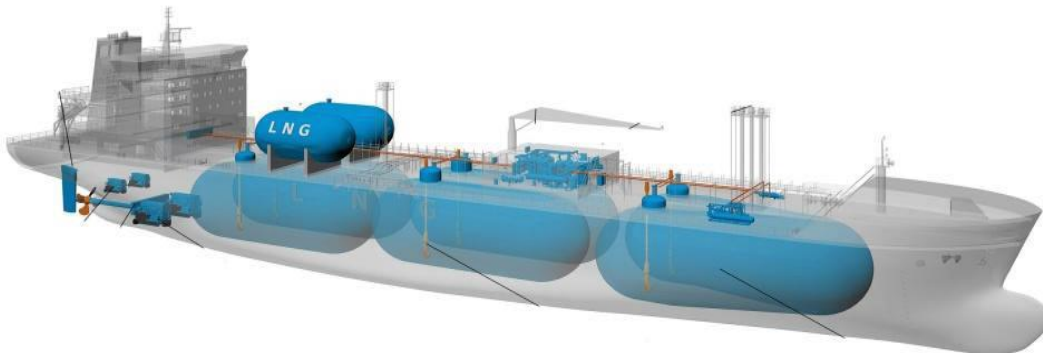
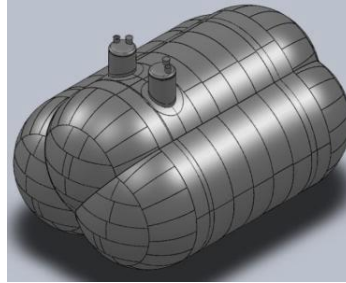
WATTS ENERGY & ENGINEERING

Main Products

- LNG/LEG/LPG Cargo and Shoreside Storage Tanks,
- LNG/LEG Onshore Storage Tanks
- Cryogenic Cargo Handling Systems
- Marine LNG Dual Fuel Gas Storage and Supply System
- Oil and Gas Processing Modules for FSRU, FPSO, etc.

Major References

- 8500cbm LNG bunkering vessel built in DSIC
- 85000cbm VLEC built in DSIC
- SWS 209K Dual Fuel Bulk Carriers SWS Shipyard



LNG BUNKERING SYSTEM

SHANGHAI UPRO MARINE SYSTEM

Main Products

- Cargo Handling System
- Fuel Gas Supply System (LNG/LPG/Ammonia)
- NH3 Fuel Gas Supply System
- Methanol Gas Supply System

Major References

- 5000cbm LPG Carriers built in CSSC Wenchong shipyard
- 9500cbm LNG/LPG/LEG Carriers built in CSSC Wenchong shipyard
- H-line 7000 CEU PCTC

