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EcoNuri

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ecoNuri

the first environmentally friendly LNG fuelled ship in Asia.

By the use of LNG fuel, approximately 95% or more of NO_x and SO_x, 100% of dust and about 23% of CO₂ are reduced compared to use diesel fuel.

It satisfies all of the international shipping environmental regulations of CO₂ emission regulations (EEDI) and NO_x, SO_x emission regulations(ECA).

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Specification

- L.O.A : 38.0 m
- L.B.P : 34.0 m
- Breath : 8.0 m
- Depth : 4.6 m
- Draft (Full Load) : 2.2 m
- Displacement : 382 TON
- Gross Tonnage : Abt. 200 G/T

Machinery

- Main Generator(DF Engine) : 1 x 1,584 kW
- Electric Propulsion Motor : 2 x 700 kW
- Aux. Generator(Diesel) : 1 x 324 kW
- Propeller(CPP) : 2 x 4 Fin
- Bow Thruster : 1 x 75 kW

Utility Capacity

- LNG Fuel Tank : 20 m³
- DO Tank : Abt. 7.9 m³
- Fresh Water Tank : Abt. 12 m³
- Ballast Tank : Abt. 30 m³

Ship Cruising Condition

- Speed : 15 knots ±5%
- Cruising Range : Abt. 470 NM(LNG)
: Abt. 485 NM(DO)

Passenger

- Crews : 4 Persons
- Passenger : 53 Persons

Accommodation

- Conference Room : 39 Persons
- SALON (VIP Room) : 14 Persons

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Subtle & Exquisite Design



VIP Salon



Conference Room

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Ship Exterior



Saloon Interior & Deck

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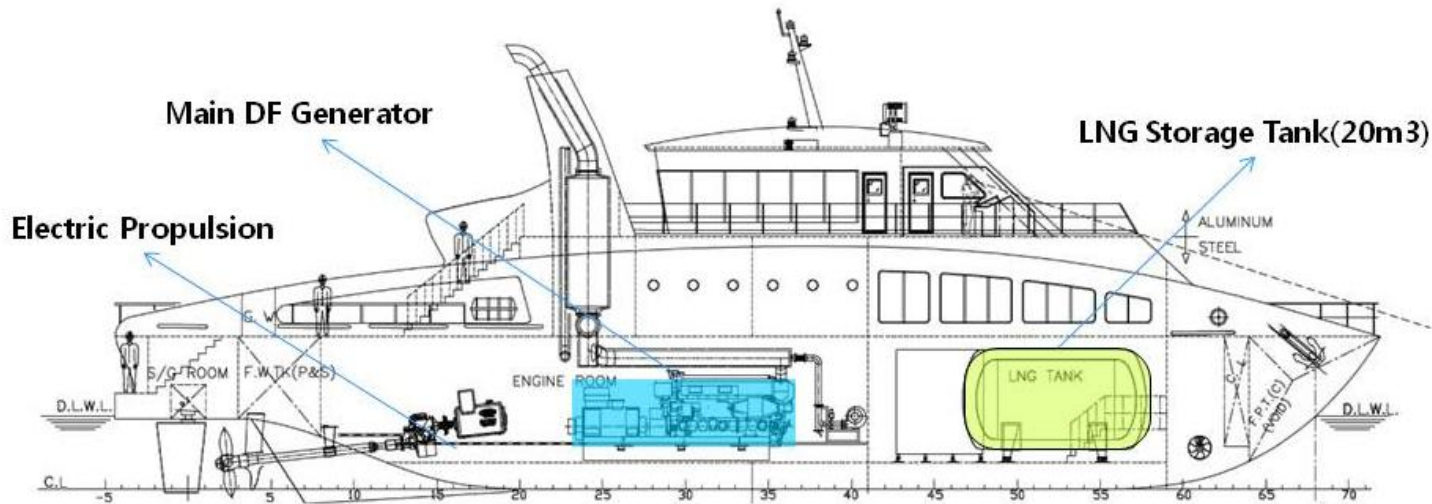
General Arrange.

LNG Supply System

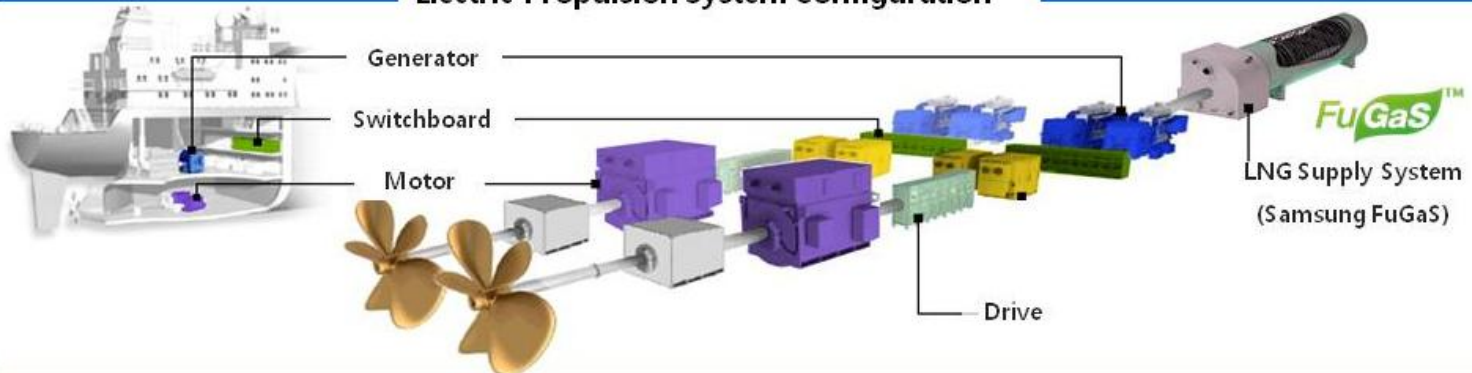
Green Effect

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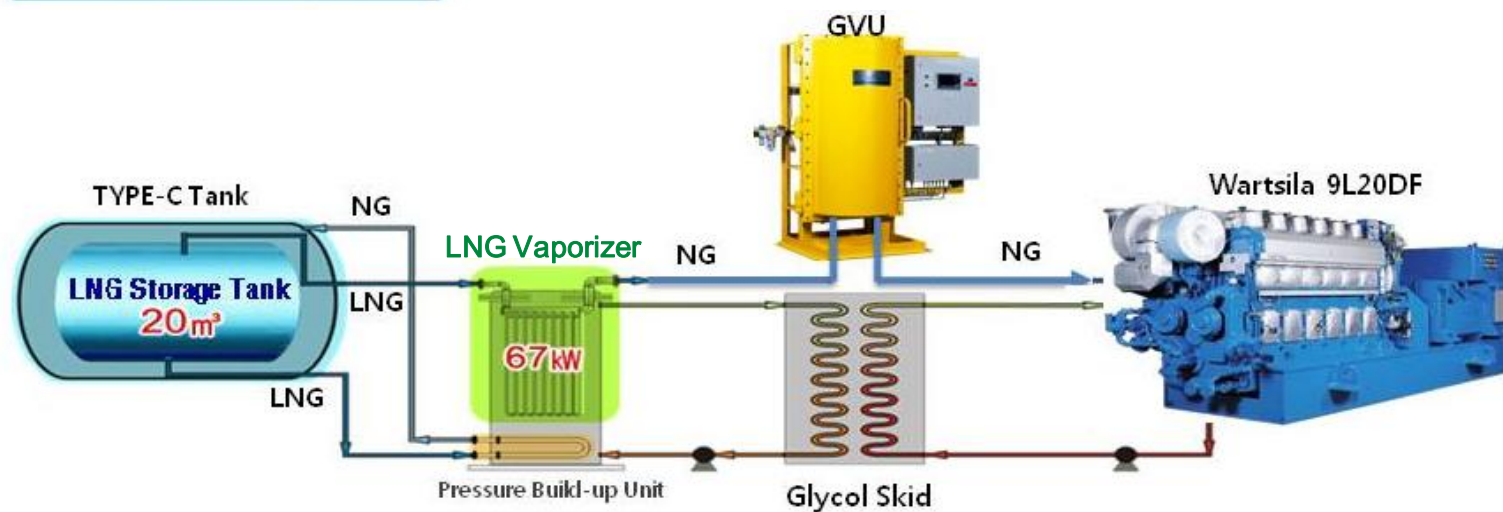


Electric Propulsion System Configuration



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SAMSUNG FuGaS™



Components

- LNG Storage Tank → LNG Vaporizer → NG(Natural Gas) Supply
- Heat Source for LNG Vaporizing: Jacket Cooling Water from Generator Engine
- LNG Tank Pressure is controlled by BPU(Pressure Build-up Unit)

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I Reduction of CO₂

Annual CO₂ reduction : **300 ton** per year

**Abt. 300 ton**

25% of CO₂ reduction
For Conventional ship

CO₂ 300 ton

=

Pine
tree  X 60000
CO₂ Absorption per year

I Cost Saving

Abt. **USD 8,000,000** can be save by changing fuel (Diesel → LNG)

(30Years life time, 3000hours operation, 70% of LNG price than diesel)



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Preparation for LNG Bunkering



Pipe Connection from LNG Tank lorry



LNG Bunkering



Monitoring at Wheelhouse during LNG Bunkering

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Departure from Shipyard



Arrival in Incheon Port



LNG Bunkering Facility in Incheon Port

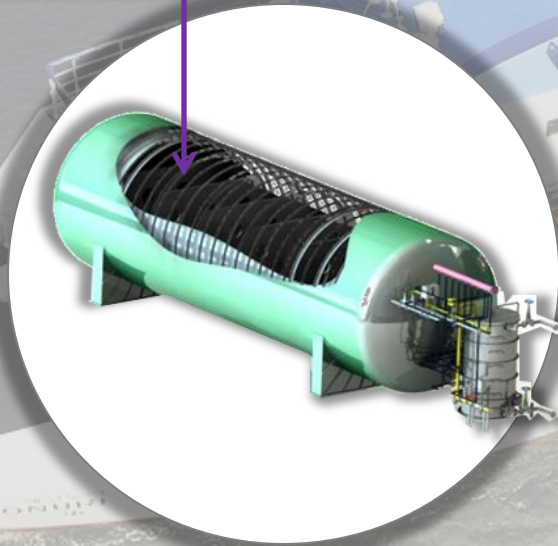


First LNG Bunkering in Incheon Port

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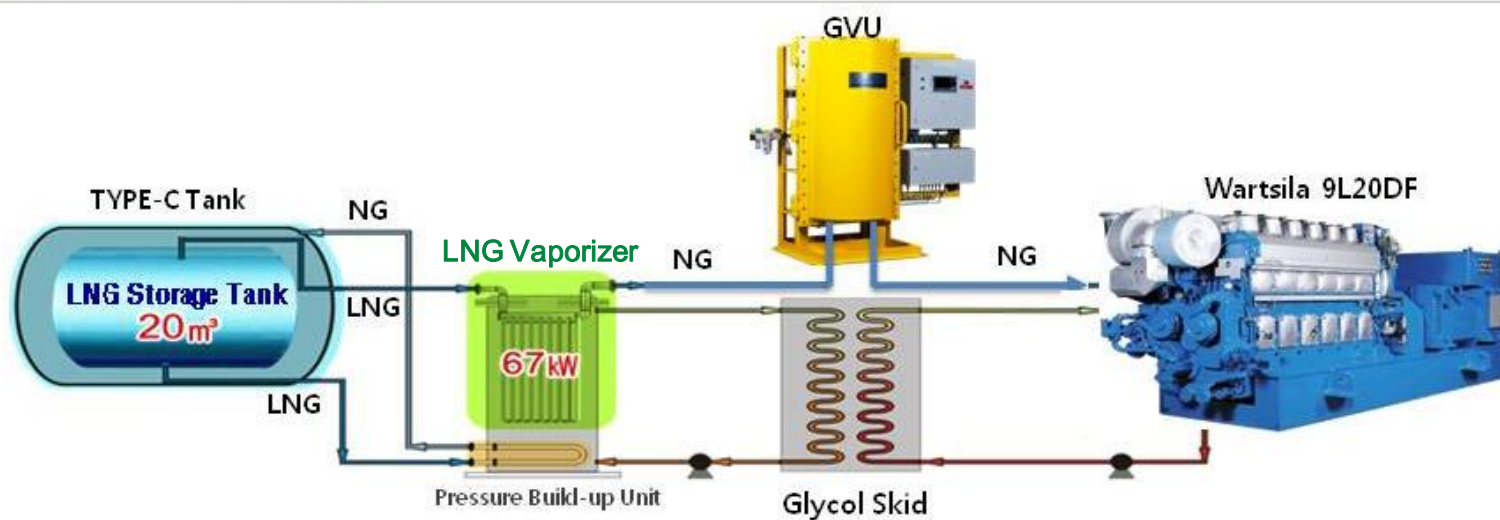
LNG Fuel Supply System

- Samsung FuGaS
- 20m³ LNG Storage Tank with Tank Room



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General Overview



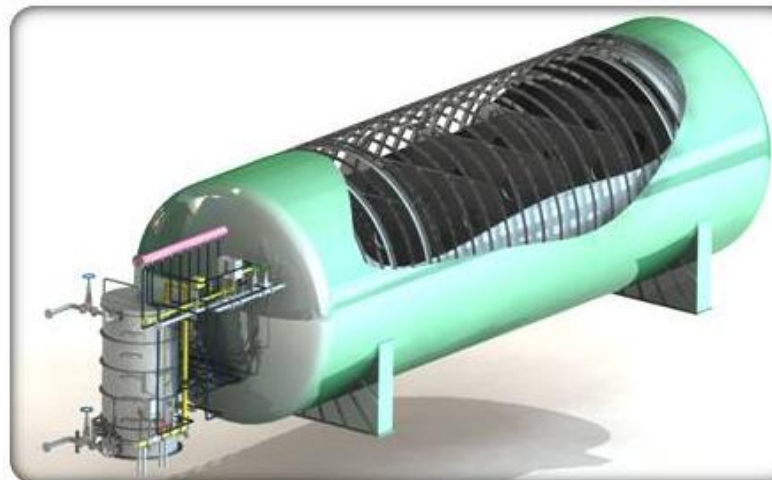
System

- Process Flow : LNG Storage Tank → LNG Vaporizer → NG(Natural Gas) Supply to DF Engine (5~6 barg).
- Heat-exchanged glycol water from DF engine H.T water used for heating source of LNG vaporizer.
- Pressure build-up unit controls natural gas pressure for DF engine.

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LNG Storage Tank

- Type C tank (IMO/IGC)
- Double shell (Barrier space with Perlite) with Vacuum insulation
- Fully welded confined space with tank room
- Vacuum insulation with perlite (~ 0.1 torr)
- Filling limit: 95% of gross volume
- Design/ Operating pressure: 9 barg/ 5~6 barg
- Inner / Outer shell : SUS-304 / 304L



[Inner Tank]



[Outer Tank]

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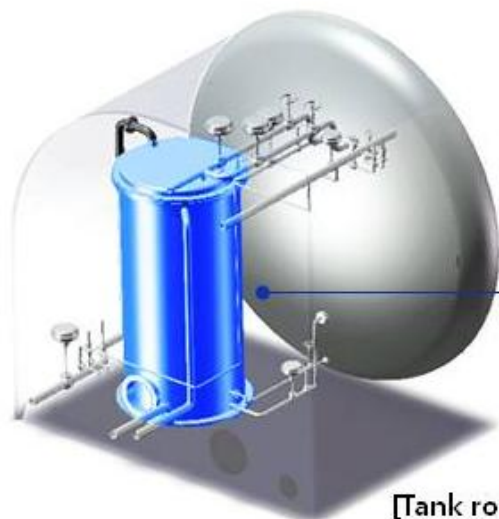
LNG Storage Tank



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TANK ROOM

- Located at the end of LNG storage tank
- Vaporizer and valves are installed in Tank Room
- Tank Room Ventilation: 30 times air change /hour
- Temperature sensor, Level limit switch and Two gas detectors in vent outlet



[Tank room]



[Water Bath Vaporizer]

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Dual Fuel Engine

- Wartsila 9L20DF, 1,584kW
- LNG/Diesel Fuel for Generating Electric Power



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General Overview

GVU
(Gas Valve Unit)



9L20DF Engine



General Overview

- Engine Output : 1584 kW, 440V, 60Hz, 1200 rpm
- Fuel Gas Consumption at 100% Load : 8500 kJ/kWh
- Operation Mode : Diesel / Gas / Backup mode
- Min. Working Gas pressure : 5.5 barg

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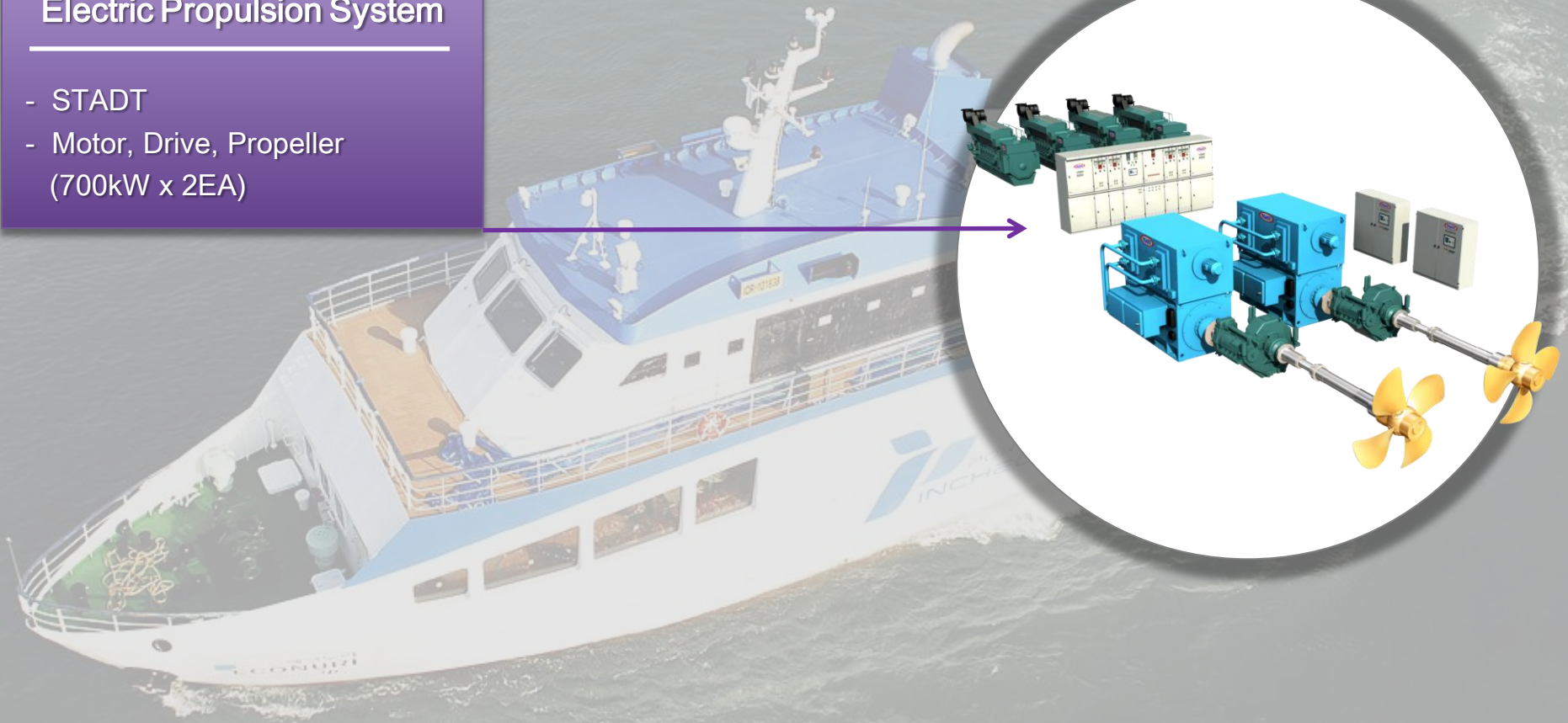
Engine Installation

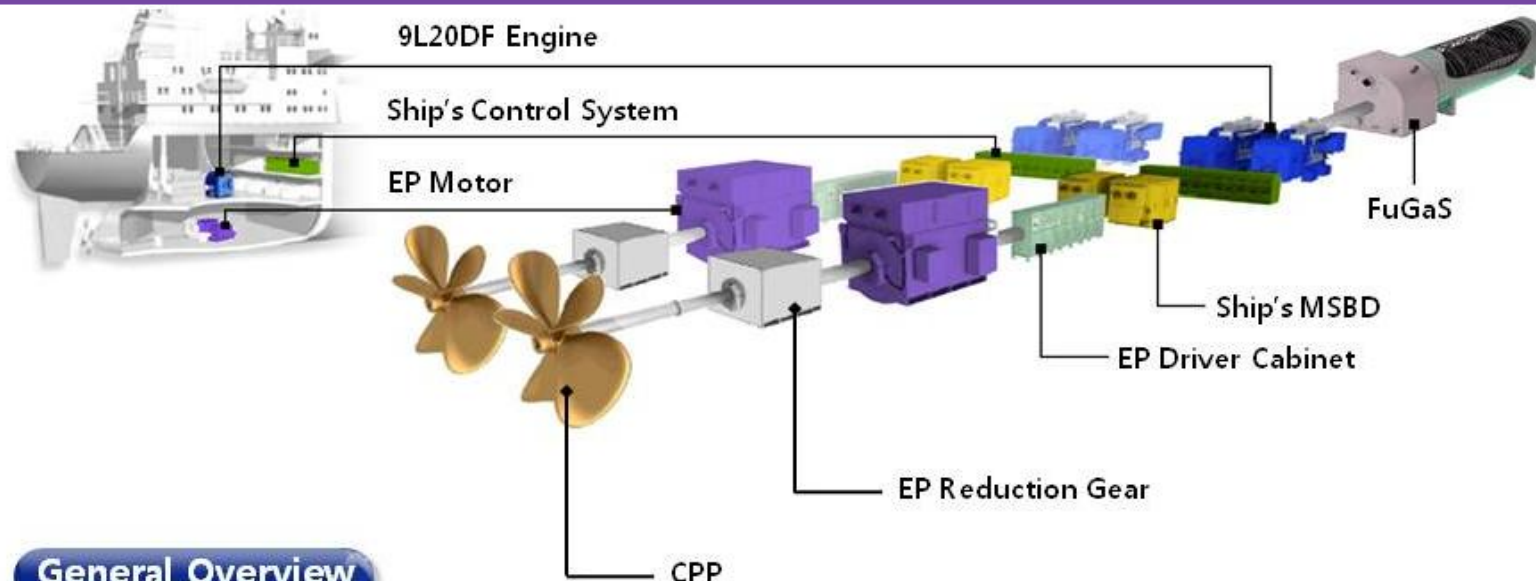


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Electric Propulsion System

- STADT
- Motor, Drive, Propeller
(700kW x 2EA)



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General Overview

- Electrical propulsion powered from DF generator in order to run electric motor shall be consist of MSBD, driver cabinet for motor control(Variable Frequency Converter)

Advantage

- Fast torque response, high maneuverability and outstanding controllability compared with mechanical direct driven propulsion.
- Low vibration/noise, high flexibility for machinery arrangement

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DF Engine

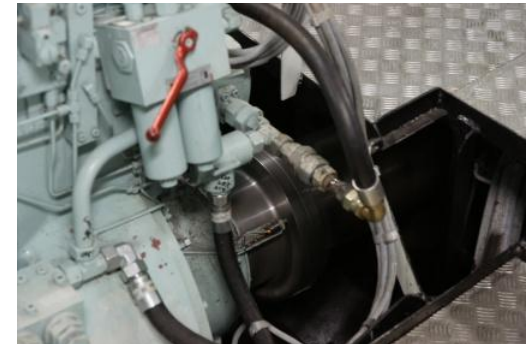
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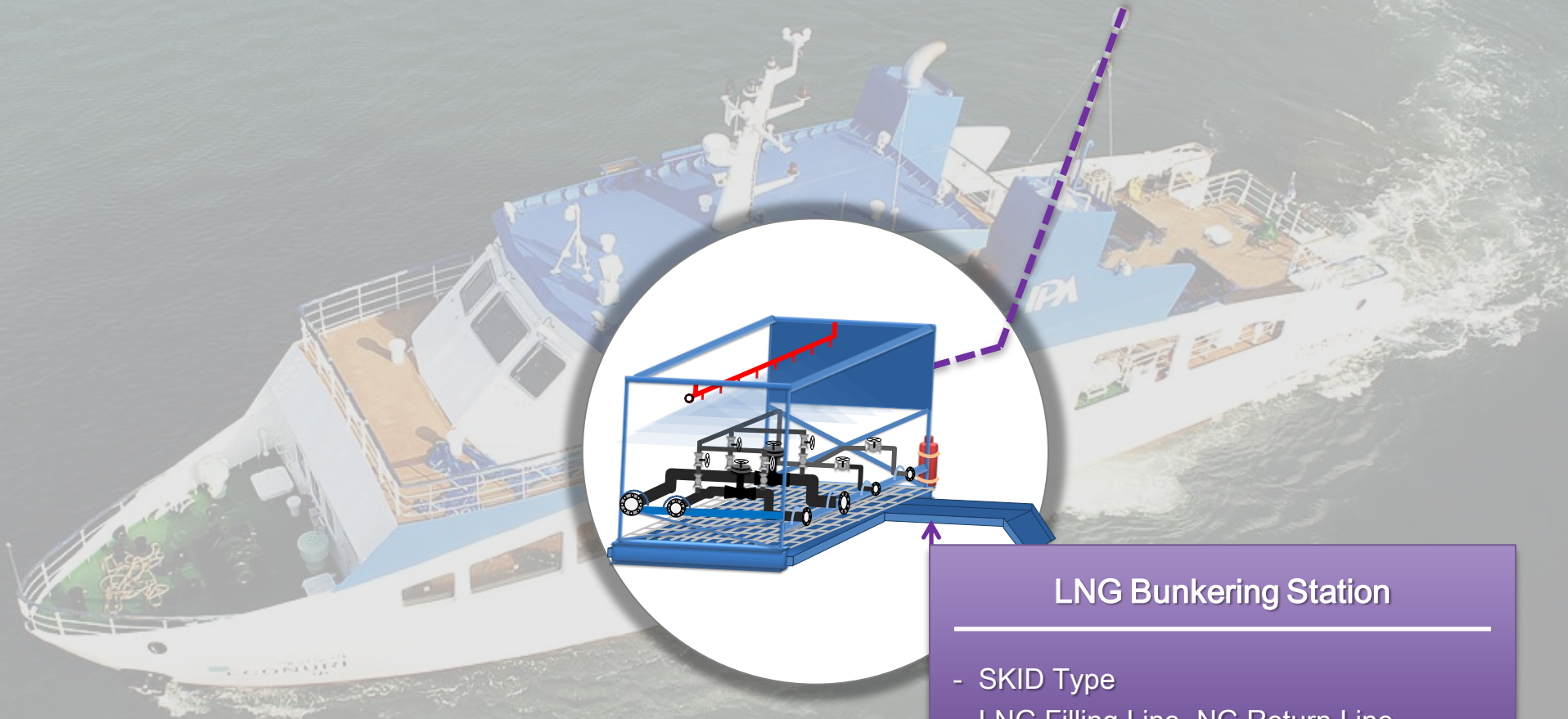
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Installation



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LNG Bunkering Station

- SKID Type
- LNG Filling Line, NG Return Line
- Water Cotton, Chemical Power

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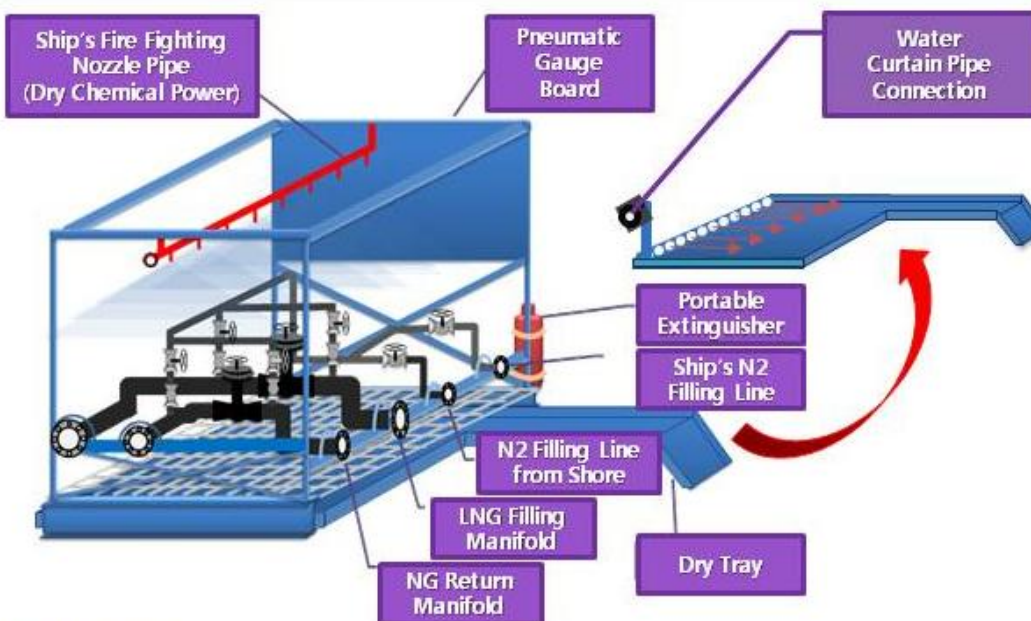
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General Overview



Skid Material : A240-316L

Pipe Material : A240-316L, Sch 10S

Line : 1XLNG Filling Line, 1XNG Return Line, 2XN2 Purging Line

Fire Fighting : 1XPortable dry chemical fire extinguisher(abt 6.5kg), Top Fire Nozzle for ship's dry chemical powder system

Drip Tray : A240-316L, Water curtain pipe with movable extension nozzle for ship's overboard line.



[LNG bunkering]



[Water curtain flow]

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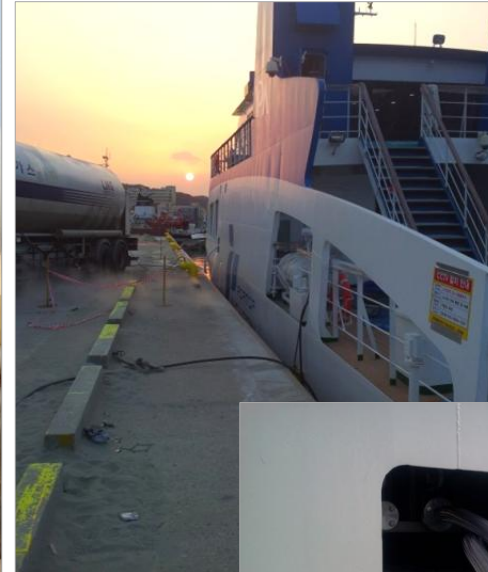
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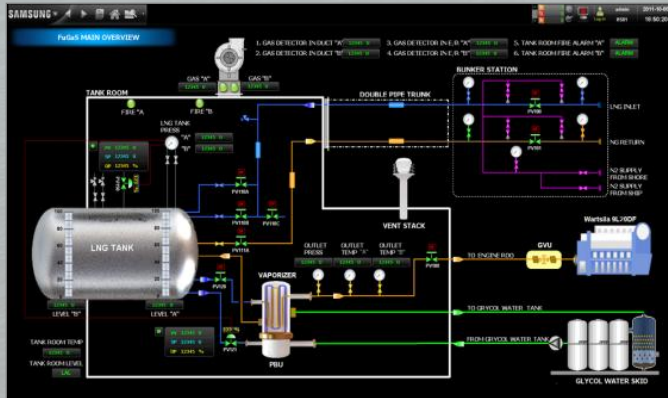
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FuGaS Automation System

- Samsung SSAS-Master
- Operator Control Station
- Control Panels & I/O Cards

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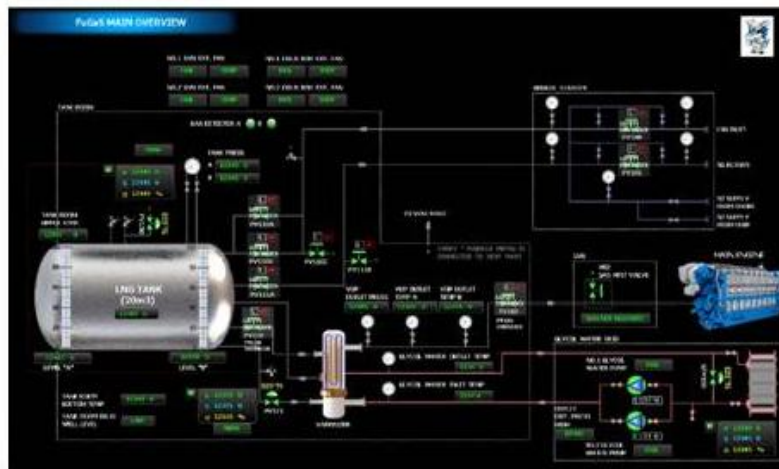
Electric Propulsion

Bunkering Station

Automation

Network Structure

Network Structure



- AMS + FuGaS Control System Integration
- Interface : Gas Detection System + Fire Detection System (Modbus / RS485)
- FuGaS Local Control Panel : 2EA (Tank Room / Bunker Station)
- LNG Valve Remote Control
- ESD Function
- 22" LCD Monitor X 2EA, HS Server, MS SQL, Alarm Printer X 1EA

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Network Structure

Wheel House



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Thank You

And for more information, contact
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