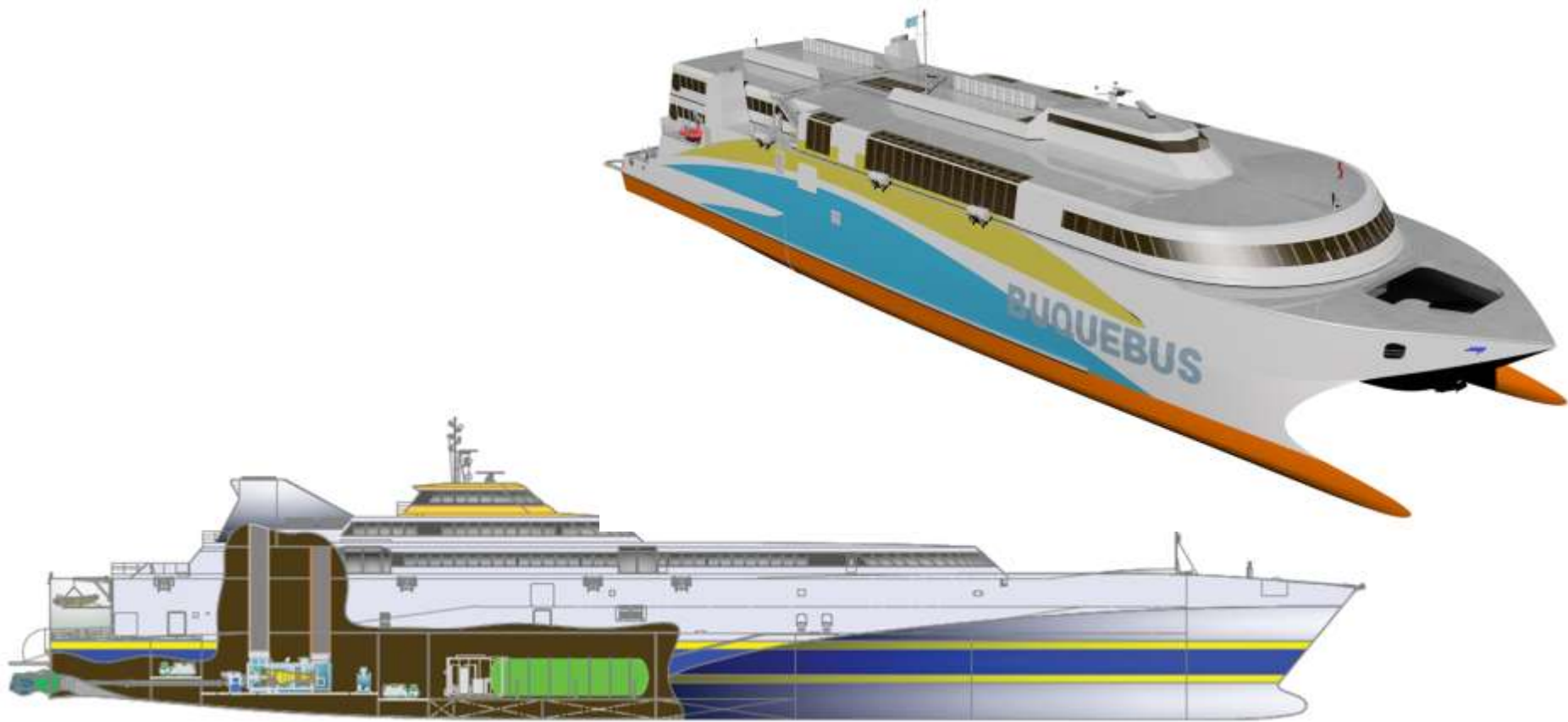


Fast Ferries

GE Marine



imagination at work

GE Aviation ... \$22B

2014 Rev.

Commercial Engine



Commercial Engine Service



Military Engine and Service



Marine



Business and General aviation



System



Largest provider of jet engines and aero gas turbine in the world

- 39,000 employees
- 83 sites globally
- China ARJ (CF34-10A)
- C919 (LEAP-1C)
- C919 (Avionics System)
- Fast Ferry (LM2500)

Gas turbine value in referenced fleet

1992

Fast Ferries



Cruise Ships



Emissions ... no visible smoke, Low NO_x

Power density ... advantage vs. diesel engines

High power → high speed
Low weight → reduced displacement, reduced draft, reduced drag
Compact → fits catamaran and trimaran hull form

Small volume → more revenue generating space
Small volume & low weight → arrangement flexibility ... Queen Mary 2 & Princess installed GT in base of funnel

2014

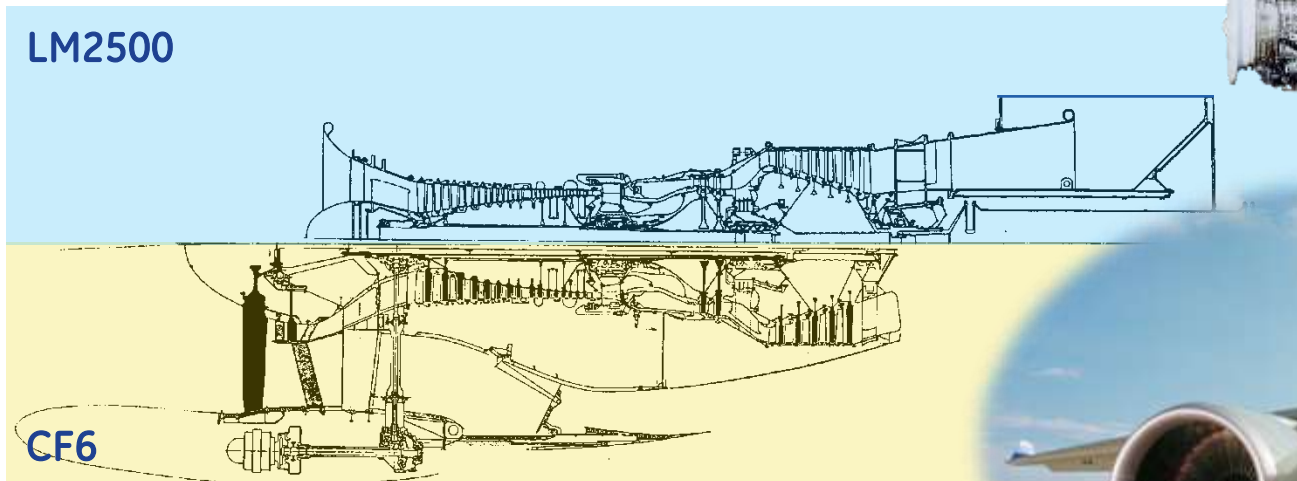
First LM2500 LNG-powered fast ferry in service!

Additional revenue space enhances payback



Proven ... >13M operating hours

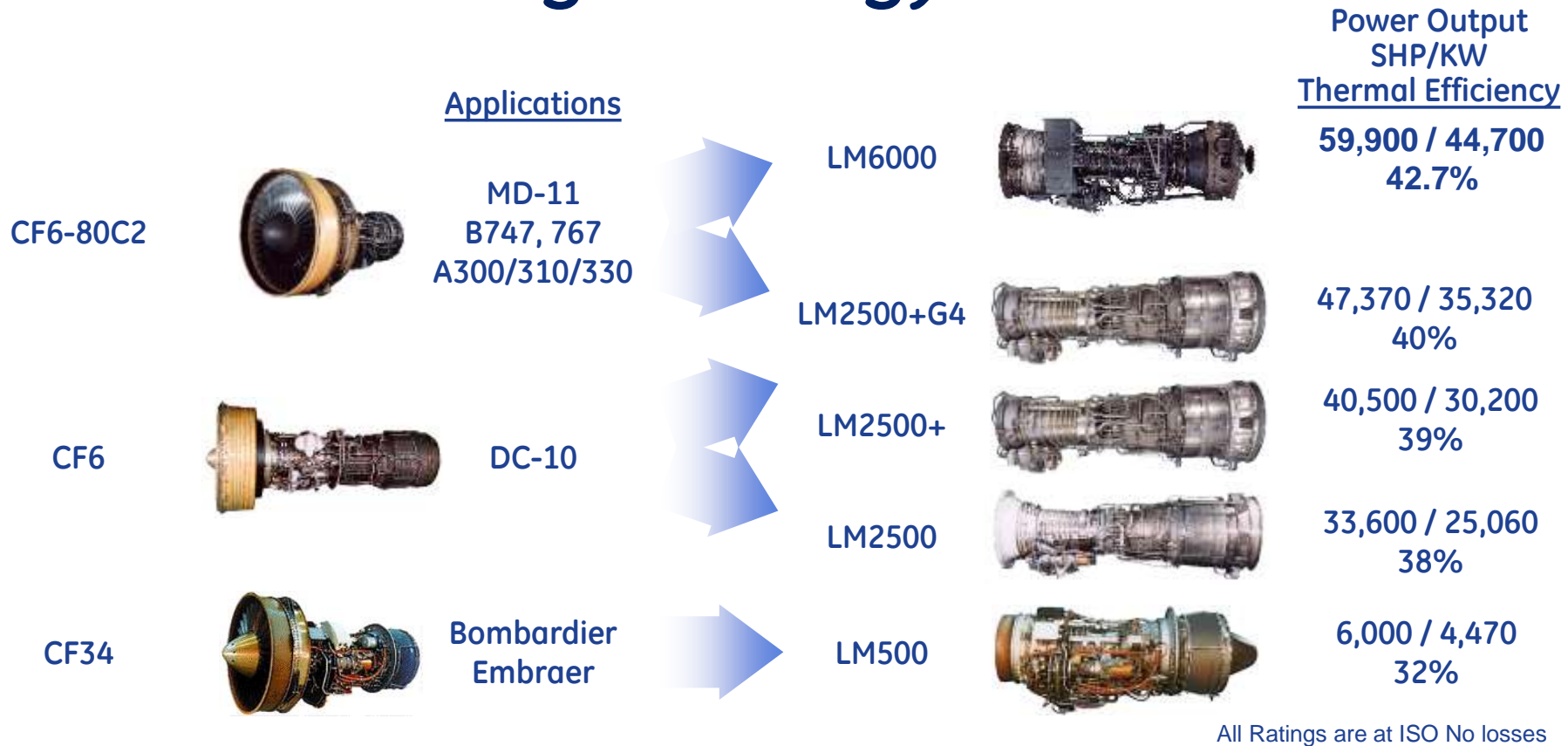
LM2500 gas turbine is a GE CF6 aircraft engine at heart



GE's LM aeroderivative engines:

- Share the same proven jet engine technology
- Are built under the same quality system, in the same factory
- Can be serviced worldwide ... like a jet engine

GE Marine GT genealogy



LM aero derivative designed for marine applications

Integrating proven technology for LNG carrier power & propulsion

(All figures are LM2500/+/-G4 only)

Dual Fuel & Gas
Operation

69,700,000
operating hours on gas

21,600,000
on dual fuel engines

Land-based &
Offshore



FPSOs

Combined Cycle
Operation

10,700,000
operating hours

17 cruise ships

42 Offshore
installations

179 land-based
installations

Dry Low
Emissions

12,200,000
operating hours

578 industrial
installations



Land-based &
Offshore

LNG Fueled

1st LNG fueled
fast ferry

World's
Fastest
ship

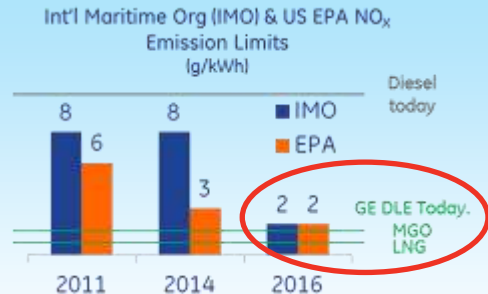
2 x LM2500
make 58 kts



Fast Ferry Value

Through system solutions & technology

Emissions



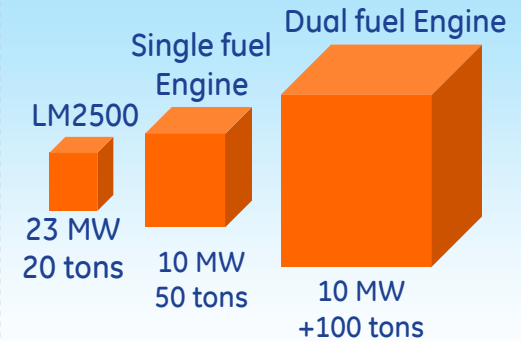
Tier III IMO compliance today
... without exhaust after-treatment

Engine Availability



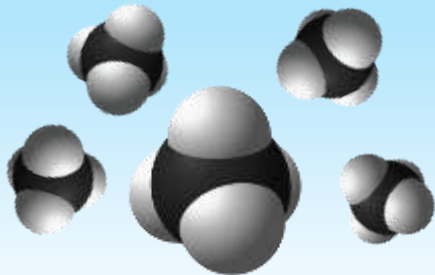
High standards inherited from Aviation flight engines
>99% engine reliability

Power Density



Lowest kg/kW ratio

No Methane Slip



Dual fuel engine, able to handle wide gas variation

Support Network



World-wide service network
Gas Turbine "Swap out" in 24-48 hours

Fuel Flexibility



- Gas or liquid fuel operation
- Change over in the "fly"
- No pilot fuel needed for gas operation
- Accepts variations in the gas composition

Francisco Principal Particulars



Shipyard: INCAT
Owner: Buquebus
Contract duration: May 2010 – July 2013
Class: DNV
Main engines: General Electric
LM2500 Gas Turbines,
Dual Fuel 22 MW

Length: 99 m
Beam: 26.94 m
Draft: 2.98 m
Deadweight: 450 tonnes
Capacity: 1000 passengers
150 cars
Speed: +58 knots @ 100 %
MCR Lightship
52,5 knots service
speed
Gas system: Chart Industries
Waterjets: Wartsila LJX 1720SR
Gearbox: Renk Bus 175

Francisco's Route

Buenos Aires to Montevideo



Distance: 106 nautical miles

Duration: 2 hours 12 minutes

2 daily crossings

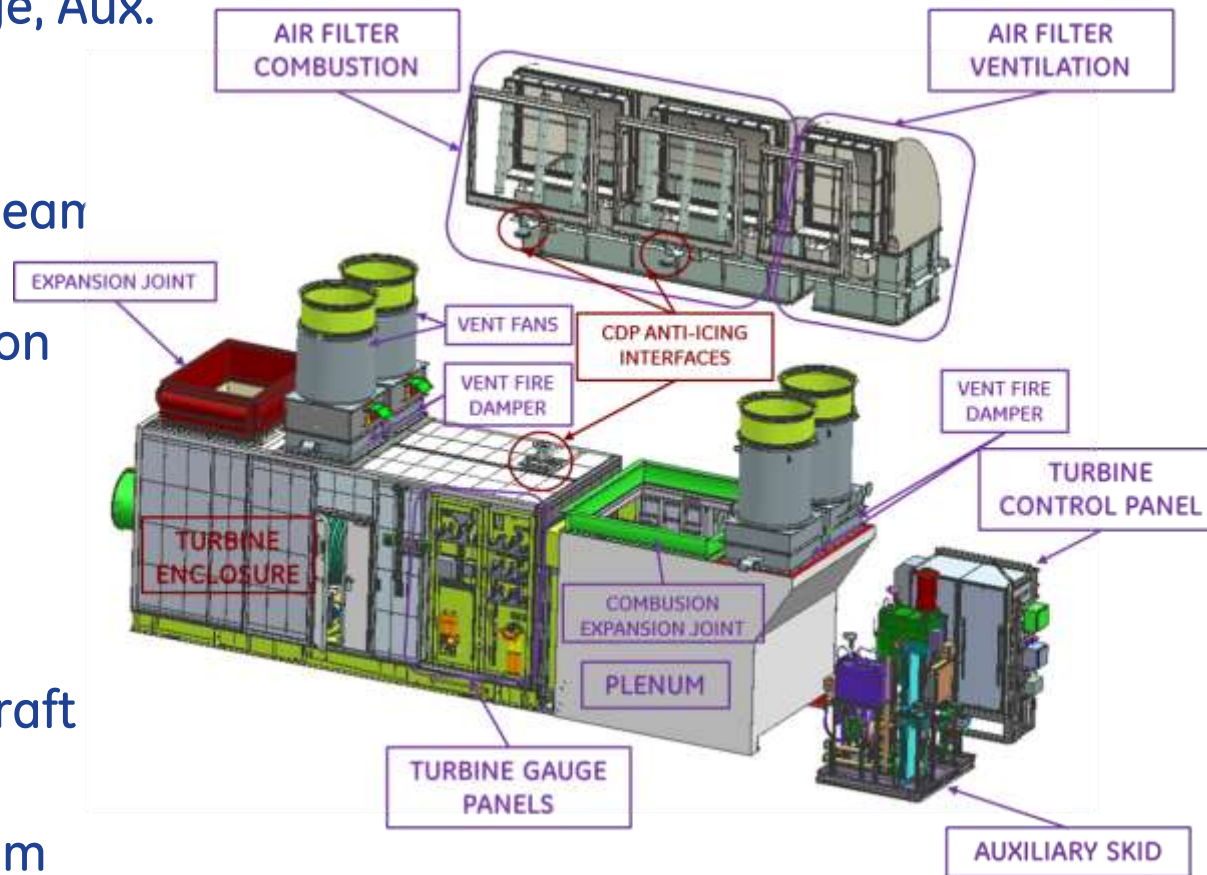
Competition: Buenos Aires to Montevideo by plane takes +3 hours

Key features: First Class, Business Class, Tourist class and 1100 m² of tax-free shopping

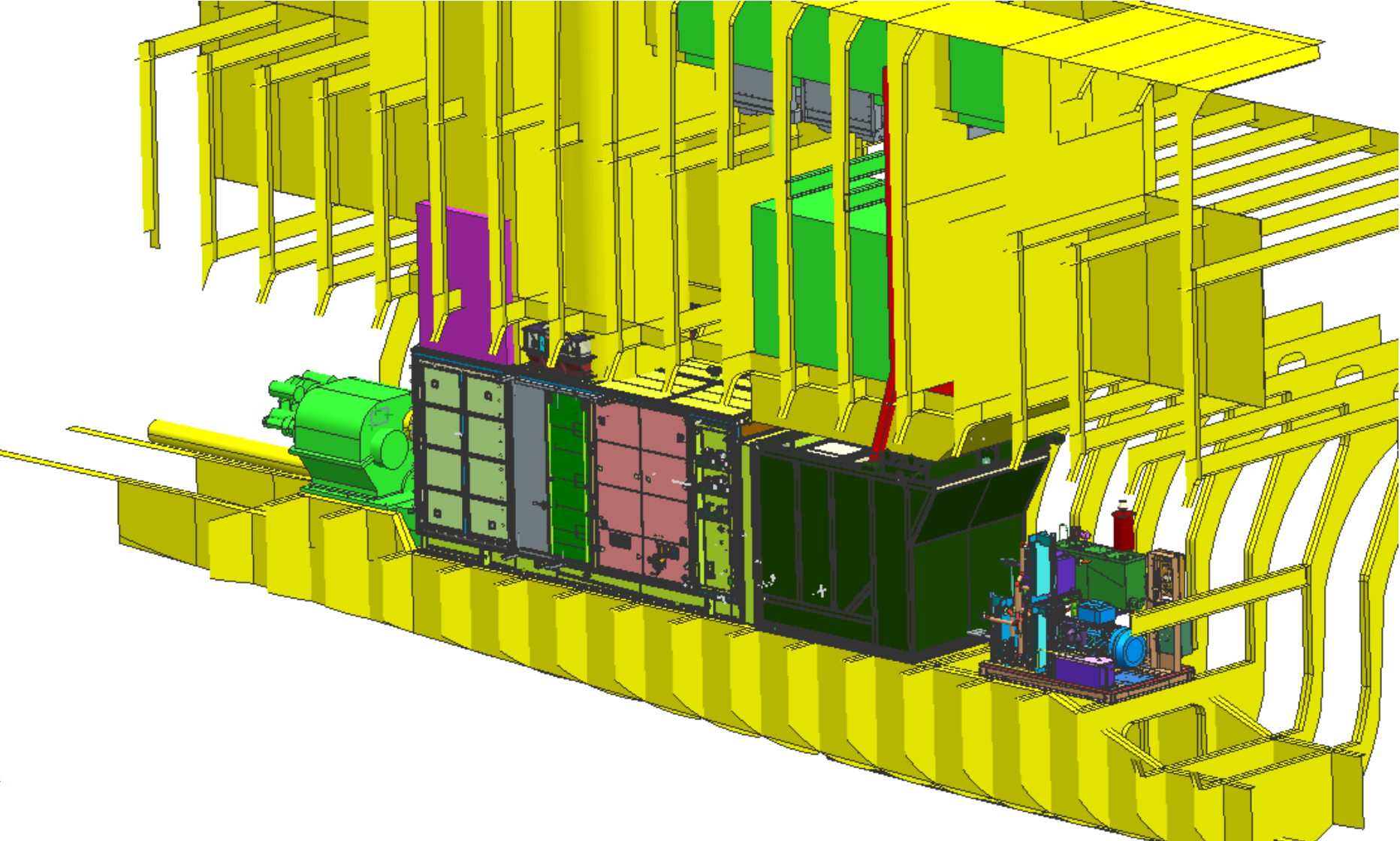
LM2500 Dual Fuel Fast Ferry Package

Key features

- Easy installation (Package, Aux. Skid, TCP and Air Filter)
- Low installation weight
- Dual Fuel Capabilities - Seam change over “on the fly”
- Under Pressure Ventilation
- No pilot fuel needed
- Low NO_x emissions
- **NO** methane slip
- Easy Maintenance
- DNV High Speed, Light Craft certified.
- L 10,3 m x W 2.6 m x H 4 m
- Package weight 16,3 tons



Package Layout



LM2500 Gas Turbine Enclosure

Main Features

Hi-grade shock attenuation

Excellent thermal isolation

Airborne & structure borne noise attenuation

Fire detection & suppression with HALON, CO₂, HFP or AFFF

Primary airflow passage—inlet duct through inlet plenum, gas turbine, exhaust collector to exhaust duct

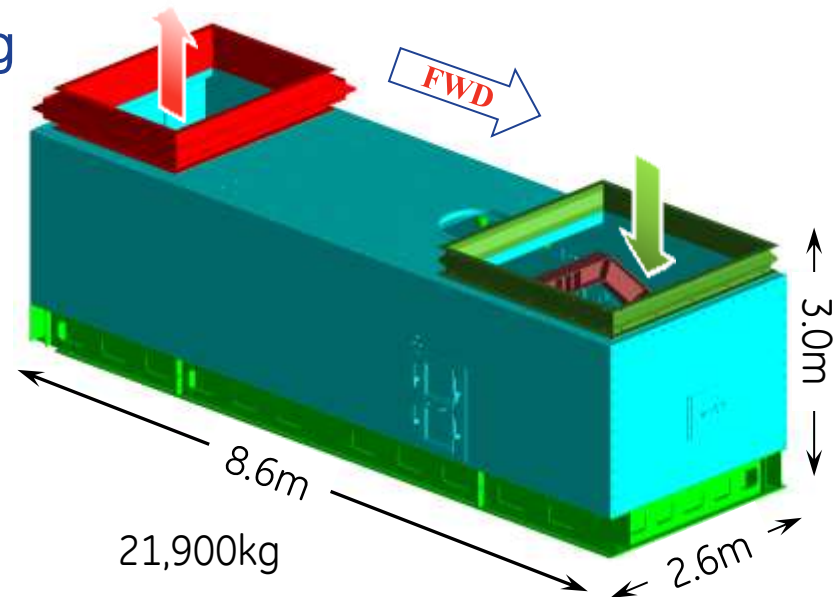
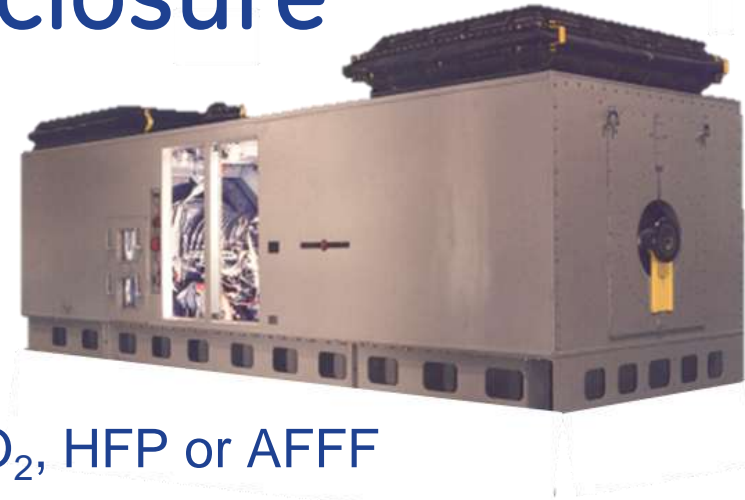
Secondary ventilation air passage for engine external cooling

Gas turbine and instrumentation mounting

Fluid interfaces—component mounting

Electrical interfaces—GT controls & ship power

Maintenance access—removable rear & side panels; engine removal through inlet



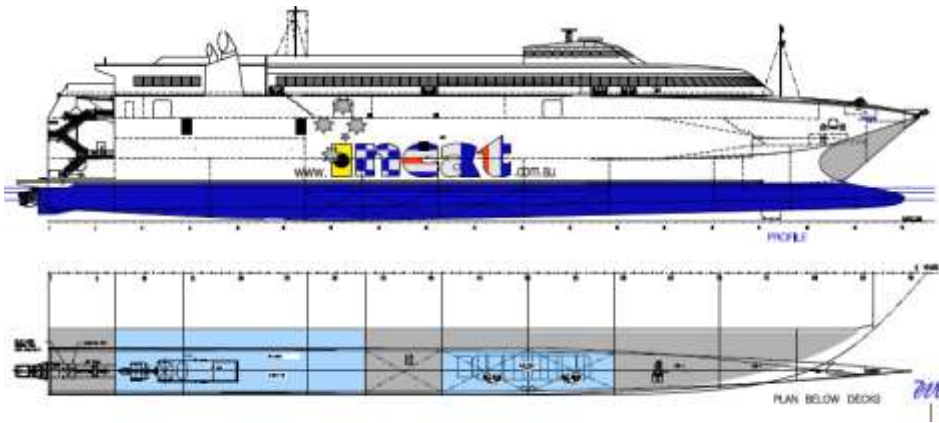
New designs with DF gas turbines

INCAT

- Various concepts based on INCAT's wave piercing catamaran design.

114 m catamaran

- 2 x LM2500 dual fuel, 42.6 knots, 1300 tdw, 1200-1400 pax, 560 TLM and 260 cars



Austal

- Various concepts based Austal's trimaran designs
- Gas Turbine and CODAG configurations

127 m trimaran

- 2 x LM2500 dual fuel, 42 knots, 1000 tdw, 1300 pax, 450 TLM and 123 cars



Commercial Marine Turbine Ships

Ship Owner/Ship Name Number/Type of units Equipment Location CODAG/COGES

Celebrity Cruises

| | | | |
|---------------|----------------|-----------|-------|
| Millennium | 2 LM 2500+ STG | Deck Zero | COGES |
| Infinity | 2 LM 2500+ STG | Deck Zero | COGES |
| Summit | 2 LM 2500+ STG | Deck Zero | COGES |
| Constellation | 2 LM 2500+ | Deck Zero | COGES |

RCI

| | | | |
|------------|------------|-----------|-------|
| Radiance | 2 LM 2500+ | Deck Zero | COGES |
| Brilliance | 2 LM 2500+ | Deck Zero | COGES |
| Serenade | 2 LM 2500+ | Deck Zero | COGES |
| Jewel | 2 LM 2500+ | Deck Zero | COGES |

Holland America

| | | | |
|-----------|-----------|-----------|-------|
| Zuiderdam | 1 LM 2500 | Deck Zero | CODAG |
| Oosterdam | 1 LM 2500 | Deck Zero | CODAG |
| Westerdam | 1 LM 2500 | Deck Zero | CODAG |
| Noordam | 1 LM 2500 | Deck Zero | CODAG |

Princess Cruises

| | | | |
|-------------------|------------|--------|-------|
| Coral Princess | 1 LM 2500+ | Funnel | CODAG |
| Island Princess | 1 LM 2500+ | Funnel | CODAG |
| Diamond Princess | 1 LM 2500+ | Funnel | CODAG |
| Sapphire Princess | 1 LM 2500+ | Funnel | CODAG |

Cunard

| | | | |
|--------------|------------|--------|-------|
| Queen Mary 2 | 2 LM 2500+ | Funnel | CODAG |
|--------------|------------|--------|-------|



All LM 2500+/LM 2500 have the 6 stage power turbine



Commercial Fast Ferries

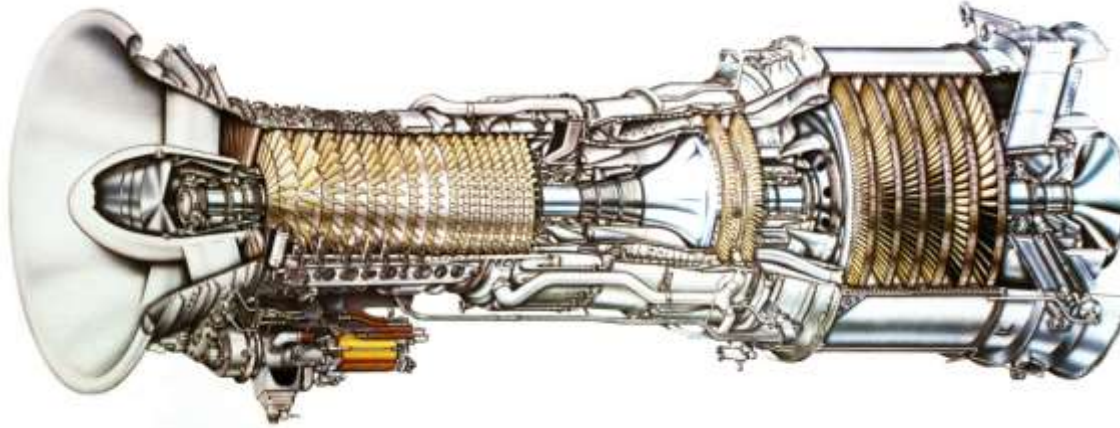
| <u>Ship Owner/Ship Name</u> | <u>Number/Type of units</u> | <u>Equipment Location</u> | <u>Propulsion</u> |
|------------------------------|-----------------------------|---------------------------|-------------------|
| Mols Linien | | | |
| Mie Mols* | 2 LM 1600 | Deck Zero | Water Jet |
| May Mols* | 2 LM 1600 | Deck Zero | Water Jet |
| Nordic Ferry Services | | | |
| Villum Clausen* | 2 LM 2500 | Deck Zero | Water Jet |
| Stena Line | | | |
| Stena Explorer* | 2 LM 2500 + 2 LM1600 | Deck Zero | Water Jet |
| Stena Discovery* | 2 LM 2500 + 2 LM1600 | Deck Zero | Water Jet |
| Stena Voyager* | 2 LM 2500 + 2 LM1600 | Deck Zero | Water Jet |
| Mega Yacht | | | |
| Ecstasea* | 1 LM 2500 | Deck Zero | Water Jet |
| Buquebus: | | | |
| Francisco | 2 x LM2500 <u>Dual Fuel</u> | Deck Zero | Water Jet |



** Packaged by Kvaerner Energy A/S*

ecomaginationSM

LM2500 Fast Ferry LNG Solution



By using Liquid Natural Gas (LNG) versus Marine Diesel Oil (MDO), ship builders and ferry operators can reduce fuel costs as LNG production increases around the world. LNG fuel is the most cost effective way to meet these regulations. The high power output and low weight and size of aeroderivative gas turbines make them ideal for the fast ferry application.

Thank you





imagination at work

Fast Ferry – Engine Room



Fast Ferry Aux Skid



Fast Ferry TCP





Francisco Launch Ceremony



Argentinian President Cristina Fernández de Kirchner and Uruguayan President José Mujica pictured with Buquebus President Juan Carlos Lopez Mena at the launch of Francisco.



GE imagination at work

Francisco Principal Particulars

FRANCISCO



Builder: Incat Tasmania Pty Ltd
Owner: Buquebus
Interior Design: Julio Cesar Ortega
Contract to Delivery: May 2010 – July 2013 (38 Months)

PRINCIPAL PARTICULARS

Class: Det Norske Veritas
LOA: 99.00 m
Beam: 26.94 m
Draft: 2.98 m
Deadweight: 450 tonnes
Gross tonnage: 7,109
Speed: 51.8 knots @ 450 tonnes deadweight
58 knots @ 100% MCR Lightship
Capacity: 1000 passengers
150 cars
1100 square metres duty free
Engines: GE Gas Turbine LM2500
2 x 22 MW Total power 44 MW
Waterjets: Wartsila LJX 1720SR
Gearbox: Renk Bus 175

Francisco Route – Buenos Aires to Montevideo



**Buenos Aires to Montevideo
route distance:**
106 nautical miles

Scheduled crossing time:
2 hours 12 minutes

High season:
3 Return crossings per day

Competition:
Buenos Aires to Montevideo
via plane 3+ hours

Francisco Passenger Tier General Arrangement

*THE PASSENGER CABIN INCLUDES
TOURIST, BUSINESS & FIRST CLASS SEATING.*



Francisco Duty Free Tier General Arrangement

*OVER 1100 SM OF EXTENSIVELY FITTED OUT
DUTY FREE SHOP.*



Francisco Interior – Duty Free Shop



Francisco Interior – Duty Free Shop



Francisco Interior – Seating Area



Shore Infrastructure

Buquebus Terminal, Puerto Madero



Buquebus Terminal, Montevideo



Buquebus Terminal, Puerto Madero



Shore Infrastructure



Buquebus Terminal, Puerto Madero

Shore Infrastructure – Buquebus LNG Plant



The LNG Plant will be operational from November 2013.



GE imagination at work

Shore Infrastructure – Buquebus LNG Trucks



