THE WORLD’S FIRST LNG/DUAL FUEL FAST RO-RO FERRY

HULL 069

LOA: 99.00 m
LWL: 90.54 m
Beam: 26.94 m
Draft: 2.98 m
Deadweight: 450 tonnes

Capacity:
Over 1000 passengers and 153 cars.
Duty free shop over 1000 square metres

Engines:
GE Gas Turbine LM2500
2 x 22 MW Total power 44 MW

Waterjets:
Wartsila LJD 1720SR

Gearbox:
Renk: Bus 175
BUILDING THE
FASTEST,
ENVIRONMENTALLY
CLEANEST,
MOST EFFICIENT
HIGH SPEED FERRY

LNG BUQUEBUS

Incat is building what will be the world’s first high speed Ro-Ro ferry to be powered by LNG as a primary fuel, and the design team of course commenced preliminary work several years ago. This is a relatively slow build period for our company however the engine delivery date to a large extent determines our completion date. Sea trials and delivery to our South American customer, Buquebus will be late 2012.

In the late 1980’s Incat commenced building fast craft in lightweight marine grade aluminium even before the IMO’s High Speed Craft Code was written. We’re not unaccustomed to working with the authorities as new ground is broken.
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HULL 069
99m WAVE PIERCING CATAMARAN

General Particulars
Yard No: 069
Designer: Revolution Design Pty Ltd.
Builder: Incat Tasmania Pty Ltd.
Class Society: Det Norske Veritas
Certification: DNV + IAL ISL R4 CAR FERRY B GAS FUELED EO
Length overall: 99.00m
Length waterline: 90.54m
Beam (overall): 26.94m
Draft (design): 2.98m
Deadweight: 450 tonnes
Speed: 47 knots @ 450 tonnes deadweight, 100% MCR

Capacities
Passenger Capacity: maximum 1024 persons (passengers and crew)
Tier 2 Passenger Deck is divided into three areas as follows:
T2 A2 Lounge (Tourist Class) with seating areas and Bar/Kiosk.
T2 Duty Free Shop Lobby with Male/Female Toilets
T2 Duty Free Shop
Tier 3 Passenger Deck is divided into four areas as follows:
T3 A3 Lounge (Tourist Class) with seating areas and Bar/Kiosk.
T3 Main Foyer with Reception Area, Business Lounges (P&S),
Male/Female Toilets and Disabled Toilet/Mothers Room,
T3 Mid Lounge (Business Class) with seating areas Bar/Kiosk,
Male/Female Toilets
T3 Forward Lounge (First Class) with seating areas, Bar, VIP
Lounge and Male/Female Toilets.
The Tier 4 wheelchair and Tier 3 lower wheelchair are accessed from
the T3 Forward Zone.

Vehicle Capacity: 1.55 car spaces at 4.5m long x 2.3m wide.
Tier 1 Vehicle Deck clear height: 2.3m
Tier 1 Vehicle Deck: Axle load: 2.0 tonne per axle
Vehicle Access: Via shore based stem ramps across transom.

Tankage
Fuel Oil (main storage) 2 x 70,000 (approx) litres
Fuel Oil (generator header tank) 2 x 1,240 litres
LNG (main storage) 2 x 40m3 litres
Fresh Water: 1 x 5,000 litres
Black & Grey Water: 1 x 5,000 litres
E/R Oily Water: 2 x 160 litres
Bilge Holding: 1 x 1,000 litres
All Hydraulic Oil: 2 x 400 litres
Fwd Midships Hydraulic Oil: 1 x 200 litres
(Note: * denotes tank content excluded from deadweight)

Construction
Design - Two slender, aluminium hulls connected by a bridging section with
center bow structure at fwd end. Each hull is divided into nine vented,
watertight compartments divided by transverse bulkheads. Two compartments
in each hull are prepared as fuel tanks with an additional compartment
prepared as long range tank.

Air Conditioning
Reverse cycle heat pump units throughout capable of maintaining between
20-22 deg C and 50% RH with a full passenger load and ambient
temperature of between 0 deg C and 35 deg C and 60% RH.

Safety & Evacuation
Four Marine Evacuation Stations (MES), two port and two starboard
each MES capable of serving a total of up to 256 persons. A total of
nine, 128-person open reversible life rafts are fitted.

Machinery
Gas Turbines: Two (2) GE Energy LM2500 marine gas turbines rated at
22MW each.
Water Jets: Two (2) Wartsila UK 1720 SR waterjets are configured for
steering and reverse.

Generators: 4 x Caterpillar C18 340 kW generators fitted with marine
brushless self-excited alternators, arranged for automatic start-up and
paralleling, provide power for all passenger and ship services. The
electrical control system considers one genset is maintained as a standby set.
GT Generators: 2 x Caterpillar C9 200 kW generators fitted with marine
brushless self-excited alternators provide electrical power for gas turbine
services. Each GT genset is considered independent.

Trim Control: A hydraulically operated trim tab is fitted at the aft end of
each hull to allow adjustment of the running trim of the vessel.

Hydraulics: Three hydraulic power packs, one forward and two
aft, all alarmed for low level, high temperature, filter clog and low pressure,
supply hydraulics for capstans, trim tabs, steering and stern ramp.

Electrical
Distribution - 415V, 50 Hz. 3 phase. 4 wire distribution with neutral earthing
allowing 240 volt supply using one phase and one neutral. Distribution via
distribution boards adjacent to or within the space they serve. 200amp
415V 3-phase shore power connection point fitted in starboard anteroom.
**THE ENGINE ROOM**

A cut-away of the engine room and fuel tanks indicate the layout of essential equipment. The engine itself is contained in a sound box which also provides a fire barrier.

**LM2500 MARINE GAS TURBINE**

The LM2500 is a single-rotor gas turbine with an aero-dynamically coupled power turbine. More than 1450 units have logged over 65,000,000 operating hours.

- **Dimensions:** \( l = 4.29 \, \text{m}, \, \Omega = 1.52 \, \text{m} \)
- **Weight:** 3266 kg
- **Compr. / HPT / PT:** 16 / 2 / 6 stage
- **Combustor:** Annular
- **Compression ratio:** 18 : 1
- **Output (ISO):** 22,233 kW
- **Speed LPT:** 500 - 3780 rpm
- **Fuel:** ISO 8217:1996(E)
  - Class F DMX / DMA
  - Natural gas
- **Reliability:** \( > 99.8 \% \)

**GE AERO ENERGY DUAL FUEL MARINE GAS TURBINE PACKAGES**

The power plant is fuelled by distillate to start, but after ten minutes when the heat exchangers have produced enough gas from the liquified gas in the main tanks the engine is changed over to gas fuel, this is an automatically controlled process that promises to be unfelt by passengers.

On arrival at the next port the engine will return to distillate fuel burn for the manoeuvring process.

**LNG FUEL TANKS**

The fuel tanks will provide for up to four hours of high speed operation. Of course the fuel tanks and system has been designed for the specific route and refuelling requirements for our client.

As a back-up long range distillate tanks are provided for auxiliary and delivery voyage use.

**AUXILIARY MACHINERY**

- Wärtsilä LJX waterjet
- Renk Type Bus 175 Gearbox
Q. WHAT WILL OUR LNG FERRY LOOK LIKE?
A. VISUALLY THE SAME AS PREVIOUS INCAT VESSELS
THE INTERIOR WILL BE SOMewhat MORE PLUSH THAN MOST WITH LOTS OF SPACE FOR PASSENGERS TO MOVE ABOUT
BUILDING THE WORLD’S FASTEST, ENVIRONMENTALLY CLEANEST, MOST EFFICIENT HIGH SPEED FERRY

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