

RO-ROS & FERRIES

VISENTINI'S NEXT-GENERATION JACK OF ALL TRADES

Italian shipbuilder Visentini, together with the naval architects of NAOS Ship and Boat Design, has developed a new SRtP- and SOLAS 2020-compliant ro-pax ferry platform that addresses all the shortcomings of the highly successful standard Visentini ro-pax built hitherto. Corsica Linea's recently introduced LNG-powered *A Galeotta* is the lead ship of this new design with construction of a near sister ship already well underway. More Visentini Mk II class ro-paxs are set to follow in the years to come

By **Philippe Holthof**, Correspondent

During the past 25 years, Cantiere Navale Visentini has been one of the most successful builders of non-complex, yet very efficient ro-pax tonnage. The family controlled shipyard, located in Porto Viro, delivered its first large ro-pax ferry, the 2,200-lane-metre and 330-passenger capacity *Mersey Viking* (currently *Strait Feronia*), in mid-1997. Trieste-headquartered NAOS Ship and Boat Design has been instrumental in the success of the series, acting as the naval architects on Visentini's behalf.

Arguably the most successful ro-pax class of the past two decades, Visentini's ro-pax ferries have been deployed in all four corners of the world. All major European ferry operators have operated them, a testament to the design, characterised by simplicity and excellent fuel economy. Sweden's Stena RoRo, a leading provider of ro-pax and ro-ro tonnage, has been a keen supporter of the Visentini ro-pax platform. The vessel's uncomplicated design, fuel efficiency with twin engine setup and the use of only the necessary high-quality equipment served as a benchmark

for Stena's one-size-fits-all Stena E-Flex class, of which nine ships have already been built by CMI Jinling Weihai Shipyard with three more to follow.

Built-in flexibility is a Stena hallmark and as this was a shortcoming of the first Visentini generation, lessons have been learned when designing the Mk II class which, not coincidentally, started out as a project for Stena RoRo. Many years back, Stena was already looking at ways to modify the Visentini design to drive-through mode, yet the builder wasn't convinced and stuck to the stern only loading/unloading arrangement. As the Visentini Mk II started out as a Stena RoRo project, the original design called for a drive-through concept. When Stena RoRo withdrew, the bow entrance was jettisoned but a later conversion to drive-through mode has somehow been considered with the main vehicle deck, Deck 3, now devoid of the extreme forward centreline stair casing. Instead of a Visentini Mk II, Stena RoRo walked down the E-Flex path, but the platform also attracted interest from



A GALEOTTA. SOURCE: CAPTAIN PHILIPPE SILLAN



EACH TYPE C LNG TANK HAS A MAXIMUM CAPACITY OF 250M³ WITH A 95% FILLING RATE LIMIT. SOURCE: CAPTAIN PHILIPPE SILLAN

Brittany Ferries. The long negotiations between Brittany Ferries and Visentini eventually came to nothing with the French ferry operator choosing for an adapted Stena E-Flexer design to renew its fleet.

While the 203.28m-long *Ciudad de Valencia* and *GNV Bridge* represented a lengthened version of the Visentini Mk I design, the standard first-generation Visentini ro-pax had a length of about 186m and 25.6m width. The

New design from scratch

Production of the Visentini Mk I class continued until 2021 with *GNV Bridge*, delivered in May 2021, closing the successful series. As the vessel's keel had been laid before 1 July 2010, *GNV Bridge*, just like her sister ship *Ciudad de Valencia*, and Baleària's LNG-powered *Hypatia de Alejandria* and *Marie Curie* – both from 2019 – wasn't Safe Return to Port (SRtP) compliant. SOLAS 2020 damage stability regulations and SRtP rules made the Mk I design obsolete, so the Mk II represents a totally new platform that complies with these IMO regulations. When Corsica Linea ordered the first Mk II in July 2019, the design was 90% complete so rather than starting from a clean sheet of paper, Corsica Linea opted for an off-the-shelf design adapted to its requirements when it came to LNG propulsion, the number of passengers, passenger cabins and car intake.

Although showing similarities with the original design, especially when it comes to the layout of the passenger decks, the Mk II platform started from scratch with a totally new hull design.

The twin skegs have been retained, but the so-called free flow form with V-brackets has been abandoned in favour of a full twin skeg. NAOS Ship and Boat Design's proprietary Flex Bow, creating a longer waterline and near-vertical stem, has been redesigned. This 'Flex Bow 2.0' comes with an integrated bulb. Thanks to exploiting the full available ship's length, the angle of entrance of the waterlines is lowered, reducing the vessel's pitching movements and guaranteeing a lower bow pressure impact in rough seas. Depending on the Froude number in relation to service speed, the Flex Bow also contributes to a reduction of fuel consumption with a 4% lower power requirement compared to a conventional bow shape.

TECHNICAL PARTICULARS A GALEOTTA	
Length oa	206.6m
Length,bp	200.98m
Breadth, moulded	28.2m
Depth to main deck	9.6m
Draught, full load	6.7m
Gross tonnage	38,282
Net tonnage	14,943
Deadweight	8,190t
Lanemetres	2,559m (+149 cars)
Passengers	1,000 (short international voyages); 400 (international voyages)
Passenger cabins/berths	220/878
Main engines	2 x Wärtsilä 12V50DF
Output	2 x 11,000kW at 514rpm
Service speed	23knots
LSAs	2 x 150-person Palfinger lifeboats + 2 VIKING MES (+ 8 liferafts)
Class	RINa
Class notation	RO-RO passenger ship, Unrestricted navigation, AUT-UMS, AUT-PORT, Gas fuelled, SRTP, IWS
Flag	France





THE VISENTINI MK II BOASTS A TOTALLY NEW HULL DESIGN WITH FULL TWIN SKEGS. SOURCE: CAPTAIN PHILIPPE SILLAN

dimensions of the Mk II increased to 206.6m and 28.2m, respectively, resulting in a higher block coefficient and displacement. For this reason, one of the main challenges was to achieve the same or even a better fuel efficiency which was achieved thanks to a long CFD optimisation process carried out by NAOS Ship and Boat Design. The ship's dimensions were dictated by the limitations imposed by Visentini's single building dock with *A Galeotta* having a Visentini-max beam. The near sister ship currently under construction for long-term bareboat charter to Polferries will be 10m longer, the shipyard's absolute maximum possible length.

Built-in flexibility – a Visentini first

While the low block coefficient of the first generation was one of the ship's strengths, it was at the same time also one of its weaknesses as it didn't allow for an extension of the accommodation decks on account of stability and displacement limitation issues. This drawback has been addressed in the new design, which allows for an extension of the accommodation decks to the ship's very aft, increasing the maximum passenger capacity to

2,000. This, together with the possibility to convert to double deck drive-through mode is part of the built-in flexibility, something that will be welcomed by shipowners operating outside of the Mediterranean Sea.

The lower decks, including the machinery spaces, have been redesigned to comply with SRtP and SOLAS 2020 damage stability rules. The Mk I design already featured a B/5 double skin for almost the full length of the hull, something which has been repeated on the Mk II class. Once again, simplicity rules in the engine room with twin engines driving two Kongsberg shaft lines via single input, single output clutchless Renk reduction gears. Although not an SRtP requirement, the naval architects opted to separate the main engines from the auxiliaries. A longitudinal centreline bulkhead divides the engine room into two halves with a transversal bulkhead separating the twin main engine rooms from the aft genset rooms, effectively creating four engine compartments. This compartmentation is probably best in class but is a more expensive solution as it requires additional escape routes and ventilation ducts.

The B/5 double skin protects both the main and auxiliary engine rooms from flooding. This compares to the *Stena E-Flexer* and other recent ro-pax designs which have full-width transversal bulkheads separating the main-cum-auxiliary engine rooms without B/5. Despite being fully SRtP compliant, such a design could potentially flood both engine rooms in the event of a damaged bulkhead following a collision, jeopardising the SRtP principle. On *A Galeotta*, the starboard B/5 double skin holds void spaces and the fixed ramp that connects the main vehicle deck with the lowermost car deck. On the portside, the B/5 compartment contains stores and the purifier room.

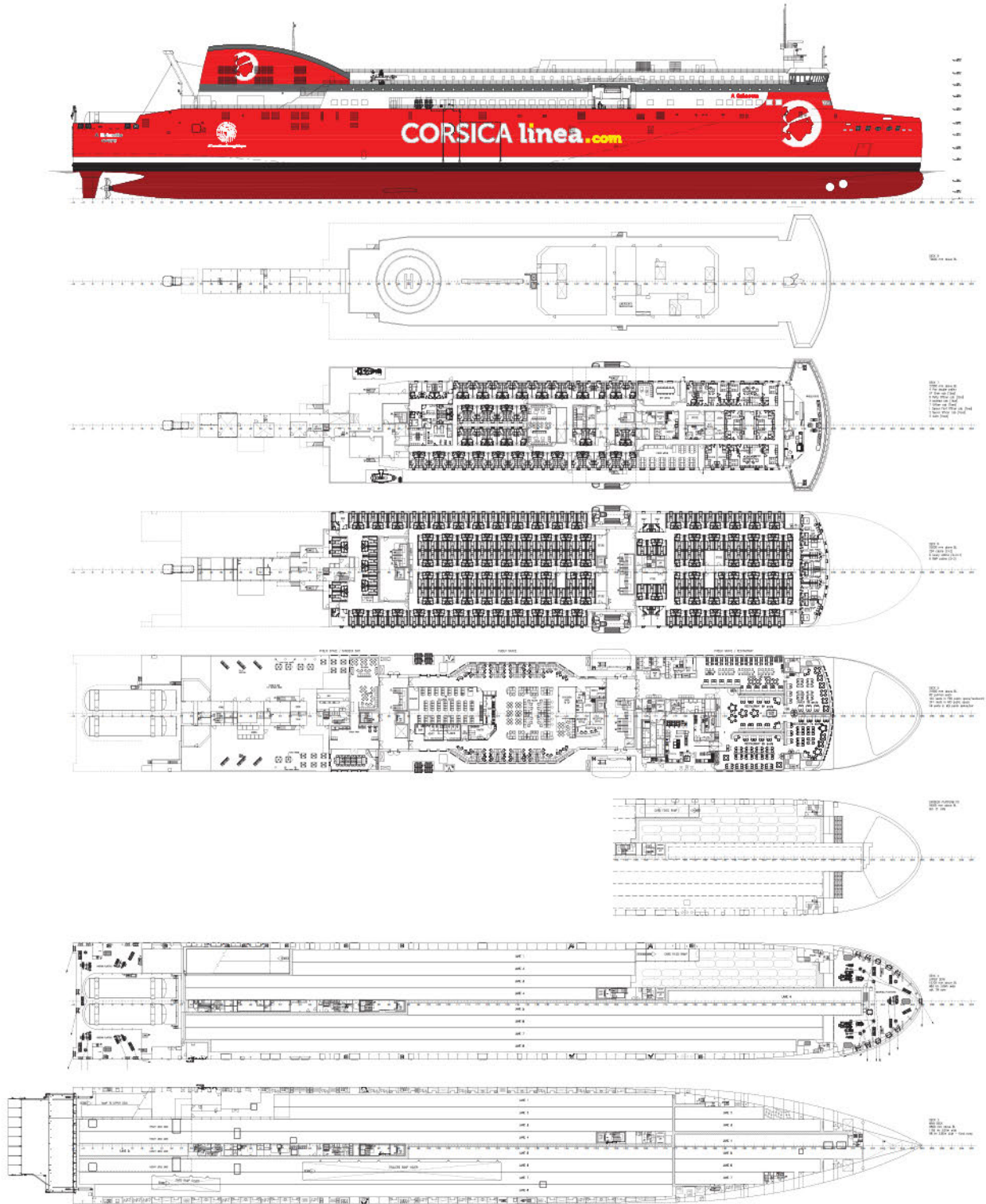
Dual fuel engines

Rather than the popular 46-type main engine, Corsica Linea opted for Wärtsilä's 50 Series which is now out of production. The 12V50DF engines each have an output of 11,700kW, guaranteeing a 23knot service speed at 85% mcr and 15% sea margin. Anticipating a possible higher hotel load should accommodation be added, the Visentini Mk II comes with an extra auxiliary engine. In the case of *A Galeotta*, each genset compartment holds a



THE FULLY ENCLOSED 983LM UPPER VEHICLE DECK HAS A FIXED CAR DECK ON THE PORTSIDE FORWARD. SOURCE: CAPTAIN PHILIPPE SILLAN

GENERAL ARRANGEMENT PLAN FOR A GALEOTTA



THE SINGLE STERN RAMP GIVES DIRECT ACCESS TO THE MAIN DECK WITH STRAIGHT LANES AND FIXED RAMPS LEADING TO THE LOWER FREIGHT DECK AND SEPARATE CAR DECK, RESPECTIVELY. SOURCE: CAPTAIN PHILIPPE SILLAN



combination of a Wärtsilä dual-fuel 9L20DF and an MDO-powered Caterpillar 3516C engine.

A Galeotta is engaged in a public service contract between mainland France and Corsica, serving either Bastia or Ajaccio from Marseille. Bastia is the island's main freight gateway and as *A Galeotta* is too long a ship to turn inside the port's basin, she swings off her berth just outside of the port, helped by a pair of Mariner spade rudders and Kongsberg bow thrusters that have an output of 1,500kW each.

On-deck LNG tanks

Corsica Linea considers *A Galeotta* as a major first step in its energy transition strategy and therefore it was clear from the outset that the new vessel had to be LNG-powered as no other alternative, 'cleaner' fuel was readily available on the market yet. The on-deck positioning of the two Type C LNG tanks, which each have a maximum capacity of 250m³ with a 95% filling rate limit, follows the tank arrangement of *Hypatia de Alejandría* and *Marie Curie*, the first LNG-powered ro-pax ferries built by Visentini. The Italian shipbuilder typically relies on proven technologies and therefore felt more comfortable to have the tanks installed on deck. However, the yet unnamed near sister ship under construction for Polferries will be completed as 'LNG ready' with tanks to be installed below deck, yet occupying the same location as on *A Galeotta*, which means that the fully enclosed Deck 4, the upper vehicle deck, will be extended to the very aft, creating an additional open car deck on Deck 5 level aft accessed via a hoistable car ramp.

According to NAOS Ship and Boat Design, the location of the LNG tanks on *A Galeotta* allowed for an optimisation of the cargo intake on decks 2, 3 and 4. Added benefits of the outdoor location of the LNG tanks are a complete segregation between the LNG spaces and the cargo as well as passenger spaces, not to mention the reduction of extra ventilation that is required when tanks are installed below deck. The tanks and all ancillary equipment were supplied by Wärtsilä with high partitions on either side of the funnel casing separating the tank and vent mast zone

with the sundeck on Deck 5 aft. Until the arrival of Titan LNG's dedicated 4,500m³ LNG bunker barge *Krios*, Corsica Linea is relying on truck-to-ship bunkering in Marseille with *A Galeotta* having an autonomy to make three return sailings per week between Marseille and Corsica.

Improved cargo flow

To comply with the SOLAS 2020 damage stability rules, the blueprint of the lower vehicle decks had to be rethought. The standard Mk I Visentini typically boasted a car deck below the main deck with its access ramp continuing to a lower freight deck. As per SOLAS 2020 regulations, this arrangement was no longer possible, but NAOS Ship and Boat Design found a solution to retain both the car and freight deck without affecting the lane-metre intake. The freight deck moved up one deck, to Deck 2 level. Accessed via a single 47.7m-long and 4.05m-wide fixed ramp which has a two-section side-hinged watertight cover, Deck 2 has a 295lm intake. This comes very close to the 301lm capacity on Deck 1 of the 203.28m-long Mk I pair, *Ciudad de Valencia* and *GNV Bridge*. The Deck 1 car deck is totally separated from the lower freight hold, being directly accessed via a 48.7m-long and 3m-wide fixed ramp with a single watertight cover. It has a capacity of about 90 cars, nine cars short of the Deck 2 car deck capacity on the extended Mk I. It is a steep climb from the lowermost car deck to the accommodation decks, but a small stair casing forward also contains a lift that brings passengers directly to decks 5 and 6.

The ramp covers, just like the rest of the hydraulic access equipment, including the single stern ramp, were designed by Seville-based SP Consultores y Servicios. It also supplied the hydraulic and electric systems, but the steel structures were built by the yard. The 16m-long stern ramp, including 3m flaps, gives access to the eight-lane, 1,183lm main deck. The ramp has an 18m driveway that increases to 21.2m at the Deck 3 entrance. A fixed, 52.2m-long and 4.55m-wide portside ramp – which itself has a 98lm capacity – connects the stern with the fully enclosed upper vehicle deck which has a 983lm capacity. On the earlier generation, this fixed ramp was wider,



boasting the engine control room underneath it on Deck 3 level. With the engine control room moved to Deck 2 and the fixed ramp to Deck 4 narrowed from three to two lanes, the cargo flow into the main deck has improved a lot with straight lanes from stern to stem.

A requirement from Corsica Linea was the installation of a fixed car deck in the extreme forward end, on the portside of Deck 4. Up to 59 cars can be parked on two levels, increasing the total car capacity to about 149 without affecting the total 2,559lm trailer intake. Besides simultaneous loading of decks 3 and 4, the separation of the lower deck from the car deck, now makes simultaneous loading of all four vehicle decks possible. Something missing on *A Galeotta* though is the separate stern entrance for foot passengers with escalators connecting Deck 3 with the main accommodation deck.

A purebred Visentini

Never change a winning formula applies to the proven layout of the accommodation decks which span about two thirds of *A Galeotta's* length. All public spaces are concentrated on Deck 5 with Deck 6 being the main passenger cabin deck. As befits a Visentini class ro-pax, the interior design is functional with long-term partner IGI Allestimenti in charge of the interior outfitting. The interior design was in the hands of Corsica Linea which collaborated closely with Paolo Ancora acting as the interior architect on behalf of IGI Allestimenti. Two stair halls divide Deck 5 into three parts. Forward is the 440-seat restaurant with partitions splitting the vast room into five smaller sections. Passengers can either opt for à la carte dining or light meals which are served from a dedicated snack bar located at the restaurant's portside entrance. With the focus on à la carte dining or snacks, the restaurant lacks the standard self-service counter. Instead, there is a small counter/buffet that is used to serve breakfast. The galley is located to the starboard side of the restaurant's entrance corridor, forward of the stair hall. A 347-seat midships bar lounge connects the aft with the forward stair hall. It comes with a dedicated children's play zone and a separate inboard reclining seat lounge with 82 seats that have plenty of legroom. The reception desk can be found on the starboard side, immediately abaft the forward stair hall.

At the rear of Deck 5 are a multifunctional room and electronic games zone to the starboard side and quiet seating lounge on the portside. On either side, there is access to the sundeck which has fixed deck furniture. On the starboard side of the funnel casing is a kennel with the sundeck bar on the portside of it having an outdoor-indoor function as it also service the quiet lounge. More outer deck space in the form of promenade decks is available midships. This doubles as the evacuation deck with two 150-person Palfinger lifeboats and two Viking MESs connected to eight inflatable liferafts.

216 passenger cabins stretch the full length of Deck 6 – 204 standard four-berth inside and outside cabins, six four-berth cabins for people with reduced mobility and six five-person forward-facing luxury cabins. With four more double-bed cabins on Deck 7, the bridge deck that also accommodates the officers and crew, the total number of passenger cabins stands at 220, equivalent to a maximum capacity of 878 passengers. Visibility from the fully enclosed bridge has improved with full-height windows replacing smaller windows throughout. In compliance with the SRtP rules, a windowless emergency bridge has been integrated into the Deck 8 deckhouses, being located abaft the emergency generator room.

More Visentinis to follow

Once the Mk II for Polferries has been floated out, Cantiere Navale Visentini will start with the construction of a lengthened sister ship of the 2017-built *ML Freyja*. A freight-only vessel, there are no SRtP obligations to be adhered to. This freighter will be followed by yet another Mk II ro-pax which will be built on speculation as Visemar, the builder's shipowning arm, is already in discussion with potential charterers. Interestingly, the lengthened sister ship of *ML Freyja* will be the first ship to have NAOS Ship and Boat Design's in-house Wing Sail Module (WSM) installed. Meant to reduce the ship's mechanical propulsion, the fully automated WSM is made of rotating solid steel and aluminium blades that can fold down. A scale model prototype of the WSM has been in operation onboard *GNV Bridge*. The system has met expectations so far and the design has meanwhile been improved with NAOS Ship and Boat Design likely to join forces with an unspecified equipment manufacturer for the production of its WSM. ■

COMPARED TO THE EARLIER VISENTINI GENERATION, VISIBILITY FROM THE FULLY ENCLOSED BRIDGE HAS IMPROVED THANKS TO FULL-HEIGHT WINDOWS THROUGHOUT. SOURCE: CAPTAIN PHILIPPE SILLAN

