Commercial Marine

GLOW MARINE DELIVERS CATAMARAN FERRY POWERED BY APAC'S FIRST IMO TIER III-READY *mtu* SERIES 4000 ENGINES

Who:
Glow Marine

What:
Dual ***mtu*** 16-cylinder Series 4000 M65L diesel engines

Why:
Ferries with high-speed, fuel-efficient engines to fulfill stringent emissions regulations.

Where:
Donggang and Lambai Island, Taiwan

The last three years have been unprecedented times for shipbuilders caught in the grip of a pandemic and prevailing world events. The maritime industry has had to operate in uncharted waters amid travel, trade and supply chain disruptions. On the plus side, industry players have been embracing innovative technology and sustainable solutions toward net zero emissions goals. Shipbuilder Glow Marine is pioneering the way in Asia Pacific with a ferry powered by ***mtu*** engines that have the potential to fulfill IMO Tier III emissions regulations. The catamaran now shuttles between Donggang and popular destination Lambai Island in Taiwan.

A Rolls-Royce solution

When Singapore shipbuilder Glow Marine sought to build an environmentally friendly and fuel-efficient fast catamaran ferry for its client Fei Ma Ferry Holdings in Taiwan, it turned to Rolls-Royce for green-ship capabilities. “Rolls-Royce’s ***mtu*** engines are well-known for their power-to-weight ratio and fuel efficiency,” said Alan Chang, Executive Director for Glow Marine, pointing to key considerations influencing the client’s decision.

As a partner to shipbuilders, Rolls-Royce’s business unit Power Systems aspires to offer its customers clean and powerful propulsion solutions, and pledges to place the clean energy transition at the heart of everything that it does.

In particular, the ***mtu*** 16V 4000 M65L engine has the potential to achieve International Maritime Organization (IMO) Tier III / US Environmental Protection Agency (EPA) Tier 4 emissions regulations, when installed together with the ***mtu*** Selective Catalytic Reduction (SCR) system developed in-house. IMO Tier III is the latest emissions standards set by IMO to reduce nitrogen oxide emissions. In the US, EPA Tier 4 is the most stringent emissions requirement for marine applications.

*“The new high-speed four-stroke engines, which are based on proven **mtu** technologies, are currently available to comply with emissions regulations up to IMO III and EPA Tier 4 emissions. The engines will also be released to run on sustainable fuels such as Hydrotreated Vegetable Oil (HVO) by 2023, thus enabling climate-neutral operation in all applications.”*

Tee Kian Seng
Rolls-Royce Power System’s Senior Manager,
Sales – Commercial Marine for the APAC region

Keeping afloat amid shipbuilding challenges

Current world events—from the global energy crisis to the pandemic—have made business infinitely more challenging for the shipbuilding sector. With cruise activity taking a big hit following the outbreak of COVID-19, newbuild orders have been impacted, not to mention project delays and postponed deliveries.

The rising emphasis on climate action globally has also put urgent pressure on maritime shipping to decarbonize its operations. This will rely partly on a smooth transition to alternative low- to zero-emissions marine fuels by 2030 – among other technologies – toward reaching net zero by 2050.

Another important factor that needed to be taken into consideration are the CR Classification Society’s new shipbuilding rules introduced in 2020, which Glow Marine must comply with for its Taiwan-based client. These govern the structure and safety of the vessels and engine rooms.

Altogether, this has been a challenging journey for Glow Marine. However, the team decided to press on with its mission to realize the first ferry vessel to deploy the first ***mtu*** 16V 4000 M65L engines in Asia Pacific. “This will serve as a pioneer example for subsequent newbuild ferries in Taiwan and elsewhere,” said Chang.

Uncompromising safety, economic performance

Glow Marine's client Fei Ma Ferry Holdings had three top requirements to meet for the project—primarily vessel speed, fuel consumption, and vessel stability. Once completed, the 31-meter-long twin-hulled ferry will carry up to 200 passengers at a speed of 39 knots, while offering comfort and safety with low fuel consumption.

When it came to the engine vendor of choice, it was a non-issue for Glow Marine to recommend Rolls-Royce and its brand ***mtu***. "Our newbuild catamaran ferries with ***mtu*** engines have established a sound reputation, particularly among ferry operators in Taiwan. This combination has consistently exceeded end user expectations," said Chang.

The team selected the ***mtu*** 16V 4000 M65L engine as it ticked all the right boxes.

"Together with Fei Ma Ferry Holding's owner, we had heard plenty of positive feedback about the preceding Series 4000 engines—designed based on experience gained from more than 250 million hours of operation achieved by the 52,000+ engines sold to date, and which have provided mission-critical power for 25 years. So even though the 16V 4000 M65L engine was relatively new back in 2019, we decided to deploy it because the profile of the engines met our demands."

Alan Chang
Executive Director for Glow Marine

In terms of sustainability, the Singapore-based subsidiary of Rolls-Royce Power Systems was able to offer Glow Marine a clean and powerful marine propulsion system in its ***mtu*** 16V 4000 M65L engine, without compromising performance.

Chang also said Glow Marine attaches great importance to the excellent seaworthiness of its vessels. "The ***mtu*** 16V 4000 M65L engines provide reliable and ample power for speed. This is while also meeting the dimension and weight demands of the vessel's engine room to provide stability and ease of maintenance during operation."

Chang shared, the performance of the engines reached around 44 knots during the sea trials, exceeding end-user expectations. "The faster speed helps to cut cruise time by half between Donggang and Lambai Island, allowing Fei Ma Ferry Holdings to carry more passengers and at greater speeds," he added.
The 16V 4000 M65L engines also feature optimized fuel efficiency throughout the complete operating range (low, medium and high power), with each cylinder generating 14 percent more power than the previous generation. Based on the marine diesel engine E3 test cycle, customers can expect up to 5 percent fuel savings compared to that of the engine's predecessor.

Time-between-overhaul of the engines has also been greatly extended, preserving both current and future engine value and sustainability for the customer. Running time can now be optimized up to 50,000 hours, subject to the actual load profile of the engines. "This translates into substantial cost savings for the owner's operating expenses in the long run compared with competitors," said Chang.

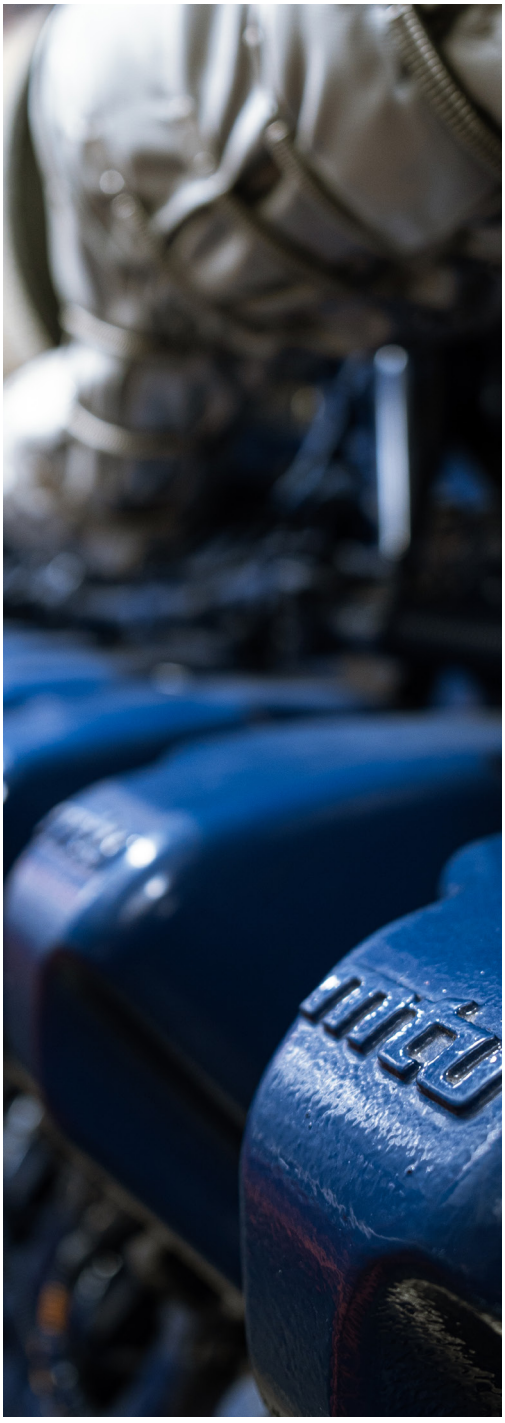
"The low noise and vibration levels from the engines also exceeded the expectations of the owner. This, combined with the vessel's stability proved to be crucial in providing comfort to passengers even at high speed", he added.

A one-stop solutions provider

Rolls-Royce also more than met its commitment to maximize customer satisfaction. Glow Marine said it greatly appreciated the smooth delivery and handover of the ***mtu*** engines despite pandemic-related challenges.

Chang shared that from the vessel design phase to engine installation and commissioning, right up to in-region service support, “Rolls-Royce was proactively supporting us all the way. The aftersales service presence also helped us to convince the owner. Other brands were being considered, but trust and performance established with ***mtu*** engines over past projects proved to be crucial”.

The shipbuilding specialist will be working with Fei Ma Ferry Holdings to renew its ferry fleet with another four to five more ***mtu***-powered catamarans. Said Chang: “We are also looking into green technologies such as hybrid propulsion solutions to develop more fuel-efficient and reliable vessels with our designer. We are glad to have Rolls-Royce as our partner to help realize this vision.”



We at Rolls-Royce provide world-class power solutions and complete life-cycle support under our product and solution brand ***mtu***. Fully utilizing the potential of digitalization and electrification, we strive to develop climate-neutral drive and power generation solutions that are even cleaner and smarter and thus provide answers to the challenges posed by climate change and the rapidly growing societal demands for energy and mobility. We deliver and service comprehensive, powerful and reliable systems, based on both gas and diesel engines, as well as electrified hybrid systems and batteries. These clean and technologically advanced solutions serve our customers in the marine and infrastructure sectors worldwide.