

Supporting the green cruising revolution

Sarah Zitouni, business development manager at Lean Marine, discusses how its FuelOpt solution can help cruise ship efficiency in adapting to greener fuels

The environmental impact of cruise ships has been in the spotlight for a lot longer than their cargo ship cousins, given that they are a public-facing sector of the industry under the eye of increasingly environmentally conscious customers. Since the connection between ship fumes, local air quality and negative impact on population health has been scientifically acknowledged, the pressure on cruise operators to minimise air emissions from their ships in port areas has also increased considerably and continues to do so.

In response to customer demand and increasing environmental regulations, cruise operators have begun to invest in green technology solutions across their ships. For example, a growing number of newbuildings are equipped with plug and play shore power connection equipment that allow them to plug into the local power grid when in port, switching auxiliary power demands to using electricity rather than diesel fuel.

Since 2015, lower emission fuel alternatives, such as LNG, have also come to the fore, with many cruise lines having gas-powered ships on order. Carnival Cruise Line has taken delivery of two LNG powered cruise ships: *AIDAnova*, which was the world's first LNG powered cruise ship, and *Costa Smeralda*, which was the fifth largest cruise ship in the world as of 2019. Additional investments in green technology such as exhaust gas cleaning systems (EGCS), optimised hull designs and antifouling coatings are helping the sector clean up its act.

Swedish marine expert Lean Marine has also played a central role in supporting the green cruising revolution through the provision of our automated propulsion optimisation system FuelOpt. While FuelOpt is suited for all vessel types and any type of conventional propulsion system, it is particularly effective for RoPax and cruise vessels, and their owners' operational requirements.

FuelOpt achieves real time fuel savings by controlling the ship's propulsion. It ensures that the propulsive power is optimised automatically, based on the

command set on power, fuel consumption and/or speed from the bridge. This removes costly variations in speed and power caused by human operational factors, allowing the vessel to achieve optimal fuel consumption at every given point throughout a voyage. For vessels with controllable pitch propellers, FuelOpt acts as a dynamic tuning system for the propulsion machinery to assure engine and propeller operate at optimal conditions.

With the FuelOpt control panel on the bridge, the ship's master is able to directly control speed and consumption. Using the speed input function, they can ensure that the vessel will reach the next port on time, a factor that is very critical for a liner service or for a cruise ship. Through the consumption input function, the master can limit fuel expenditure in order to automatically avoid costly overconsumption due to adverse weather, shallow waters, hull fouling or off-design losses.

It's also a highly social system, meaning it can be integrated as an 'on top' propulsion automation system in the current chain of tools and processes already onboard. As such, it can take inputs from a weather routing system, route optimising tools, AI systems and more. The technology is also completely independent of the fuel type or energy source and works with both conventional and newer engine designs.

FuelOpt is supported by another smart solution that Lean Marine offers: it creates and gathers vast volumes of vessel data which is sent to the cloud-based performance monitoring software, Fleet Analytics. For cruise ship operators wanting to digitalise vessel or fleet performance data, FuelOpt does this already for you without need for another data gathering system installation. We believe that combining these two solutions allows ship owners to reach the full optimisation potential of their fleet, making Big Data exploitation less intimidating by and more user-friendly.

Fleet Analytics turns data into knowledge for every department of the company. With this new information, our passenger ship customers are empowered to make efficiency a continuous improvement cycle with smooth long-lasting impactful operational changes towards healthy and sustainable operations. **NA**

About Lean Marine

Lean Marine, based primarily in Gothenburg, offers solutions for fuel saving and increased operational efficiency for the marine industry. FuelOpt and Fleet Analytics have so far been contracted for more than 175 vessels, representing over 40 different ship owners.

Further information can be found by visiting: www.leanmarine.com



Lean Marine's fuel saving system, FuelOpt