



# RMS Queen Mary 2 Technical Specification



## The Technical Department

The technical department has 27 officers and 70 ratings. This covers all disciplines from welding and plumbing to advanced electronics and computer science.

**The Engine Control Room** is situated close to the main machinery spaces and is manned 24 hours a day. The watch keepers work a rotation of 4 hours on - 8 hours off.

The vessel's propulsion, power generation and ancillary machinery systems are monitored and can be operated from the ECR.

### **Propulsion**

The vessel is propelled by 4 Rolls Royce, Mermaid pods consisting of 2 x Azimuthing Pods each rated at 21.5 MW – Reversible motors with 360 deg. rotation - and 2 x Fixed Pods each rated at 21.5 MW – Reversible motors.

Total maximum propulsion power is therefore 86.0 MW – equivalent to 115,328 HP.



The vessel has no conventional rudders; it is steered by the 2 Azimuthing pods which are controlled by the steering control on the bridge. The Azimuthing pods can be turned 90 deg out or in, to give side thrust while the vessel is manoeuvring.

The fixed pods give forward and aft thrust only. Inside the pod is the electric motor. The propeller hub is fixed direct to the motor shaft. Each pod weighs 260 tonnes.

Each pod is fitted with 4 fixed pitch propeller blades with a total circle diameter of 6 meters. Spare blades can be viewed on Deck 7 forward. Each blade weighs 4,500 Kg, or 9,900 lbs. The blades are made of a special stainless steel.

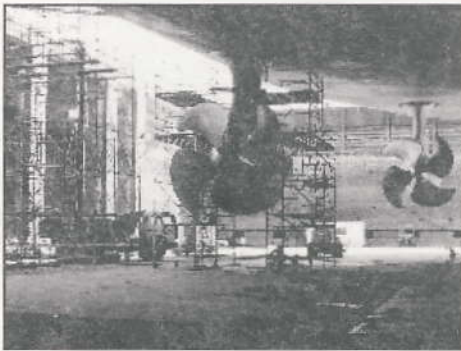


Fig.1. Starboard Pods

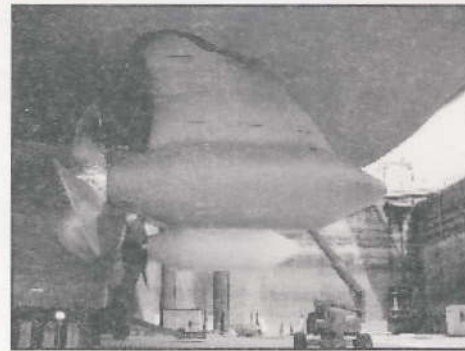


Fig.2. Port Aft Azimuthing Pod

For manoeuvring, the vessel also has 3 Bow Thrusters. They are Rolls Royce Transverse thrusters each 3.2MW with Variable pitch propeller blades. Total diameter is 3.3 metres. Each bow thruster also has a hull door on each side of the ship. These doors are opened for Manoeuvring and closed at sea to create a smooth flow over the bow and reduce turbulence, thus giving the vessel true liner capabilities.

### **Electrical power generation**

The pods, the bow thrusters, and all electrical functions of the ship are supplied from a common high voltage main switchboard.

Generation supply – 11,000 V, 60 Hertz, 3-Phase. This switchboard is supplied on the power station principal from the following:

- 4 x Wartsila W46 V1646C Diesel Generators each with Power Output 16.8 MW
- 2 x General Electric LM2500+ Gas Turbines each with Power Output 25.0 MW

Therefore the total power produced is 117.2 MW, equivalent to 157,168 HP.

This configuration provides flexibility to allow the vessel to run at lower speeds while cruising or crossing the Atlantic at higher speeds since any combination of engines can be used to supply main power.

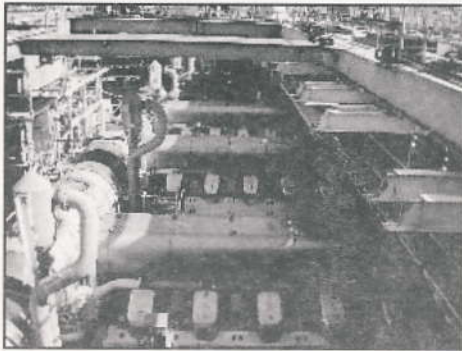


Fig.3. Diesel Engines – during construction

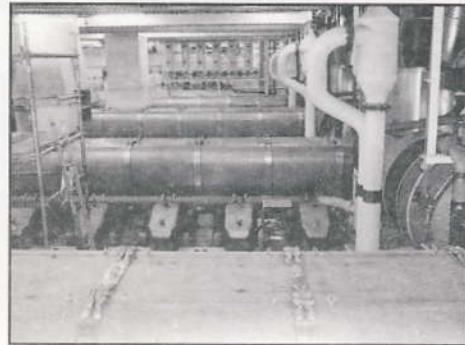
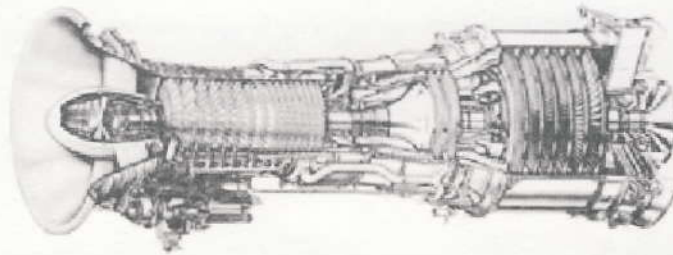


Fig.4. Diesel Engines



**LM2500+ MARINE** Gas Turbine

Fig.5 Gas Turbine

### **Fuel Consumption**

- Diesel Engines – 3.1 tonnes/hour each of Heavy Fuel Oil (HFO) at 100% Load
- Gas Turbines – 6.0 tonnes/hour each of Marine Gas Oil (MGO) at 100% Load

Daily consumption at a speed of 29 knots, depending on the sea state and wind, is approx 261 tonnes of HFO for the diesel engines and 237 tonnes of MGO for the gas turbines.

Fuel tank capacities –

HFO – 5,348.7 m<sup>3</sup> or 1,412,977 US gallons

MGO – 3,658.8 m<sup>3</sup> or 966,553 US gallons

### **Stabilisers**

The vessel is also fitted with 4 stabilizers – 2 x Pairs of Brown Bros/Rolls Royce Retractable Fin Stabilisers each with a surface area of 15.63 m<sup>2</sup>.

These are controlled by a gyroscopic vertical reference instrument which senses the ships potential roll and operates the stabilisers to compensate accordingly.

### Fresh water production

Water Production from sea water is by 3 x Alfa Laval Multi Effect Plate Evaporators each producing 630 tonnes/day.

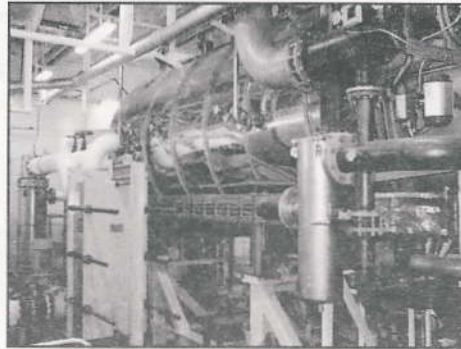


Fig.6. Multi-effect Plate Evaporator

The daily consumption is approx 1,100 tonnes/day which equates to approx 302 ltrs - or 79 US gallons – per person per day. This includes water used for cooking and washing the ship.

Potable Water tank capacity = 3,830 m<sup>3</sup> or 1,011,779 US gallons.

### Steam production

Steam is produced by 2 x Saacke Oil fired boilers. Steam is also produced by Exhaust Gas Economisers by using waste heat from the Diesel Engine and Gas Turbine exhausts. Steam is used for accommodation heating, Laundry heating, fuel oil heating, and for steaming in the galleys.

### Air conditioning

Air Conditioning by 6 x Carrier Chiller units

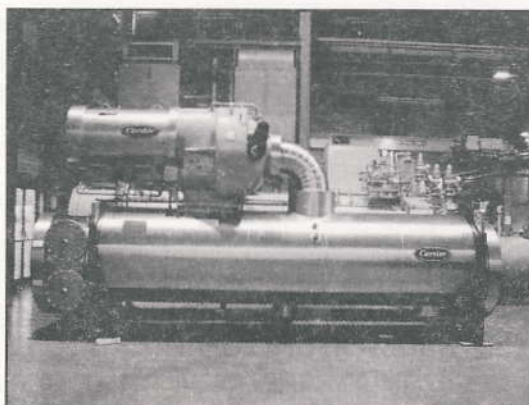


Fig.7. Chiller unit under construction