

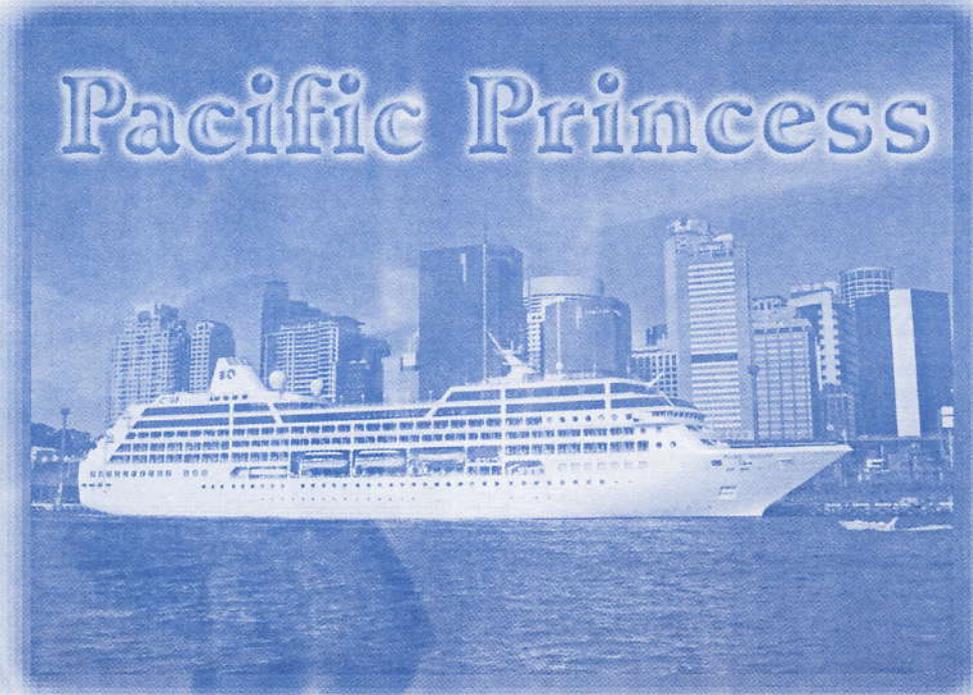


Pacific Princess

# Navigation Bridge



Deck 8, Forward



## Pacific Princess



PRINCESS CRUISES

come back new™

The bridge of Pacific Princess is manned 24 hours a day. Three teams of experienced watch keepers share the time on a 4 hours work , followed by 8 hours rest basis ensuring they are at all times properly rested. The Officer of the Watch has overall responsibility and reports directly to the Captain. A Junior Officer of the Watch and a dedicated Able Seaman assists him. P&O Princess has a stringent policy on training and certification. All Officers are trained to a high standard, utilizing Resource Management and Team Management Courses backed up by regular simulator training, to a level that ensures we remain industry leaders.

The Senior First Officer takes the 8-12 watch alongside the Second Officer, the Senior Second Officer and a Third Officer take the 12 - 4 watch and the First Officer Navigator takes the 4 - 8 watch with another Third Officer. In port approaches, areas of confined navigation or high traffic density, the Captain and the Staff Captain supplement this team.

The primary duty of the Navigation Officers is the safe navigation of the vessel, allowing the safe and timely arrival of the Pacific Princess at her destination.

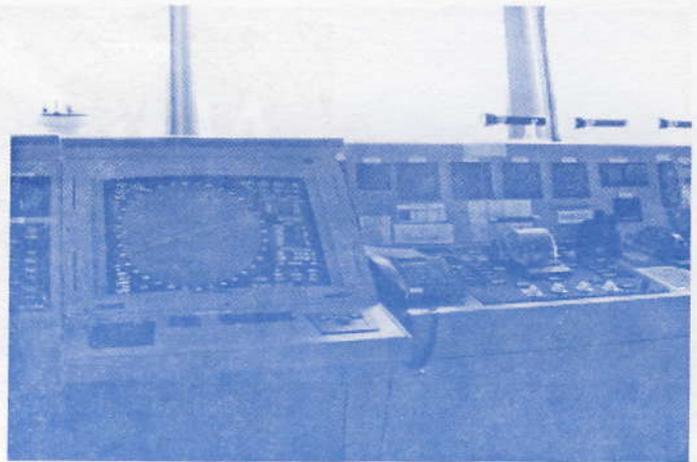
This duty involves knowing the ship's position at all times, being fully aware of the ship's surroundings, including the presence of other ships and hazards to navigation, knowing the prevailing meteorological conditions, such as rain, fog, wind and their effects upon the safety of the vessel and comfort of our Passengers. They also control the speed of the ship, working closely with the Engineering Officers on Watch, to ensure the vessel will arrive on time at her next port. In addition they monitor the ships Safety Detection equipment.

#### NAVIGATION AND BRIDGE EQUIPMENT

Our bridge is fitted with what is commonly known as an Integrated Bridge System, (IBS). The concept of an IBS means that all the different pieces of equipment and sensory inputs can intelligently communicate with each other. Our Navigation is based on the Global Position System (GPS). We have three receivers on Pacific Princess that collect standard GPS signals. To further enhance our levels of accuracy we utilize a differential correction when in range of a signal, to improve our accurate GPS position. We are comfortable that our (D) GPS position is generally accurate to within 6 feet.

The Navigator (or Planning Officer), pre-plans the ships route from one port to another using the Chart Pilot and the Sperry VMS System. The final route will be approved by the Master and then uploaded to the voyage management system appearing on the radar display as a red line. Using the autopilot we can manually steer the ship along the line, or alternatively, using "Nav Mode" we can instruct the ship to stay on the line automatically adjusting her heading to allow for sideways drift and set caused by wind and currents.

Thus, we can actually program the ship to find its own way from one port to another. Despite these advanced control system, at times it will be necessary to use the ships wheel to manually hand steer the ship by giving helm orders to the Able Seamen. Generally we will engage hand steering in heavy traffic, foggy conditions, shallow or confined waters and of course on the final approaches to port.



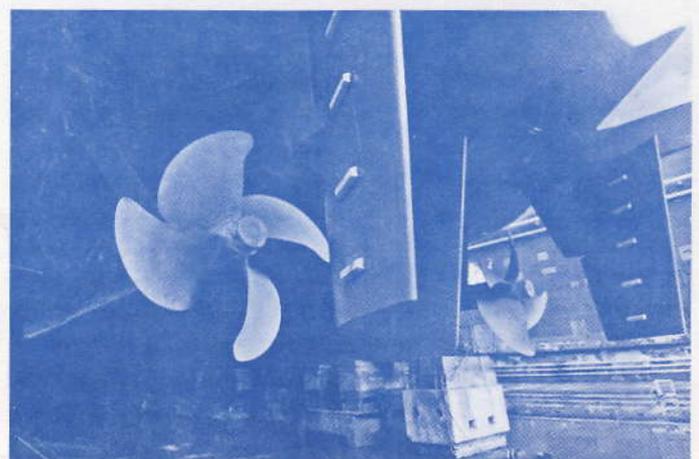
#### SAFETY MANAGEMENT

Princess Cruises has developed an industry standard for safety management, and our on board safety culture is second to none. We have an integrated Safety Management Computer on board, which uses our fire detection system to passively monitor all spaces on the ship using 2000 sensors, including those in your stateroom. The system allows us to "interrogate" any of the sensors to establish the condition in all the spaces on board.

#### CONTROL OF THE SHIP AND THE MAIN PROPULSION SYSTEM

The control of the ships propulsion system and main machinery plant is carried out from the Engine Control Room situated on Deck 3. Pacific Princess is fitted with an integrated Valmarine monitoring and control system that is operated by the Chief Technical Officer and his team of Engineering and Electronics Officers. The direct control of the ship's propulsion system is Electrical power, provided by 4 Wartsila generators producing 13,500 kW of total power. This power is then fed to the Hotel systems, such as lighting, galleys and laundry, and also to the Electric Propulsion System. When at sea, Pacific Princess operates on 2, 3 or 4 generators, depending on the speed required to arrive at our next port.

The propulsion is provided by two diesel electric motors. Located on Deck 1 at the rear of the ship, they are configured in two halves, so that if one half should fail the other half can provide 70% of the rated torque ensuring minimum loss of speed. Each propulsion motor is connected directly to a 4 bladed fixed pitch propeller through a drive shaft giving a nominal cruising speed of 20.0 knots.



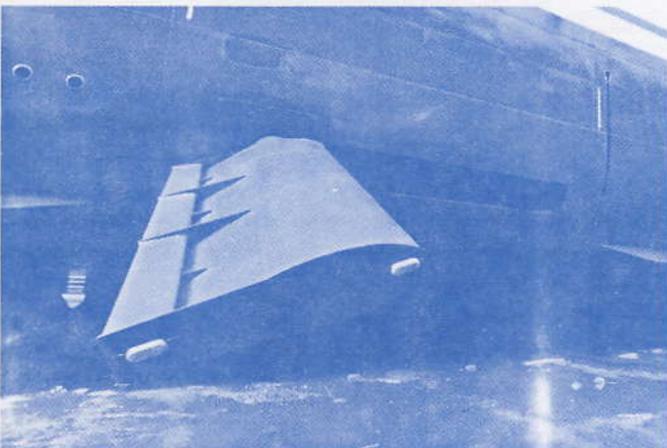
### BOW THRUSTERS

Thrusters are provided for manoeuvring the ship and holding position. There are two Brunvol bow thrusters of 750 kW (1000 h.p.) each. These transverse thrusters can hold the ship against a 25 knots wind



### STABILIZER FINS

To maximize comfort and safety, Pacific Princess is fitted with two folding type ACH CN/AC stabilizer fins each 13 feet long. These retractable fins ensure that we remain steady in even the roughest conditions. At a speed of 18 knots, the rolling motion of the ship is reduced by up to 90%. The folding fins are operated from the Bridge through an electric-driven hydraulic power system. To improve efficiency it is not always necessary to have both fins deployed at the same time, but in heavier seas they work extremely well together. The fins fold flush into slots in the ship's hull when arriving in port to ensure that they are not damaged as we berth alongside the quay.



### SECURITY

The Security Team are led by an experienced Security Officer who works closely with the Officer of the Watch on the Bridge. Our passenger counting computer, designed by A-Pass, allows us to access passenger and crew movements and gives us a real-time index of who is on onboard at any time. This information is vital in the event of an incident when the ship is in port.

We use airport style x-ray machines to monitor luggage being brought aboard and surveillance cameras to monitor gangways, ship's side openings and sensitive areas around the ship. Patrols are conducted 24 hours a day ensuring both passenger and crew areas are protected at all times.

### WEATHER

All P&O Princess ships are voluntary Observing Weather Ships. The Deck Officers make coded observations in a Log Book every 6 hours when the ship is at sea. This information is then transmitted via satellite to shore based weather stations where it is decoded by computer. These reports provided by a number of ships worldwide, are then assimilated together with other sources to provide weather analysis and forecasts. Our primary forecasting media is now the Internet, although we still utilize weather fax, local and long range radio forecasts, Navtex and Satellite forecasts.

### FRESH WATER GENERATION

Fresh water is generated on board using a system of 3 Flash Evaporators. Our system is cleverly designed to make the most of the waste heat (energy) generated by the four Wartsila engines. The cooling water (jacket water), passed through these engines is re-used to heat salt water in the Flash Evaporators. Because the Evaporator chambers are kept in a state of vacuum, the salt water will boil at a temperature of about 76 C or 169 F. The jacket water is therefore the primary source of heat for this process, topped up by a low-pressure steam system as necessary. When the salt water boils it changes state to steam at which time the salt is removed. Following condensation this distilled water is treated to improve taste before being delivered to all the services on board ranging from your stateroom showers to the galley. Each evaporator has a capacity to generate approximately 150 tons per day.

### WASTE MANAGEMENT AND THE ENVIRONMENT

With all modern cruise ships being subject to tough pollution laws we have designed a waste management system that is efficient, compact and totally green. On a typical day the entire ship consumes some 5 tons of food, and about 400 tons of fresh water. Our waste control includes the use of biological sewage treatment plants. The three main treatment units use a combination of aeration and bacterial systems to break down waste. At the final stage of treatment the manufacturer's claim the effluent is clean enough to drink!

The food wastes left over from preparation and mealtimes is ground in a disposal unit to fine pulp and is then either dried out and incinerated at high temperature or is recycled to sea when we are far enough from land to do so. All wood and paper product are incinerated at high temperature so as not to produce toxic fumes.



# Pacific Princess®

## Ship's Particulars

Operated By	:	Princess Cruises
Built by	:	Chantiers de L'Atlantique
Date of Keel Laying	:	19 <sup>TH</sup> December 1997
Port of Registry	:	Bermuda
Official Number	:	732137
IMO Number	:	9187887
Call Sign	:	ZCDS3
Classification Society	:	Bureau Veritas
Gross Registered Tonnage	:	30277 t
Net Registered Tonnage	:	11481 t
Length Overall	:	180.45 m
Length Between Perpendiculars	:	157.95 m
Moulded Breadth	:	25.46 m
Total Breadth (Wings)	:	28.3 m
Maximum Draught	:	5.965 m
Corresponding Displacement	:	16146 t
Corresponding Deadweight	:	3376 t
Propulsion Type	:	Diesel Electric
Diesel Engines	:	4
Total Output of Main Engines	:	13,500 kW @ 720 rpm
Manufacturer of Main Engines:	:	Wartsila Diesel
Thrusters:	:	2 Bow Thrusters @ 750 kW each
Propellers:	:	2 Fixed Pitch Propellers, Four Blades
Rudders:	:	2 Semi-Balanced, Each Rudder 19.4m <sup>2</sup>
Stabilizers:	:	2: Each Fin 9.9m <sup>2</sup>
Cruising Speed:	:	20 Knots



PACIFIC PRINCESS