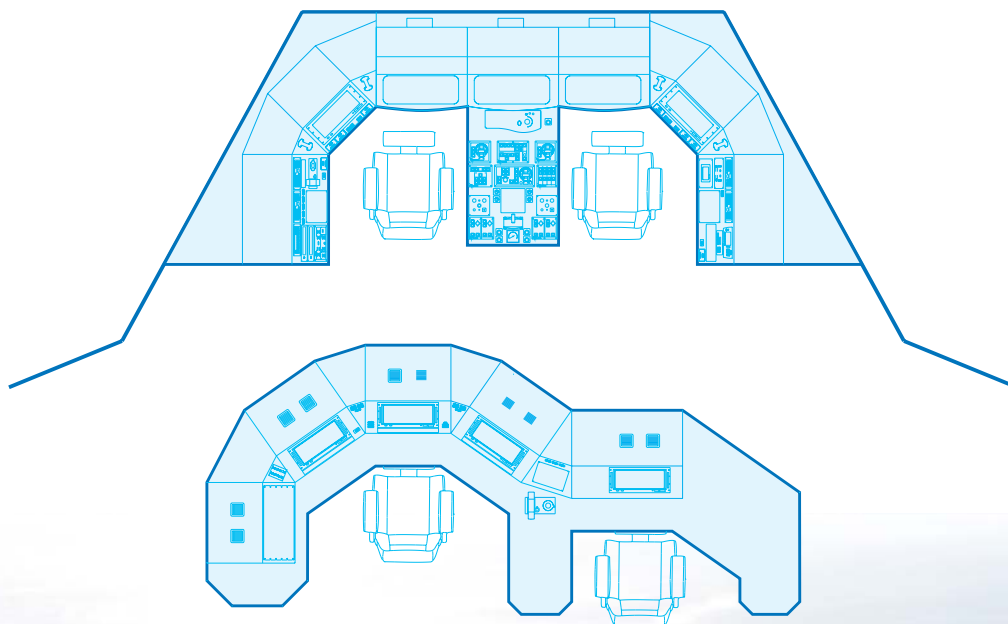




CONTROL CONSOLES ALARM AND MONITORING



PacifiCat Series 1000

**British Columbia Ferry Corporation
Three 122.5m RO-RO/Passenger Catamarans
Det Norske Veritas ✕1A1 R4 HSLC Car Ferry B EO**

PRIME MOVER CONTROLS INC.



After extensive ergonomic study and analysis, PMC designed and manufactured the PacifiCat

BC Ferry Corp. has one of the world's largest ferry fleets with 41 vessels serving 23 million passengers and more than eight million vehicles annually over 26 routes.

The PacifiCat Series 1000 aluminum catamaran is one of the world's largest and most efficient high speed ferries. It can carry 250 vehicles and 1,000 passengers at a service speed of 37 knots. Propulsion is by four MTU 20V-1163 high-powered diesel engines, each driving a KaMeWa 112 steerable waterjet.

PMC performed ergonomic studies with BCFC and equipment suppliers for the integrated bridge. After extensive analysis, PMC designed and manufactured the Navigation, Engineer's, Wing and Deck Head consoles. Due to weight considerations these consoles were constructed using aluminum.

All critical machinery functions on this vessel are continuously monitored and displayed by the PMC Integrated Machinery, Alarm and Control System (IMACS). This graphical user interface allows the crew to monitor and control the machinery. It also performs trending and health monitoring from three IMACS workstations, ergonomically integrated into the Engineer's console. A total of 175 graphic pages and 50 pop-up windows allow the crew to easily identify and monitor the 3000 machinery status points. The system automatically logs all machinery alarms to a disk archive for future reference.

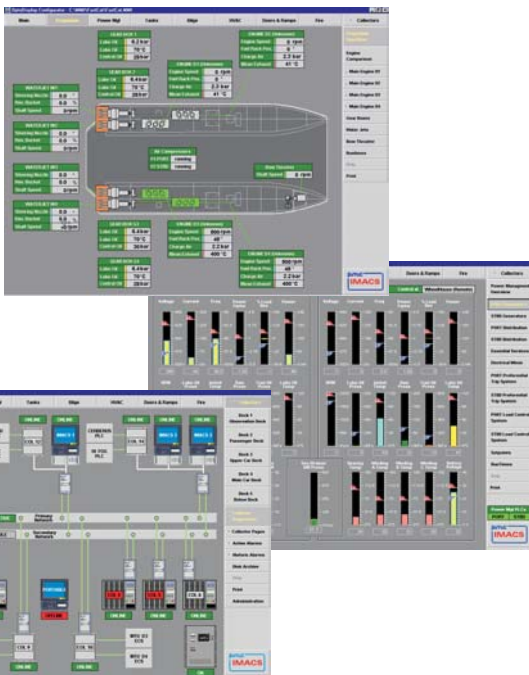


PacifiCat Engineer's Console with three

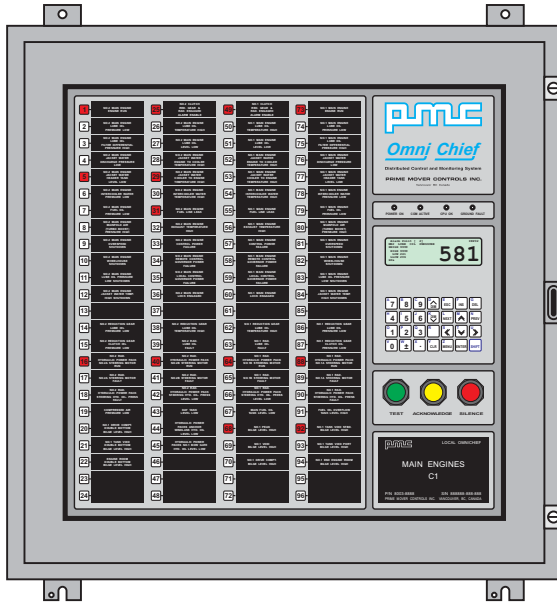
Intuitive graphics page construction using dedicated day/night viewable color screens greatly simplifies the engineer-machinery interface.

The powerful, easy to use, IMACS workstations are independently networked to six Omni Chief data collectors, one remote bridge collector, one Omni Chief HVAC control system, and four Omni Chief communication processors. For maximum reliability, a monitored redundant high speed communication network is used.

Each Omni Chief data collector consists of a dedicated 96 point display showing the status of the optically isolated analog and digital field sensors. All alarm configuration, setpoints, time delays, etc. can be setup from the Omni Chief, as well as from the ship's computers.



PMC IMACS (Integrated Machinery, Alarm and



PMC's Distributed Control and Monitoring System features discrete LED indicators for 96 points and a LCD display with key pad

Each Omni Chief communication processor provides isolated independent network links for direct communication with the processors of other automation systems. Custom communications protocols were written by PMC to allow efficient data transfer with the following systems:

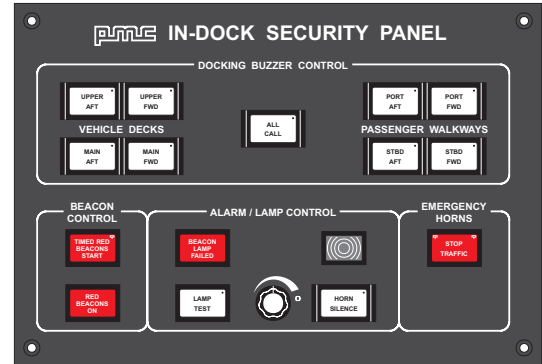
- Main engines (redundant links with auto-changeover)
- Power management and switchboard
- Motor control centers
- Fire detection
- Fire suppression

Additional groups of controlled and monitored system information consist of tanks, pumps, bilges, fire doors, RO-RO ramps, fans, vents and system self-diagnostics.



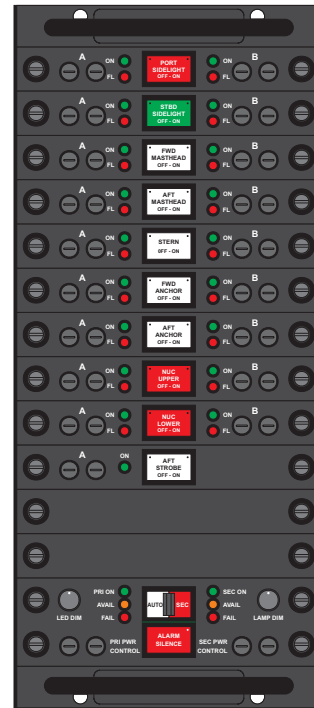
MCH-E control heads provide remote control for the bow thruster from the Navigation Console and each Wing Console.

PMC supplied the bow thruster control system including the MCH-E control heads mounted in the bridge consoles, as well as the throttle and gearbox actuators located in the machinery space.

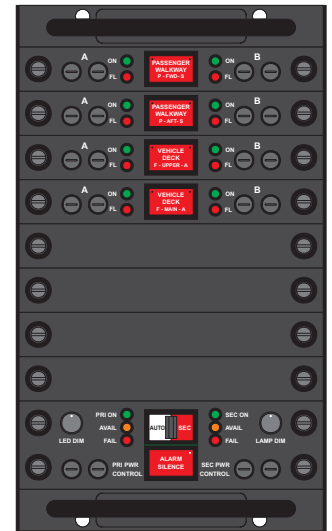


PMC In-dock Security Panel

A PMC in-dock security system provides two way communication between the Bridge and the passenger/vehicle loading ramps. A PMC Type 8012 Navigation Light Control Panel is used for monitoring the in-dock security beacons.



PMC's Type 8012 Navigation Light



PMC provided a Type 8012 navigation light control panel to control and monitor the navigation lights. This solid state electronic panel continuously monitors the status of the remote navigation lights and wiring whether the lights are on or off. When the primary lamp circuit fails an alarm sounds and transfer to the back up lamp is automatic. Dual power sources are monitored and alarmed. Transfer is automatic when either fails.

OTHER PRODUCTS FROM PMC

**Type 5360
Azimuth Control Head**



The Azimuth Control Head provides accurate propulsion control of power and rotation for 360° thrusters.

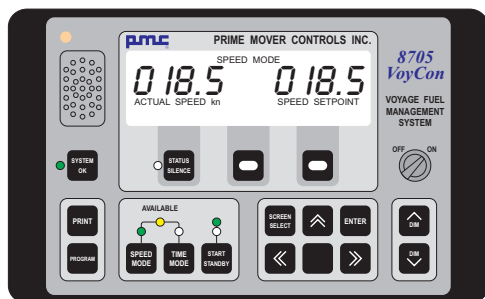
The azimuth control head can also be configured for applications that require limited rotation, such as propulsion power combined with water jet or rudder control.

**Type 5400 PCH
Propulsion Control Head**



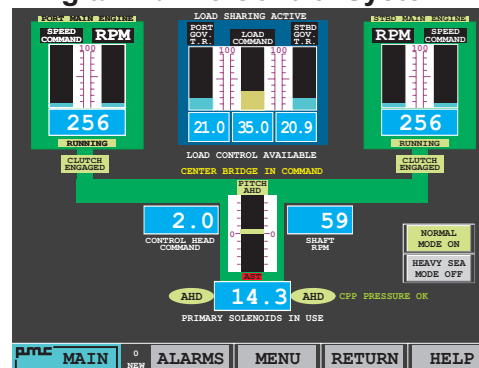
The versatile PCH propulsion control head may be fitted with electric, pneumatic or mechanical controls, and may also be configured with electric shaft and telegraph functions. It is available in single or dual lever models.

**Type 8705 VoyCon
Voyage Fuel Management System**



The VoyCon is a voyage fuel management system designed to reduce fuel consumption. Based on PMC's 30 years experience in the field of marine automation and integration, the VoyCon design was optimized to meet the most stringent requirements demanded by marine applications.

**D-MaC
Digital Marine Control System**



The D-MaC is designed to accommodate a wide range of propulsion control requirements from the simple to the sophisticated. It is equally suitable for single or multi engine installations as well as arrangements with PTO devices such as generators and fire pumps.

The D-MaC is a powerful, easy-to-use micro-processor based system. For maximum reliability it utilizes a touch screen display panel with non-volatile memory and no hard drives.

PRIME MOVER CONTROLS INC.

3600 GILMORE WAY, BURNABY B.C. CANADA V5G 4R8
TEL (604) 433-4644 FAX (604) 433-5570 www.pmc-controls.com