

Propulsion Solutions for Offshore Patrol Vessels



Offshore Patrol Vessels (OPVs) for coastal defence are becoming a strategic feature in the naval fleets of most nations. However, these modern vessels are also used to perform many non-military functions, including coast guard and rescue operations, as well as the policing of Exclusive Economic Zones (EEZ), and even fishery related activities.

Since the operational profiles of these various applications can be quite different, OPV propulsion systems need to be capable of adjusting to varying load requirements. While OPVs are typically between 500 t and 3300 t displacement with a speed of up to 25 knots, the design features can vary considerably from one vessel to another, in line with the intended operational function.

Wärtsilä Solutions Enhanced to fit an Evolving OPV Market

Wärtsilä has an extensive track record in delivering propulsion

solutions for OPVs. This success has been largely based on being able to match the solution to the particular design criteria. The versatile Wärtsilä 26 engine has been proven to provide the ideal centrepiece of these solutions, regardless of the operational application. The Wärtsilä 26 is a robust engine that has been specifically designed to achieve 24,000 running hours before a major overhaul needs to be scheduled, with all engine servicing able to be carried out in-situ.

Optimal performance, reliability and maintenance is achieved with an

integrated solution that combines this engine with Wärtsilä gearboxes and controllable pitch propellers (CPP), which are available in both 4 and 5 bladed configurations.

This solution is favoured by the Chilean Navy Coast Guard who cite the integrated nature of the control system, coupled with the competitive cost of ownership, as key reasons for selecting the Wärtsilä package.

A similar solution has also been taken up by the Irish Navy, but with the addition of a small loiter drive of around 350 kW for continuous operation at less than 10 knots. The



Comandante Toro, Chilean Navy Coast Guard. Courtesy of Chilean Navy.

Wärtsilä 26 range offers 340 kW per cylinder, extending to the 16-cylinder V configuration Wärtsilä 26 at 5440 kW maximum continuous rating. When larger engine powers are required and the power-to-weight ratio demands high speed engines, Wärtsilä can offer CPPs and gearboxes to suit such applications.

OPVs with installed propulsion power up to 18,000 kW are driven by Wärtsilä CPPs. The versatility of the Wärtsilä propeller range is well suited to OPV applications as their highly skewed designs offer silent operation

up to 18 knots without the need for special hub designs.

Wärtsilä works closely with independent testing facilities, such as HSVA and MARIN, to develop the techniques that will ultimately provide the best full scale results. This is important since it is envisaged that more and more vessels will be performing similar functions to those of today's OPVs, which will mean more varied propulsion solutions will be required in the future.

For OPVs requiring towing, Dynamic Positioning (DP) and ice-class capabilities have already been requested, while a gas engine driven full electric propulsion OPV is already in operation in Finland. This latter development followed successful market experience in the offshore segment. Clearly, the trend is towards greater versatility and Wärtsilä propulsion solutions are designed to meet these changing needs.

Chilean Navy Coast Guard, Comandante Toro

Main Machinery

- 2 x Wärtsilä 12V26 A2 engines
- Power installed 2 X 4080 kW

Reduction Gearbox

- 2 x Wärtsilä SCV 62

Command Control

- 2 x Wärtsilä Lipstronic 7000

Propulsion Equipment

- 2 x shaftlines
- 2 x Wärtsilä WCP, type 4D775
- Diameter 2850 mm

Seals & Bearings

- Wärtsilä Enviroguard Seals
- Wärtsilä Line Shaft Bearings
- Wärtsilä Floodguard Seals



Comandante Toro, Chilean Navy Coast Guard.
Courtesy of Chilean Navy.



Irish Navy Class OPV, Samuel Beckett

Main Machinery

- 2 x Wärtsilä 16V26 engines
- Power installed 2 x 5440 kW

Reduction Gearbox

- 2 x Wärtsilä SCH68-SDC51

Command Control

- 2 x Wärtsilä Lipstronic 7000

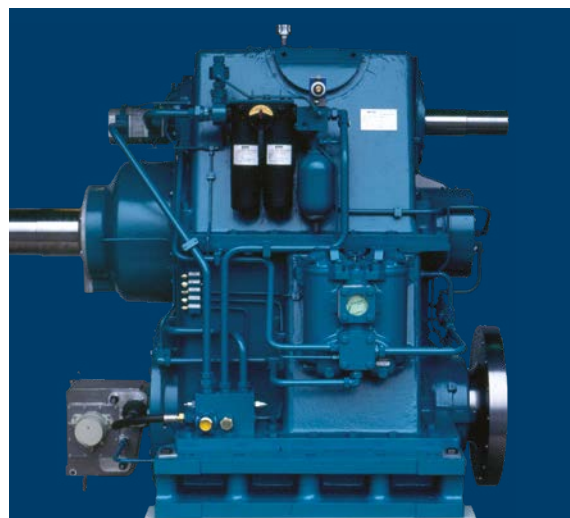
Propulsion Equipment

- 2 x shaftlines
- 2 x Wärtsilä WCP, type 5C09
- Diameter 2750 mm

Seals & Bearings

- Wärtsilä Enviroguard Seals
- Wärtsilä Floodguard Seals
- Wärtsilä Enviro-safe and Intermediate Shaft Bearings

Samuel Beckett, Irish Navy.
Courtesy of Irish Navy.



Our Solutions

Engines – Generating Sets

The guiding principles behind the design of Wärtsilä engines and generating sets are:

- Reliability and low maintenance costs
- High thermal efficiency and low emissions
- Modular construction and reduced parts count
- Ergonomic interfaces
- Minimised consumables
- Cylinder liner with Anti Polishing Ring
- Extended time between overhauls (up to 24,000 hours between major overhauls)
- Variable Inlet Closing (VIC) installed for low smoke and improved load response
- Compliant with IMO Tier II emission requirements

Reduction Gears

- Modular and flexible design
- Compact and reliable
- Optimum propeller speed for any engine

- CP propeller combination
- Optional PTO/PTI solutions
- Optional built-in multiple plate type of clutch
- Combined oil system for gear and CP propeller

Controllable Pitch Propellers

- Tailor-made designs
 - Wake-adapted
 - High efficiency
 - Low noise
 - Low vibration level
 - No erosive cavitation
- Design based on mission profile
 - Reduction of fuel consumption
- Optimised match of propeller with engine
 - Reduction of fuel consumption
 - Increased engine lifetime

Electrical & Automation

- Turnkey integrated system solutions covering Power Distribution and Automation
- Detail engineering, electrical analysis and equipment for naval applications

- Power Generation, Drives, Electric Motors, Distribution, Automation and Integrated Bridge

Seals & Bearings

We provide Tail Shaft Support Solutions with an extensive portfolio of products and services to help owners maximise efficiency, reduce risk, and promote environmental excellence throughout the entire lifecycle of the vessel.

- Design simplicity provides maximum sealing system security
- Leakage virtually eliminated and high & low frequency vibrations are easily accommodated
- Axial and Radial movements are also absorbed, thereby eliminating minor vessel build errors
- ENVIROSAFE composite bearing materials with low wear down properties

OPV References

| Customer country | Class | Ships per class | Displ. (GT) | Speed (Knots) | Wärtsilä products, equipment per shipset |
|-------------------------|------------------------|-----------------|-------------|---------------|--|
| Brazil | Amazonas class | 3 | 2 000 | 25 | 2 x CPP 5C10 |
| Chilean Navy | Piloto Pardo class | 4 | 1 730 | 21 | 2 x ME 12V26 + 2 x GB SCV62 + 2 x CPP 4D775 |
| China | Haix un class | 2 | 3 000 | 22 | 2 x ME 8L38B + 2 x GB SCV85 + 2 x CPP 4D920 |
| Colombian Navy | 20 de Julio class | 2 | 1 730 | 18 | 2 x ME 6L26 + 2 x GB SCV56 + 2 x CPP 4D650D |
| Colombian Navy | 20 de Julio class | 1 | 1 800 | 21 | 2 x ME12V26 + 2 x GB SCV62 + 2 x CPP 4D775D |
| Finnish Coast Guard | Turva | 1 | 4 600 | 18 | 1 x DG 12V34DF + 2 DG 6R34DF |
| German Maritime Police | TBD | 3 | 1 750 | 22 | 2 x ME 12V26 + 2 x 600/300 kW PTI/PTO Motors & drives+ 2 x SCRs |
| Indian Coast Guard | Samar class | 4 | 2 005 | 22 | 2 x CPP 5C09 |
| Indian Coast Guard | Sankalp class | 2 | 2 250 | 24 | 2 x CPP 5C10 |
| Indian Coast Guard | Samarth class | 6+6 | 2 400 | 25 | 2 x CPP 5C10 |
| Indian Navy | Saryu class | 4 | 2 200 | 25 | 2 x CPP 5C10 |
| Irish Navy | Roisin class | 2 | 1 700 | 23 | 2 x ME 16V26 + 2 x CPP 5C08 |
| Irish Navy | Samuel Beckett | 4 | 2 000 | 23 | 2 x ME 16V26 + 2 x GB SCH68-SDC51 + 2 x CPP 5C09 + 2 x 355 kW PTI |
| Italian Navy | Comandanti class | 4 | 1 520 | 26 | 2 x ME 18V26 |
| Italian Navy | Sirio class | 2 | 1 520 | 22 | 2 x ME 12V26 |
| Philippines Coast Guard | San Juan class | 4 | 500 | 24 | 2 x CPP 4D710D |
| Portuguese Navy | Viana do Castelo class | 4 | 1 500 | 20 | 2 x ME 12V26 + 2 x GB SCH61V61-SDC48 + 2 x CPP 5C08 + 2 x 250 kW PTI |
| Romanian Border Police | Stefan Cel Mare | 1 | 1 028 | 21 | 2 x CPP 4D650 |
| Royal Moroccan Navy | Bir Anzaran class | 1 | 800 | 22 | 2 x ME 12V26 + 2 x CPP 4D650 |
| Royal New Zealand Navy | Otago class | 2 | 1 600 | 22 | 2 x CPP 5C09 |
| Russian Coast Guard | Ocean Project | 1 | 2 200 | 21 | 3 x DG 4L20 + 2 x ME 16V26 + 2 x GB SCH75-PDC53 |
| South Africa DEAT | Sarah Baartman | 1 | 1 875 | 22 | 2 x ME 12V26 + 2 x CPP 4D775 |
| Spanish Navy | Meteoro class | 6 | 2 600 | 20 | 2 x CPP 4D1000 CLT |
| Sri Lanka Navy | 105 m AOPV Saruyal | 2 | 2 350 | 25 | 2 x CPP 5C10 |
| Thai Navy | Krabi | 2 | 2 000 | 24 | 2 x CPP 5C10 |
| UK Royal Navy | River class | 3 | 1 700 | 20 | 2 x CPP 5C08 |
| UK Royal Navy | Modified River class | 1 | 1 850 | 20 | 2 x CPP 5C08 |
| UK Royal Navy | River class Batch II | 5 | 2 000 | 24 | 2 x CPP 5C10 |
| Venezuelan Coast Guard | Guaicamacuto class | 4 | 1 500 | 22 | 2 x CPP 5C09 |
| Venezuelan Coast Guard | Guaiqueri class | 4 | 2 350 | 24 | 2 x CPP 5C11 |

ME: Main Engine - DG: Diesel Generator - GB: Gearbox - WCP: Controllable Pitch Propeller



COMANDANTI class, Italian Navy



Finnish Border Guard, Courtesy of Meyer Turku Oy



HMS Clyde, Royal Navy. Courtesy of BVT

More information

More detailed information about Wärtsilä's Solutions for OPVs can be found on our website www.wartsila.com/navy

www.wartsila.com

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