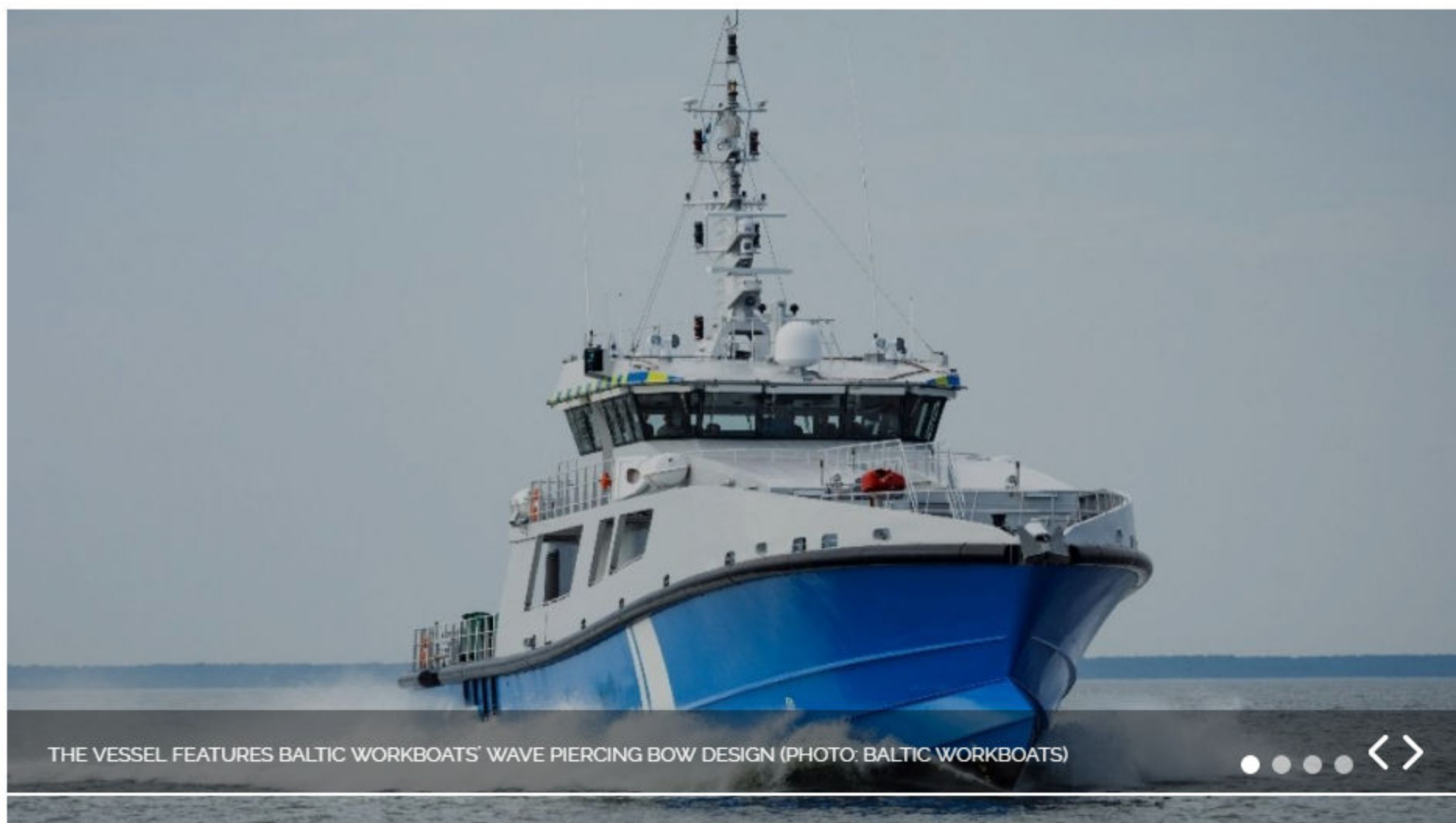


MORE THAN JUST A BORDER GUARD

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THE VESSEL FEATURES BALTIC WORKBOATS' WAVE PIERCING BOW DESIGN (PHOTO: BALTIC WORKBOATS)

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30 Oct 2018

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Estonia's new 45m hybrid powered Police and Border Guard patrol boat is a surprising example of true vessel multifunctionality at work writes Jake Frith.

Estonia is a small country in terms of population (Just 1.3 million at the last count), but it lies at a marine crossroads, sharing Eastern land and sea borders with Russia, Northern sea borders with Scandinavia and acting as a key gateway to the rest of Europe to the West.

With all this in mind, Estonia's Police and Border Guard fulfils a range of duties that in larger countries would be conducted by multiple agencies with multiple fleets of specialist vessels.

So *Raju*, the agency's latest vessel, recently completed by local builder Baltic Workboats on the Estonian island of Saaremaa, has to provide a huge range of competencies from oil spill response or pursuing smugglers, to Search and Rescue or firefighting.The President of the Republic of Estonia, Kersti Kaljulaid, said at the naming ceremony that adding *Raju* to the fleet in the Tallinn base completed a significant modernization of the Border Guard's assets.

This is the biggest patrol vessel built by Baltic Workboats and considered by BWB as start of a new chapter in that it is the first in the company's new range of battery hybrid patrol vessels. It cost a total of EUR 16 056 000 and was funded with the support of the European Union Cohesion Fund, to which 15% was contributed by the Estonian state.

POLLUTION CONTROL

The Baltic Sea will become an Emission Control Area from 2021 leading for a requirement for operators such as the Border Guard to run cleaner vessels- hence the choice to go for a battery hybrid solution.

More than 160 million tons of fuel are transported annually in the Gulf of Finland, and there is considerable shipping traffic in The Gulf of Tallinn. All of this means that the Border Guard fleet must have a steady state of readiness to react promptly to a range of possible pollution incidents.

Raju's state-of-the-art radar is claimed to be able to detect surface contamination, such as from oil spills, up to five miles away. Twin oil booms can then be rolled out, but when not required they stow in carousels beneath the deck.

The aluminium-hulled vessel is designed to operate with a crew of 10 persons, although up to 18 persons can be accommodated onboard when a larger crew is required for longer missions. In the event of a mass casualty SAR emergency it is envisaged that the vessel will accommodate over 100.

INNOVATIVE PROPULSION

The hybrid propulsion plant from Danfoss Editron provides a maximum speed of 27 knots, while the vessel's economic cruising speed is 10-12 knots with a range of 3000 nautical miles. A fully integrated electrical and energy storage system offers the option to run the vessel on full electrical mode up to 12 knots. In the event of a SAR incident or special operation tasking it can deploy an aft garaged 7m workboat or deck launched Rescue Runner.

According to Baltic Workboats' Sales Manager for Patrol and SAR, Edgar Peganov, the real beauty of the Danfoss Editron system is its flexibility: "All the major component parts of the system can be separated and placed optimally in the boat to give lots of options around weight distribution and design constraints. While fitting all the equipment into this 45m boat was not a major struggle for us, we plan to use the technology in much more compact platforms".

The Editron marine system is said to be half the size of a conventional diesel-electric propulsion and power plant system.

Volvo Penta engines turn generators to provide charging to the battery system, or power the propulsion motors. A pair of MTU 4000s provide the diesel grunt for higher speeds. As an early indicator of the vessels use profile, when we visited it a couple of months following launch the Volvo Pentas had 500 hours on them, the MTUs 200 hours. The Lithium ion batteries fit in a quarter sized container on the aft deck, and provide about 25 miles of near silent, battery only, slow speed propulsion, ideal for tasks such as creeping up on other boats in anti-smuggling operations.

The vessel features Baltic Workboats' wave piercing bow design, which has been very popular on its smaller pilot boats due to its documented reductions to vertical accelerations and hence improvement in crew comfort.

To improve the vessel's comfort when loitering or at standstill, it has a wave dampening tank aft of the bridge. This baffled tank can be pumped partially full of 4 tonnes of seawater to reduce rolling, and can be pumped empty again to reduce weight aloft when underway. The idea was inspired by similar systems used on Belgian Navy patrol vessels.

MAIN DIMENSIONS

Length LOA 44.6 m
 Beam 8.8 m
 Draught 2.6 m
 Displacement 235 t
 Power 2 x 2000 kW (MTU 4000)
 Speed 27kn
 Cruising speed 10-12kn
 Range (estimated) 3000 nm @ 10kn
 Crew 10 + 18
 Tank capacities:
 Fuel 30 000 l
 Water 2 000 l
 Waste 3 600 l
 Ballast 14 500 l

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