

Compact port icebreaker is designed and built to deal with Arctic extremes

The 12MW diesel-electric port icebreaker, *Ob*, has been delivered to FSUE Atomflot by Vyborg Shipyard. After commissioning, the vessel will be stationed at the Sabetta LNG terminal in the Gulf of Ob, in the north of Russia inside the Arctic Circle.

Designed by Aker Arctic, the Finnish maritime design and engineering company that specialises in vessels and structures designed to operate in the harshest of icy conditions, *Ob* is the first of its Aker ARC 124 design, described by its creators as the “world’s most advanced port icebreaker”.

This is no idle boast given the vessel’s gestation and development. When Aker Arctic began developing the port fleet for Sabetta LNG terminal in co-operation with Yamal LNG in 2012, the initial evaluation included three potential designs – a conventional design with two azimuthing propulsion units in the stern, an asymmetric oblique icebreaker with three thrusters, and a novel concept with two propulsors in both bow and stern.

It was determined that the most suitable for the heavy, brash ice conditions prevalent in the Arctic LNG terminal would be the quad variant – a configuration never before used in any ice-breaking vessel. Initial technical development of what would become the Aker ARC 124 began with the preparation

of the tender design in 2013. Following the selection of Vyborg Shipyard – to the north of St Petersburg – as the builder and FSUE Atomflot as the operator, Aker Arctic developed the final contract design and carried out ice model tests in 2015.

During this time, the design gradually evolved from initial concept to final design based on main equipment selection as well as close co-operation with the future owner and builder.

In 2015, Aker Arctic submitted the final technical design documentation to the Russian Maritime Register of Shipping (RS) for approval. This documentation also formed the basis of the workshop design at the shipyard.

The keel of *Ob* was laid at Vyborg Shipyard in September 2016, and Aker Arctic continued to provide technical support throughout construction. A launching ceremony took place in September 2018 and a year later the vessel left for sea trials in the Gulf of Finland before being handed over to the customer the following month.

What FSUE Atomflot has at its disposal is a powerful yet compact vessel capable of carrying out a range of duties to support the year-round operations of the LNG carriers transporting natural gas from the Yamal Peninsula.



Measuring 89.2m (including towing notch) x 21.9m with a 7.5m draft, *Ob* has a trio of main engines in the shape of three Wärtsilä 8V31 medium-speed diesel generator sets, each developing 4,880kW, while a single Wärtsilä 4L20 800kW medium-speed harbour diesel gen set provides auxiliary power. Propulsion comes from a quartet of ABB Azipod ICE 1400 thrusters, each providing 3,000kW.

Additionally, the vessel features ABB’s Onboard DC Grid to further improve efficiency and reduce fuel consumption. The DC system allows the diesel engines to operate at variable speed, resulting in lower specific fuel consumption when operating at partial load. Resulting performance is a service speed of 15 knots and a bollard pull of 115 tonnes. During ice-breaking activity, *Ob* can achieve 2 knots in 1.5m of solid ice and 4 knots in brash ice. In addition to its IACS Polar Class 3, the vessel’s RS notation covers Icebreaker 7, KM, [1], AUT1-ICS, FF3WS, EPP, ECO-S, BWM(T), Oil Recovery Ship (>60°C), Tug.

On deck, Croatian specialist Adria Winch has provided a comprehensive set of products designed and built to operate in the extreme cold of the Arctic. A double drum electric towing winch has a pull force of 1,000kN and brake holding of 3,900kN for the first layer. Drum 1 capacity is 1,000m of 75mm diameter steel wire, while drum 2 has 1,000m of 72mm diameter synthetic rope. Hydraulic towing pins have an SWL of 1,300kN, while anchor and mooring winches are also installed.

Adria Winch has also supplied a pair of electrical tugger winches on the aft cargo deck for cargo handling, and these operate alongside a Palfinger DKF 300 electro-hydraulic knuckleboom crane with a maximum SWL of 28 tons @ 5m outreach. The 400m² cargo deck has space for 14 TEU or 12 TEU and two 10-foot containers and is capable of taking a load of 5 tonnes/m².

The fire-fighting system features two Wärtsilä pumps running off the main engines with a 1,200m³/hr capacity linked to a pair of Jason Engineering monitors. A dry chemical powder system includes a dry powder tank

