Baltika proves her capability in arctic ice management

Photo: Gazprom Neft

The world's first asymmetrical icebreaker has successfully been serving as an ice management vessel at the Arctic Gates oil terminal in the Gulf of Ob for two years.

The *Baltika* was designed to operate in Baltic Sea conditions. However, after she was delivered in 2014, she was taken to the Gulf of Ob for ice trials, and surpassed all expectations. Gazprom Neft then chartered her as an interim standby vessel for their Arctic Gates terminal, while waiting for two Aker Arctic designed high capacity icebreakers currently under construction at Vyborg Shipyard.

Three icebreakers

There are currently three icebreakers supporting oil tanker operations in the Gulf of Ob: the nuclear escort icebreaker, *Vaygach,* the icebreaking supply vessel, *Vladislav Strizhov,* and the oblique icebreaker, *Baltika*. The *Vaygach* takes care of breaking the ice, which can be up to two metres thick Arctic ice, and escorts tankers to the terminal. The *Vladislav Strizhov* supports the tankers in mooring. The *Baltika,* which is extremely easy to manoeuvre, keeps the ice channel, the tanker mooring site, and all the icebreakers' parking sites clear of brash ice and ice rubble. She uses her vertical side to push the ice away, her inclined side to smooth the frozen edge of the channel and can also flush brash ice around a vessel while remaining stationary. The oblique mode has not been used for icebreaking, as it is not needed in her current task, and secondly the ice in the region is often much thicker than the *Baltika* was designed for. The oblique mode was, however, tested during ice-trials and showed that the relatively small icebreaker can create a wide channel in the ice by breaking ice obliquely, just as planned. The *Baltika* is also constantly ready for emergency rescue and oil spill response on site.

Aker Arctic's Development Manager, Alexey Shtrek, visited the *Baltika* in the Gulf of Ob in May to gather feedback about her operations and to inspect that the ice load monitoring system on board functions well.

"The feedback from the crew was that no other icebreaker can perform such ice management operations as the *Baltika*, even if they are more powerful," Shtrek says. "The icebreaker master told me that the vessel is easy in operation, however requires practice to steer."

"The unique asymmetrical hull form together with the three free-moving Steerprop propulsion units, two in the stern and one in the bow, are a winning concept."

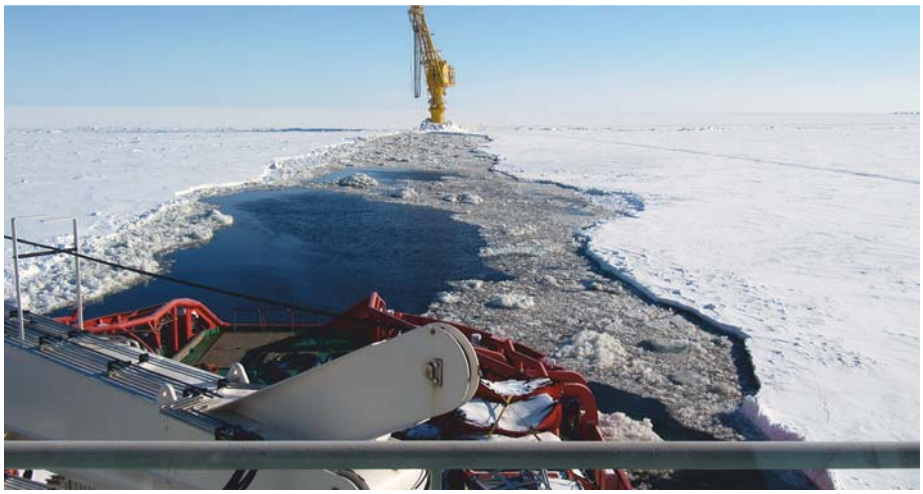
An ice load monitoring system has been measuring ice loads on the oblique side for two years. Data from the measurements will help developers learn more about the asymmetrical hull shape.

Successful transportation system

Five years ago, nobody thought it would be possible to explore this area with temperatures reaching -40 degrees Celsius in winter and with high-strength ice up to two metres thick. Three years ago, there was still nothing in this area during the long winter seasons. Today, there are 250-metre-long and 34-metre-wide 42,000 DWT shuttle tankers arriving every second day to the offshore loading terminal. In May, Gazprom Neft achieved a milestone when the total cumulative oil shipped from the Arctic Gates terminal exceeded five million tonnes.

"The transportation system we have created for this and other arctic projects seems to be working well," says Shtrek.

Aker Arctic developed the powerful Aker ARC 130 A icebreaker design to support tanker loading operations at the terminal. Two vessels, the *Aleksandr Sannikov* and the *Andrey Vilkitsky*, are currently under construction at Vyborg Shipyard and will be delivered this and next year.



The Baltika clears the loading area by pushing the ice away.

Technical specifications

Length	76.4 m
Beam	20.5 m
Draft	6.3 m

Diesel-electric power plant with three Wärtsilä 9L26 generating sets with a total output of 9 MW

Three 2.5 MW Steerprop SP60PULL azimuth thrusters, two in the stern, one in the bow

DP system by Navis Engineering

RMRS Icebreaker6

Built-in oil recovery system

They will have a similar propulsion concept to the *Baltika*, consisting of three azimuth propulsion units: two in the stern and one in the bow of the vessel.

Additionally, Aker Arctic was involved in the development of the 42,000 DWT shallow-draught icebreaking shuttle tankers that were built specifically to transport oil from the Gulf of Ob to Murmansk. The hull form was developed in cooperation with Samsung Heavy Industries and the development work also consisted of ice model testing at Aker Arctic's ice laboratory.

Oblique icebreaker concept

The innovative oblique icebreaker concept was the result of an innovation contest in the late 1990s. The idea was to design an icebreaker which could create a wide channel for oil tankers, without becoming too large and expensive. The exceptional concept received much attention, but construction of the first vessel only began in 2011 after the Russian Ministry of Transport decided to order one for assisting large vessels in icy harbours.

The asymmetrical hull form and the three propulsion units is a winning concept for excellent manoeuvrability.

Meet Alexey Shtrek

Alexey Shtrek joined Aker Arctic this year as Development Manager. He worked previously at the Central Marine Research and Design Institute in St Petersburg, Russia, and has been involved in joint icebreaker projects with Finland since 2002. Alexey was also part of the team of experts investigating innovative proposals in icebreaking technology including the oblique icebreaker concept. During 2011-2013, he actively participated in the feasibility study of the icebreaking LNG carrier for the “Yamal LNG” project. Alexey likes to spend his free time with his wife and two small children, skiing in winter and biking in summer.