Aker Arctic Technology Inc Newsletter

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.

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.

Ice Load Monitoring System on Baltika

The oblique icebreaker Baltika has been equipped with a strain gauge sensor based measurement system to measure ice loads. The system has been up and running since 2014.

An ice load monitoring system was installed on board the Baltika in 2014. As she was a completely new vessel design, Aker Arctic wanted to measure the ice load effects on the new oblique hull form.

“The ice load monitoring system installed on the Baltika included 22 gauges on the port side of the hull,” says Electrical, IT and Automation Team leader Antero Jäppinen. “The display onboard shows only the plain data from each sensor, instead of prediction and the more user friendly graphical user interface, which our current system has. The amount of data that is registered by the system is around 1TB per year.”

In the current version of the ice load monitoring system, there are sensors on several locations around a vessel’s hull. The results are also immediately displayed on a monitor for a clear overview of the load, peak values and the predicted ice load in simplified form. This supports the captain in deciding how to proceed in an ice field and at what speed.

Two different types of sensors can be used, fibre-optic sensors or traditional strain gauge sensors. The advantage of fibre-optic sensors is that they are free of any electrical interference and can easily be installed on both dry and wet tanks. The main advantage of traditional sensors is the lower price range for the overall package.

A new feature under development is to add propulsion monitoring to the system.

“Our plan is to offer an integrated monitoring and prediction system for ice loads on both the hull and the propulsion line in the future,” Jäppinen adds.

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

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