

Aker Arctic has developed an ice load monitoring system to assist the navigator to monitor ice loads against the vessel. A new feature is a prediction tool, which will forecast if there is risk for ice damage and are the ice loads increasing or decreasing. This will be very useful in real-time decision-making.

The ice load monitoring system measures ice loads against a vessel. The results are displayed immediately on a monitor for a clear overview of the magnitude of the load, peak values and most importantly, what is the outlook for the ice load and how large is the risk of ice damage in current conditions. Based on this information, the vessel's captain can make the decision to continue, change heading, slow down or even stop entirely so that the vessel is not damaged from the ice.

Sensors gather information

"We use different sensors which are attached to the vessel's hull," explains Antero Jäppinen, electrical systems specialist at Aker Arctic Technology and responsible for developing the ice load monitoring system.

"When ice loads are encountered, the sensors register the pressure and send the information to the monitoring system. Part of our job is to find the optimal location for the sensors so that the measurements are accurate."

Based on the information gathered by the system, we can offer the owner a season analysis where we analyse the ice load pressure and vessel data over the entire season. This is especially useful if the ship has been damaged and the owner wants to know how it has happened and learn to avoid damages in the future.

On-line monitoring

Another new feature will be online monitoring. This means that, depending on a vessel's communication system, we

Ice load monitoring and prediction helps in decision making

The oblique icebreaker Baltika has been equipped with sensors, which measure ice loads.

can monitor system condition and send warnings if necessary. Previously, the measurement data has only been available later when somebody actually has collected the hard drive from the ship.

"The possibility to forecast ice loads is really important," Jäppinen emphasises. "When you drive into an ice field and the vessel is designed to manage a certain load, it is a crucial information to know how the ice load will develop. Is it likely that it will increase, can the vessel continue, should speed be lowered or course changed, or should the vessel stay still and wait? Based on the prediction, the captain can make informed decisions."

"The ice load monitoring system is currently available. We have already used it to measure ice loads on vessels such as the oblique icebreaker *Baltika*.

Measurements and analyses are part of our expertise. What we are now improving

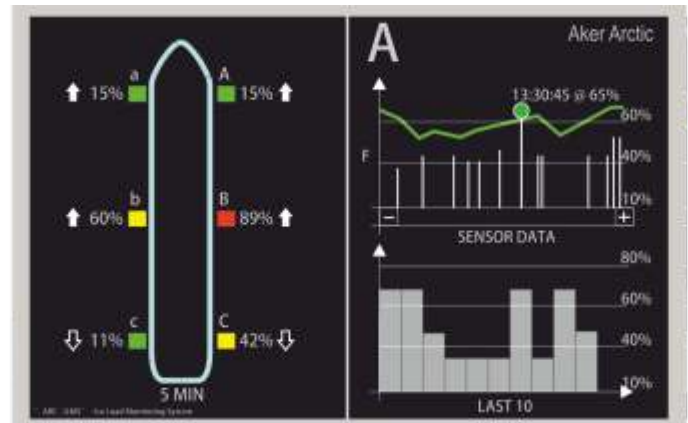
are the algorithms for the load prediction and the user interface. Our aim is that the improved system is ready for actual use in early autumn."

Aker Arctic Technology Inc and Light Structures AS have signed a cooperation agreement when working exclusively with fibre-optic sensors. Light Structures has a long experience in fibre-optic sensor and measurement technology. Our package can be offered as part of Light Structure's scope and vice versa.

The benefits of the ice load monitoring system:

- season analysis of measured data
- allows use of various sensor technologies
- ice loads forecasting function
- online monitoring and warning

The ice load monitoring system is a very useful tool for predicting ice loads on a vessel. It will help the captain to make informed decisions.



Meet Antero Jäppinen

Antero Jäppinen joined Aker Arctic last year as specialist in electrical systems at the Engineering department. He was previously at Edec Oy, where he worked 10 years as project manager in electrical design projects. Antero also has a solid background in shipbuilding from working twelve years at Helsinki Shipyard, Kvaerner Masa Yards.

In his free-time, Antero is involved in a wide range of activities. Apart from spending time with his wife and two children, being a radio amateur and a technical delegate for the Finnish Red Cross international delegate reserve, he likes to repair old machines and equipment, work in the garden and forestry.

