



The ice simulator offers an excellent tool for both planning and training operations in ice.

Ice simulator reduces risks

Requirements of safety and risk elimination are top priorities in the Arctic. With the new Aker Arctic developed ice simulator, operations in ice can be simulated and vessels' behaviour in ice can be practised in advance, which greatly reduces risks for accidents. It is also useful in the planning stage and therefore reduces investment risks for ship owners.

Aker Arctic's Ice simulator offers an excellent tool for simulation and training. It is based on the knowledge of ice we have gathered for decades in our database, made into a visually appealing program and installed at The Finnish Maritime Academy Aboa Mare in Turku. Aboa Mare has trained seafarers now for 200 years.

The ice simulator is in use on two of their ship bridges and they help students grasp what it really feels like navigating a vessel through ice. Individual vessel designs can be programmed into the simulator so that a new or planned vessel can be tested before it is constructed. The ice simulator is also sold separately for use at customers' own premises.

Both for planning and training

"The ice simulator is a tool that can be used in many stages of a vessel project. In the planning stage it can be used to test how a ship design will function in ice. A ship owner can also use it when planning operations. Before sending a fleet on a mission the situation can be simulated in order to evaluate e.g. how many ships will be needed. It can then be used to train the icebreaker crew or commercial ship crew," Project Manager Jorma Koponen explains.

The ice simulator now features icebreaking in different ice types, cutting a vessel loose from ice and propeller washing. It is constantly being improved and new features added. Next to come are close towing in ice, inclining effect of ships and maybe in the future, calculation models for e.g. fuel consumption, depending on the specific needs from customers.

"A practical example is for instance towing in ice, which is extremely challenging as the vessel being towed can push the assisting vessel into a difficult position against an ice ridge. With the simulator this can soon be practised, therefore substantially reducing risks when performing such an operation in a real-life situation," Mr Koponen adds.

Lower investment risk

"We can now offer our clients the entire package: from planning and designing to testing and training. And most of it can actually be done before constructing the vessel when plans can still be changed. This is a new possibility, which greatly reduces also the monetary risk of investments," Mr Koponen emphasises.

First feasibility study using ice simulator

We have recently done our first feasibility study for a customer who wanted to simulate how a planned port would function and how vessels would move in that port. Our customer was able to navigate a transportation vessel and an assisting icebreaker in different ice circumstances and in different wind conditions in order to see if plans would work as intended, or if there was a need for adjustments. The ice simulator was programmed to include exact designs of the port and the two vessels for an accurate simulation. The simulation took place in Turku at Aboa Mare's training premises last July.

"The customer was really happy with the possibility to have a full-mission simulator study to test the viability of the port design and find operational limits for the port and the vessel in year-round conditions. Later when the vessels are constructed, the crew can be trained using the same simulator," Mr Koponen tells.



Our customer used the ice simulator to navigate a transportation vessel and an assisting vessel in different ice and wind conditions in order to see if plans would work as intended or if there was a need for adjustments.

Safe winter navigation on the Baltic Sea

The European Union is funding a project called Winmos, where the plan is to develop safe winter navigation on the Baltic Sea. Our ice simulator is also being developed as part of this project, with an educational program jointly with Kalmar Maritime Academy. The Finnish Meteorological Institute is additionally planning an icebreaker plot, a situation awareness system, which would provide icebreakers with satellite images of ice-covered areas and show the vessels moving in that area for improved safety.



"The visual choices in our ice simulator are realistic and therefore it is easy to use and trust," Mr Koponen says.
 "The cost for using the ice simulator is low in comparison with all the possibilities it offers in increased safety and preventing accidents in winter navigation."

Aker Arctic Ice Simulator is shown at SMM Exhibition in Hamburg in September.

Meet Jorma Koponen

Jorma Koponen joined Aker Arctic last April and is responsible for developing the ice simulator and bringing it to the market. He began his career building boats, proceeded to marketing and then studied to become a Captain at Aboa Mare in Turku. He transferred from Navis Engineering Oy, where he was selling DP units equipped with simulators. Being a captain himself, he says he can really understand the needs of ice-going vessels' skippers.
 "Navigating in ice is a challenging situation for a captain, and the chance to practice in advance with the ice simulator is simply fantastic," he says.
 Jorma spends his free time with his wife and two boys. He has a special hobby: orienteering with his six brothers.

