French polar logistic vessel delivered

L'Astrolabe, the new Polar Logistic vessel for France, left metropolitan France towards her home port at Reunion island in the south of the Indian Ocean to carry on Antarctica missions according to the original plans, and schedule.

Aker Arctic was awarded the basic design contract for the French polar logistic vessel in June 2015. By January 2016, the design work and model testing was completed. The steel hull was constructed in Poland and then towed to Concarneau in France, where the vessel was outfitted and finalised for the past 7 months at Piriou Shipyard.

Inclining tests were performed in May 2017, when the vessel was nearly ready. The lightweight and centre of gravity of the ship were determined in the successful tests.

In June 2017, open water tests were successfully completed, where performances such as speed, endurance, noise and vibrations, turning and manoeuvrability of the vessel were tested.

Positive feedback

Project Manager, Anders Mård, and Managing Director, Reko-Antti Suojanen were present during the name giving ceremony in Concarneau on 12th of July when the vessel was named the *L'Astrolabe*. Speeches from the Minister of Overseas, Annick Girardin, and CEO of Piriou, Pascal Piriou, were held before the name giving ceremony.

“We received very positive feedback about Aker Arctic's efforts on the project from all the parties involved,” says Mård.

The *L'Astrolabe* was delivered in September 2017. Soon afterwards, she will be deployed for her first supply mission to Reunion Island in the Indian Ocean, where she will operate as a patrol vessel during the southern hemisphere's winter. From Reunion, she will sail to Hobart in Tasmania for her first cargo loading and then continue to the French research station, Dumont D'Urville, in Antarctica. During the southern hemisphere's summer months she will complete four resupply trips between Hobart and Antarctica.

TAAF - the French Southern and Antarctic Lands, IPEV - the French polar Institute and the French Navy will jointly own and operate the new logistic vessel. She will replace two existing ships, the L'Albatros and the former L'Astrolabe.

Technical solutions

The fairly compact sized polar logistic vessel, based on a concept design issued by the French engineering company Marine Assistance, is fitted with two shaft lines. Its four main engines are Wärtsilä 8L20 engines with a total propulsion power of 6.4 MW. Two sets of engines are connected to one reduction gear on both sides of the ship. The reduction gears can be connected to power take out (PTO) generators (with 500 kW power each), used mainly for operating of bow thrusters. The electricity required by the ship is supplied by two auxiliary generator sets.
All main engines and auxiliary engines fulfil the IMO's Tier III regulations, with reduced NOx emissions as a result.

The two shaft lines are equipped with controllable-pitch propellers (CPP), which have the advantage of being able to navigate the ship at different speeds without changing the rotation direction of the engine. With this setup, the ship also has a faster response, which comes in handy in icy waters.

The vessel is capable of carrying various goods onboard, such as containers, heavy construction work equipment, pallets and liquid drums in the cargo hold or on the aft exposed deck above the cargo hold. The ship has a deadweight of about 1,600 tonnes and can also fit two helicopters.

Model testing

Ice model tests in the Aker Arctic test basin verified that the design fulfils all requirements. The vessel can break 80 cm of level ice at a speed of 2 knots. It is capable of navigating in areas with second year ice and can also sail through a stretch of coastal ice with a concentration of 10/10 up to 1 m thick. Furthermore, it can penetrate through ice ridges in ramming mode.

Aker Arctic also performed the seakeeping model tests in order to ensure that the vessel can manage in the rough sea conditions of the southern Atlantic.

“We additionally performed resistance and propulsion model tests in order to obtain more precise information about the performance of the vessel,” Mård explains.

Construction support

In addition to basic design and testing, Aker Arctic provided technical support to the shipyard during the entire construction period. Aker Arctic's specialists visited the shipyard for a few days at regular intervals to ensure that aspects necessary for an ice-going ship were taken into account in the construction work.

Mård says it has been a very positive shipbuilding project and mentions especially the tight schedule that was maintained from the start of the project.

“As with most Aker Arctic projects, this is a special vessel which is custom designed for its intended use. It's a one of a kind vessel and to keep to schedule without delays is an excellent achievement for a shipyard building a high ice class vessel for the first time.”

Piriou Shipyard states that collaboration with Aker Arctic was found to be very constructive. "It was a very interesting experience for Piriou to share Aker Arctic's experience and skills in designing and building ice and arctic vessels. Aker Arctic and Piriou teams have worked together in order to find the best technical solutions to achieve the vessel's performances and to meet the tight schedule for her delivery. Despite differences in cultural and shipbuilding practices, the two parties have worked together with positive dialogue in order to succeed in this challenging project."

Meet Anders Mård

Anders began his career at Aker Arctic in early 2011 when he was still studying at Aalto University. He worked at the ice model testing facility preparing ice, arranging tests and outfitting the ship models. In 2012, he transferred to the ship design department as project assistant for the Chinese research vessel. A year later Anders finished his master's thesis titled, “Experimental study of the icebreaking Trimaran” and graduated as a naval architect.

Since then he has worked as project engineer in different research icebreaker projects and as discipline manager for the research discipline for the Chinese research vessel. For the French polar logistic vessel, Anders first worked as project engineer and later as project manager.

In his spare time Anders spends time with his family and friends. He also enjoys playing disc golf and the guitar.