

04 December 2008: Technical Design of the new European Research Icebreaker „Aurora Borealis“ finished Icebreaker, Deep-Sea Drilling Vessel and Multi-Purpose Research Ship for the Polar Seas

Berlin. The Alfred Wegener Institute for Polar and Marine Research in the Helmholtz Association and the engineering company Wärtsilä Ship Design Germany (formerly Schiffko GmbH) today presented the technical design of the European Research Icebreaker „Aurora Borealis“ in Berlin. „Aurora Borealis“ will be a unique vessel – a combination of a heavy icebreaker, a scientific drilling ship and a multi-purpose research platform that can operate year-round in all polar waters.

The construction of the „Aurora Borealis“ was already recommended by the German Science and Humanities Council back in 2006. The anticipated construction costs as of 2008 are around 650 Million Euro. The German Federal Ministry for Education and Research funded the technical design process and planning works with 5.2 Million Euro, as a precondition for a later realisation.

Subject to the condition of sufficient financial support, the preparations for the construction of the vessel shall be finished by 2011. Construction itself could start as early as 2012, resulting in the first scientific operations in about 2014.

This most sophisticated research vessel worldwide shall be realised within a European Cooperation. European nations have a particular interest in understanding the Arctic environment and its potential for change because their territories reach into high northern latitudes and because Europe is under the steady influence of, and in exchange with the Arctic environment. Therefore, „Aurora Borealis“ was included in the priority list of the European Commission's „European Strategy Forum on Research Infrastructures“ (ESFRI) within the 7th Framework Program as one of only seven projects in the „Environmental Sciences“ section. Following up on this process, fifteen institutions and agencies from ten European nations, including Norway and the Russian Federation, have founded the „European Research Icebreaker Consortium“ (ERICON), which is funded by the European Commission for the preparatory phase with 4.5 Million Euro.

Germany has gained a remarkable reputation in polar research with the operations of the research icebreaker „Polarstern“ for more than 25 years. The Alfred Wegener Institute alone is globally connected by more than 74 cooperational agreements to the most important international research centres for polar and marine research. While „Polarstern“ will be available for German polar research as before, „Aurora Borealis“ shall strengthen the operational capabilities for the science community, enabling German and European scientists to maintain a sustained leading position in the international scientific competition for the next decades to come.

To date, research icebreakers of comparable size and capacity for year-round autonomous operations in all polar waters are neither available for commercial nor for scientific operations worldwide. Thus „Aurora Borealis“ shall facilitate for the first time all-seasons expeditions into some of the most extreme realms of our planet and help gain new insights into the history, the climatic variability and the present environmental conditions of the polar regions.

If the unresolved questions of climate change and variability are to be answered, one has to access the Arctic Ocean to perform scientific drilling – and be prepared for pack ice. „Aurora Borealis“ will thus be equipped with a drilling rig that enables researchers to drill more than 1000 m into the sea-floor, in water depths between 100 and 5000 m. For the first time, scientific deep-sea drilling will become possible even in drifting pack ice, without support by additional icebreakers. To perform these drilling operations, „Aurora Borealis“ has to be kept exactly on position in the floating ice. A dynamic positioning system capable for manoeuvring in ice is mandatory for this task – an absolute novelty in the shipping industry. Extensive model tests in the ice tanks of the Hamburg Ship Model Basin (HSVA) and Aker Arctic Helsinki have proven that „Aurora Borealis“ is indeed able to dynamically position in ice cover with thickness of two metres and more.

Another unique characteristic of „Aurora Borealis“ are the two moon pools of seven by seven metres. These are continuous vertical funnels in the midst of the hull into the water below the vessel that enable scientists to deploy their equipment into the ocean without being subject to wind, waves and ice. The aft moon pool is mainly dedicated to drilling operations, while the forward moon pool is reserved for most other scientific works. This allows as a first the deployment of very sensitive and expensive equipment, e.g. remotely operated or autonomous underwater vehicles within closed sea ice cover. Scientific laboratories are located on several decks around the moon pool, which is designed in an atrium-like shape with circular walkways and preparation areas. In order to optimally equip the ship even for any kind of specialised expeditions, containerised laboratories can be also loaded here and become fully integrated into the scientific workflow on board.

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Notes for editors:

More photos and video material can be obtained from the communication department of the Alfred-Wegener-Institute (www.awi.de).

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