

CONCEPTUAL & ENGINEERING DESIGN FOR NAVAL SHIPS, COMMERCIAL VESSELS & OCEAN ENGINEERING STRUCTURES

The Krylov Institute is traditionally involved in the conceptual design studies with the goal to define the outlines of most prospective ships. In the recent years, these studies have become especially important. One of the reasons is steady growth of demand in special marine installations and associated transport required for development of organic fuel and other mineral resources at the Russian sea shelf. Besides, ships and vessels are required for new developments and shipping routes. Therefore, conceptual design studies encompassing determination of advisable configurations, types and characteristics for these installations and vessels are of great value.

A new important area of activities in the past decade is direct project development of commercial vessels and ocean engineering structures. Recently, a great amount of conceptual design research has been devoted to modeling of emergency situations including fire propagation on board the ship. Finally, conceptual and engineering design studies have been required for profound restructuring of the shipbuilding industry, merging of companies, enhancement of national defense and industrial security, development of scientific and technological potentials. Fundamental, advanced and applied research work accomplished at the Krylov Institute in 2004-2005 is described below.

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DIESEL-ELECTRIC ICEBREAKER PROJECT DEVELOPMENT

The Krylov Institute in cooperation with CDB Baltsudoproekt affiliate has developed the technical design basis and work design documents for a line diesel-electric icebreaker for navigation in the Baltic Sea. The project number is 21900.

The icebreaker designation:

- ▶ Pilotage of large-tonnage vessels 40-50 m in breadth in the Gulf of Finland during winter;
- ▶ Towing of vessels and other floating rigs in ice and ice-free water;
- ▶ Fire-fighting operations;
- ▶ Salvage and rescue operations, emergency aid to ships under ice conditions and in ice-free water.

Architectural & design type: double-decker with long forecastle, amidships engine room, two fully steerable podded propellers and bow thruster, with accommodation superstructure shifted to the fore and weather deck in the aft end.

The vessel shall be built in accordance with the Russian Maritime Register of Shipping rules and under RMRS supervision for KM *LL6 [2] A1 P1 class.

The vessel will comply with the requirements of international, national and regional regulations, conventions and rules duly amended and annexed thereto in force at the beginning of 2005.

Basic engineering solutions for the icebreaker have been made based on a set of theoretical investigations and model tests in hydrodynamic, ice and seakeeping test tanks. The performed tests and studies have allowed achieving high parameters of propulsion and ice-breaking abilities of the vessel and steering in ice-free water and in ice.

Compliance of icebreaker parameters to all requirements of contract specification has been confirmed by the tests. The structure and quality of engineering project documents have ensured the tightly scheduled issuing of work design documents and specifications allowing to launch construction of the vessel prior to completion of detailed design stage.



21900 project line diesel electric icebreaker