

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

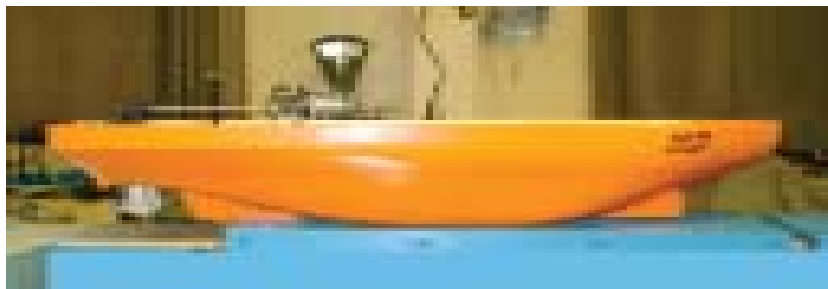
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Icebreaker model tests in test tank

Main particulars of 21900 project line diesel-electric icebreaker	
Area of navigation –	unlimited
Operational area –	Baltic Sea
<i>Operating conditions:</i>	
Water temperature	-2 – +32°C
Ambient air temperature	-30 – +35°C

A set of numerical & experimental studies has been completed for 21900 project icebreaker maneuverability in ice-free water. It was revealed that initial icebreaker version had good turning abilities, but straight-line stability was unacceptable. Recommendations have been elaborated and experimentally verified for increase of deadwood area providing satisfactory stability characteristics.



21900 project icebreaker model prior to experimental studies of maneuverability in the ice-free water

DEVELOPMENT OF DESIGN DOCUMENTATION

In 2004-2005 The Institute (CDB Baltsudoproekt) has completed conceptual and engineering design studies. The main outcomes are stated below. Due to extensive development of northern oil fields and active development of oil ports in the Baltic Sea, CDB Baltsudoproekt has continued studies aimed at upgrade of Murmansk Shipping vessels to ensure oil offloading, and retrofit of the sea tugs with skippers to clear the oil spills for the Russian Ministry of emergencies.

Engineering detailed design for upgrade of "Klavdiya Elanskaya" steam vessel

**Purpose of upgrade:** Improvement of the vessel maneuverability

**Scope of upgrade:** Engineering detailed design is developed for installation of bow thruster. Design documentation and specifications has been worked out for the hull, ship gears, ship systems, mechanical and electrical equipment.



"Klavdiya Elanskaya" steam vessel

Detail review of upgrade for "Marshal Krylov" floating command & instrumentation complex

**Purpose of upgrade:** Improvement of ship electronic and computer aids, i.e. instrumentation complex to fulfil urgent and complex engineering tasks.

**Scope of upgrade:** Complete replacement of computer complex, electronic computers EC-1045 (3 sets) with peripheral devices for automated workstations based on modern electronic & computer engineering for multiple enhancement of special ship system speed with respect to better processing of data.

Engineering detailed design for upgrade of 745 project tug

**Purpose of upgrade:** Retrofit for frontier service as a frontier speed craft.

**Scope of upgrade:** Complete upgrade including replacement of all radio communication and navigation aids.



"Marshal Krylov" floating command & instrumentation complex