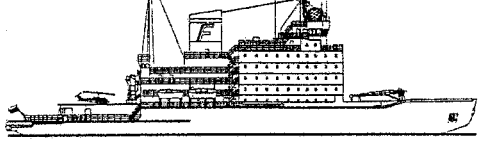

Icebreaker *KAPITAN KHLEBNIKOV*
Ледокол **Капитан Хлебников**

The ship is a Kapitan Sorokin class, Diesel electric ice-breaker operated by the Far East Shipping Company (FESCO) of Vladivostok, Russia. There are three other vessels of this class: *Kapitan Sorokin* (launched 1977), *Kapitan Nikolayev* (1978), and *Kapitan Dranitsyn* (1980) [first two were lengthened in 1990]. These four shallow draught escort ice-breakers are designed to operate in the Arctic Ocean entering northern Siberian deltas in ambient temperatures down to -50°.

Kapitan Khlebnikov was built in Helsinki by the Wärtsilä company and launched on 5 November 1980. Modifications for carrying passengers were made in 1992 after which she has operated in waters of the Antarctic, Greenland, Canadian Arctic, and Alaska as well as off Siberia. The ship is named after Yuriy Khlebnikov, a mariner with exceptional experience in Arctic navigation and the Northern Sea Route.

Port of Registry: Vladivostok, Russia. Number: M 17454. Radio call sign: UGSE.
Displacement tonnes: 15 000 (full load).
Length; 121 m (waterline), 132·4 m (overall); breadth 26·75 m; draught 8·5 m; height 48·7 m.
Main engines: 6 Wärtsilä-Sulzer 9 cylinder ZL40/48 Diesel sets developing 18·5 MW (24 200 horse-power) which drive 6 AC generators. The current is rectified for the propulsion motors.
Propulsion: 3 twin DC electric motors, each producing 5400 kW in either direction turn the 22 m long propeller shafts (a spare shaft is carried). Switch gear can change the speed and direction of the propellers at about 1% a second (thus 100% forward to 100% astern may be accomplished in some 200 seconds).
Propellers: 3, fixed pitch, 4·3 m diameter with 4 hardened steel blades turn at from 120 to 180 revolutions a minute. Spare blades are carried which can be deployed at sea.
Steering: 1 rudder, protected by an ice horn, can move through 35° either way. Propellers and the air curtain may be used to assist steering.
The ship may be navigated from 3 positions on the bridge and from an aft auxiliary bridge (ice can also be broken when going astern).
Full speed: 20 knot (36·5 km h^{-1}) with 6 engines; cruising speed 16·5 knot (30 km h^{-1}) in calm open water; soft first-year ice 1½ m thick may be broken continuously at 1 knot (1·8 km h^{-1}). Repeated ramming allows ice 3 m thick to be broken.
Operating range: 10 500 nautical miles (19 500 km) at 16 knot (30 km h^{-1}).
Auxiliary power: 5 AC generator sets developing 1600 kW (2200 horse-power).
Heating: two boilers provide water for the heating systems, and supply water and steam
Fuel consumption, daily: 6 main engines, 13 tons each; 5 auxiliary engines, 2·5 tons each; 2 boilers, 3 tons each; 2 air curtain systems, 2·5 tons each.
Maximum daily fuel use breaking severe ice: 78 tons (11 December 2005) and 72 tons (5 January 2006), both in Ross Sea
Oil capacity; 3300 tons heavy fuel (main engines and boilers), 400 tons light fuel (auxiliary engines), 33 tons helicopter fuel
Anchors: 2 weighing 6 tonnes each, with 300 m chains, one spare.
Hull thickness is 45 mm where ice is met (ice skirt) and 22-35 mm elsewhere.
Powerful searchlights are used for winter operations in darkness.
Complement: 76 during normal operations (60 for a passenger voyage).
An air curtain system can be deployed to assist ice-breaking (air at 2·5 kg cm^{-2} may be discharged through vents from forward to midships 2 m above the keel).
Ice friction is reduced by polymeric coatings on the lower hull (ice skirt).
An ice knife is fitted 26 m aft of the prow.
Hull is double with water ballast between them; there are 7 bulkheads, which allow the ship to be divided into 8 watertight compartments. Rib centres are 40 cm apart.
A cushioned stern allows close-coupled towing when vessels are being assisted through ice.
Pumps can move 74 tonnes of water a minute between ballast tanks (fore and aft) and heeling tanks (athwart ships). This allows motion of the hull to sally the ship in ice, and adjustment of the depth of the ice knife, or propellers
Fresh water is provided from a vacuum distillation apparatus heated by exhaust gasses, this is supplemented by reverse osmosis apparatus. A maximum of 80 tonnes daily can be produced.
Helicopters are carried to assist ice navigation.
Radar equipment includes ice detection systems.
Communications are HF and VHF systems, and satellite apparatus adapted for high latitudes.
Navigation equipment has satellite, gyroscopic, and inertial systems, as well as conventional instruments.
Safety equipment includes 4 fully enclosed life-boats and 4 inflatable life rafts (total capacity 264 persons).
Deck cranes: 2 forward can lift 3 tonnes each, and 1 aft lifts 10 tonnes.
The icebreaker is equipped to undertake rescue operations with fire-fighting apparatus (3 water and foam jets powerful salvage pumps, and emergency accommodation).

R. K. Headland. 26 January 2006