

POWER PLANTS FOR NAVAL SHIPS, COMMERCIAL VESSELS & OCEAN ENGINEERING STRUCTURES

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of liquid carbon dioxide in the spherical pressure casing of the power module;

- justify development of the power module with electric power of 30-40 kW and capacity of 240-320 kWh based on CLE with internal diameter of 1.9 m and operating diving depth of up to 2000 m. It is characterized by enhanced safety against fire- and explosion risks due to the filling in of the free volume with carbon dioxide and its automatic supply and extraction.

These results will find practical application in the design of APP with CLE for various underwater vehicles.

RESEARCH & DEVELOPMENT OF MARINE HYBRID POWER GENERATING PLANT WITH APPLICATION OF ELECTROCHEMICAL GENERATORS AND WASTE-HEAT RECOVERY GAS TURBINE GENERATORS

Application of hybrid power generating plants with the use of electrochemical generators based on the high-temperature fuel cells and waste-heat recovery gas turbine generators provides up to 50-60% increase (depending on the load) in the total electrical efficiency of the vessel PP and ensures ecological indicators for emission of harmful substances at the level of the best standards. Introduction of low-potential heat recovery circuit for general ship purposes may increase the power plant efficiency up to ~ 70%. The performed studies have enabled to:

- develop design tools for determination of heat & physical and energy parameters of hybrid power plant;
- develop the circuit diagram for a hybrid power generating plant and define its basic parameters;

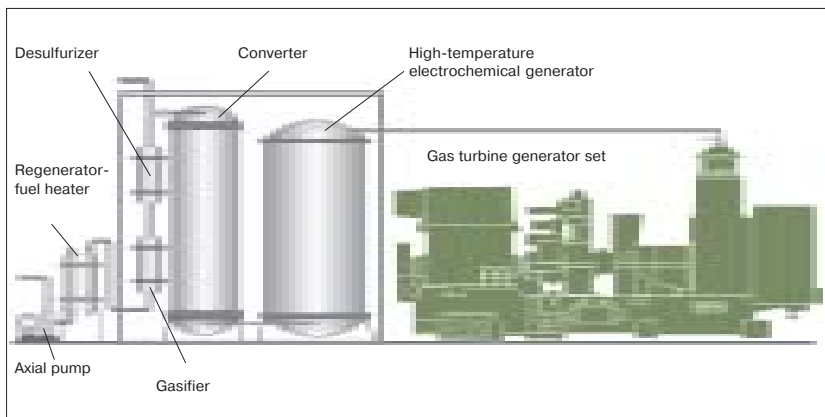
- identify the main equipment and its preliminary arrangement within the marine hybrid power generating plant.
- The obtained results will find practical application in the design of marine power plants of the stated type.

MAIN POWER PLANTS FOR FLOATING POWER STATIONS

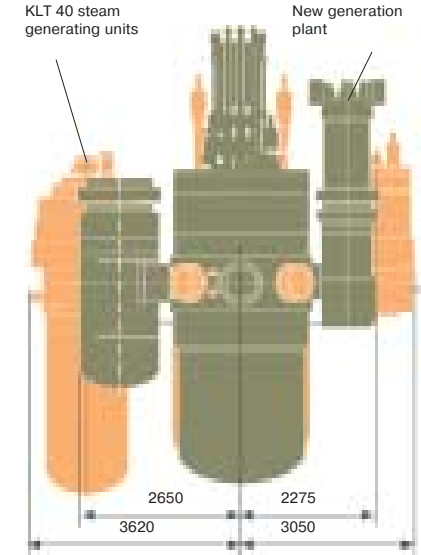
The Krylov Institute is presently conducting studies aimed at outfitting of floating power plants with various types of power plants. Nuclear power plant (NPP) The studies have been accomplished for the NPP of the floating power station with reactor plant capacity of about 150 MW. The performed work has enabled to develop proposals for the power plant arrangement including the following:

- More compact and standardized (as compared to the prototype - project 20870, JSC "CDB Iceberg") steam generating plant of a new generation for floating power stations and nuclear-powered icebreakers;
- Main turbine units (2 x 37 MW or 2 x 25 MW in non-derating version), where each unit consists of high- and low-pressure turbines with intermediate steam separator in the receiver.

Utilization of improved propulsion plant will enable to reduce displacement of floating power unit (FPU) as compared to the prototype for 3000 t, as well as to increase the total sales volume of supplied heat and electric power by 20%.



Main equipment of hybrid marine power generating plant. Layout diagram



Comparison of dimensions for steam generating units of KLT 40 plant (four steam generators, four CNPK) and new generation plants (two steam generators and two CNPK)