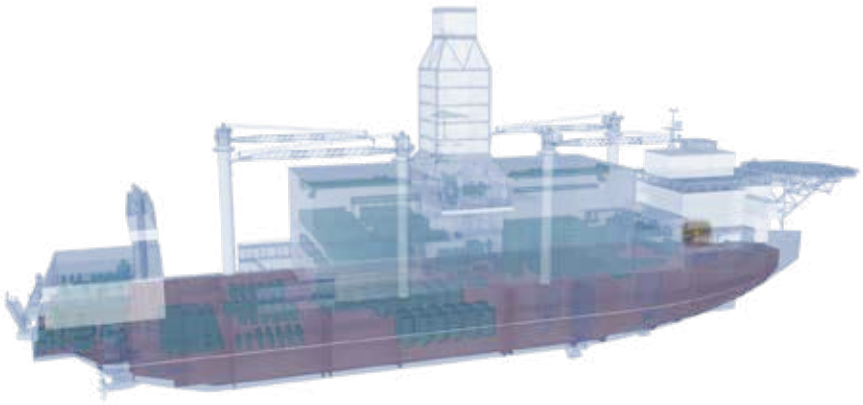
RUBIN DESIGNS OFFSHORE FACILITIES FOR ARCTIC EXPLORATION

Rubin's contribution to the Prirazlomnoye project is recognized very successful

St.Petersburg JSC «CDB ME «Rubin» being a part of JSC «United Shipbuilding Corporation» is well known both in Russia and abroad as diversified design bureau for design of various marine facilities. Yet in recent decades the Bureau has become actively engaged in civil marine engineering and first and foremost in creation of offshore facilities for offshore oil and gas field development on Russia's Arctic and Far East shelf.

Experience and capacities of CDB ME «Rubin» encompass the whole range of engineering services, from concept design to maintenance engineering of offshore installations and structures.

Contribution of CDB ME «Rubin» as one of the leading designers to the development of offshore ice-resistant fixed platform Prirazlomnoye proved to be a remarkable success. Prirazlomnoye oil field is the first implemented project of offshore hydrocarbon field development in the Arctic region, with no immediate parallels worldwide. The platform stationed in harsh Arctic shelf conditions alone provides for the entire oil production cycle from well drilling and primary crude oil processing, to storage and offloading to tankers. The platform was put into operation in 2011, and oil export has already surpassed 10 mln tons. At present, CDB ME «Rubin» continues to render



Equipment for offshore drilling units will be designed and manufactured in Russia

Subsea Facility for Seismic Survey

services to LLC «Gazprom Neft Shelf» within the framework of Prirazlomnoye platform maintenance engineering.

Other offshore oil and gas facilities, design and construction of which involved considerable portion of work of CDB ME «Rubin», include platforms for Sakhalin shelf created under the Sakhalin-1 and Sakhalin-2 projects and put into operation in 1999-2015.

Expanding the scope of its activities, the Bureau also designed unique marine engineering facilities for different purposes not related to the hydrocarbon field development. For instance, the most sophisticated engineering elements of St. Petersburg Flood Protection Barrier — floating sector gates for S-1 Navigation Pass — were constructed to the design developed by CDB ME «Rubin» and put into operation in 2011. Since putting the Barrier into operation, more than fifteen floods have been prevented thanks to the floating gates, and specialists of the Bureau provide support to the operating agencies in aspects related to the stable operation of these objects.

Under conditions when Russian oil and gas sector must be technologically independent from foreign suppliers to the maximum extent feasible, experience and competence of CDB ME «Rubin» in developing offshore facilities and their technical equipment is gaining significance. In 2018 within the framework of the Platform project, completion of certain activities marked an important stage of meeting objectives of developing Russian equipment for offshore drilling units. Within the project, composition of major completing equipment for the offshore drilling units and requirements for the equipment were validated, possibility of this equipment being manufactured by Russian companies was assessed, and proposals for development of equipment with production not yet mastered in Russia were put forward. Technical assignments for R&D efforts were drawn up and studied jointly with PJSC «Gazprom Neft» and potential contractors. This equipment, for which requirements were formulated in the course of project activities, shall ensure development of new offshore drilling units out-performing those floating drilling units presently used on the Russian shelf.

Presently, CDB ME «Rubin» suggests implementation of a number of new projects and lines of work enabling development of the Arctic shelf. Scientific and technical project on Subsea Technologies for Underwater (Under-ice) Development of Mineral Deposits in Arctic Seas ('Iceberg') implemented at the request of Russian Foundation for Advanced Research Projects comprises a number of sub-projects united by a common objective of developing technologies and facilities that ensure fully sub-sea (sub-ice) development of hydrocarbon fields for permanently (all-year) ice covered zone, as listed below:

- Subsea Power Plant, ensuring power supply to engineering facilities developing hydrocarbon fields underwater.

- Subsea Drilling Facility, intended to perform the full work cycle of underwater construction of wells.

- Subsea Facility for Seismic Survey, performing seismic survey (from regional 2D to detailed 2D-3D and monitoring 4D).

- Subsea Transportation & Installation and Service Facility, ensuring transportation, installation, removal, repair, and maintenance of the underwater engineering facilities.

- Integrated Safety System, ensuring safe operation of sub-sea hydrocarbon fields development facilities in the remote Arctic areas.

At present, CDB ME «Rubin» is developing a comprehensive seismic survey method using a group of autonomous unmanned underwater vehicles (AUVs), providing various options of sub-sea (sub-ice) seismic survey both at the bottom and in water mass, similar to towing of streamer cable through the water.

The goal of JSC «CDB ME «Rubin» is to make the best use of undertakings in diversification so as to dynamically build up competence, working in the face of fierce competition with Russian companies.