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FLOATING AND GRAVITY-BASED DRILLING PLATFORMS

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In offshore drilling (i.e. exploration and production of oil and gas in the oil fields, so-called offshore zones) mainly offshore rigs are used. They are conventionally divided into two classes – floating and stationary (fixed). As is known, the cost of offshore oil and gas field development accounts for over 50% of all investments. Suffice to say that the value of certain oil and gas production platforms reaches 1-2 billion dollars. For example, deep gravitational field Troll platform operating now in the North Sea is estimated at over 1 billion dollars. [2] When using the mobile jack-up drilling rigs or semi-submersible platforms, wellhead equipment after drilling can be located on the bottom of the sea. In such cases, a number of companies in the US, UK, France developed a set of equipment with remote control. However, with increase in the depth of development and in the sea water areas with moving ice fields the method of bottom wellhead location is preferred. [3] Gravitational platforms differ from metal pilings ones both in construction, materials, and manufacturing, transportation, and installation in sea. The total resistance of gravity platforms under the influence of external loads from waves and wind is provided by their own weight and the ballast weight, so there is no need to mount the piles to the seabed. Gravitational platform are used in the seawater areas where strength of the sea ground provides strong resistance structures. [2] The analog of this technology is the platform "Prirazlomnaja". The Prirazlomnoe field (Khanty) is located on the shelf of the Pechora Sea, 60 km from the coast (stl. Varandey). The sea depth in the area of deposit is 19-20m. Design characteristics:

- cumulative production of oil - 75 million tons;
- profitable development period - 22 years;
- the maximum production level - 6.6 million tons / year. [1]

Prirazlomnoe field operated since 1986. In 2011, at the Prirazlomnoye oil field marine ice-resistant stationary platform of gravity type was established. It was made in Russia. "Gazprom" began to work at the Prirazlomnoye field in December 2013. The cost of the project amounted to about 100 billion rubles, including the 60 billion cost of the oil platform. The largest shipping company Sovcomflot built two Russian ice tankers with deadweight of 70 thousand. tons, which will run between Prirazlomnoye and floating terminal "Belokamenka" on the roads of the Kola Bay. [5] "The project payback begins with the yield of 16.5%", - said the deputy of general director of "Gazprom Neft Shelf" Nikita Limonov. Managers of the company specified that to start-up such projects, their yield should be about 20%. "Gazprom Neft Shelf" are going to achieve the third complexity category of the project (currently, the Prirazlomnoe field is qualified as a project of the second complexity category of the three) to reach the payback and the rate of return of at least 17.5%. [4] The advantages of this development method:

- the construction experience;

- facilities suitable not only for well-drilling, but also for production and storage of oil prior to its transportation to refinery;

- direct shipment of oil tankers.

Disadvantages of gravity and floating installations:

- lack of space for equipment;

- dependence on climatic conditions;

- high price;

- need for personnel presence on the platform for a long time.

All offshore structures must be decommissioned when the production life time arrives to the end. The offshore structure must be removed with a floating unit, in theory, it can be reused by unplugging the rivers and moving to another field.

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THE HISTORY OF SHTOKMAN FIELD DEVELOPMENT

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The Shtokman field is one of the world's largest gas fields and is located in the Russian sector of the Barents Sea, 550 km from the coast. The field was discovered in 1981. Shtokman reserves are estimated at 3.9 trillion cubic metres of gas and about 56 million tons of gas condensate. The licence for the development of the field is held by Gazprom neft shelf. The department responsible for the development of offshore fields was established at Gazprom in 1993.