2.8.2. Well drilling and development technology

Уровень Training level: aspirantura
Form of training: aboutchnaya
Group of scientific specialties: *Subsurface use and mining sciences*
Number of seats: 2 (contract)
Срок The training period is 4 years

Well drilling and development technology is a field of science and technology that studies, develops scientific foundations, and improves the theory and practice of drilling and development of wells for various purposes – parametric, exploratory, exploration, and operational.

Research areas

1. Mechanics of rocks. Deep structure of the subsurface. Physical-mechanical, filtration-capacity properties of rocks. Reservoir fluids. Stress state of the disturbed rock mass during drilling, its interaction with the well support.

2. Well structures. Profile and wiring technology of vertical, inclined, and horizontal wells, including those with branched shafts. Geonavigation during drilling.

3. Technology of drilling wells on land and at sea. Destruction of rocks in a well using mechanical, thermal, electromagnetic and other methods and means of action in thermobaric conditions of their occurrence. Technologies and technical means of various drilling methods. Technology and technical means of construction of offshore wells with underwater and surface location of the mouth.

4. Drilling tools. Design and optimization of rock-breaking tools. Designs, characteristics and application technology of downhole motors. Technology and technical means for core drilling. Design and technology of application of downhole equipment used in the construction of wells.

5. Complications and prevention of complications in well construction. Forecasting of emergency incidents with drilling tools, factors affecting risks during well construction. Technologies and technical means to eliminate complications and accidents in the well. Methods and technologies for ensuring wellbore stability.

6. Hydro-mechanics of well drilling processes. Fluid movement in the well under various thermobaric conditions. Rheology of process fluids and the influence of rheological parameters on well construction processes.

7. Physical and chemical processes in the volume of process fluids. Compositions, properties and technologies of application of process fluids, chemical reagents for drilling and well development. Filtration processes in the well.

8. Fixing of wells. Technology, technical means and materials for cementing casing strings, installing cement bridges. Buffer liquids. Grouting cements and compositions based on them. Technologies and technical means заканчиванияof well completion.

9. Technical means and materials for improving the permeability of the borehole formation zone, intensifying the inflow of reservoir fluid, preventing subsurface contamination, and ensuring environmental protection. Technologies and technical means of well conservation and liquidation. wells.

10. Modeling, automation and robotization of drilling and development processes, including repair and restoration prevention and elimination of complications.