

MODERN METHODS OF DRILLING OIL AND GAS WELLS AND TYPES OF WELLS

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Abstract: Horizontal, vertical and inclined drilling in the formation of oil and gas wells basic technologies for exploration and exploitation oil and gas resources in deep layers. At the same time, they are very important methods of exploitation transfer of deep geothermal energy and geo-resources international continental scientific drilling program. The purpose of this review is to review and discussing vertical and directional drilling technologies and their recent developments since pioneering work in the 2010s. It starts with history development and classification of the main drilling methods of oil production, for example, vertical drilling, directional drilling and horizontal drilling, and the main application areas of these methods was also discussed.

Keywords: Impact drilling, rotary drilling, horizontal, vertical and curved drilling, geological prospecting, mine technical conditions, drilling parameters, structure of oil and gas wells.

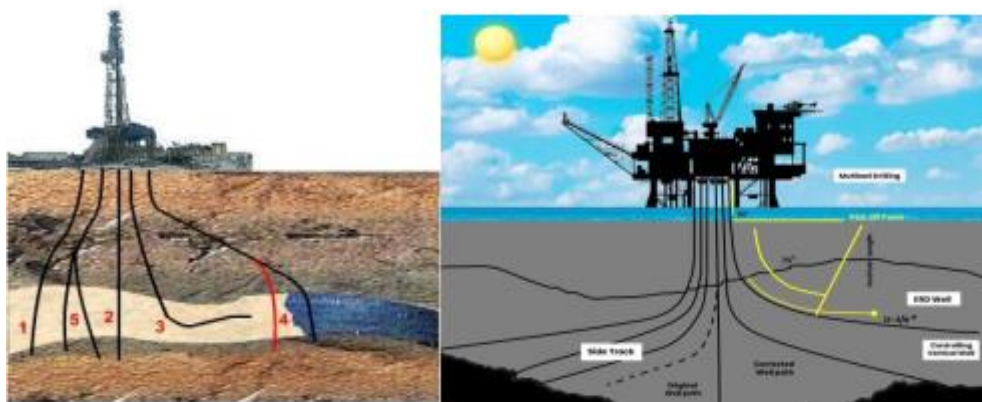
Introduction

Rocks are mechanical, thermal, physico-chemical, electrical, etc it is broken down in different ways. One of the most widely used methods in the industry is the mechanical fragmentation of rocks, and this method is the perfect method. The mechanical method depends on the method of impact in breaking the rock, It is divided into rotary, shock and impact rotations. The most commonly used method

is rotary drilling, stone. The erosion equipment rotates from a special mechanism and uses a drill pipe or core motor and hydraulic or electric power. In this regard, spindle, rotor drilling and divided into an electric drill. The first method, that is, without a sample - use and technical wells used in drilling. The second method is called structured and it is mainly useful used in the search and research of fossils. Impact drilling method. Of all types of impact drilling, only impact chain drilling is used. Drilling equipment consists of a drill, impact bar, barbell-scissors moving with the help of a chain and locks is lowered into the well. The lowering speed is adjusted by the brake, vibration and a shock absorber will be installed to lower it. The right drill for efficient drilling operations depending on the choice. Soft rocks and rocks of medium hardness When drilling, two-point drills give the best results. When drilling hard rock, the walls of the well are long and double-sided cutting with shaped teeth is one of the effective methods. Cracked rocks it is advisable to use (band) drills for drilling. There is no possibility of jamming when pulling the drill bits out of the well it is necessary to clean the broken stones accumulated at the bottom. For cleaning wells from soft stones used. In percussive drilling, the well is not filled with water, so the well reinforcement pipes to prevent the walls from collapsing are installed, they are connected to each other through grooves. Due to the lengthening of the reinforcement ridges to be installed, drilling difficult or impossible to tap even with the help of special equipment. that is why a second small diameter pipe is lowered from inside the reinforcement pipe. Elements that erode rocks enter the rock under loading and impact. Oil and gas wells is formed and bent (cut) under the influence of a turning moment. There are two types: there are better drilling methods with a rotor and a well engine. In rotary drilling, connections are made using a rotor motor and a rope is set in motion. The rotor is in place of the drill, that is, the leader moves the pipe. Lead pipe drill pipe and auger placed attached. Downhole tool when drilling a well twists are formed. In this case, the casing of the drilling rig and the lower engine is stationary will be Characteristics of the rotary drilling method well rocks drilled at the bottom with water or a specially prepared solution washed with. For this, the drilling pump is

driven by the engine, the washing solution is pumped through the pipe. These pipes are installed in the tower. A flexible hose and vertluge are installed on the tower for cleaning and maintenance the drilled rock from the machines is cleaned and then collected at the receiving point and pumped back into the well. Horizontal wells or wells with increased rotation relative to the axis provides the opportunity to obtain oil at a high level, that is, the well column is productive provides the maximum value of the contact surface with the layer surface. Expenditure on digging such wells increases and their completion the complexity of the technology limits its application. Drilling drilling wells due to the high acceleration of technology the emergence of the possibility of technological research is above to positively solve complications, to drill horizontal wells led to increase. Currently, horizontal well drilling is essentially horizontal selection of suitable options for drilling (off-axis drilling). and then from drilling, completion and well testing, acceleration methods inclined or horizontal from the reservoirs of the productive layer of use and oil Mining with wells can sometimes make exponential profits from the well They said that it will grow. Therefore, drilling horizontal wells around the world a significant increase in technology on an industrial scale, This situation is also observed in the drilling of oil and gas wells in our republic in recent years expanded the possibilities of using the method. Horizontal wells are branched in folds of very small radius the bending radius of the wells is 40-80 m, and during the drilling process, the wellbore in the vertical part, at least 80 m, expansion up to 2-3 meters is required. After that a well with a diameter of 4-5 cm is dug using hydraulic fracturing at a height of 40-80 m and is drilled. Small radius oil and gas wells 6-12 m, horizontal well the length of the highway is 40-300 meters. When drilling vertical wells the first preliminary window slot 4.5-8 m vertical reinforcement ridge and the non-vertical shaft of the well goes through the window slot. Small when exiting the horizontal section through the radius, the well is directed and bent a drill bit is used and a smooth curved neck is formed. The turning radius of the wells on the average inclination is 100-250 m and and the horizontal section of the horizontal well is 500 m. so wells are usually drilled using

a hydraulic turbine downhole motor and when turning horizontally, a flexible drill string is used. The slope of the well is changed by 3° every 40 meters and then the horizontal part is drilled.



Picture2. (1) a well in an inclined position; (2) vertical well; (3) horizontal well; (4) side drilling and drilling and cutting the second barrel; (5) multi-ball drilling. Although there are horizontal, vertical, inclined wells and elongated wells only a special case in directional drilling, however due to more features and difficulties we will also discuss these are two ways. Horizontal and high angle drilling operations are generally similar to direction drilling, but more complicated due to the higher construction rates and drift angles, longer tangent and horizontal departments. Discussions about horizontal drilling generally apply to high-angle, elongated access patterns unless otherwise specified. Horizontal drilling, high angle deviation drilling and extended reach. The drill shown here involves larger angles more than about 60° , usually about $70-90^\circ$, like shown in Picture. 1.

Horizontal drilling is the process of drilling a well to an underground location just above the surface a target oil or gas reservoir called the "Starting Point", then moving the well off the vertical plane " around the curve to cut the reservoir at the entrance point " with a slope close to horizontal and remains inside the reservoir until the desired depth. hole location is reached. Traditional route wells can be drilled with a slope of about 60° . More than 60° inclinations produce many drills problems that significantly increase costs well drilling. However, there are certain advantages drilling high deviation wells and horizontal wells (1) increase the drainage area of the platform; (2) prevent gas or water problems; (3) increase

manufacturing penetration forming; (4) enhanced performance improvement oil recovery techniques; (5) increasing productivity in intersecting fracture reservoirs a number of vertical cracks.

Conclusion

Oil and gas well formation is an integral concept, information on vertical, horizontal and inclined drilling technologies is provided. Developments of routing techniques, main direction tools (turning tools, bottom hole motor, rotary controlled drilling system and vertical drilling system), directional research methods (measurement and transmission techniques), basic drill bits (roller taper bits, fixed cutter bits and hybrid bits) and basic drilling fluids (gas drilling fluid, water-based drilling fluid and oil-based drilling fluid liquid) are summarized and analyzed. This part presents concluding remarks and some potential applications based on considerations applicable to vertical and directional drilling technologies. Most of the current oil and gas wells were Drilling at a depth of more than 6000 m and 2000–4000 m in horizontal displacement. The the final extended capability reached 10,000 m not only in horizontal displacement, but also within vertical depth. Therefore, the main technologies revolves around how to drill deeper or longer wells. A staple for deep or ultra-deep wells solving the problem caused by high pressure and high temperature. For directional wells the key is an advanced automatic control solution techniques. Vertical and directional drilling is advanced from real-time to digitized, visual, automated, integrated and intelligent. However, The level of automation is still insufficient for reality industry. Thus, advanced automated vertical and directional drilling is still a promising field. Application of vertical and orientation drilling is very successful in oil and gas exploration, oil and gas extraction production. Meanwhile, vertical and directional drilling can also be scientifically scaled up drilling, geothermal drilling and other related aspects.

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