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QATLAMNI GIDRAVLIK YORISHDA QO‘LLANILADIGAN ERITMALAR TURINI ASOSLASH

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Annotatsiya

Tik va gorizantal quduqlarni gidravlik yorishda qo‘llaniladigan eritmalarning turi ishlab chiqilgan, jihozlarni o‘rnatish ketma-ketligi asoslangan, yuvush ishlarini amalga oshirishda yoriqlarni qaytadan ifloslanishini oldini olish choralari ishlab chiqilgan, QGY da yoriqlarni qaytadan ifloslanishini oldini olish choralari ishlab chiqilgan, QGY da yangi texnikalarni tanlash va samaradorlik ko‘rsatgichlari, ishlov berishda qo‘llaaniladigan konstrktiv sxemalar to‘g‘risidagi ma’lumotlar keltirilgan, yorishni takomillashtirilgan usullaari va ulardagi muommoli masalalarni yechimi bo‘yicha takliflar berilgan.

Kalit so’zlar: QGY (Qatlamni gidravlik yorish), PAA (poliakrilamid), SSB (Sulfat-spirtli barda), NQK (neytrallashgan qora kontakt)

Аннотация

Разработан тип растворов, применяемых при ГРП вертикальных и горизонтальных скважин, обоснована последовательность установки оборудования, разработаны мероприятия по предотвращению повторного загрязнения трещин при промывочных работах, разработаны мероприятия по предотвращению повторного загрязнения трещин в КГЯ, В КГЯ разработаны мероприятия по предотвращению повторного загрязнения трещин, в КГЯ приведены сведения о выборе и показателях эффективности новых приемов, конструктивных схем, применяемых при обработке, даны предложения по совершенствованию методов взлома и решения их проблем.

Ключевые слова: QGY (гидравлический крекинг пласта), PAA (полиакриламид), SSB (сульфатно-спиртовой брусок), NQK (нейтрализованный черный контакт)

Annotation

The type of solutions used in hydraulic fracturing of vertical and horizontal wells was developed, the sequence of equipment installation was based, measures to prevent recontamination of cracks during washing operations were developed, measures to prevent recontamination of cracks in QGY were developed, QGY developed measures to prevent re-contamination of cracks, QGY provides information on the selection and

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efficiency indicators of new techniques, constructive schemes used in processing, improved methods of cracking and solutions to their problems suggestions are given.

Key words: QGY(Hydraulic cracking of the layer), PAA (polyacrylamide), SSB (Sulfate-alcohol bar), NQK (neutralized black contact)

In the method of hydraulic fracturing of the formation (HFR), fluid is pumped into the formation under pressure, and under the influence of pressure, the formation is opened and separated into layers. When the pressure is reduced, large sands are pumped together with the fluid to prevent the cracks from connecting with each other, the permeability is maintained, and the permeability of the fractured layer is improved up to 1000 times.

When hydraulic fracturing is carried out at a pressure of 100 MPa and a large amount of fluid, complex and various types of equipment are used.

According to the principle of hydraulic fracturing, hydraulic fracturing occurs at pressures below or equal to and greater than full rock pressure for deep wells. When the depth of the wells is not great, it happens at full mountain pressures.

In most cases, cracking in the bottom zone of the well occurs when the pressure is 1.5-2.0 times greater than the hydrostatic pressure. When the porosity of the layer is vertical, it acts with a force equal to the distance of the rocks lying above the porosity. The average density of waste rock is usually taken as 2300 kg/m3.

The pressure of the river

$$P_{t.j} = g\ H$$

Here: the density of water is 1000 kg/m3. The pressure of the flood (Pt.j) is 2÷3 times greater than the hydrostatic pressure. In QGY, oil or water based solutions are prepared. An oil-based solution is used to reduce formation absorption and improve sand transport conditions. Liquids are divided into three according to the category of use: blasting liquid, sand blasting liquid, washing liquid.

Hydraulic fracturing of the formation, like other methods, is used to increase the permeability of the bottom zone of the productive formation.

Hydraulic fracturing of the formation is a technological process that expands the cracks in the well bottom zone of the productive formation and deepens the natural cracks, increasing permeability. For this, fluid is injected into the well zone with a pressure higher than the rock pressure and the strength properties of the rock. Selected quartz sand is pumped into the formed cracks together with liquid. The composition of the selected sands does not allow the cracks to connect with each other after the pressure is removed from the layer.

The cracks formed in the process of hydraulic fracturing are 2/4 mm wide and several tens of meters long, and are connected to each other or to other cracks. It increases the permeability of the well bottom zone several times.

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As a result of hydraulic fracturing of the formation, the flow rate of the well increases, sometimes by two or more. There are cases where oil wells have been increased by 10 times or even more using the QGY method in mining operations. Hydraulic fracturing of the formation not only accelerates the reserves, but also expands the drainage zone of the well. Attracts weakly drained layers to use and increases water permeability.

In QGY, more attention is paid to solutions that are completely soluble in formation fluids. The viscosity of working fluids should be stable during QGY implementation. Hydrocarbon-based fluids are often used for QGY in oil producing wells. In pilot wells, clean water or condensed liquids are used as fluids. Thickening components include starch liquids, polyacrylamide (PAA), sulfate-alcohol (SSB), carboxyl methyl cellulose. When water-based fluids are used, it is necessary to take into account its interaction with the formation rocks, but some of the clay components of the formation will swell (swell) due to the interaction with water. In such cases, water-based chemical reagents are added to liquids, that is, it stabilizes the mud when it concentrates. Chemical reagents are added to the emulsion components and mixed with a pump.

Type of working solutions used for cracking;

Hydrocarbon liquids Aqueous mixtures Emulsion	Aqueous mixtures	Emulsion
1. Degassed oil	1. Sulfate-alcohol bar (SSB)	1.Hydrophobic water-oil emulsion
2. Storage oil	2. Salt-acid mixture	1.Hydrophobic water-oil emulsion
3. Fuel oil or its oily mixture	3. Concentrated mixture of hydrochloric acid	3. Petroleum-acid solution
4. Diesel fuel (or kerosene) thickened with a special reagent	4.Water condensed with various reagents	4. Kerosene - acid emulsion

Sand-carrying fluid is used to supply cracks in the formation over the well. The sand carrier fluid must be non-leakable (non-filterable) or have the ability to rapidly reduce leakage and retain highly permeable sands. The solution used for fracturing the formation is selected as sand carrier fluids.

When sand or any other material is driven into the cracks, it serves as a filler for the cracks and prevents the cracks from joining each other after the pressure is reduced.

The main requirements for sand-carrying fluids are high sand retention and low-rate filtration.

Due to the efficiency of filling cracks with fillers according to the above requirement and the absence of fillers sitting in separate elements of the transport system (on the well, in the NKQ, at the bottom of the well) and due to the mobility of the crack, the filler can be used ahead of time. conditions are set to prevent the loss. Low-index filtration is taken in advance to prevent the sand-carrying fluid from filtering on the wall of the cracks and blocking it with crack fillers at the beginning. Conversely, when the concentration of fillers increases at the initiation of cracks, it prevents the fillers from penetrating deeper into the cracks.

From viscous oil or oil with structural properties as a sand-carrying fluid in production wells; from a mixture of oil residues; from hydrophobic water-oil emulsion; concentrated hydrochloric acid and others are used.

From solutions of SSB as sand-carrying fluid in driving wells; from hygrophilic oil-water emulsion; from starch-alkaline solutions; neutral black contact (NQK) is used.

To reduce the force of friction when filling liquids are pumped through NKQs, special additives are added to it - soap-based solutions; high molecular polymers and others are added.

The following are used as fillers:

-from quartz sands;

- from glass balls;
- from agromerized grains of bauxite;
- from a special filler-proppanate.

The filler serves to fill the formed cracks and prevents the cracks from sticking together after the pressure is applied. Quartz sand with a size of 1.4÷1.2mm is used to strengthen the cracks formed during hydraulic fracturing of the layer. It is not allowed to pollute the sand with clean dust or clay particles. For the first time in QGY, 1.5÷2 per crack ,0 tons of sand are introduced.

When a large amount of sand (more than 1.5-2.0 tons) is driven into the layer in order to penetrate the pores of the layer, very fine-grained sands (0.4÷0.6mm) are driven in the first portion (30÷40%), and then larger is transferred to fractions of size. The concentration of sand-carrying liquids is in the range of 200÷1000g/l, depending on the technical capability of the liquid pump used to hold the sand.

The density of quartz sand is high (2650 kg/m3), it differs greatly from the liquid density, it sinks suddenly in the flow of liquid and makes it difficult to fill cracks. In addition to the boom, the fineness of the sand may often be insufficient. Taking into account the above, agglomerated grains of glass balls, crushed walnut shells, airopanat, etc. are used as fillers.

The density of glass balls is close to that of quartz sand (2650 kg), they are very strong and they are not pressed into the rock. The density of agglomerated bauxite powder is 1400 kg/m3. Recently, special solid fillers of synthetic polymer substances are used, the density of sand carriers is 1100 kg/m3.

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In the hydraulic fracturing of the layer, when cracking the cracks in the layer, closing the cracks in the layers, propanate, which consists of ceramic material, is used as a filler. Propanate contains 71% -Al2O, 29% -Fe2O3, the size of grains is from 0.4mm to 4mm. Before QGY, the fluid receptivity of the well is determined under the influence of pressure. For this, a pump unit is added to the first or second speed. Fracturing fluid is pumped into the well until pressure is restored. Pressure and mixture consumption are measured. After that, the dependence of fluid consumption on pressure is determined when increasing the driving level of liquid. The fracture moment of the formation and the expected pressures when driving the sand-fluid mixture are determined.

Bitta when the pumping unit drives fluid at a low speed, when it is 3-4 times higher than the absorption coefficient, sand and sand-liquids are pumped into the formation with the appearance of cracks in the formation. If fracturing does not occur even when the fracturing fluid is pumped at a high maximum rate, then a fluid with increased viscosity and minimal leakage is used and pumped into the formation.

After the fracture of the formation is clearly established, in order to strengthen the branching of the cracks and to facilitate the introduction of sand, before driving the sand-carrying fluid, 3-4m3 of weakly filterable, enhanced viscosity fluid is pumped into the well. Intermediate hydraulic fracturing is widely used in practice.

When the inter-interval QGY is determined, the upper and lower parts of the interval are closed with two parkers and anchors during the formation of the crack, and the fracturing fluid is pumped into the interval of the defined productive layer. After the layer or layers are cracked, the packer is released, installed at the border of the second interval, processed independently, etc. Cracking of layer gaps is used when layers or layers are treated with a common filter, layers and layers are sealed (separated) of rock layers that are impermeable to each other.

The method aimed at hydraulic fracturing of the layer was used.

During hydraulic fracturing of the layer in the directed method, additional drilling is carried out in the given interval of the productive layer with the help of sand flow, and hydraulic fracturing is planned. "Point" hydraulic sand-flow drilling and fracture drilling can also be used for this. After additional sand flow drilling, hydraulic fracturing of the layer is carried out according to the usual technology. The widespread use of hydraulic fracturing during the last decade is due to the improvement of existing innovations and the creation of new technologies. One of QGY's effective new technologies, propane is deposited at the very end of the fracture (TSO), with a new targeted orientation that limits longitudinal fracture propagation, increases width, and consequently increases fracture permeability.

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The selected technology of hydraulic fracturing is used to accelerate the operation of reserves in low-permeability layers and reduce the line of descent of cracks into water and gas layers.

A special technology has been created to prevent the propanate from coming out of the cracks, in which special flexible glass fibers are added together with the propanate, which means that it firmly fills the gaps between the particles and the propanate provides a strong bond. In recent years, low-polymer fracturing fluid LOWGUAR has been developed and used. Clean FLOW additive system was created to prevent cracks from being filled with residual sediments.

The most common method of local hydraulic fracturing is used to reduce the resistance of the well bottom zone and increase the effective radius of the well.

In local hydraulic fracturing of the layer, the length of the cracks is 10-20 m, since tens of meters of liquid can be pumped per ton of propane, the flow rate of the well increases by 2-3 times in the chest

One of the most effective factors for increasing well discharge in highly permeable layers is the width of fractures. In low-conductivity layers, the length of cracks is considered. The use of TSO (screening at the end of cracks) technology in the formation of wide cracks, in which the volume of hydraulic fracturing fluid is reduced to 1÷5 m3, while pyropanate is increased to 20 tons and more.

Deposition of propanates at the very end of their cracks prevents the cracks from extending. When the fluid continues to flow, the width of the cracks increases to 25 mm. In the usual QGY method, the width of the cracks is 2÷4mm. is not greater than and the effective permeability of cracks increases to 500-3000μm2.

When it was clarified on the basis of industrial experience testing, when the permeability of the layers is 0.01 - 0.05 μm2, the optimal fixing length of the cracks is usually 40-60 meters, and increasing the length of the fixed cracks does not lead to an increase in fluid flow rate. tens-hundreds of cubic meters, and propanate tens of tons. When the permeability of the layer is around 0.001 μm2, the optimal length of crack strengthening is 100÷200m, the volume of driving fluid is equal to one hundred cubic meters and 100-200 tons of propane. The technology of QGY is used for industrial processing of gas heaps with very low collector permeability (less than 10-4 μm2). When this technology is used, the length of the cracks is up to 1000 m, and hundreds of cubic meters of liquid are pumped into the well. In this case, the debit will increase up to 3-10 times. QGY technology is widely used in horizontal wells.

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