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GEOLOGICAL BASES OF A BALANCED GAS RECEIVER SYSTEM FROM A GAS CYLINDER

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Abstract:

In this article, when exploiting oil and gas fields, a specific exploitation system for oil fields with gas caps is required. The initial reservoir pressures in them should be slightly lower than the saturation pressure. As a result, only part of the gas dissolves in the oil, and the remaining part is located on top of the oil, forming the primary gas cap, which is the effect of gas production from the gas cap on the oil production rate and the importance of controlling the displacement state of the gas-oil contact surfaces.

Keywords: Oil, gas duppsii, saturation, formation pressure, oil cone, gas, reef, horizon

INTRODUCTION

The South Kemachi field is located on the southern slope of the Ispanli-Chandir valley in the north of the Khordjui tectonic step of the Buroro-Khiva oil and gas region.

The Paleocene limestone deposit is the western dome of the Kemachi-Zekri anticlant, with an area of 7x9 km. The height of this dome is 40 meters.

The Kemachi-Zekri anticline is located in the Kushab tilt from the south. The geological structure of the Kelloway-Oxford deposits is different from the Paleocene and Cretaceous deposits. The difference is that reef formation is widespread at the Oxford end of the field boundary, which has resulted in multiple reef arrays.

All reef arrays are hydrodynamically strongly connected with each other. They are connected by the upper part of the XV horizon, the conductive layers, which serve as the bedrock for all the reef massifs in this section under construction.

The formation of the reef massifs is closely related to the Upper Oxfordian tectonics of the region.

MAIN PART

In the oil part of an oil and gas field, along with oil, there is gas dissolved in it, as well as associated water. The gas part of these fields contains gas and associated water. It is speculated that the gas portion of some oil and gas fields may contain oil with gas and associated water at low oil saturation.

The main requirement for developing oil and gas fields, with or without formation impact, is that the oil must not move toward the gas cap. In other words, the oil and gas field should be operated in such a way that the oil and gas connection does not move towards the gas ball. It is estimated that the oil that has migrated into the gas cap will create a residual oil saturation in it. As a result, oil in the dry rock pore is "swept" and this leads to additional losses of oil in the gas cap.

In the natural operation of oil and gas fields, the transfer of the oil and gas connection to the side of the gas cap is carried out by holding the formation pressure at the initial level or preventing it from falling negatively in the oil and gas sections.

Such performance assumes no gas production from the gas reservoir or limited recovery if the reservoir pressure is allowed to drop by a certain amount in the oil portion of the reservoir. However, it is difficult not to get gas from the gas cap at all during the operation of oil and gas fields, because gas cones are formed due to the large surface area of the gas cap along the field . In addition to the use of special measures known to prevent gas intrusion into oil wells, the amount of gas extraction from gas caps in oil and gas fields is mainly limited by reducing the flow rates of oil wells, especially those located near the gas-oil connection. Reducing the flow rate of oil wells, on the one hand, is economically necessary to maintain a sufficiently high rate of oil extraction from them, and on the other hand, it leads to the drilling of additional wells, which reduces the profitability of field operation.

As we know, one of the ways to increase the efficiency of the operation process is the comprehensive use of the energy of the gas cylinder.

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Due to the fact that there is a demand for obtaining free gas at a high volume that is currently being produced, as well as it is very problematic to maintain the calculated maximum permissible flow without water and gas, it is desirable to combine (organize) the production of free gas and oil in one well, but the generally accepted method of gas lift inside the well not in appearance, but calculations show that even if the annual gas production is increased to 1 billion m^3, the flow rate of gas wells will not exceed 220 thousand m^3/day, and even in the case of the current annual gas production of 350 million m^3, the average daily flow is 110 thousand m^3 organizes. The calculated average flow rate of free gas entering the oil producing wells is 60 thousand m^3/day. It may be possible to try to conduct test operations, assuming that the planned free gas volume is provided with the same oil volume as the gas produced by the oil producing wells.

The implementation of this proposal is possible, of course, using satellite gas (sent to the consumer), and it is necessary to revise and organize the existing underground equipment and interconnecting pipelines.

Organizational proposals are that the uppermost part of the oil rim should be fired to create the conditions for free gas inflow in the planned volume and at the same time to form an "oil" cone from the oil-saturated lower parts of the intersection.

Another positive aspect of the proposed action is that there is no need to extract large volumes of satellite water together with hydrocarbons.

CONCLUSION

The South Kemachi field is one of the unique fields in the Bukhara-Khiva oil and gas region, which is characterized by a complex geological structure, a small thickness of the oil rim, and the presence of a large gas cap.

XV-r+XV-nr horizons, which form the only natural reservoir with groundwater in the South Kemachi field, are considered productive.

Two options (I, II) of using the South Kemachi mine in the quenching mode and one option (III) with high-pressure gas circulation were considered in the technological development of the South Kemachi mine.

For practical implementation, the following technological principles were adopted:

- extraction of oil reserves should be preceded by extraction of gas reserves;

- 19.6 ha/well in the heap. should have a network of dense wells, and the effect of inter-well interaction should be insignificant (small);

- in order to ensure that the gas-oil contact surface does not move or to move it, it is necessary to apply controlled gas extraction from the gas cylinder in the gas-saturated area.

- the selection of the perforation interval is carried out taking into account the presence of impermeable and weakly permeable layers saturated with productive oil, and in order to achieve a higher oil permeability coefficient due to the prevention of the formation of gas cones, alternate extraction of oil-saturated intervals is carried out;

- it is necessary to strictly adhere to the given limit of allowed oil without gas and without water, and to prevent the penetration of water and gas into the bottom of the wells.

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