ANALYSIS OF LOSSES AND EFFICIENCY OF THE RPM SYSTEM AT THE SHARIKHAN-KHOJAABAD FIELD

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Abstract. *In the article, based on data from the Sharihan-Khojaabad field, an analysis of losses and the effectiveness of the water pressure maintenance system was carried out, as a result of which, thanks to the dynamics of changes in injection, it was revealed that water is not pumped to the target site, or the injected water cannot influence a nearby production well due to a tectonic fault between them. In order to increase their productivity, measures have been proposed that can subsequently increase the efficiency of wells.*

Keywords: *compensation of withdrawals, injection wells, pressure maintenance system.*

1. Losses in the RPM System:

- Mechanical losses: These include friction in bearings, gears, and other moving components, which can result in energy losses and decreased overall efficiency.

- Electrical losses: In an electrical RPM system, losses can occur in the form of resistance in wires, contacts, and electrical components, leading to power dissipation and reduced efficiency.

- Aerodynamic losses: If the RPM system involves rotating components exposed to air, such as a fan or turbine, aerodynamic losses can occur due to air resistance and turbulence, resulting in reduced efficiency.

2. Efficiency of the RPM System:

- Electrical efficiency: This refers to how effectively electrical energy is converted into mechanical energy or vice versa. It can be measured by comparing the input electrical power to the output mechanical power (or vice versa) and calculating the efficiency ratio.

- Overall efficiency: This takes into account all energy losses in the system, including mechanical, electrical, and any other losses. It can be calculated by comparing the useful output energy (mechanical power) to the input energy (electrical power) and determining the overall efficiency ratio.

In the oil and gas industry, maintaining reservoir pressure is a key aspect for increasing hydrocarbon production and efficient operation. This system is being developed to compensate for pressure losses in the formation and maintain it at an optimal level.

The Sharikhan-Khojaabad field was put into development in 1948. This field refers mainly to strata-vault, stratigraphically and tectonically screened types of deposits. Oil and gas reservoirs are both terrigenous (sandstones, fine-grained, calcareous) and carbonate (limestones, dense, dolomitized) rocks.

At the Sharikhan-Khojaabad field, one of the artificial methods of maintaining reservoir pressure is practiced - artificial waterflooding. According to the field data, as of January 1, 2024, water is injected along horizon VIII, but no studies have been carried out to determine the

injectivity profile. During the current period, water is pumped in a volume of 782 m3/day, with liquid withdrawal equal to 397.4 m3/day, that is, compensation of withdrawals is 197%.

Today, the operating injection wells are No. 5N, No. 284, No. 325, however, they do not affect the existing production wells, which can be seen on the constructed isobar map (Figure 1).

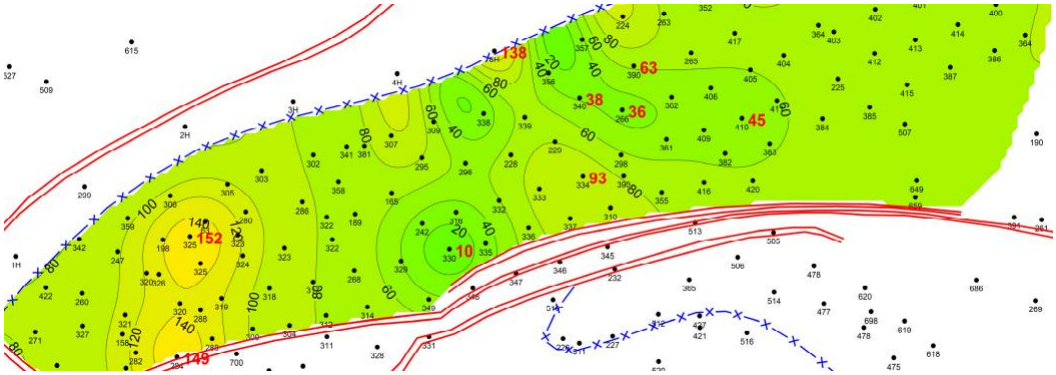

Figure 1– Isobar map for the Sharikhan-Khojaabad field

For a more accurate picture, each active injection well was analyzed separately. In these wells, logging was not carried out to determine the injection intervals during injection, to determine the technical condition of the well to exclude leaks. Also, with an increase in injection on average from 100 to 300 m3/day, the average daily fluid production and the dynamic level at nearby wells did not change (Figure 2). Based on the above data, it is likely that water is not being injected at the target object, and since well No. 5N is located behind a fault, it is likely that it does not have an impact on nearby wells due to the tectonic fault between them.

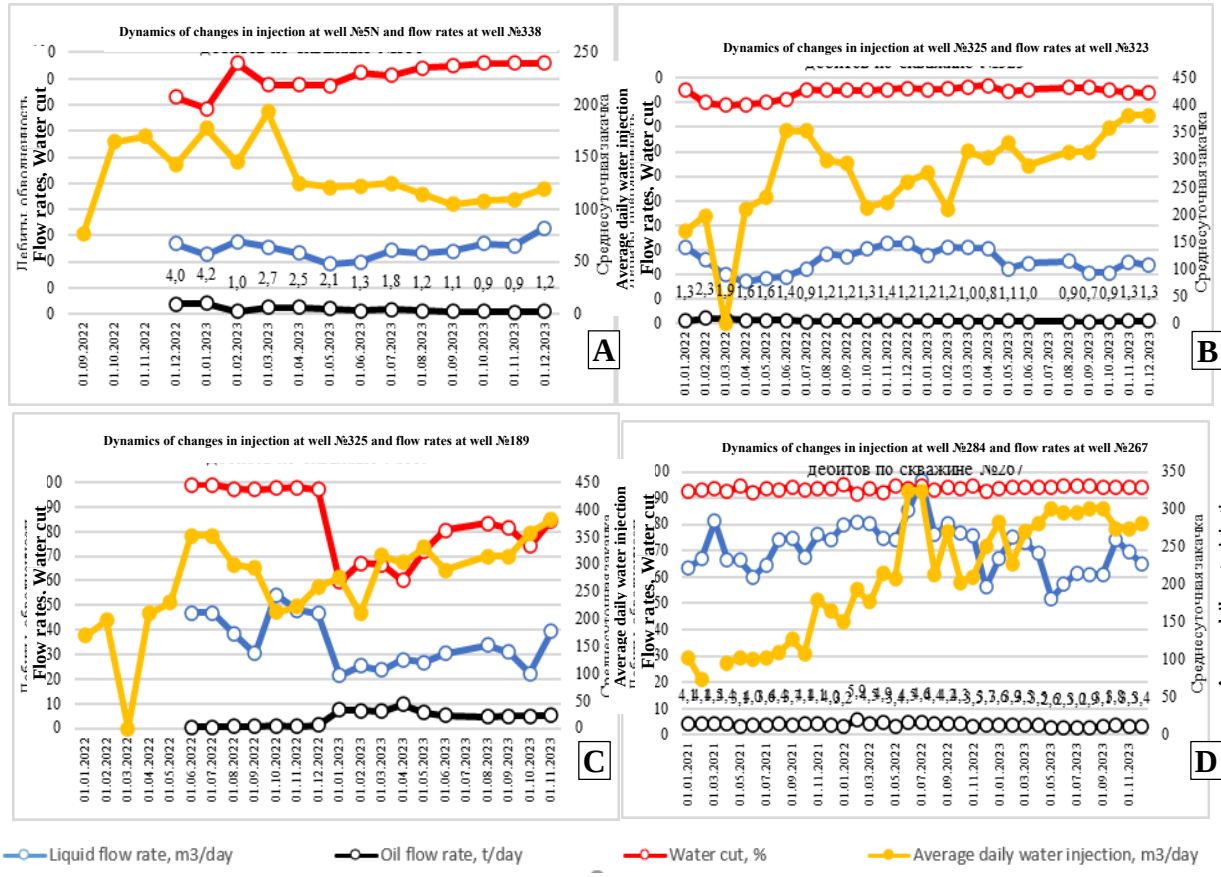

Figure 2– Dynamics of changes in injection of an injection well to a nearby production well

In conclusion, analysis of losses and system efficiency Maintaining reservoir pressure is a mandatory step in the development and optimization of oil and gas wells, so it is worth choosing

the right effective method of maintaining pressure to maximize production. To determine in more detail the effectiveness of the current injection system, it is necessary to conduct geophysical surveys of wells to determine the technical condition of the production casing (cement bond log, electro-magnetic fault detector) and determine the injectivity profile to determine injection intervals for injection wells №5N, 284, 325 and inflow intervals for production wells №267, 280, 306, 323, 338. Also, when selecting candidate wells for transfer to the injection stock, you should consider focal waterflooding according to a five-point scheme for wells Nos. 298, 339, 382 and, during injection, monitor changes in fluid flow rates and dynamic levels in nearby production wells.

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