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TECHNOLOGIES OF PROCESSING OF THE PRECIOUS ZONE WITH ACID COMPOSITIONS

In the history of the world, the first mention of acid OPZs of the reservoir was made in 1895. The author of the created method of increasing the productivity of wells was a scientist, the chief chemist of the Solar oil refinery of the American oil company Standard Oil Herman Resch. The acid treatment technology was tested in 1895, but as a result, corrosion appeared on the well equipment. Hermann Fresch received the patent in 1896. This patent relates to hydrochloric acid and its interaction with carbonates. It took 30 years for the method of acid treatment (CO) of the near-outlet zone of the formation to be evaluated, in fact, considering various trials and errors. In 1934, in the USSR, one of the promising methods of increasing the inflow of wells was hydrochloric acid treatment (SCO), and it was tested at the VerkhnyochusivskiiMistechka deposit in a well, the productive layer of which is composed of carbonate deposits. Since 1947, the very frequent use of SKO was in the Baku fields, where the layers were composed of terrigenous rocks. But, of course, the best results of increasing production were shown when processing carbonate rocks. The organization of acid treatment processes includes the management of a group of processes performed by various divisions of an oil and gas production company, and includes the following separate operations:

– selection of wells for acid impact,
– choice of impact technology,
- conducting additional studies of wells intended for carrying out works on acid waste disposal,
- control of the functioning of the quality assurance system.

The skin factor is a hydrodynamic parameter that characterizes the additional filtration resistance to the flow of fluids in the PZP (which leads to a decrease in production). The causes of the skin factor can be turbulent flow, compression of the rock skeleton, hydrodynamic imperfection of the reservoir opening, degassing of the fluid, and the main reason is the contamination of the near-outlet zone of the reservoir. Acid treatments are carried out with skin factor values from 0 to 5. The limit of the result that can be achieved from acid treatment can be S = 1-3. The skin factor is calculated and interpreted in organizations that conduct hydrodynamic studies of wells and analysis of the obtained data.

In the case of the algorithm for selecting wells for processing, it is possible as follows:

1) the entire fund of wells is considered,

2) wells with a steady drop in flow rate are identified. The following wells are excluded from this list:

– at the exit to the established regime (new, after geotechnical measures),
– in which there is a decrease in the RPL (undercompensated areas - marginal zones, underformed cells),
– a decrease in the debit on which is associated with a decrease
pump performance (long maintenance period),
- from those that remain, those on which the drop in liquid flow rate is associated with interference are rejected,

3) calculation of the change in the skin factor for the remaining wells, based on the technological regimes,

4) wells are selected, on which a real skin effect was established during hydrodynamic

studies,

5) a list of wells operating below their potential is highlighted, while priority is given to wells with a lower frequency of acid exposure. From the received list of wells, remove wells on which other methods of productivity intensification are prescribed (microhydrofracturing , vibration impact , additional perforation, etc.)

As soon as one or another well is selected for processing, the oil and gas production company (PDNG) together with (if there is a special need for this) determine which method of acid solution composition will be used, actually - which solution to choose.

OPZ with the use of an acid composition for it individually. This plan includes the following items:

– general information on the well;
– the current state of the well;
- the purpose for which the processing will be carried out;
- works that were previously carried out at this place;
- information on the DDI of the well until the OPZ;
- work on the preparatory plan;
– sequence of necessary operations;
- personnel safety.

Due to the fact that the majority of fields are at the final stage of development, special attention is paid to the methods of intensification of well inflow in order to clean the overburden zone and increase the capacity and productivity of wells. The most effective, common and cost-effective method is acid treatment of the near-outlet zone of the formation. The purpose of SKO is to thoroughly clean porous or cavernous and fissured channels that filter, improve or restore a certain value of permeability in the most problematic zone near the well. Today, the complex treatment of the near-outlet zone of the formation is relevant, which allows to increase the efficiency of cleaning (for example, the simultaneous use of saline and clay-acid treatment, as well as the addition of various surfactants, which prevents the formation of emulsions and ASPO). Despite a fairly large increase in debit, the effectiveness of measures for acid treatment of the near-bottom zone can be increased if you follow the selective selection of the appropriate technology of the OPZ, having analyzed the reasons for the decrease in productivity (acceptability). Taking into account the variety of formation conditions, as well as the process of drilling, development and operation of wells, the design of the OPZ and the selection of reagents is carried out taking into account the nature of the colmatant and the reason for the decrease in productivity. Depending on the purpose, the content and composition of the acid composition for treating wells is chosen. In order to achieve the maximum efficiency from the processing of PZP and to avoid the formation of insoluble precipitates and persistent emulsions, it is necessary to take into account specific geological and physical conditions, determine the cause of pollution, take into account the filtration -capacity properties of the formation and the physico-chemical properties of fluids, as well as consider from the point of view of economic feasibility application of dosing technology and features of the combination of acid components in the percentage ratio.

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