TUBING CORROSION ANALYSIS

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Nowadays, in most oilfields in Western Siberia the challenging problem of downhole equipment corrosion is actual. Most of them are at the third stage of development, which is characterizing by the water cut increasing. For this reason, the right anti-corrosive strategy choosing plays the crucial role in project economic.

In this project, the reasons of corrosion ware analyzed for more effective defense strategy development. It was discussed, that the water cut, fluid flowrate, pH, temperature, CO2 and H2S content and formation water properties. The analysis was provided only for water cut, flowrate, pH and formation water properties, due to the lack of other data. On the basis of information about six oilfields, this information was used for the rate of corrosion versus input parameters dependency development for individual wells. As a result of calculations, no dependency was found. It is recommended to study other parameters influence on failures and try again to develop equation for the rate of corrosion calculations. There was a lack of input data for that purpose.

From the 2010, anti-corrosion techniques were actively used. It is happen because the water cut increasing, which could lead to failures increasing. It could be seen, that the line repeat the graph about number of failures and this similarity do not allow increasing the number of failures. Compare to total yearly water cut (Fig. 1). The graph about number of failures starts to be logical (Fig. 2):

- Increasing of water cut is lead to increasing of number of failures;
- Increasing anti-corrosion commissioning from 2010 is lead to decreasing of number of failures

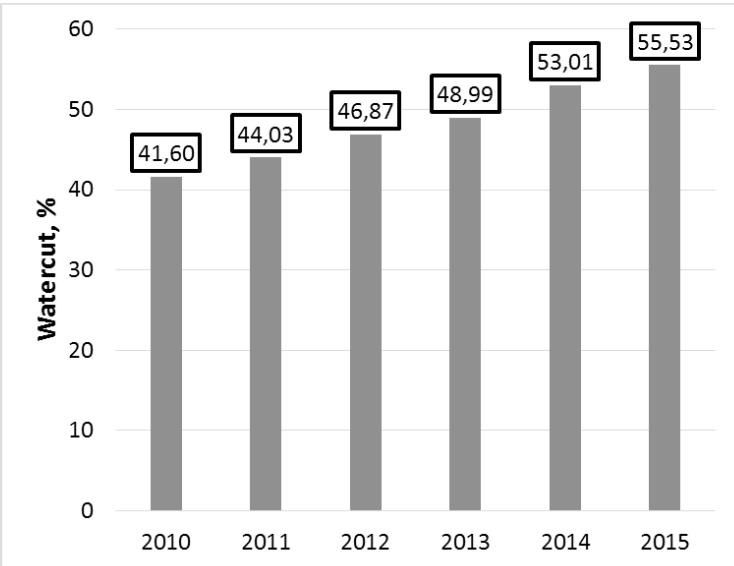

Fig. 1. Total yearly water cut

As could be seen from the graph, early year the water cut has the growth about 2-3 percent, this value could be used for corrosion forecasting if the development of corrosion rate equation will be successful in further investigations.

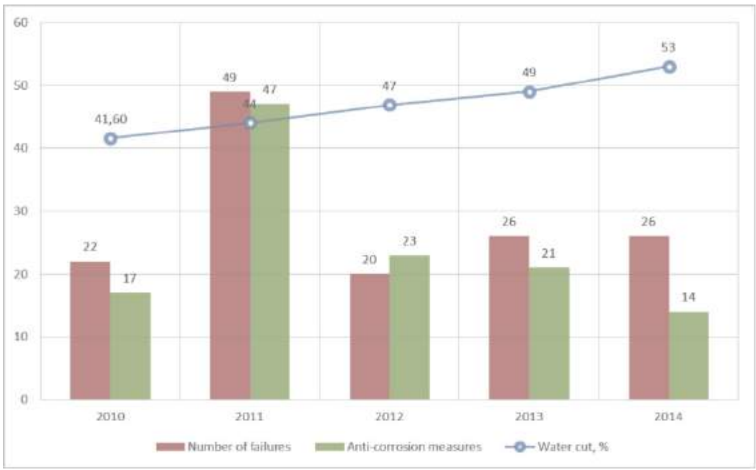

Fig. 2. Final water cut, number of failures and anti-corrosion measures relationship

This graph represents that the anti-corrosion measures, used in company are very useful and do not allow the further growth of number of equipment failures due to corrosion. However, it does not mean that the methods used are the most effective methods.

The results shows, that there is no correlation between input parameters and equipment failures as for absolute values as for parameters dynamics. There are no reasons for trying to develop equation, which correlate the rate of corrosion and input data (pH, flowrate. water cut. and water chemical composition). It is possible that other parameters, such as CO2 and H2S fraction, temperature and tubing quality control gives the result and the equation for corrosion rate could be constructed. However, there is no sufficient data for further analysis.

The efficiency of anti-corrosive methods, used in company, was analyzed and on the basis of input data the main parameter for efficiency estimation, mean time before failure, was calculated for each method. Moreover, the analysis of methods efficiency was provided based on input data.

It was discussed that water cut has highly influence on the rate of corrosion. The anti-corrosive measures, used in the company, have a positive effect on corrosive count, and. as a result, the number of failures due to corrosion activity is not increased despite the fact of water cut increasing. The developed parameters, water cut pH, flow rate and formation water composition theoretically influence on the rate of corrosion, and however, there is no dependency in practice for individual wells. Therefore, it is not possible to develop the equation for the rate of corrosion.

It was calculated, that the most economically and technically effective anti-corrosive method is steel with anti-corrosive additives – 26ХМФА and this method is recommended for further use.

As a result of project, the economics of different methods practice for different oilfields was calculated. The steel 26ХМФА was recommended for further implementation due to the fact that this technology has not only the best economic results, but also the number of competitive advantages.

References

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GEOLOGICAL STRUCTURE AND FUTURE DEVELOPMENTS OF UST-TYM DEPRESSION

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At present Tomsk region is characterized by having oil fields which exploration needs in specific technologies. Ust-Tym depression has some factors of oil presence. Thus, the main objective of the investigation is to determine the reliable occurrences for oil development.

Ust-Tym depression, located in the central part of the Tomsk region, is formed by two systems of north-west and north-east direction chutes. Depression area is 19,400 km^2. Depression is bounded from different directions by the positive structural forms. Ust-Tym depression is bordered by Alexander anticlinal fold in the north-west, in the west and south-west - by Middle-Vasyugan and Pudin megalithic bank, respectively, in the south – by Parabel anticline, in the east – by Payduginsky and Pyl-Karaminsky megalithic bank (Fig.). Shinginskoye saddle is located at the junction of Srednevasyugan and Pudinskogo megalithic bank, small in size and is a zone of articulation Ust-Tym and Nurol depressions in the section of negative structures. Considering depression bounded by Karaminskoy saddle in the north, which includes the North-Tym basin and positive group of local structures: Kiev Yoganskoye, Tungolskaya, Linear, Emtorskaya and others.

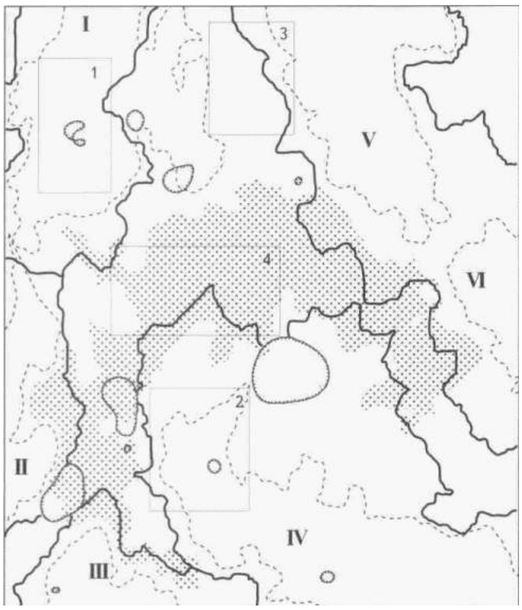

Fig. General cheme of Ust-Tym region:
1 – Ust-Tym depression;2 – positive structures of the 1st order (I – Alexander anticlinal fold, II – Middle-Vasyugan megalithic bank, III – Pudin megalithic bank, IV – Parabel anticline, V – Pyl-Karaminsky megalithic bank, VI – Payduginsky megalithic bank); 3 – zone of sandstone layer U_2 lack; 4 – borders of generalized zones of SAF, associated with positive structures Ist order; 1-4 – fragments of resulting map