USE OF NUCLEAR METHODS IN THE ORGANIZATION OF THE WELL SECTION

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Annotation: Nuclear methods of geophysical research of wells are one of the most effective methods for determining a number of parameters that are measurable using electrical logging methods (natural radioactivity, bulk density, hydrogen content, elemental composition, ash content of coals). In addition, nuclear methods can be used not only in an open (not cased) wellbore, but also in a closed well, when many electrical methods are fundamentally inapplicable.

Key words: Radioactive elements, nuclear reactions, changing parameters, geophysical studies of wells, nuclear geophysical options, well survey methods.

There is a huge amount of naturally occurring radioactive elements in the earth's crust, especially in acidic and sedimentary rocks. These elements can be minerals by themselves (radium, potassium salts containing K-40), or they can be signs of other minerals (there radioactive elements, and radium is rarely found in nature separately from uranium, therefore it serves as a sign its presence in the search for uranium deposits).

Nuclear methods, for obvious reasons are not used by all types of nuclear reactions, For example, in principle, alpha logging in a well cannot exist, since alpha particles have an extremely low penetrating ability, (free path in air is about 10 cm, in a sheet of foil it is less than a micron).

Beta logging is also practically inapplicable, since beta particles have low penetrating power. Due to this, the reactions associated only with neutrons and gamma quanta, which have a huge penetrating ability, have become very widespread. The most and methods are widespread: GK, GGK, NGK, NNK, INNK and their varieties, however, others exist and can be applied. Among them, you can find the following types of logging: NAC (neutron-activation), GOC (gamma-neutron), X-ray radiometric and others. Nuclear, like any other logging, depends on the speed of descent and ascent of the geophysical probe.

If the probe has too high a speed of movement, it may simply not have time to measure the changing parameters, and for nuclear methods, this is especially important, since many nuclear reactions take hours.

Moreover, separate measurements have also found their application, when the second measurement is carried out in the same well, with the same device at the same speed, but after a rather long time, until all nuclear reactions initiated underground are completed.

Geophysical well survey (GIS) is a set of physical methods that are used to study rocks, as well as control the technical condition of drilling.

According to their purpose, such studies are divided into two groups. These are directly methods of logging and borehole geophysics. The first is also known as the field or drilling science of studying rocks that are within a radius of 1-2 kilometers.

Often these two terms are the same. In any case, research is carried out using the methods of exploration geophysics. In recent years, the study of igneous rocks is gaining momentum.

GIS is carried out at all stages of geological exploration, which relate to oil and gas. Geophysical surveys of wells make it possible to directly characterize wells section; lithology; reservoir parameters, etc. Geophysical surveys are usually carried out in near-wellbore and interwell space. Based on the results, the necessary geological constructions are performed. For example: structural maps; profiles; isopach maps and others. They are necessary for studying the structure of oil and gas facilities, as well as calculating hydrocarbon reserves in wells.

An excellent option for studying the education of the industry, as well as its tendencies and directions, will be a visit to the Neftegaz exhibition, which is organized by the world-famous Epicenter Fairgrounds.

The well is influenced by rock pressure; high humidity; temperature drops. Research methods are called geophysical because not only the drilling rig itself is studied, but also the adjacent rocks. The need for it is obvious. The service life of the drilling rig directly depends on the structure and density of the rock. Considering the types of geophysical studies of wells, it is worth noting that today there are a huge number of them. Through applications, you can study rocks, as well as monitor the technical condition of the drilling rig.

All GIS methods include electrical options. This is directly resistivity logging. This set of techniques makes it possible to conduct a lot of research. It should also be noted that there are nuclear geophysical options. They belong to logging methods, and their basis is the study of gamma radiation and the reaction of the rock. Main types of well logging

The classification of geophysical studies of wells is carried out according to the type of the studied fields. To date, more than 50 different methods are known. They have significant differences among themselves and are applied depending on a certain type of work. The main types of geophysical surveys include the following methods: electrical; nuclear; thermal; seism acoustic; magnetic. Generally, logging logs are logs of various kinds.

This means that tracking the change the required values are carried out by means of a special device descended on an electric cable, which is supplied with appropriate equipment. Geophysical well survey methods are necessary directly to find the physical and hydrogeological characteristics of the productive strata. The characteristics of the strata are determined in the following ways: electric logging; caliper measurement; flow metering; thermometry, etc. Comparison of the obtained results of a comprehensive study allows compiling a complete description of the hydrocarbon horizon.

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