

The automated system for gravimetric monitoring of the oil and gas deposit

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Abstract

In recent years in the Republic of Kazakhstan much attention has been paid to questions of geodynamic and ecological safety of the oil and gas deposits development. The technogenic influences caused by deposit development can cause the events of geodynamic character which are caused by geodynamic processes (extensive sags of the terrestrial surface and activate the fault zones). In order to avoid manifestation of such geodynamic processes it is necessary timely performance of high-quality monitoring which includes gravimetric monitoring in measurements of gravity variations, display of wells location and their types, volumes of pumped water, production volume, reservoir pressures, isobar cards, data interferometer, profiles, well status. One of the ways of geodynamic researches is measurement by the gravimeter.

Keywords: GIS, gravimetric monitoring, oil and gas deposit, process model, functional modeling, information system.

1 General

Processing of significant volume of primary gravimetric monitoring data involves using of graphic, visual and interactive technologies. Development own software that automates processing and provides storage, accumulation of the gravimetric researches given for the long-term period and also application of geoinformation system (GIS) opportunities allows to facilitate work of experts and to improve the visibility of research results.

The program used gravimetric measurement data carried out on one of the oil and gas deposit located in the south-eastern part of Caspian Depression. In work [1] is shown high efficiency of carrying out gravimetric researches for this region. For creation of data model and definition of the automated system functional part is carried out functional modeling of research and production center, which is engaged in gravimetric researches of the oil and gas deposits development [2].

The cartographical Google Map technology was chosen as the GIS-system of monitoring for visualization of data as the simplified service working in the web mode. Special program module has written for this service and visualizes a set of additional layers on fragment of district map territory of the oil production. To visualize the deposit data information on coordinates of wells, field contours, supervision points, profiles and GPS data is necessary. In figure 1 the example of some layers visualization of the oil

and gas deposit is represented.



FIGURE 1 Example of layers visualization of the oil and gas deposit

For development of the primary data processing system it is necessary to automate process of loading and data processing for their further entering in the database that will provide convenient and fast information search and will allow to form and keep reports, to build schedules according to the user parameters.

Automation of gravimetric monitoring data processing on the oil and gas deposit allows to increase efficiency of processing and interpretation of gravimetric data.

References

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