

EVALUATION OF TECHNICAL OBJECTS ACCORDING SPACE SURVEY

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Making electronic maps of industrial sites and their immediate surroundings with the help of satellite images with high resolution makes it possible to obtain highly accurate plans and schematic maps fully reflects the current state of the object. This is especially important for objects large area or length or located in remote places. In addition, the use of satellite images allows to solve the problem of unification of map projections and coordinate systems. Often faced with a situation where ground-based measurements were conducted in the local coordinate system attached to a frame object. Design and documentation of the actual objects might have the same or another system of coordinates, which does not correspond with the real geographical coordinates or hydro, and often - and each other. Therefore, errors may occur when combining this documentation with other data having a coordinate binding. Consequently, the possible problems, for example, in the case go beyond the boundaries License plot inconsistencies ROW, pollution of nearby areas, etc.

One of the most important points is that the maps that are based on large-scale satellite images are full of geographic and sectoral information, which allows you to define all the necessary numerical data and distances, angles, etc.

Electronic maps of industrial facilities and decryption of their technical condition is conducted on space multispectral high-resolution images, such as Quick Bird and Ikonos with a resolution of less than 1 m.

This provides the necessary accuracy in determining the spatial parameters of the objects and the precision of their location.

The end result of evaluating the technical state of objects is an analytical treatment of the results decryption.

In reality, the decryption and analytical processing is a complex creative process and its outcome depends largely on the expertise of specialists, who in addition to practical skills, should have profound theoretical knowledge about the object of research.

In his recent work on processing of satellite images based on the new GIS technology, which is based on the information model of the object, which from the standpoint of the decryption described all the technical processes of the device and the appearance of systems, stages of operation, all kinds of interactions of natural and engineering structures, the requirement specifications and technical documentation, as well as possible causes (or sources) of occurrence and development of defects of the objects.

As an example, using the information model have been described interpretive features of objects in the technical corridor lining the main gas pipeline, the processes of their operation, external exposures, use of normative and technical documentation.

Figure 1 shows a fragment of space image, obtained with the spacecraft Quick Bird overlaid with the route of the underground main gas pipeline Baku-Novorossiysk.

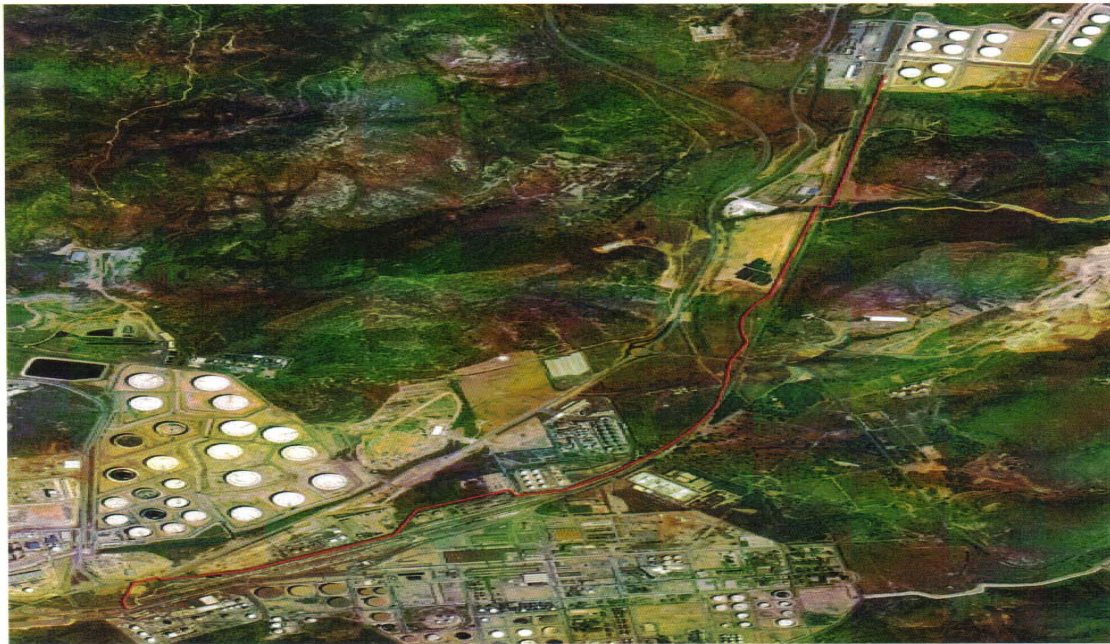


Figure 1. Satellite image satellite Quick Bird coated with a route of the underground main gas pipeline

Figure 2 shows a map of the technical corridor gas pipeline and his closest associates, built on the basis of a space picture Quick Bird [1]. On the map the types of intersections of main gas pipeline with the objects and the distance to them from the initial reference point.

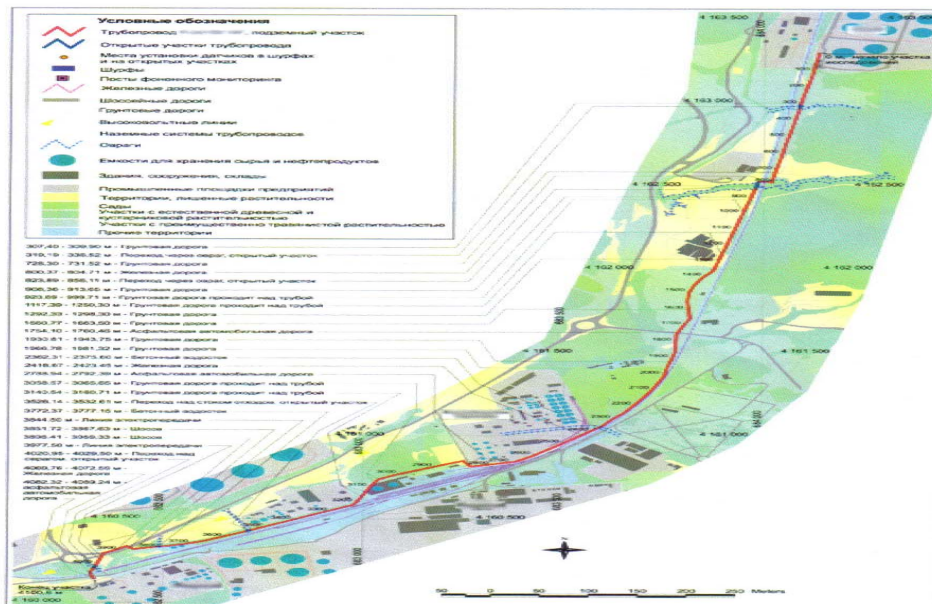


Figure 2. Map technical corridor, built by a space picture Quick Bird.

To the problem is solved by electronic mapping using satellite images with high resolution are the following:

- Construction of complete coverage across the facility, technical corridors and adjacent areas;
- Monitoring changes in the situation outside the technical corridor of the object, in particular, the identification of adverse natural and man-made phenomena that can lead to emergency situations;
- Monitoring the construction of remote objects;
- Determination of compliance with the provisions of interpretable objects normative project documentation;
- Decryption of the technical condition of onshore pipelines, terminals, oil and gas reservoirs;
- Detecting the state of the intersection of main pipelines (MT) with natural and man-made objects;
- Identification of an emergency condition dangerous areas and natural hazards near the facilities and technical corridors including the development of erosion and slope processes, construction of various facilities and communications, illicit excavation, etc.
- Assessment of oil spill area;
- To construct maps of soil corrosives for the territories of enterprises and technological corridors, and through the pads MT interpolation local and ground measurements;
- Construction of three-dimensional models of objects;
- Construction of the vertical profiles passing the MT in the presence of data on the project or the actual depth of occurrence.

References

1. Shirin-zada, A.A., Ramazanova E.E., Jamalov A.T., Ragimov RM. Development of methodology ensure energy and environmental security of transportation of hydrocarbons in the pipelines. Proceedings of the Azerbaijan National Aerospace Agency, № 3 (12), 2009, pp. 3-9.