MONITORING OF OVERHEAD POWER LINES.

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Annotation. Monitoring of overhead power lines allows you to control their integrity and serviceability, to detect defects. For this, 3D reconstruction technologies, neural networks and computer vision are used - they allow you to collect a large list of design parameters, generate reports and defective statements. Overhead line monitoring is used in large power distribution companies with long power transmission networks. In addition, among the key consumers, one can single out large power distribution companies, fuel and energy companies, as well as services for operating and developing the infrastructure of enterprises.

Key words: Monitoring of overhead power lines, infrastructure facilities, laser scanning, intelligent information systems, functional modeling.

The use of a power line monitoring system allows you to analyze the state of objects, determine their coordinates, control the flood situation, which can affect the stability of power lines, as well as detect fires and unauthorized activities in the protected areas of objects. With the help of these technologies, it is possible to restore or create an (a digitally transformed image of a terrain or an object) and a digital 3D terrain model, to determine inconsistencies in the state of networks with the requirements of regulatory and technical documentation. [1,2]

The implementation of the solution improves the reliability of the operation of power networks, respectively, and the quality of energy supply to consumers due to the prompt determination of the causes of accidents. In addition, monitoring of overhead power lines makes it possible to predict the state of objects and more accurately plan repair and restoration activities. The system allows to reduce the time for assessing the technical condition of objects in relation to standard visual and instrumental methods by an average of 30-50%, and also reduces the time for developing reporting and project documentation by 10-20%. [2,3]

II. RESULTS AND DISCUSSIONS.

The safety and reliability of the production, transmission and distribution of electrical energy is becoming an increasingly complex process for energy companies and regional dispatch services. Many new factors have emerged that did not exist before, but which will be the basis of energy efficiency in the future. These factors must be taken into account by grid companies that are responsible for the reliable supply of electricity to consumers. In accordance with the requirements of the time, according to the approved policy of innovative development, energy saving and energy efficiency improvement, the tasks of determining the locations of damage to wires of high-voltage power lines and distribution networks, as well as automated monitoring of operating modes based on direct measurements of wire parameters, are relevant.

Power lines are characterized by a large length, as well as the presence of a large number of elements. It is quite natural that over time they wear out, which is due to the features of the design itself, as well as operating conditions. As practice shows, the main damage is caused by third-party, climatic and atmospheric influences. At present, the problem of timely monitoring of defects in overhead lines in order to eliminate them as soon as possible is quite acute. Such work is necessary not only for the purpose of general simplification of the operation of the transmission line, but also from the point of view of economy, because the replacement of equipment caused by a break in the lines can be quite expensive. And this is not taking into account the costs incurred by the loss of electricity and payment for the work of repair teams. Based on this, we can say that the monitoring of power lines is the most important moment in their operation. [3]

Power line survey with drones is a relatively new but extremely effective method. It is especially relevant for our geographical conditions, when ground transport does not always have the opportunity to reach the object of verification. A distinctive feature of this technology is the accurate determination of wires of power lines, as well as the construction of their 3D model and clearings, based on data

obtained from aerial photography. In addition to it, Power Line monitoring includes the processing, analysis and visualization of the information received. The list of works also includes the inspection of individual supports using drones. [4,5]

III. CONCLUSION

As part of power grid facilities control schemes, our systems are used for:

- high-precision operational indication and localization of wire damage points (within one span);
- prevent damage to wires due to icing or peak overloads;
- monitoring the voltage level at power transmission line control points to ensure the requirements of the power quality standard;
- control of power transmission modes by direct measurements of wire parameters (temperature, current, sag angle, etc.);
- ensuring the reliability and safety of the functioning of electrical networks and the quality of the services provided for the transmission of electricity. During operation, the following problems can be found:
- Mechanical damage to individual components of the structure.
- The inclination of the pole relative to the direction of the power line.
- Identify unsuitable insulators.
- Presence of wires.
- Lack of any details.
- The presence of overheating in some areas, if you use a thermal imager.

Based on the information received, the customer receives a detailed report on the state of the power line, as well as its individual elements. You get fully substantiated and correct data, on the basis of which you can make appropriate decisions, without relying on the assessment of an employee visually inspecting the power line. **[4,5]**

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