

DIGITAL SUBSTATIONS AS THE DEVELOPMENT PATH OF POWER GRIDS

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The last decade in the energy industry for the Republic of Belarus was based on the modernization of substations and the introduction of new technologies to improve the equipment reliability and the safety of substations' operation; to minimize errors of operational and maintenance personnel; to reduce capital and operating costs. Further these facts contributed to the implementation of the trend of transition to the first digital substations in the country.

A digital substation is a substation that has a high level of control automation of all technological processes, equipped with intelligent electronic devices (IED). All information exchange between the substation elements is carried out by digital signals based on the channels of the IEC 61850 standard [1]. The structure of the digital substation contains three main parts: process, bay, and station levels.

Currently, one of the examples of the introduction of this technology is the digital substation "Mogilev 330", which supplies such large enterprises as Belarusian Metallurgical Plant, "Mogilevkhimvolokno", "Mogotex", "Mogilevliftmash" and others.

As a result of the modernization of the Mogilev 330 substation, the following goals were achieved: the increase in the class of energy and substation efficiencies; the improvement of the maintenance safety by automation processes and the reduction of human intervention in the equipment management; the decrease of the copper cable connections use; the reduction of the area of the Mogilev 330 substation by about 40 % after the reconstruction.

References

1. Electrical Engineering Portal [Electronic resource]. – Mode of access : <https://electrical-engineering-portal.com/digital-substation>. – Date of access : 13.09.2021.