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SMART GRID TECHNOLOGIES IN UKRAINIAN POWER SYSTEMS

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Abstract
The features of Smart Grid technologies in electric power industry of Ukraine are analysed. The Smart Grid technologies will promote efficiency of power delivery. The necessity of Smart Grid technologies is similarly proved for electric power industry of Ukraine at legislative level.
Keywords: Smart Grid, power, industry, electric power system, efficiency

Introduction

Exploiting "intelligent" electric networks directly affect the lives of consumers, programs of consumer participation, their learning of the features of the Smart Grid function.

A smart grid is an electrical grid which includes a variety of operation and energy measures including smart meters, smart appliances, renewable energy resources, and energy efficient resources. Electronic power conditioning and control of the production and distribution of electricity are important aspects of the smart grid.

As part of such smat grid programs, energy companies should provide consumers with intelligible information, apply schemes, new methods and ways of informing information in order to increase consumer confidence and show the benefits that the project brings to their everyday life.

The purpose of the article is to analyze the features of introduction of Smart Grid technologies in the electric power industry of Ukraine with the aim of "intellectualizing" electric networks.

Research results

As a result of analysis, it has been shown that the successful solution of new tasks within the framework of the existing extensive development of the electric power industry, mainly by way of only the increase of capacities and the expansion of the quantitative composition of power and electrical equipment, even with improved characteristics, is inadequate. The role of a revolutionary initiative that stimulates economic development in the world's leading countries is devoted to the introduction of Smart Grid technologies.

Novadays in Ukraine, electric networks work according to the principle (generator - system or electric networks - distribution electric meters - consumers - consumers). System-forming networks in most cases are looped, and distributed electrical networks consist of radial lines with one-way power

The concept of "intelligent" electric power offers another principle of construction. This system is a generator - a transmission line - a consumer, but the user is involved in the production and redistribution of energy.

Recent developments in the country have led to a shortage and significant increase in the cost of fuel, which stimulates the development of alternative sources of electricity. That is, generating power in the future power supply system will be more distributed than concentrated, as it is now.

The main future of alternative sources of electric power sources is their relatively small power and instability of power parameters generated. Obviously, to stabilize the parameters of such sources and their automatic synchronization with the network requires rather "intelligent" controlling the device.

The process of introducing Smart Grid technologies for the Ukrainian electric power industry will result in the following fundamental changes compared to the existing state of the grid:

- The transition from centralized methods of generating and transmitting electricity to distributed power generating objects and topology of the network at any point, including at the consumer level;
- Refusal from strict controller regulation in favor of coordinating the work of all glass network;
- Translation on Smart-technology of processes of control, accounting and diagnostics of assets, which

will provide prospects for self-restoration of the power system, as well as effective mode of exploitation of fixed assets;

- Construction of high-performance information and computer infrastructure as the nuclei of the energy system;
- Formation of prerequisites for widespread implementation of new devices that increase maneuverability and controllability of equipment - flexible connections, DC inserts, energy storage devices, etc .;
- Creation of next generation operating systems (SCADA / EMS / NMS), allowing to use innovative algorithms and methods of management of the power system, including its new active elements.

On the base of these signs, it is possible to give a fairly precise definition of the "intellectual" electric network as a set of software and hardware connected to the generating sources and electrical installations of consumers, as well as information-analytical and control systems that provide reliable and high-quality transmission of electric energy from the source to the receiver at the right time and in the required quantity.

Conclusion

The ways of introducing Smart Grid technologies in Ukraine with the "intellectualization" of electric networks, which considerably increase the efficiency of functioning of the electric power industry, was analyzed. The basics of changes in the electric power industry in comparison with existing stationary systems in the implementation of Smart Grid technologies are presented in the research.

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