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Smart Grids

In many countries, enterprises in the energy sector of the economy are undergoing a period of reform. The ongoing processes of mergers, acquisitions and changes in the management structure, the boundaries of the sphere of activity and territorial presence force many former monopolies to look for new models of value creation for themselves. Inevitably, the tasks of companies and their business processes are changing. Markets for the provision of public services are being formed. Market mechanisms are being introduced. Technological changes are required to meet the modern needs of the industry. While all of these changes vary by location and type of utility activity, innovation will inevitably transform the entire utility industry. Operational infrastructure management is critical. Power utilities are faced with the need to implement new operating and maintenance standards to continuously improve the balance between power supply reliability and costs. Another key task in the power industry is the management of equipment maintenance and repairs. This is due to the huge number of pieces of equipment distributed over large areas and requiring constant routine and repair maintenance. Consolidation of information about the state of equipment in a single control system with the possibility of its prompt provision to various consumers on the ground allows to reduce downtime for repairs, reduce the cost of spare parts and materials, optimize logistics and workload of personnel.

Consumers are also an equally important driver of change. There has been a trend of transition from a process-oriented approach to a client-oriented one. The increased requirements of consumers to the level of service inevitably lead to the expansion of the range of services provided by energy companies, the introduction of new financial and payment mechanisms.

In accordance with the Smart Grid concept, among the priority areas for the development of IT in the energy sector for the coming years are:

1. Widespread introduction of smart (smart) measuring instruments at new and modernized measuring points - "smart" meters with the function of remote control of the load profile of the measured line and measuring transducers with standard communication interfaces and protocols (including wireless), corresponding to information security standards.

2. Installation at each large facility connected to the power grid (residential area, office center, factory, etc.) of advanced automated information and measurement systems (AIMS) operating in real time. AIIS should monitor object processes (for example, electricity or heat supply, including energy quality parameters), perform simple automatic control algorithms and have developed means of information exchange with the outside world.

3. Creation of a wide network of integrated communications based on a variety of communication lines - FOCL, satellite, GPRS, high-frequency communications over power lines, etc. Each AIIS must be connected to at least two independent communication channels.

4. Introduction in power companies of automated systems (AS) for managing production activities. Since all energy enterprises belong to continuous cycle industries, four types of such systems can be distinguished:

AS management of maintenance and repairs;
AC work in the markets (commercial dispatching);
AC customer service;
AS for managing the main production - generation, transmission, distribution, sales (metering of consumption) or dispatching.
5. Creation of integrated interfaces to AIIS and AS for production management for automatic data exchange with AS of other market participants. At the same time, exchange protocols and information security standards for all categories of market participants should be defined.

A number of vendors have already announced support for the Smart Grid concept and the inclusion of new functionality in their next product releases. Some are bringing to market solutions built in accordance with the new ideology and demonstrating greater flexibility and functionality in the new environment.

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