



## DEVELOPMENT OF TELECOMMUNICATIONS AND IT SYSTEMS

In 2017 business applications evolved in compliance with requirements of the business and the Board-approved strategy<sup>21, 22</sup> on IT, automation and telecommunications in the following spheres:

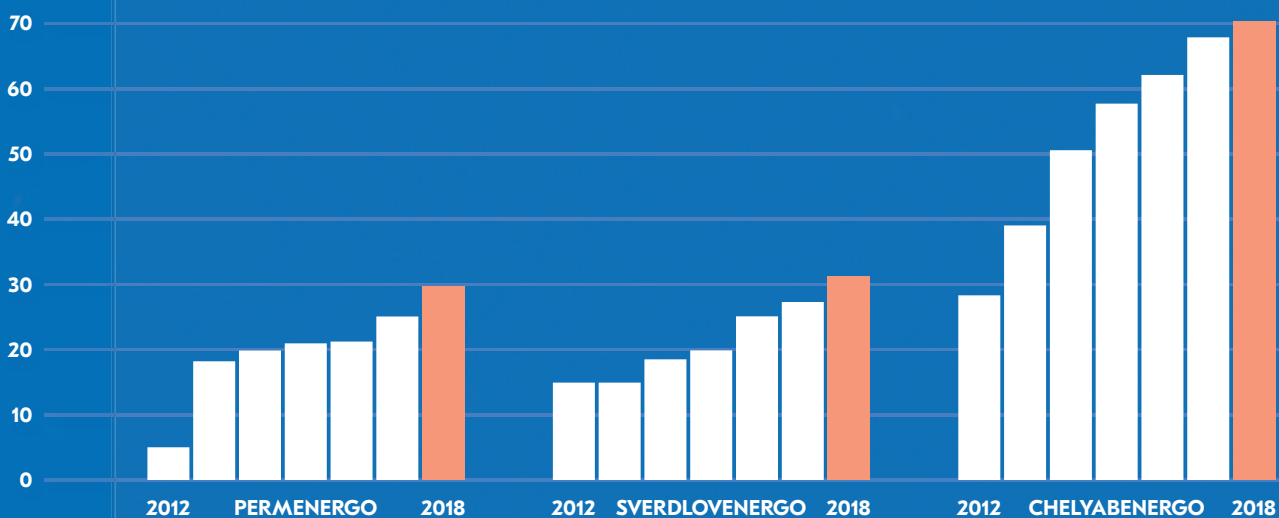
- Production Assets Management System;
- "Daily Log" information system;
- Automated information system of treasury operations accounting, centralized by PAO Rosseti;
- Development of the control system related to connection;
- Creation of a user account for connection and electricity transmission;
- Automation of requisition of materials and works that are not included into repair programs and not planned through maintenance and repair business processes;
- Upgrade and update of modules and subtasks of the system registering changes in the Company's accounting policy;
- Implementation of the automated transportation and special-purpose vehicle control system;
- Transition of all information computation systems to single-control Telescope+ information computation system (automated meter reading and control system);
- Implementation of the metrology support control system;
- Implementation of the automated metered values input control system;
- Implementation of IT security subprogram for the automated document flow control system (PIB ASUD).

To ensure performance of business applications in 2017 we completed the following works and purchased the following equipment to enhance speed of operation and reliability of IT infrastructure:

- Development of a project related to the build-up of present-day corporate computer network;
- Enhancement of computer and disc resources of data processing centers;
- Development of the IT security complex system for information telecommunications and technological systems of OAO IDGC of Urals;
- Purchase and installation of computer and office equipment at users' workplaces.

The program for upgrade of information acquisition and transmission systems at 35-110 kV substations, approved by OAO SO UES, is a high-priority target program on the development of automated systems of technological management. The program was initiated and approved in 2010, its scheduled adjustments being made on 10.08.2017. The amount of 35-110 kV substations, equipped with up-to-date IATS, serves as an index of the program progress.

Annual branch progress in the amount of 35-110 kV substations, equipped with up-to-date IATS



The progress on other aspects of the ASTM development is presented below:

#### **SVERDLOVENERGO:**

- Our affiliated company (AO Yekaterinburg Electric Grid Company) has launched the 2nd stage of DMS-based ADSM hardware and software upgrade (calculations, analysis, and evaluation of network status). SCADA-based functions were implemented earlier, with the launch of the 1st stage. The ADSM uses indigenous Russian software.
- 1st and 2nd stages of the indigenous Russian ADSM hardware and software solution for “Central Electric Grids” production department (infrastructure, telecommunications system, SCADA base functionality).
- Creation of telecommunications and information systems for IDGC of Urals’ analytical center as a part of preparation for FIFA 2018 World Cup.

#### **Permenergo:**

We prepared the project documentation for ADSM upgrade on all control levels (NCC, ODC in production departments, ODG in distribution zones), stipulating achievement of SCADA/DMS/OMS functionality. The project implementation is slated for 2018.



“PAO Rosseti has set a goal: the Company shall facilitate a countrywide shift to cyberinfrastructure and complete digital upgrade of its networks by 2030. Permenergo branch has already gone into action: in the foreseeable future, active-adaptive networks with minimally-manned automatic response to network faults and reliable electricity supply should appear in the region. Yet today, we use innovations and cutting-edge technologies in overhaul of substations or power lines. Reliability combined with innovations lies in the focus of such approach”

Vitaly Cheremnykh, Head of Permenergo’s Technological Development and Energy Efficiency Directorate