



AggreGate[®]

Power Engineering

Revolution in Power Engineering

- Modern digital substation generates gigabytes of data every day
- Federal companies deal with a much larger data amount
- Effective data management is crucial for winning on highly competitive markets of small-scale generation and smart grid

Current Problems and Challenges

- At present time, energy companies use a lot of software and integrated software/hardware solutions to support basic operations both in automation and IT infrastructure management
- Various automation and IT solutions will enlarge, integrate with each other and yield market space to global IIoT platforms that solve hundreds of different tasks

Technology Data Analysis Tasks

- Common automation and operation tasks in power engineering were solved many years ago. Today, the tasks enhancing efficiency of production and operation processes come forward. They allow to reduce costs and create additional profit sources
- In most cases, these tasks are solved by in-depth technology data analysis with the help of machine learning algorithms, such as value prediction and anomaly detection

Tibbo AggreGate Platform Application

AggreGate Platform and products based on it allow to design complex solutions, including:

- Process control systems for power generation and distribution facilities
- Smart metering of various scale
- Platforms for industrial data transmission and processing at regional, municipal and federal levels
- Dedicated solutions, such as HVTL monitoring or access control
- Engineering and IT infrastructure monitoring and management systems

Solvable Tasks

- Supervisory control for energy management facilities
- Remote monitoring and management of small-scale generation, distribution and hybrid power supply facilities
- Network, technology and business process visualization
- Long-term storage of industrial and business data
- Accounting and reporting on electric power consumption
- Efficiency enhancement of industrial control processes

IIoT Platform Application Benefits

- Easy migration to cloud-based infrastructure, IT operating costs reduction, efficient cooperation with data center and telecommunication providers
- Ability to create and replicate models of generic objects (“digital twins”) or even new commercial products
- Single flexible and customizable solution instead of dozens
- Perfectly fits almost all non-routine tasks which can’t be solved by traditional software (SCADA, MES, EAM, ERP...)

Industry 4.0 Generation Challenges

- Digitalization of various processes and softwarization of objects (physical form loss)
- Dealing with Big Data (predictive maintenance, trend analysis and anomaly detection in time series, classification, etc.)
- Ability to create large-scale situation centers and manage distributed infrastructure from a single place
- Stepwise withdrawal of isolated products and niche solutions not integrated into the ecosystem

Structured Data Processing

- Being the heart of AggreGate Platform, its Unified Data Model was specifically developed for processing structured data as well as tag-based (time + value + quality) values
- Structured data can be acquired from third-party enterprise systems via hundreds of protocols (SOAP, HTTP/REST, JDBC/SQL, CORBA, MQTT, any other industrial and IT protocols)
- **Examples:** incident table, service topology, etc.

Развитие созданных решений

The key IIoT platforms idea is reducing custom solution costs and making development of monitoring/control applications faster and easier.

Using AggreGate's visual tools and editors and getting an expert knowledge from dedicated training programs allows to develop new solutions in a variety of ways:

- Directly working with vendor (Tibbo) project department
- Working with system integrators or engineering companies
- Involving your own specialists

Project: Centralized Monitoring of Cellular Network Base Station Power Supply

Challenges: Reduce power supply cost in case of unstable power sources, logistics optimization for fuel tanks refilling

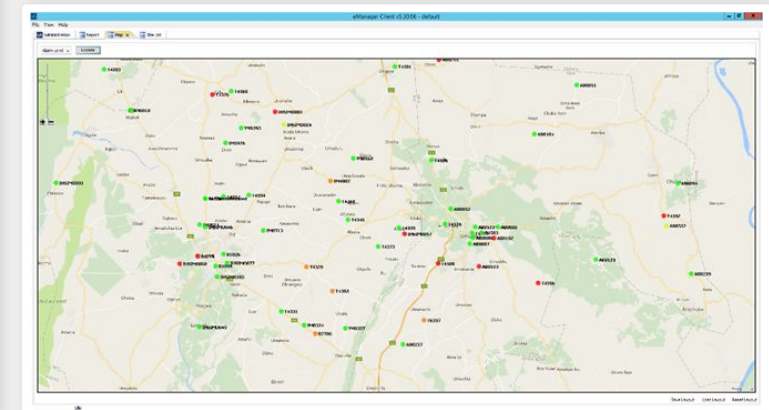
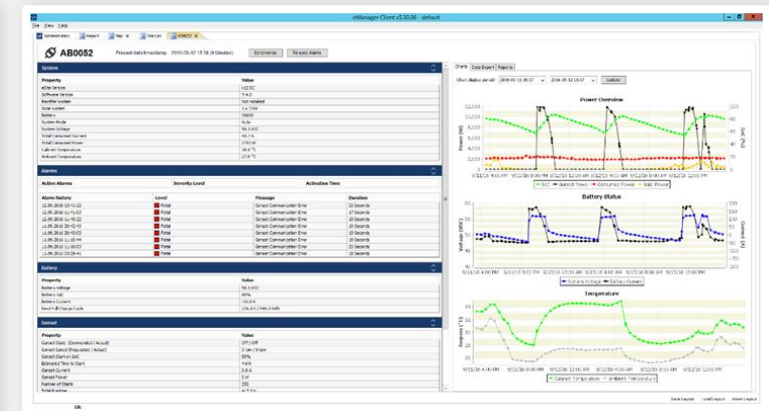
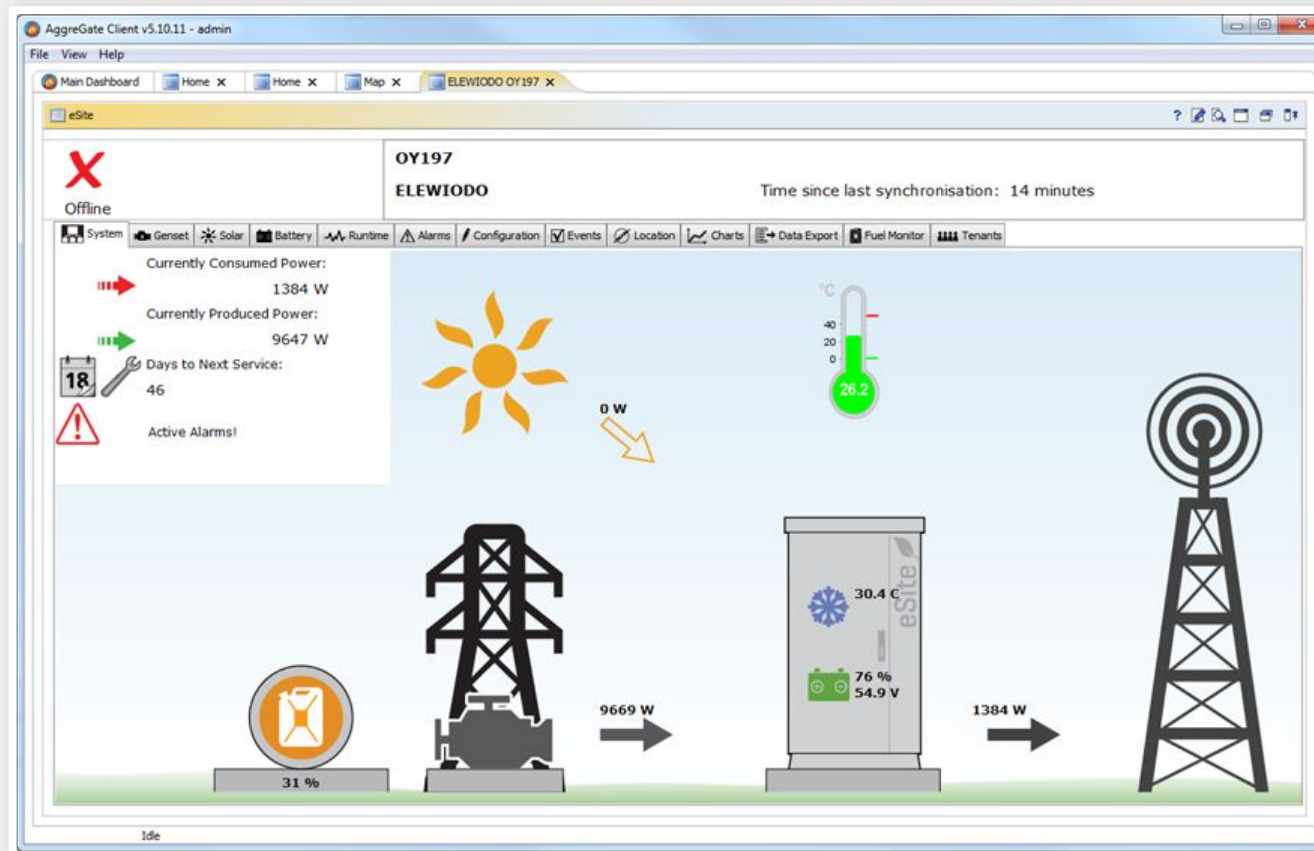
Status: Commercial product, dozens of deployments

Equipment: Container-type power supply unit with Beckhoff industrial PC

Partner: Flexenclosure AB, Sweden



Project: Centralized Monitoring of Cellular Network Base Station Power Supply



Project: Automating Steam Turbine Operation

Challenges: Efficient control of steam turbine operation, critical units condition monitoring, troubleshooting

Status: Completed commercial deployment

Hardware: Steam turbine by Shin Nippon Machinery company

Customer: Shree Renuka Sugars LLC, India



Project: Industrial UPS Monitoring at Power Substations

Challenges: Detailed analysis of UPS array operation modes and battery conditions

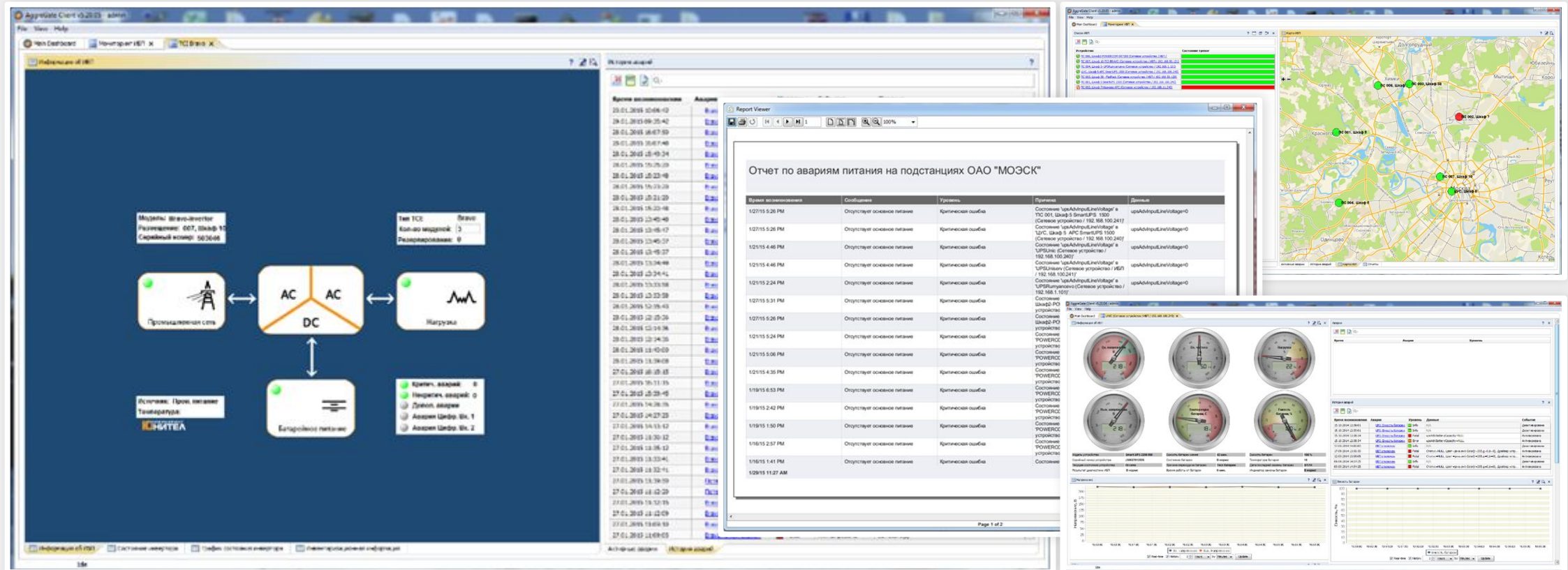
Status: Completed commercial deployment

Hardware: Industrial UPS by APC and Eltek

Customer: United Energy Company, Russia



Project: Industrial UPS Monitoring at Power Substations



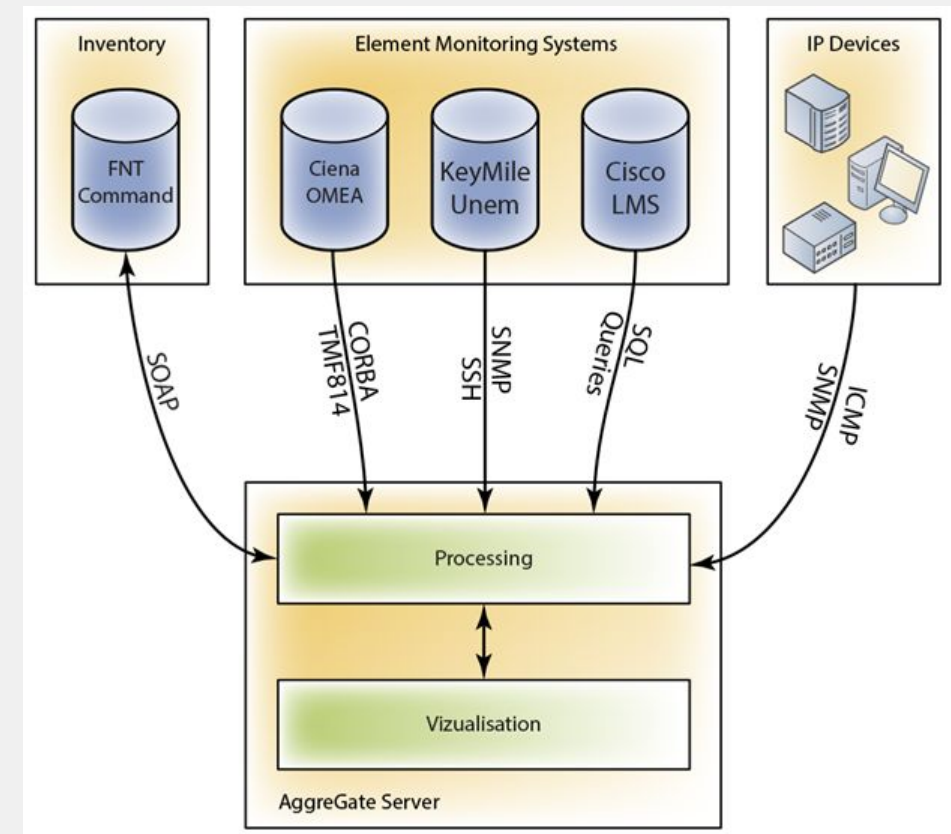
Project: Incident monitoring in a multi-service SDH/PDH data transmission net

Challenges: Incident aggregation from various element monitoring systems, event correlation, failure root-cause analysis

Status: Completed commercial deployment

Objects: Ciena OMEA, KeyMile Unem, Cisco LMS monitoring systems, FNT Command telecommunication resource inventory, IP network assets

Customer: United Energy Company, Russia



Project: Monitoring of a Nuclear Research Reactor

Challenges: Monitoring of all reactor systems and additional equipment, visualization of operating parameters through HMIs and charts

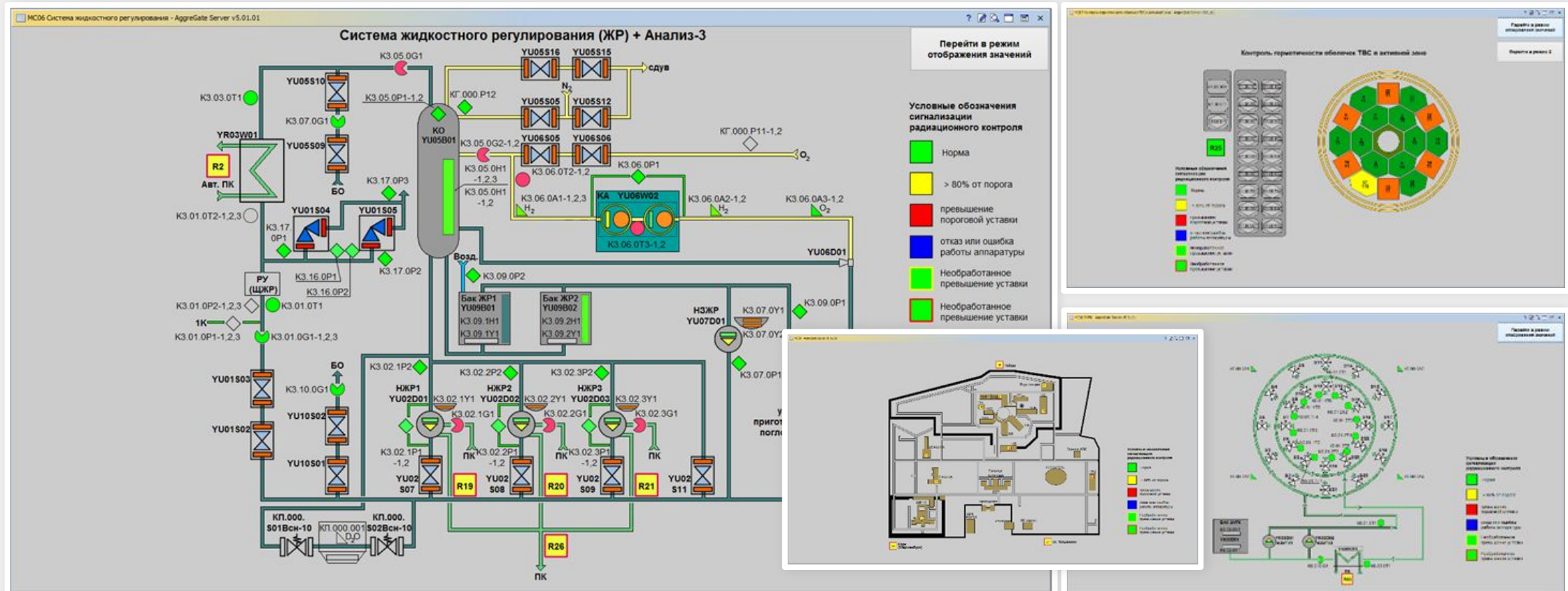
Status: Complete commercial deployment

Equipment: Dedicated real-time controllers by National Instruments

Customer: Saint-Petersburg Institute of Nuclear Physics (Kurchatov Institute), Russia



Project: Monitoring of a Nuclear Research Reactor



Project: Comprehensive IT Infrastructure and Industrial Network Monitoring

Challenges: IT assets and industrial equipment monitoring, data consolidation and analysis

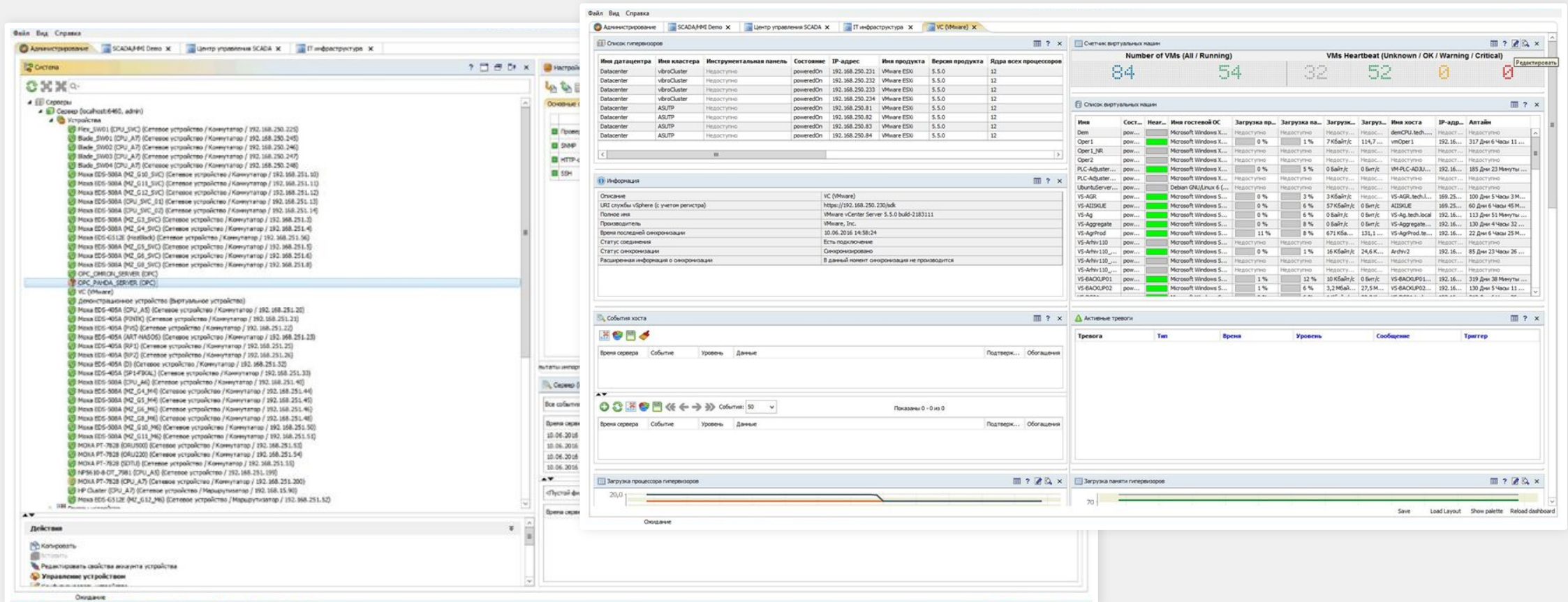
Status: Completed commercial deployment (1st stage)

Equipment: Industrial network equipment, interface converters, controllers by various vendors

Customer: Krasnoyarsk Water Power Plant, Russia



Project: Comprehensive IT Infrastructure and Industrial Network Monitoring



Project: Distributed Smart Metering, Industrial Data Bus, IT Management

Challenges: Data acquisition from various meters, integrity checking, integration with local SCADAs and Smart Metering systems, IT infrastructure monitoring

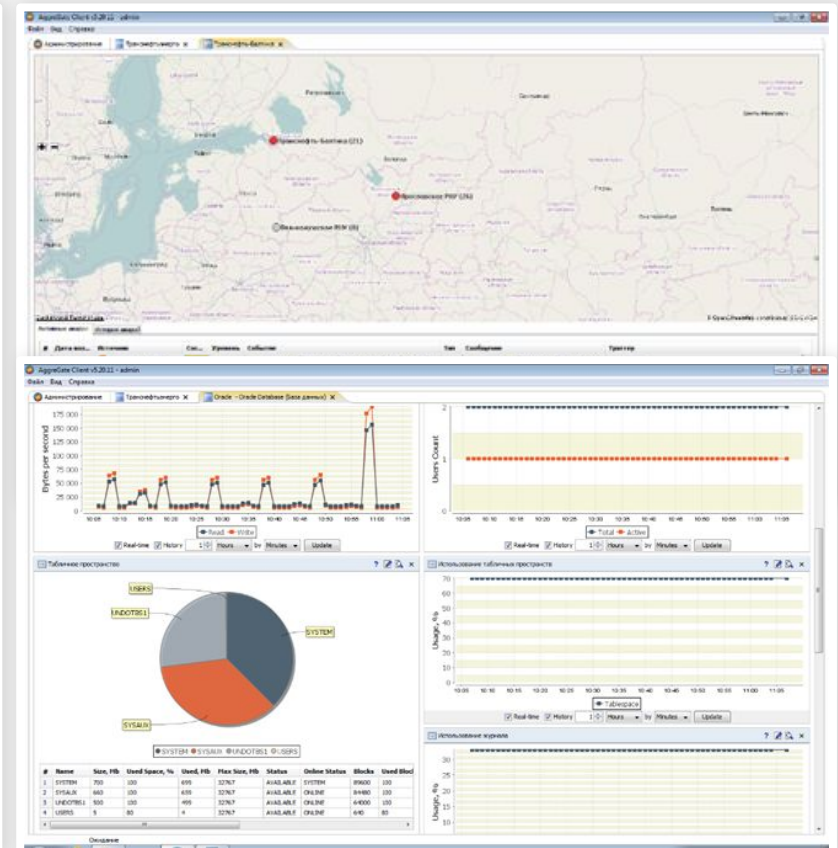
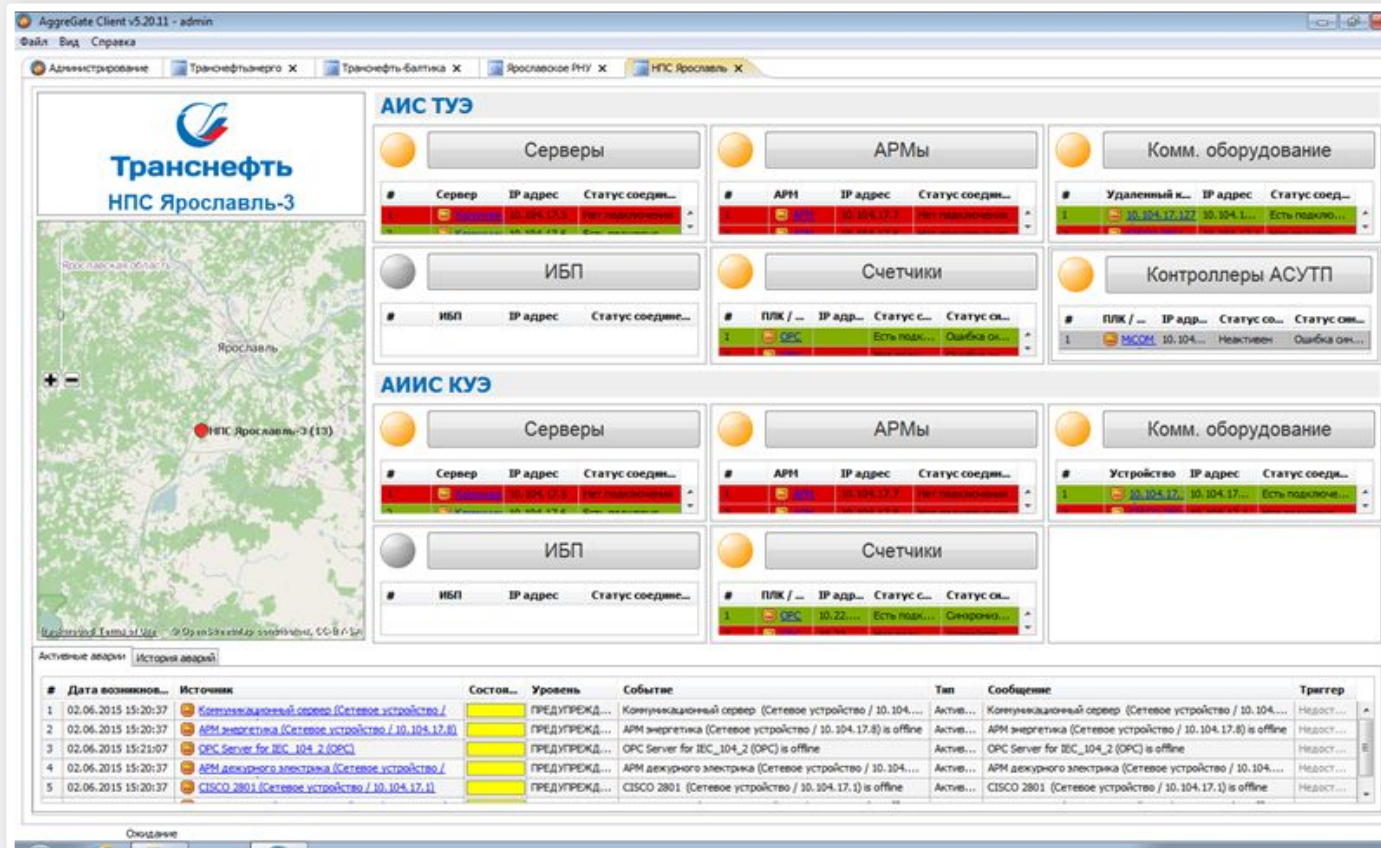
Status: Current commercial deployment

Equipment: Electric power meters, local gateways, various IT systems

Customer: Transneft Energy, Russia



Project: Distributed Smart Metering, Industrial Data Bus, IT Management



Tibbo
SYSTEMS



AggregateGate[®]

Check our website: **aggregate.digital**

