

Engineering Systems Monitoring for PVC Integrated Plant

Industry

Petrochemical industry

Hardware

Layer 2 and 3 network switches, SHDSL equipment, VoIP gateways, Radiokupol RoIP gateways, DEPO servers, Dolomant controllers



Partners:

RusVinyl LLC,
Engineering
Corporation
Insight LLC

RusVinyl Company Profile

RusVinyl LLC is a Russian-Belgian joint venture operating a Polyvinyl Chloride (PVC) Integrated Plant near Kstovo, the Nizhniy Novgorod region.

RusVinyl PVC plant uses the cutting-edge European technologies (BAT – Best Available Techniques) that assure the necessary range of PVC with low process costs, and will comply with the most rigorous environmental requirements of the Russian Federation. The plant capacities are 300 kilotons of PVC- suspension, 30 kilotons of PVC- emulsion and 225 kilotons of caustic soda.

The hardware and software suit for Critical Engineering Infrastructure Monitoring System (CEIMS) is designed to monitor technological processes and ensuring proper equipment functioning directly in potentially hazardous facilities. CEIMS transmits the status information through communication channels to duty dispatcher services (DDS) for further processing so to assess, prevent and eliminate the accident consequences in real time, as well as provide the emergency information, including terrorist attacks and the related forecast to public duty dispatch services (PDDS).



The CEIMS is intended for:

- Reducing human and material losses in case of an emergency, fire
- Automated real-time status monitoring of critical technological, life support, security, fire protection, and communication systems for ensuring personnel, population, and environment safety
- Real-time reporting to municipal PDDS on pre-emergency or emergency state of technological, life support, security, fire protection, and communication systems, as well as terrorist attacks
- Informing appropriate services and departments (emergency, DDS, emergency rescue) through municipal PDDS of carrying out certain rescue operations and eliminating accident, fire and emergency consequences.

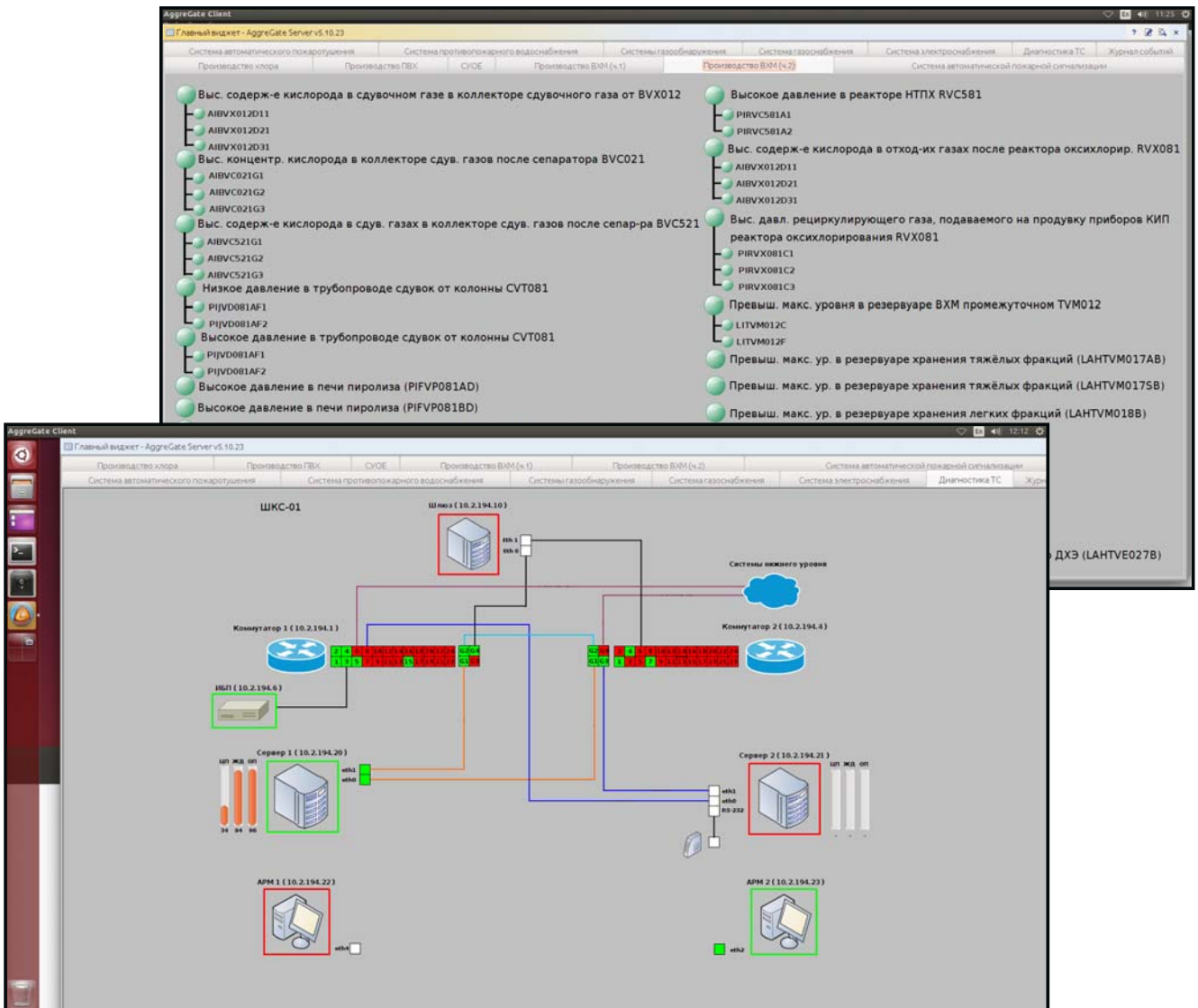
Challenges

Safe operation of the hazardous facility came to be important at the building construction stage. Thereby, CEIMS was meant to provide the following features:

- Forecasting and preventing emergency situations
- Continuous data collection, transmission, and processing
- Generation and transmission of formalized operating data to DDS
- Generation and transmission of formalized emergency messages to PDDS

- Automated or forced public notification on emergency
- Automated or forced notification of services responsible for object safety
- Automated or forced launch of alerting or emergency response systems for specific purposes or objects
- Emergency registration and documentation.

The customer set the main technical requirements, comprising redundancy based on the server platform cluster, support for Linux OS and OPC, and high CEIMS reliability through backing up servers, controllers, computer-process interfaces, and data channels.



Solution

At the design stage, RusVinyl was considering several options for implementing the CEIMS, such as alternative SCADA-based hardware and software suites. In the end, they settled upon the Automated Site Safety Monitoring System suite (rus. SAMBO) based on AggreGate software for it was more complete than the others as per customer requirements.

SAMBO is a scalable modular solution structured by object size, complexity and capacity. The solution offers the following benefits:

- Continuous safety-critical parameter value change monitoring for controlled systems and engineering (load-bearing) structures
- Sending emergency notifications to the Russian System of Prevention and Response to ES
- Personnel decision support at the levels of Operations Control Duty Desk and Russian System of Prevention and Response to ES
- Reporting the site safety status to personnel and visitors.

SAMBO solution was implemented by Insight engineering corporation on a turnkey basis with pre-installed AggreGate server and client software. At the system commissioning stage, COM/DCOM interfaces were configured for AggreGate to receive data via OPC, while the SOAP software module using secure IPsec VPN connection was also implemented for reporting to regional emergency services.

At the project development stage, access to OPC data was provided by using Matrikon OPC Tunneller. Furthermore, there were additional modules developed for connecting AggreGate to PDDS via SOAP and generating XML messages for local ministries of emergency situations.

Benefits

AggreGate SCADA/HMI solution implemented on all-level Linux servers solved the import phase-out problem and allowed to develop the new SAMBO system thanks to a large number of drivers and interfaces available in AggreGate.

Monitoring of safety systems, communications, and automatic process control systems provided efficient prevention of emergencies, fire, terror threats, and not only.

By means of the efficient emergency alerting system, the risks of environmental damage, financial losses and losses among personnel have gone down dramatically. The solution largely contributed to technological process stability and correct safety system operation.

Ultimately, the AggreGate-based SAMBO hardware and software suite allowed RusVinyl to lower insurance expenses in potentially hazardous facilities and acquire an all-in-one automated monitoring and emergency alerting system.

About Tibbo

Located in Taipei, Taiwan, Tibbo Technology Inc. brings simplicity to the embedded world defined by enormous complexity of operating systems, programming languages and design tools. Tibbo's programmable hardware and the AggreGate Platform offer a complete solution for delivering robust, distributed automation and monitoring systems.

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