

Expertise
in Solutions

Компетенция
в решениях

GROUP
SPUTNIC



GROUP

SPUTNIC

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SPUTNIC GROUP

*Implement Innovations that Contribute
to Economic and Social Development*

Company profile:

- Industrial construction
- Energy generation and distribution
- Gas turbine technologies
- Process equipment production
- Industrial automation
- Service maintenance





In all that we do, we strive to achieve superior results based on years of our experience, well designed project management system, and multi-level quality control to add value to our Customers' business.

A handwritten signature in black ink, consisting of stylized initials 'AK'.

Director General
Aleksandr Khudorozhkov

History of SPUTNIC GROUP

1974

SPNU, which specialized in automated control systems, was established as an installation and startup office for implementation of automated control systems and automation equipment in pulp and paper industry, later on referred to as Perm Centre for Automated Control Systems.

1993

A separate affiliate of the Company – Sputnik – emerged based on one of the Centre's divisions.

1997

Sputnic concluded a partnership agreement with Siemens A&D.

2001

Perm Centre for Automated Control Systems registered Sputnik-2 as a subsidiary and assignee of Sputnik. Sputnik-Komplektatsia was set up.

2004

Sputnic-Avtomatika was established to develop and implement automated process control systems and provide maintenance service of implemented systems.

2005

A new business area focused on gas turbine technologies and development of automatic control systems for power packages (power units, gas pumping units) and automated process control systems for power stations of in-plant use.

2006

Sputnic-Integratsia was established as a result of arrangement of dedicated deliveries of equipment to oil producing companies and until now it has been providing maintenance services of the systems as well.

2007

SPUTNIC Group set up its Quality Management System. A Registration Certificate was issued to the Electric Laboratory qualifying it for conducting of tests and measurements of electrical equipment and installations of up to and exceeding 1000 V.

2008

The Company's Quality Management System was certified for compliance with requirements of ISO 9001:2000 and validated by Bureau Veritas Certification.

2009

Due to arrangement of dedicated deliveries of equipment, Sputnic-Energetika and Sputnic-Energoavtomatika were established.

A new 800 m² production workshop was put into operation for assembling of electric switchboards.

Workshop manufacturing metalwork and packaged equipment began its operation.

Novaya Nasosnsya Servisnsya Kompaniya was set up.

2010

An office of Sputnik Group in Moscow was opened for better communication with customers.

Sputnic-Komplektatsia was qualified as a supplier of equipment to organizations of the TRANSNEFT system.

2011

Sputnic-Komplektatsia and Sputnic-Integratsia were qualified as suppliers of equipment and services to Rosneft.

A Certificate was issued for the use of Sputnik Group's equipment at facilities of GAZPROM.

Sputnic-Integratsia-Servis was set up to provide service of compressor, pump, and gas turbine units.

As of the end of 2011, over 15 certificates and statements of compliance for our own products were received (low-voltage packages, integrated switchgears, package transformer substations, switchgears, automatic control system for process systems, frequency converter control cabinet, SPUTNIC controller for automatic firefighting equipment, Ex junction boxes, etc).

2012

A new production workshop and an office building of over 3700 m² were put into operation for production of pre-engineered buildings, modular packaged equipment, metalwork, oil systems, gas turbine power units, and gas pumping units.

2013

On the territory of free economic area Seaport Aktau, Joint Kazakh-Russian machine-building enterprise.

AktauOilMash LLP was founded. It is a subsidiary of JSC NC KazMunayGas in the sphere of engineering.

2014

Quality management system of the enterprise was acknowledged as system that complies with the requirements of ISO 9001: 2008 which was confirmed by TÜV Certificate.

Useful model patent No. 141963 «Oil loading measuring system» had been obtained.

SPUTNIC GROUP Structure

Sputnic Group

Sputnic Group represents a constantly and fast growing structure where each Company's business area is integrated in a single framework which allows us to offer advanced ready-made solutions and adequately deal with tasks of any level to implement integrated projects.

Sputnic-Komplektatsia, Ltd

Sputnic-Komplektatsia develops, implements, and supports operation of automated systems (automatic control systems, automated process control systems) of facilities based on gas turbine technologies, low-voltage packages, integrated switch-gears, electric drives, and cooling systems.

Sputnic-Integratsia-Service, Ltd

Sputnic-Integratsia Service provides compressor, pump, and gas turbine unit servicing.

Sputnic-Avtomatika, Ltd

Sputnic-Avtomatika develops and implements automated power control systems for companies in power industry.

Sputnic-Integratsia, Ltd

Sputnic-Integratsia is involved in implementation of telecontrol projects, communication line construction, manufacturing of petroleum production automation, metal work, and modular packaged equipment (packaged transformer substations, pumping stations), delivery of equipment, and its maintenance service.

Sputnic-Energetika, Ltd

Sputnic-Energetika develops, implements, and supports operation of automated systems (automatic control systems, automated process control systems) of facilities based on gas turbine technologies. It is involved in the development of a promising GTES-25P power unit based on 25 MW gas turbine unit.

Sputnic-Energoavtomatika, Ltd

Sputnic-Energoavtomatika performs dedicated deliveries of equipment to GAZPROM including development and delivery of power unit automated systems with an integrated control device for gas turbine unit, uninterrupted power supply system, low-voltage package, generator excitation control system, operator's computer workstation.

Arus, Ltd

Arus develops, implements, and supports operation of automatic firefighting and gas detection systems for plant equipment process units based on commercial certified automatic firefighting systems offered by SPUTNIC and renders maintenance service.

Novaya Nasosnaya Servisnaya Kompaniya, Ltd

Novaya Nasosnaya Servisnaya Kompaniya calculates working point of pipeline systems, selects pumping units depending on the working point aiming at maximum efficiency. The Company delivers pumps, automated pumping stations, packaged pre-engineered buildings, provides service maintenance, and delivers spare parts for pumping units.

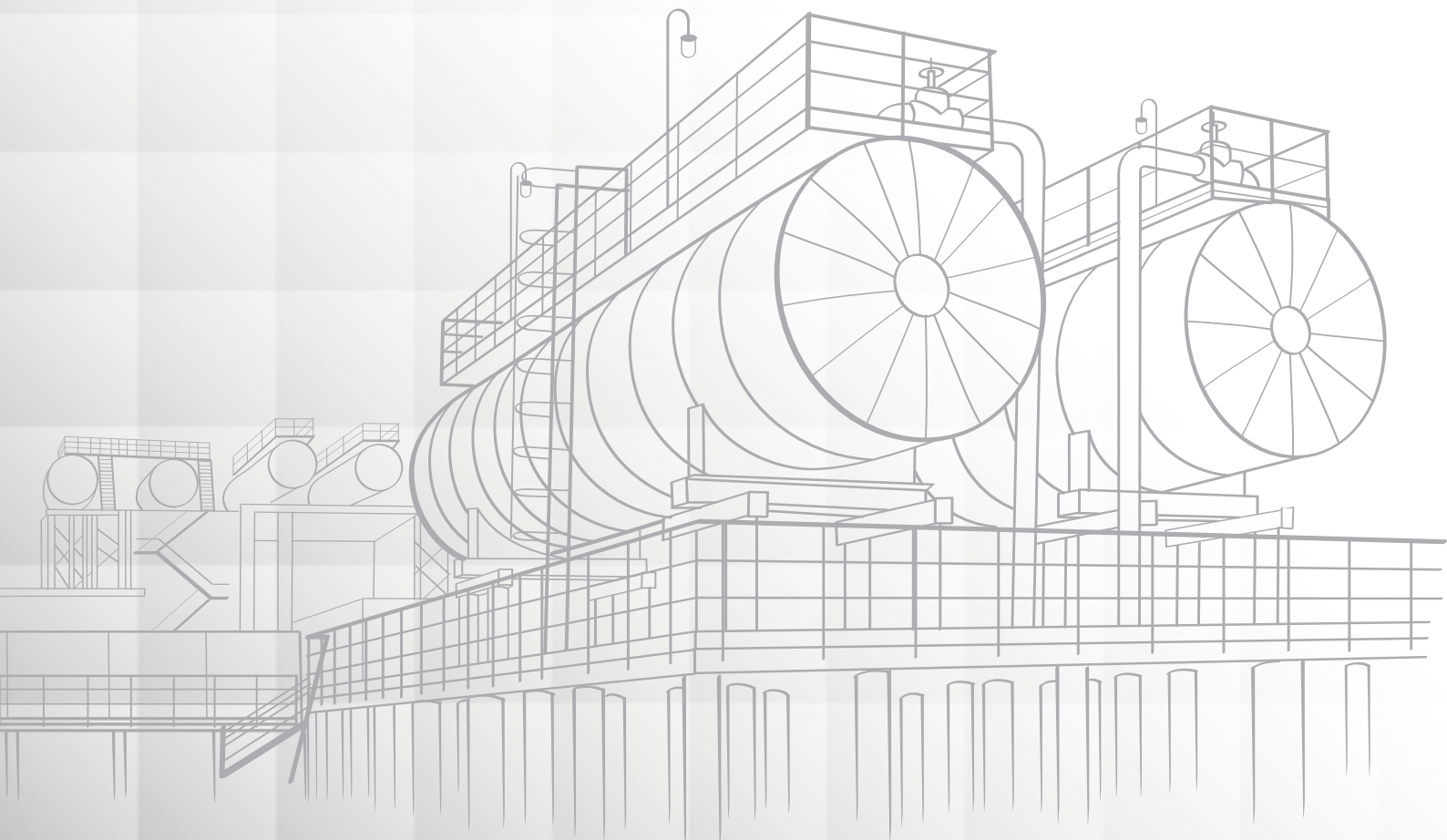
Innovacionnye Tehnologicheskie Sistemy, Ltd

Innovacionnye Tehnologicheskie Sistemy offers design, manufacture, and maintenance service of integrated systems for automation and control, measurement, distribution, and metering of corrosive, explosion/fire hazardous liquid and gaseous media.

Integrated Projects

Current business trends require collaboration with qualified partners capable of performing entire sequence of operations when complex projects are implemented.

Sputnic Group ensures performance of a work package including design; development, manufacture, and delivery of process engineering solutions; development, manufacture, and delivery of hardware and software packages; construction and installation; startup; servicing and warranty maintenance of the facilities. In such case the Customer's expectations are met in full in terms of deadlines and quality of the project implementation.





Creation and implementation of process facilities

Sputnic Group has gained resources and experience sufficient to develop processing equipment for oil and gas industry.

As of today, we have an integrated full-scale manufacturing facility located in the territory of over 7000 m². Extensive capabilities allow us to embody items combining our own innovative solutions with reliability of time-proved components.

Implementation of Projects Based on EPC Contracts

Sputnic Group offers its customers solutions for complex projects as an EPC contractor. It successfully implements projects of any complexity, provides a full range of services for business development at all stages of the facility life cycle.

EPC contract is implementation of investment and construction projects on a turnkey basis. An integrated approach to solving design problems that includes a feasibility study of the project, design, engineering, equipment procurement, construction management and supervision, self construction, start-up operations, risk management, commissioning of the facility in a strictly fixed period, servicing and warranty maintenance.

Currently, we can offer implementation of your projects based on EPC-contracts in the following areas:

- Power engineering facilities up to 500 kV;
- Own generation facilities for industrial enterprises;
- Process units for oil refining, chemical and petrochemical enterprises, oil and gas production companies;
- Systems of bench static, dynamic testing and equipment monitoring;
- Compressor plants and pump stations;
- Compressed air preparation and production systems;
- Prefabricated boiler houses;
- Water circulation facilities of industrial enterprises;
- Racks of oil loading to railcars and road tanks, blending units;
- Pre-engineered buildings of various purposes.



Oil-Loading Trestlework

Modern technologies of oil products clock loading are absolute opportunity for obtaining maximum economic efficiency, environmental safety and optimal working conditions for petroleum refineries.

Specialists from Sputnik Group developed series of complex decisions on construction of new and upgrade of existing oil products loading systems using experience of the largest producers.

Automated On-Spot Petroleum Product Loading Units

Automated On-Spot Petroleum Product Loading Unit is developed for loading of different types of oil products into the tankers by means of loading telescopic pipes and for vapors recovery out of loading area.

Main functions:

- loading of different types of oil products into rail tankers;
- loading at one or at two and more platforms at once;
- direct car weighing;
- automatic release of documentation on each tanker loading;
- preventing atmosphere contamination;
- excluding the possibility of some products blending.

Automated On-Spot Petroleum Product Loading Units allow:

achieving the most precise loading and product's fiscal metering in each tanker:

Released oil products measuring is performed using the direct method of mass measurement in accordance with GOST R 8.595-2002 using mass flow meters; this provides high accuracy and reliability of metrological performance.

preventing ground water contamination:

A concrete pad is provided in strictly located area of loading works for discharging of any possible leaks of loaded oil product. Pad drainage is directed to a tank for contaminated water collection.

providing decrease of total pressure on environment:

An air-control pressure-sealing system on basis of special inflated laying provides pressure-tight loading so that product vapors do not come to atmosphere.

guaranteeing loading security:

A loading area on On-Spot loading trestlework is next shorter than on standard racks. Loading security is guaranteed by means of checkout operations full automation.

guaranteeing security for working personnel:

Operator positioning in a special room (control room);

Tubes movement and product dampeners opening remote control;

Discharge of vapors from tanker and their consequential discharge outside of installation boundaries.

escaping the contamination of one loaded product with the another:

On the last stage of loading process the product which is left in common collector and loading pipe is fully discharged into a tanker.

providing automatic release of documentation on each rail tanker loading.

cutting installation operation and maintenance cost:

Complete automatic installation control is provided; this allows quickly detecting the equipment defects and preventing operator's mistakes.

Loading system technical upgrade

On the basis of experience of equipment operation on different enterprises we propose our customers engineering solutions which are individually adapted for requirements of any object.

Sputnic Group use recent developments and technologies for performing new construction as well as for technical upgrade of already existing equipment and integration in existing system.

At technological capability the upgrade is performed with minimal breaks in product shipment and with minimal changes in rack and pipe line construction. Therefore, a Customer receives modern rack on the same loading area.

Loading system upgrade with minimal breaks in product shipment is possible upon availability of two or more ways of tankers placement and has the following advantages:

- minimal stop period of loading processes on each platform;
- the loading continues on the second and the following platforms during the reconstruction;
- careful analysis of existing loading rack state is performed;
- no great changes are needed in existing piping manifold and supporting structures.



Pumping Stations

A pumping station represents a complex system to pump liquids at ambient temperature ranging from -50°C to $+60^{\circ}\text{C}$. A pumping station package includes a heated shelter provided with life support systems and the following equipment: pump units (in use and standby), pipelines, automation equipment, and auxiliaries. It is used as an infrastructure for water supply and sewage systems at oil fields, etc. It serves to remove water in the territories located in lowlands waterlogged due to water breakthrough or flood.

Our Company manufactures modular pumping stations for various applications, for instance:

- water-based firefighting pumping stations;
- foam-based firefighting pumping stations;
- water supply pumping stations;
- sewage system pumping stations;
- pumping stations to pump liquids;
- water-cooling system pumping stations;
- modular cluster pump stations (MCPS).

A pumping station comes to the installation site being fully assembled and that facilitates putting into operation of the process system, which the pumping station is intended for.

In addition, Sputnik Group offers:

- water-treatment systems of various purposes;
- control of impurities content in technical water systems.

Booster Compressor Stations

Compressor units supplied by Sputnik Group are used for compressing the natural, associated petroleum, propylene and other service gases and combine the best technical and economic solutions. Strict selection of materials and components ensure their trouble-free operation in the most severe environment.

Gas compressors are available in different versions, but they are mainly represented by oil two-shaft compressors. The selection of this type of equipment is conditioned by their best technical and economic indicators compared to oil-free compressors.

We use compressors produced by Howden (Scotland), GEA Grasso (Germany), GHH RAND (Germany), Mattei (Italy), Kobelco (Japan).

The main parameters of the compressor units::

- Inlet pressure within the range of from 1 to 24 bar;
- Discharge pressure not more than 60 bar;
- Degree of pressure ratio from 1.2 to 22 (natural gas);
- Capacity up to 20,000 nm³/h;
- Power of the main drive of up to 2,500 kW.

Preliminary Gas Treatment Systems

High quality gas treatment systems with the use of methods of mechanical filtration, separation, coalescence. Gas treatment systems are designed for gas purification from mechanical impurities and moisture, as well as for gas heating before further supply to the gas industry facilities. Design of preliminary gas treatment systems ensures absence of condensate at the outlet and allows its use as fuel gas for gas turbines of various manufacturers.

- System performance of 30,000 nm³/h;
- Degree of purification of 0.3 micron.

Instrument Air Compressor Stations

For reasons of security, interchangeability, as well as economic benefits, these air systems are based on the use of standard equipment of different manufacturers.

Sufficient practical experience in supplying the instrument air preparation systems for different climatic conditions was gained, namely: from desert regions with temperatures above + 55 °C to systems in their own container shelters for arctic conditions with temperatures below - 50 °C.

Capacity of instrument air preparation systems is in the range from 5.5 kW to 75 kW.



Integrated Projects

Gas Turbine Technologies

The issues of energy saving and environmental friendly technologies introduction are pushed into the foreground in the modern world. Cogeneration is one of the effective methods to solve these issues. This is the technology implicating the simultaneous production of electricity and thermal energy, which is characterized by fuel efficiency and high environmental performances. In small-scale power generation, these technologies were previously used infrequently, for many years, remaining the prerogative of large steam-turbine power plants.

Currently, small-scale power generation is not only an alternative to the centralized system – it becomes the basis for the rapid development of the newly developed areas, opening up the new industries and the expansion of existing ones.

Gas turbine technologies allow us to develop reliable, cost-effective, environmentally friendly power stations for in-plant use capable of supplying electricity and heat to consumers, considerably reducing cost for electricity and heat production, and assuring protection of the environment due to utilization of burnt associated gas.

Advanced cogeneration plants based on gas turbine engines, at full utilization of produced electricity and heat, have heat-availability factor of fuel combustion of up to 85...90%. Fuel saving in the process of electric power generation in a cogeneration cycle may reach up to 40% compared to separate production of the same amount of electric power when heat from a special burner arrangement is used.

High efficiency of gas turbine technology application may be reached, provided that optimum utilization of engineering capabilities and parameters of power station gas turbine equipment is assured accompanied with optimization of algorithms of load distribution between power units operated in parallel; that, in its turn, sets an objective of automatic (unattended) control of operation of power units in all modes.

Since 2000, Sputnik Group have been developing and delivering hardware packages for automatic control systems of gas turbine power units and hardware packages for automated process control systems of power station based on gas turbines. Since 2005, Sputnik Group has been developing and delivering software and hardware packages for automation of gas turbine power stations. Today we develop and implement systems, such as:

- Automated process control system for multiunit gas turbine power stations and compressor stations;
- Automatic control systems for gas turbine units;
- Automatic control systems for gas pumping units;
- Generator excitation control system;
- Automatic control systems for air-based oil coolers;
- Active and reactive power group control systems;
- Siemens generators for power units;
- Reduction gear boxes and transmissions for gas turbine power units;
- 10 kV Siemens integrated switchgears.

We do the entire scope of work in this field; moreover, when necessary, we can help to upgrade control systems of the operated gas turbine driven gas pumping units, gas turbine power units, and gas turbine power stations.



Steam Turbines

In recent years, the regeneration of steam turbines is observed on the market of powered drives. This is primarily associated with the desire of customers to improve the energy efficiency of their production through utilization of surplus heat. In addition to the classical thermal power generation, the following is increasingly a source of steam for the steam turbines:

- recovery of exhaust gas heat of gas turbine electric power stations by waste heat boiler (steam-gas cycle);
- recovery of steam of process units (hydrocracking and etc.);
- replacement of pressure-reducing cooling stations;
- waste burning stations;
- boilers working on associated petroleum gas.

It should be also mentioned the use of turbines as turbo expanders for reducing high pressure at gas distribution stations and gas processing plants.

The main advantages of steam turbines are reliability, long service life, maintainability.

Modern steam turbines are characterised by significant operational flexibility (the ability to operate in different modes), including the possibility of frequent cold starts.

One of the directions of activities of Sputnik Group is the introduction of steam turbines as drives of the pump-and-compressor equipment

and for the generation of electricity. We work with proven solutions of the company Siemens and offer turbines of different capacity from 75kW up to hundreds of megawatts.

Sputnik Group is ready to offer its customers the turbines complete with driven machinery (compressors, pumps, generators), all auxiliary systems and control system.



Oil Systems

We are ready to take on solving of complex issues relating to commercial manufacture of integrated, unified oil supply system for technological complex as a whole.

The arrangement of the oil system depending on customer requirements and technological problems solved can be represented in the form of package (skid-based) or within a shelter (enclosure-box), as well as in the form of shipping of individual units and groups.

In accordance with the assignment or the desire of the customer, it can be equipped with both domestic and imported equipment and components.

Dimensions and weight of the shipping modules are represented taking into account the possibility of their transportation by rail or road.

Individual approach to the customer is conditioned by the availability of appropriate staff for the design, equipment selection, simulation, manufacturing systems and control of oil management systems for machinery and units, as well as availability of base for the manufacture of block-modular buildings and framed structures.

Through the use of modern technologies, materials and equipment, together with a trained, certified and highly qualified staff, we guarantee the quality of work performed and reliability of the equipment supplied.

«Sputnic-HYDAC» Oil Systems

In April 2013, Sputnik Group signed an Agreement of cooperation with HYDAC (Germany) which is a recognized worldwide manufacturer of hydraulic and filtration equipment, control, measurement and diagnostics devices for virtually all industries. Under this Agreement, we agreed to organize joint production including oil supply systems for equipment, units and assemblies of any complexity, as well as to implement jointly the projects in the field of hydraulics and filtration. In 2014, Sputnik Group implemented the project "Test-bench for mechanical and gas-dynamic testing of centrifugal compressors produced by Rusturbomash LLC (Siemens) with an open-loop" using the oil system produced by HYDAC. Currently, the projects with the use of hydraulic systems and oil supply systems made on the basis of the Sputnik Group with HYDAC technology are being prepared.

Production Automation Systems

Sputnic Group offers decisions on automation as separate units of production processes, as integrated automation decisions at production sites/shops and production as a whole.

Specialists of the Group implement project of any complexity at industrial facilities, with due consideration of branch specifics of each production:

- oil and gas industry;
- Energetics;
- Transportation of hydrocarbons;
- Refinery and chemical manufacturing;
- Mining industry;
- Machinery manufacturing.

Process Automation Systems

We are engaged in the integration of innovative decisions based on modern hardware and software systems and field equipment (control instrumentation) of world's leading brands such as: Siemens Invensys (Wonderware), Honeywell, Rockwell Automation and many more.

For many technological facilities we already have ready-made decisions that require minimal resources to integrate systems to existing and new facilities:

- Automatic process control systems of oil and gas facilities, including:
 - PWRUs (preliminary water removal units);
 - OTUs (oil treatment units);
 - BCSs (booster compressor stations);
 - CODAPs (crude oil delivery and acceptance points);
 - MGPSs (modular group pumping stations);
 - VRUs (vapor recovery units);
 - CGPs (central gathering points);
 - TM systems (oil and gas complexes (crafts, pipelines) remotely control);
 - Oil and gas pipelines leak detection system;
 - Central dispatcher boards (including electronic data processing systems).

- Automatic control systems of water supply and water treatment pumping stations;
- Automatic control systems of sewage pumping stations;
- Automatic control systems of ventilation and heating;
- Automatic control systems of boilers, exhaust heat boilers;
- Automatic control systems of electrical drive
- Telemetry systems of water supply facilities, communication networks;
- Automatic control systems of technological lines and pipelines.

All implantable systems can be integrated with blocks of safety instrumented system (SIS) of 5111-3 level based on hardware and software of: Siemens, HIMA, Triconex, Honeywell.

In 2012, our company became an official representative having the right to integrate Siemens SPPA-T3000 in the oil and gas industry in the territory of Russia.

5RRA-T3000 system is based on modern technologies and MEB-absorbed many years of experience and the latest achievements of Siemens in the field of automation systems.



Firefighting and fire prevention Systems

Sputnic Group ensures supply of automatic fire-extinguishing systems on a turnkey basis. These systems provide comprehensive solution of fire safety issues of any facilities, industrial process plants and fire and explosion dangerous plants:

- Gas turbine plants;
- Gas-compressor units;
- Common plant systems;
- Process units.

We have developed and put into mass production the controllers SPUTNIC-300 and SPUTNIC-400, uninterruptible power supply cabinets for automatic firefighting equipment. Servicing and warranty maintenance is provided for the equipment. All products and services have the necessary certificates and licenses.

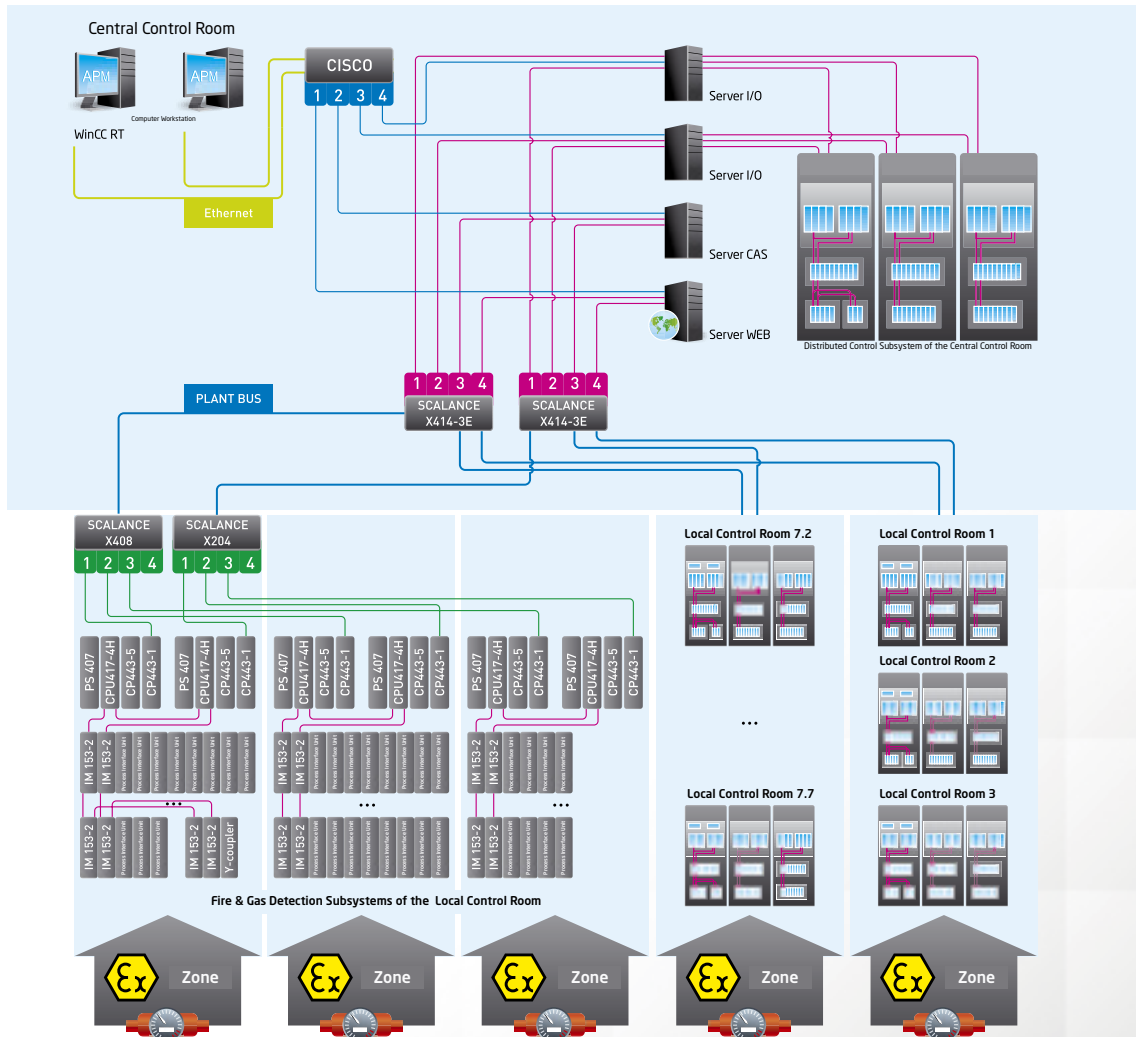
PC "SPUTNIC" is realized on the basis of industrial logic controllers (PLCs) SIEMENS SIMATIC. Its realization is possible on the basis of the PLC Yokogawa, AllenBradley.

In modern systems of automatic fire protection of a building, all the most advanced fire fighting technologies, as well as the latest hardware and software, fire alarm systems, fire warning and control of engineering systems of automatic firefighting equipment are used.

Integrated safety and security system of the modern facility equipped with all kinds of fire protection has two levels of protection: upper and higher. The upper level of facility fire protection includes hardware and software supported by operator's automated workstation. The lower level of facility fire protection

includes hardware and software of off-line active fire protection system. In case of failure of the upper level system, the lower level protection system continues its independent operation.

Sputnic Group is the official dealer of the gas fire extinguishing plants producer from Germany, "Minimax" company.



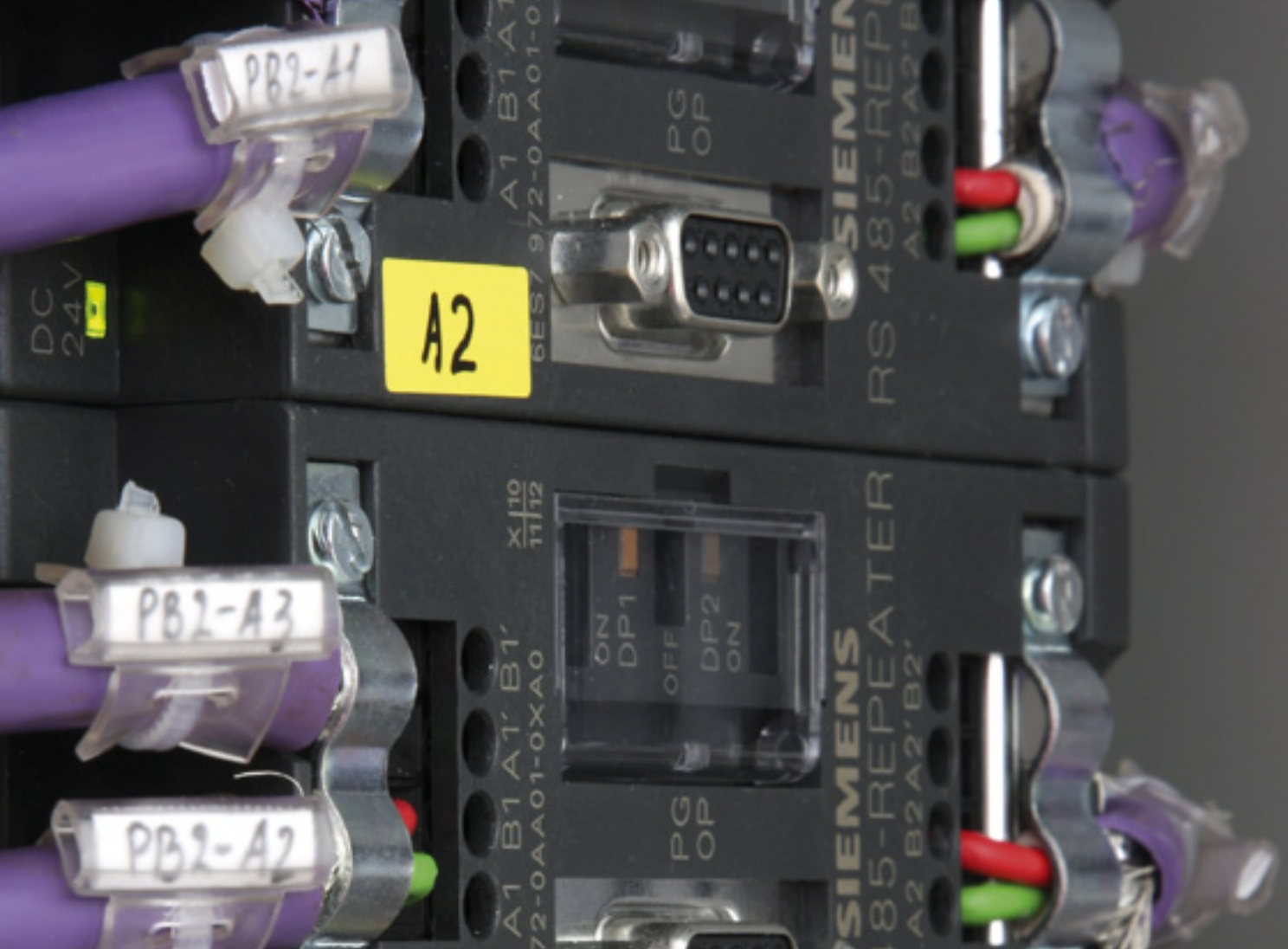
Supervisory Control

Efficient centralized control of the production requires arrangement of a single information space; this task can be dealt with by means of implementation of the Automated System of Operational Supervisory Control.

The system is designed for enhancement of the production facility operation, immediate receipt of

full information needed, timely detection of failures in the production facility operation, reduction of human factor influence on preparing of documents or management decision making.

We are ready to implement such a system based on SimaticIT (Siemens) or ArchestrA (Wonderware) software packages in any production industry.



Automation Systems for Power Industry

The task of the power industry is receipt and accumulation of primary energy resources, their transformation into derived energy and delivery of that energy to end consumers. Today, a significant part of processes in power industry is automated and the industry could not have worked otherwise.

Sputnic Group has gained solid field experience in solving problems concerned with design and arrangement of distributed and centralized automated systems of supervisory control, automated process control systems, automated information-and-measuring systems of commercial power consumption metering for modern companies in power industry based on advanced software and hardware packages made by Russian and foreign manufacturers of equipment and software.

Automated Information-and-Measuring Systems of Commercial Power Consumption Metering

Development and implementation of automated information-and-measuring systems of commercial power consumption metering is one of Sputnic's business areas.

Thanks to the automated information-and-measuring systems generating companies, power supply companies, and industrial plants can do the following:

- enter the wholesale power market (arrangement of the system as per requirements of non-profit partnership: Trading System Administrator of the Wholesale Power Market);
- improve metering accuracy;
- reduce losses and stealing of power by means of balance control by each facility;
- monitor the contracted capacity of the companies (consumers);
- balance the load due to switch to zonal rates;
- reduce costs for information processing by means of receipt of immediate and accurate information on power consumption presented in electronic format.

The solutions we offer to arrange systems of commercial power consumption metering with the use of equipment of the leading manufacturers (Elster Metronica, Prosoft-Systems, Systems and Technologies, Inkoteks) assure compliance with requirements of the wholesale power market, high accuracy and reliability of the system operation. Use of various equipment and software packages allow us to develop systems focused on different Customer's needs and requirements and achieve the best value for money.

The metering systems are arranged according to hierarchical approach and may have three levels:

- the first level: measuring equipment including measuring current and voltage transformers, digital electric power meters capable of storing a load profile;
- the second level: controllers including data acquisition and transmission devices serving to acquire, calculate, store, and transmit data on a group of metering points to the upper level of the system, and including communication equipment;
- the third level: software and hardware packages of the top level (servers, workstations), which acquire, process, store, and visualize data.

The main cost advantage of the use of automated information-and-measuring systems of commercial power consumption metering means reduction of the consumer's payments for the energy and power consumed, and decrease of peak demands and reduction of capital investment of the energy companies in development of peak generating capacities.

Automated Information-and-Measuring System of Power Consumption Metering for Technical Purposes

If a company is not interested in entering the wholesale power market, but plans to reduce costs for power and have a clear idea of its own structure of power consumption, there is a way to implement an automated information-and-measuring system of power consumption metering for technical purposes. The costs of implementation of such systems are significantly lower than those for commercial power consumption metering due to the fact that there is no need for metrological service and certification and that it is possible to use equipment of lower accuracy rating. The payoff of such systems is due to the power consumption cut down. Moreover, the automated information-and-measuring system of power consumption metering for technical purposes often serves as a base for implementation of complete automation systems of supervisory control.

Automated Supervisory Control System of Power Facilities

An Automated Supervisory Control System of Power Facilities assures the entire process of planning and control of the production, transmission and distribution of electric power: long-term and short-term planning, operational and automatic planning, design of modes, and training of personnel. The structure of the Automated Supervisory Control System of Power Facilities depends on particular tasks which it shall deal with, Customer's engineering capabilities, and structure of energy consumption (generation) of the facility as a whole. Various alternatives of the supervisory control system integration are possible with the use of different types of telecontrol devices.

Application of the Automated Supervisory Control System of Power Facilities provides a number of advantages which justify implementation of the system:

- cutting down the time needed for switching-on and switching-off of switching devices which leads to better operational control over power distribution scheme. In case of manual control of switching devices, the switching time approximately equals to 1 hour, in case of use of the Automated Supervisory Control System of Power Facilities, the switching time is within 1 second, thus allowing significant energy savings when big power is transmitted;
- significant cutting down of the time needed for evaluation of actual electrical parameters in lines and buses of power facilities;
- reduction of operating staff number servicing the facility thanks to centralized control and monitoring;
- archiving of all events and measurements, keeping databases, providing of quick and convenient access to information;
- secure protection against unauthorized access;
- reduction of human factor influence on operation of power facilities.

Application of Automated Supervisory Control Systems of Power Facilities allows you to efficiently deal with the following tasks:

- adherence to operating standards;
- accident prevention;
- continuous monitoring of power facility operating modes;
- compliance with requirements and regulations of the Trading System Administrator (a non-profit partnership), orders of the system operator to the wholesale power market entities;
- interface with the following automated system: System Operator – Central Supervisory Control.

The solutions that we develop and offer allow us to embody Automated Supervisory Control Systems of Power Facilities of any complexity (hydroelectric power stations, combined heat and power plants, electric networks, substations, and production facilities) beginning with implementation of the automated process control system of a separate substation to the construction of a full-scale automated control system for electric power system based on Network Manager software and hardware package.

Flexibility of our solutions is achieved by the use of advanced high-tech equipment and SCADA systems of the leading manufacturers, such as: ABB, Power Measurement, NTK Interface, etc.



Production Infrastructure

Sputnic Group pays much attention to development and renovation of the systems servicing the main production unit.

We believe that intelligent planning and timely upgrade of auxiliary systems make it possible to enhance efficiency of the core process, implement energy saving policy, get new opportunities from available capacities, and reduce operating costs.

Cooling Systems

Sputnic Group designs, performs packaged supplies, and subsequent maintenance of advanced systems of automated control of air-based oil coolers, heat-exchange equipment and components, including:

- selection of heat-exchange equipment and control instrumentation, pumping equipment and valves;

- design and manufacture of low-voltage packages, automated control systems for cooling systems;
- delivery of equipment to the Customer's site;
- installation supervision, start-up, and commissioning;
- warranty and post-warranty service.

Our specialists are ready to design and deliver an air-based oil cooling system applying any of current methods with regard to the plants used, environmental conditions of the region, and particular features of the process.

Advanced automatic air cooling systems of Sputnic manufacture allow you to do the following:

- minimize the number of starts of the fans;

- assure no-contact smooth starting of electric motors with limited starting currents;
- switch to more precise continuous method of oil temperature control;
- save electric power when electric motors are operated at speeds below the rated speed;
- monitor electric motor operating mode and protect the motor in case of emergency modes;
- extend life of process equipment;
- reduce labour costs of operation;
- enhance efficiency of all systems as a whole.



Oil Quantity and Quality Measurement System

Oil quality measurement and control system (OQMCS) is designed for automatic measurement of oil mass (volume); for determination of its qualitative characteristics (density, moisture content, pressure, temperature); oil sample collection in accordance with the GOST 2517; transmitting the information to the operator's automated workstation.

Arrangement of equipment and facilities.

Equipment of Oil quality measurement and control system is located in one technological modular building (unit of measuring lines (UML), oil quality measurement unit (OQMU), mechanical displacement prover (MDP)), in a modular building of hardware block-modular unit and control room. The buildings are equipped with ventilation, heating, lighting, gas control and fire alarm systems.

The main part of the process equipment and measuring instruments of the Oil quality measurement and control system is grouped into blocks and units:

- Filter unit (FU);
- oil quality measurement unit (OQMU);
- unit of measuring lines (UML);
- fixed mechanical displacement prover;
- connecting assembly for mobile mechanical displacement prover (MDP);
- drainage system;
- wash system for oil quality measurement unit;
- information-processing system.

Measurement in automatic mode of:

- oil flow on each measuring line and as a whole on unit of measuring lines, oil quality measurement unit;
- oil density in oil quality measurement unit;
- oil viscosity;
- volume ratio of water in oil quality measurement unit;
- pressure of oil in the unit of measuring lines, oil quality measurement unit, as well as at the inlet and outlet of Oil quality measurement and control system, at the inlet and outlet of mechanical displacement prover;
- temperature of oil in the unit of measuring lines, oil quality measurement unit, as well as at the outlet of Oil quality measurement and control system, at the inlet and outlet of mechanical displacement prover;
- differential pressure on filters of filter unit.

Automated control of:

- flow rate of oil through the oil quality measurement unit, through every measuring line, through mechanical displacement prover;
- pumps of oil quality measurement unit (start and stop).

Local control, indication of parameter values:

- pressure of operating environment in the unit of measuring lines, oil quality measurement unit, as well as at the inlet and outlet of Oil quality measurement and control system, at the inlet and outlet of mechanical displacement prover;
- differential pressure on filters;
- temperature of operating environment in the unit of measuring lines, oil quality measurement unit, as well as at the outlet of Oil quality measurement and control system, at the inlet and outlet of mechanical displacement prover;
- determination of the presence of free gas in the oil.

Functional capabilities of Oil quality measurement and control system:

- Auto start of backup pump in case of failure of the main pump of oil quality measurement unit;
- Automatic collection of combined oil samples in accordance with GOST 2517;
- Manual collection of sport oil samples in the oil quality measurement unit;
- Monitoring of leakages from the floor;
- Periodical checks of fixed mechanical displacement prover.

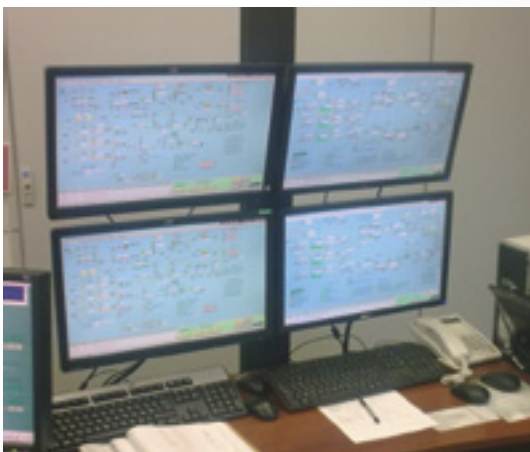
- Performance of control of metrological characteristics of mass flowmeter counters, using fixed mechanical displacement prover;
- Remote monitoring of oil leaks to drainage system;
- Local, visual inspection of leaks on valves and fittings, used for calibration and control of metrological characteristics of mass flowmeter counters, and other valves and fittings of process pipelines, which leakage can affect the accuracy of the calculation;
- Manual (on-site) control of measuring line (on, off);

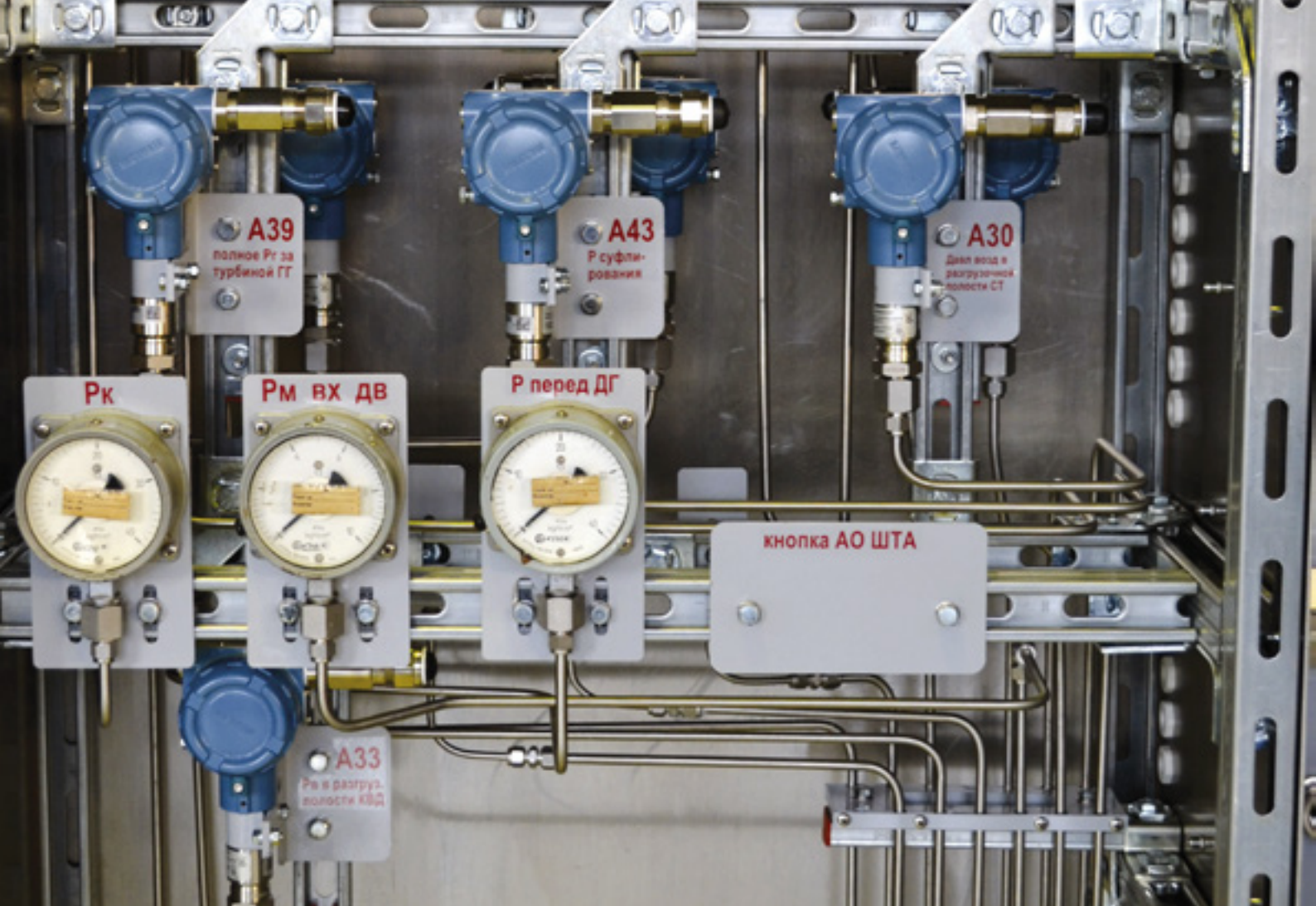
Hydraulic scheme also provides performance of the following functions:

- oil filtering from mechanical impurities;
- oil drainage, release of air or free gas from equipment, process pipelines and their subsequent filling with air displacement;
- dismantling of primary measuring transducers and process equipment without disturbing the measurement process;

Information-processing system.

Hardware and software measurement system is taken as an information-processing system. Information-processing system of oil quality measurement and control system controls for a given program the range of all the parameters and provides emergency and pre-emergency signals processing, displaying and printing of reporting data, preparation of reports on oil accounting for a specified time interval and oil shipments in the automatic mode and on request of the operator in accordance with the accepted and approved forms.





Test Beds

Sputnic Group develops, supplies and has extensive experience in engineering, procurement and construction of test facilities for different purposes:

- training stands for laboratory works based on education programs developed for students of technical institutions;
- stands for the characterization of model wheels of centrifugal compressors;
- test facilities for acceptance testing of main centrifugal compressors with the capacity of up to 64 MW;
- test stations for testing of fuel pumps of aircraft engines;
- stands for testing of high capacity electrical machinery, high voltage generators and motors up to 32 MW.

Within the complex of design, supply and construction, Sputnic Group performs the following activities:

- development and coordination of the Technical Assignment, taking into account the requirements of the customer;
- pre-project inspection of the building intended for the arrangement of the stand;
- development and construction of the foundation for the power plant;
- development, delivery, commissioning of oil management systems;
- development, delivery, commissioning of compressed air supply systems;
- development, delivery, installation and commissioning of electric power supply and automation systems;
- development, delivery, commissioning of measuring systems for collection of data of high accuracy, including instrumentation and controls;
- development, supply, installation of steel structures, including supports, frames, pipe systems;
- development, delivery and installation of control rooms that meet the requirements of sanitary standards for noise, vibration and illumination;
- development, delivery, installation and commissioning of fire-extinguishing systems that meet the requirements of fire regulations;
- development, delivery, commissioning of muffling systems in view of current sanitary standards;
- development, delivery, commissioning of power equipment (drive units) using the equipment produced by both domestic and foreign suppliers.

Media Supply, Distribution, Control and Regulation Systems

The need for compliance to high standards of manufactured equipment requires the use of the most advanced ideas and technologies. The use of high-quality pipeline fittings is an integral part of improving reliability of the process.

We are ready to offer design and fabrication of complex serial products with high quality pipeline systems under exclusive ITS technology.

To ensure performance high-tech operations and quality control, engineering and manufacturing process is carried out with using of the most advanced software and hardware and production equipment as of today:

- Modern means of 3D design;
- Automatic machine for pipes bending with program management;
- Orbital welding system, contact welding system;
- X-ray fluorescent spectrometer;
- Short list of products manufactured under ITS technology;
- Sample collection systems;
- Stands of sensor equipment for various purposes;

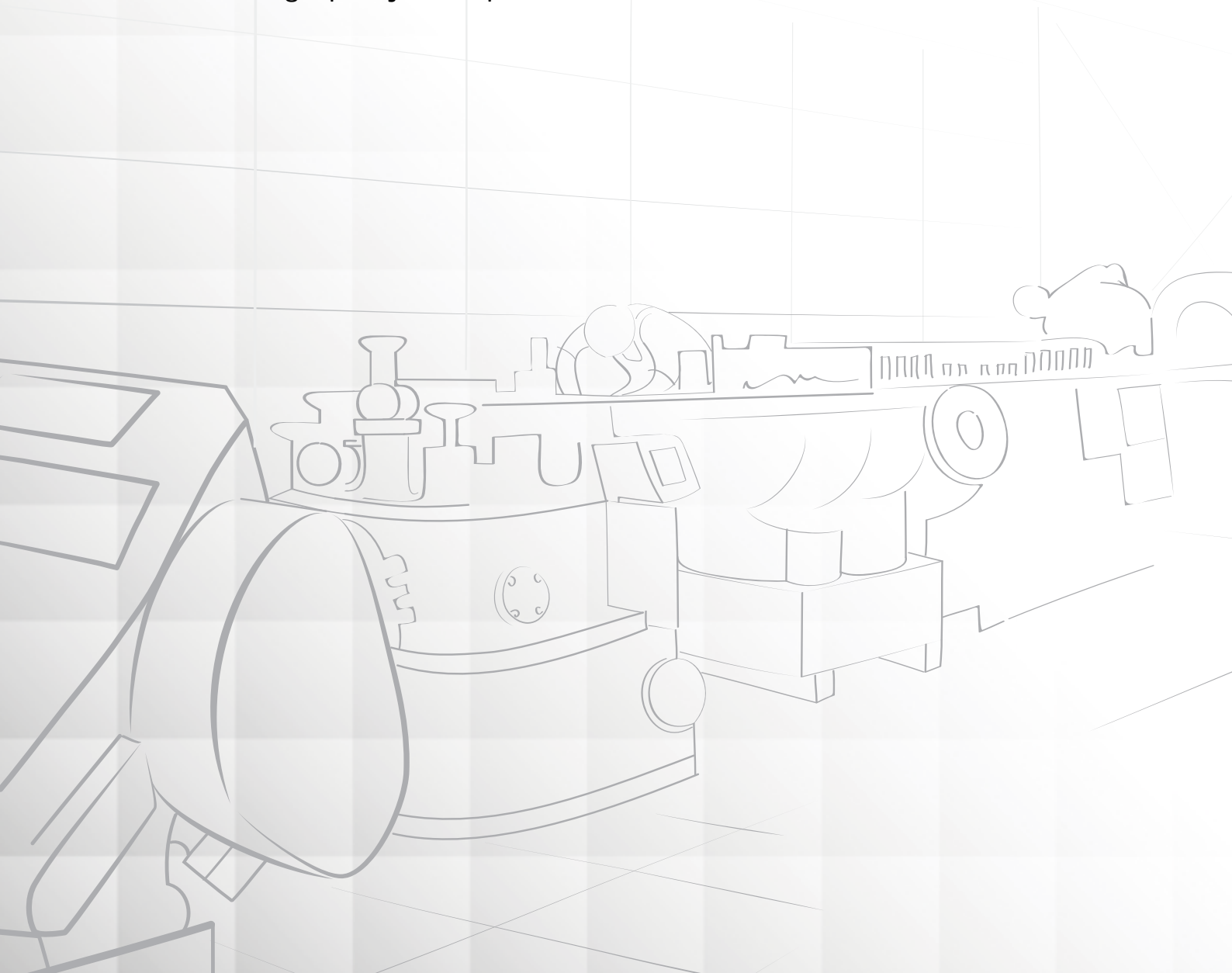
- Complete systems of energy consumption accounting;
- Gas distribution stations odorizers;
- Shields of blower gas compressor units parameters control;
- Cabinets for gas-turbine installations fuel equipment;
- Cabinets for dry seals parameters control;
- Modular packaged units for measurement of flow rate and the amount of natural gas of I and II Categories according to STO Gazprom 5.37 - 2011 classification;
- Systems for control, regulation and distribution of liquid and gaseous environments (including corrosive, toxic, etc.).



Production

Advanced production facilities of Sputnik Group which serve for implementation of integrated projects allow us to manufacture a broad variety of equipment assuring quality and meeting deadlines. The distinction of what we offer is that we can manufacture nonstandard equipment as per your particular requirements.

All batched items and quality management system of the Company are certified and approved, which guarantees consistent high quality of the products manufactured.





Electric Power Distribution Systems

One of the main Sputnik Group's business areas embraces development, manufacture, and implementation of various electric power distribution systems for companies in different industries:

- low-voltage packages;
- medium-voltage switchgears;
- power-factor correction units;
- frequency converters;
- industrial uninterrupted power supplies.

Electrical Equipment Buildings

Sputnik Group designs and manufactures sheds for any electrical equipment and assures compliance with all necessary requirements of installation.

The buildings may be of modular package type or pre-engineered.

In any case you will receive an item in the ready-to-operate condition and this significantly reduces the time period from the beginning of installation to putting into operation.

The buildings are provided with all auxiliary systems:

- automated control;
- ventilation;
- heating;
- air-conditioning;
- fire alarm;
- automatic firefighting systems, etc.

The building may be designed for installation in any climatic region and earthquake-prone zones and shall comply with requirement concerning intensity of 9 as per the MSK-64 scale.



Low voltage distribution systems

Sputnic Group designs, manufactures and implements the systems of monitoring and control with electro-technical equipment rated up to 1000 V (pumps, fans, slide valves, radiators, illumination, electric equipment of distributing panels DP and etc.) applying protector devices of electric motors, integrated with the system of anti-crash protection on the equipment of leading domestic and foreign manufacturers.

The main characteristics of the systems of low voltage distribution are:

- reception and distribution of voltage 110-690 V (up to 1 kV);
- emergency engaging of reserve (EER) supply for electro-technical equipment when exceeding the range of the input voltage parameters;
- measuring and monitoring of parameters of supplying electric grids;
- uninterrupted emergency power supply of control diagram, protector devices for motors, controller equipment;
- uninterrupted emergency power supply with the voltage up to 690 V, of electric equipment of special group of the 1st category (slide valves, pumps and etc.);
- complex control, state control and protection of electric equipment;

- preventive and emergency alarm;
- realization of algorithms of EER and self-activation of electric equipment;

- condition monitoring and control of electric equipment through the protector devices for motors;

The functions of remote control and logging:

- representation of the information on the AWP of the electrician on duty;
- archiving and logging of the information;
- diagnostics of program-technical complex in the Run-time mode;
- information gathering on the medium level of the communication lines Profibus DP;
- information gathering on the AWP of the electrician on duty on the communication line Industrial Ethernet.

Medium voltage (6-35 kV) and high voltage (110-500 kV) equipment

Sputnic Group offers the full spectrum of services as for the designing, construction and commissioning of electric installations of medium and high voltage intended for reception, transformation and distribution of electric energy in the power supply systems of industrial and civil sites.

Sputnic Group offers the turnkey construction, and also modernization of complex transformer substations (CTS), opened distribution devices (ODD), distribution stations (DS), complex distributing devices with insulating gas insulation (CDDIG) and air (CDDA) insulation and other electrical equipment of medium and low voltage.

When constructing the electric power sites we apply the up-to-date high voltage equipment of leading foreign and Russian manufacturers:

- oil-filled power transformers manufactured by Siemens, SVEL, dry power transformers (up to 35 kV) Siemens, Tesar, SVEL;
- high voltage bushings for all ranges of application manufactured by Siemens, ABB;
- reactors for different destination for the transmission and distribution grids, arc-suppressing reactors, protector systems against earth fault;
- Vacuum and insulating gas high voltage automatic interrupters manufactured by Siemens, ABB;
- compact distribution high-voltage devices DTC-type by Siemens;
- distributing devices with the insulation of insulating gas using vacuum interrupters Siemens and ABB;
- load interrupters, grounders and disconnectors by Siemens and ABB;
- limiters of overvoltage by Siemens and ABB;
- devices of automatic control and protection by Siemens and ABB;
- auxiliary structures in the block-module execution.



Complete Transformer Substations

Sputnic Group manufactures packaged transformer substations: electric installations designed for receipt and conversion (increase or decrease) of voltage in AC network and for electric power distribution in the power supply systems of industrial facilities.

Packaged transformer substations consist of power transformers and a switchgear, automatic control and protection devices and include auxiliary structures as well.

Sputnic Group offers you 160 to 2500 kVA packaged transformer substations manufactured as modular packages for the following voltages: 35/10(6) kV, 35/(0.69)/0.4 kV, 35/10(6)/0.4 kV.

We use the most up-to-date high-voltage equipment in the manufacturing of packaged transformer substations:

- power transformers, dry transformers of such manufacturers as: Siemens, Tesar with capacity of 250-2500 kVA; and on request we can use TMG, TSZ oil-immersed transformers, etc.;
- load break switch based on Sentron VL highly-reliable low-voltage apparatuses of Siemens manufacture;
- circuit breakers of Siemens manufacture;
- SF6 insulated switchgears with the use of Siemens vacuum circuit breakers.



Manufacturing of Steelwork and Packaged Equipment

In 2012, Sputnik Group put in operation additional production facilities; that allowed the Company to considerably enhance main equipment fleet and extend the scale of operation and business areas. As of today, we produce:

- gas pumping unit modular packages;
- pumping station packages;
- control station packages;
- modular buildings (boxes) with various content, including special-purpose equipment;
- switchgear and control gear;
- packaged transformer substations;
- metalwork for construction and industrial application;
- pipelines for various applications;
- metalwork for boiler equipment;
- lubrication oil systems, components of cooling systems, fire-fighting and fire alarm systems, including those of modular packaged design.



We produce a broad variety of modular buildings and enclosure-boxes and install process equipment, electrical equipment, automated control systems, and control instrumentation there.

We manufacture pumping stations, compressor plants, and process units for oil and gas industry.

Metalwork for various applications includes the following:

- housings and sheds, frame structures, staircases, service platforms, shed-type structures, and pipeline systems including those for fire-fighting systems, gas systems, cooling systems, and lubrication oil system.

Highly qualified specialists working at advanced high-tech equipment assure success to our production.

The company introduced ISO 9001: 2000 Quality Management System (Bureau Veritas Certification).

We can develop, design, and manufacture products as per the Customer's specification, perform installation and start-up at the installation site, and provide maintenance services of the product put into operation.



Explosion-Proof Equipment

Manufacturing of explosion-proof equipment for oil, gas, chemical, and other industries, where explosion hazardous facilities are operated, is of particular importance in Sputnik Group business.

Broad variety of top quality explosion-proof electrical equipment of our manufacture is a solution to very specific task focused on the development of communication networks in such industries.

We offer ready-made solutions of explosion-proof junction boxes made of aluminum, stainless steel and polyester with the following explosion-proofing marking:

- 2 Ex e II T6...T4: enhanced reliability;
- 0 Ex ia IIC T6...T4: spark-safe circuit;
- 2 Ex e[ia] IIC T6...T4: associated equipment;
- Ex tD A21 IP66 T85 °C: equipment protected against dust by means of sheathing.

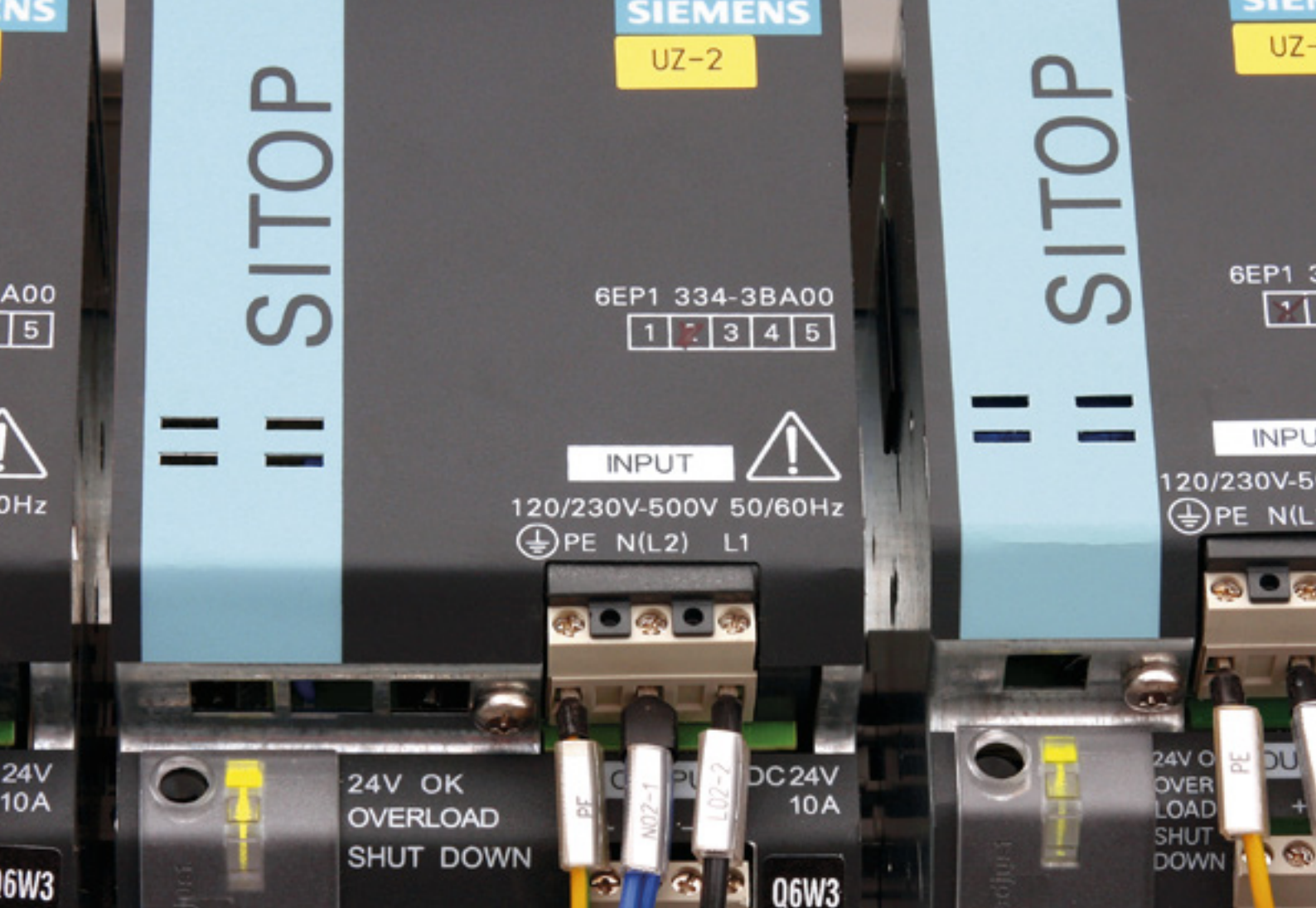
The boxes are suitable for outdoor installation in the regions of boreal climate.

The climatic modification and category of installation is Boreal climate, i.e. designed for boreal climate, as per GOST 15150 and GOST 15543.1. The products are manufactured as per TU 3434-003-35190215-2011 and comply with the following standards: GOST R 52350.0-2005 (MEK 60079-0:2004), GOST R 52350.7-2005 (MEK 60079-7:2006), GOST R 52350.11-2005 (MEK 60079-11:2006), GOST R MEK 61241-0-2007, and MEK 61241-1:2004.

Supply of Equipment and Components

For many years Sputnik Group has been an authorized distributor and partner of the biggest world manufacturers of equipment and components for industrial automation. Long-term and close collaboration with partners and suppliers assures fast deliveries and most reasonable pricing to our customers.





Sputnic Group is an authorized distributor and partner of the following companies:

SIEMENS

Honeywell

Danfoss

EMERSON
Process Management

PHOENIX CONTACT

FAT-N
Powering Business Worldwide

ABB

Lovato
electric

SEW
EURODRIVE

ELTACON
ENGINEERING BV

HAM-LET
ADVANCED CONTROL TECHNOLOGY

CABERO
HEAT EXCHANGER

KSB

Liebert

MINIMAX

Allen-Bradley

PEPPERL+FUCHS
PROTECTING YOUR PROCESS

RITTAL

KTR

STAHL

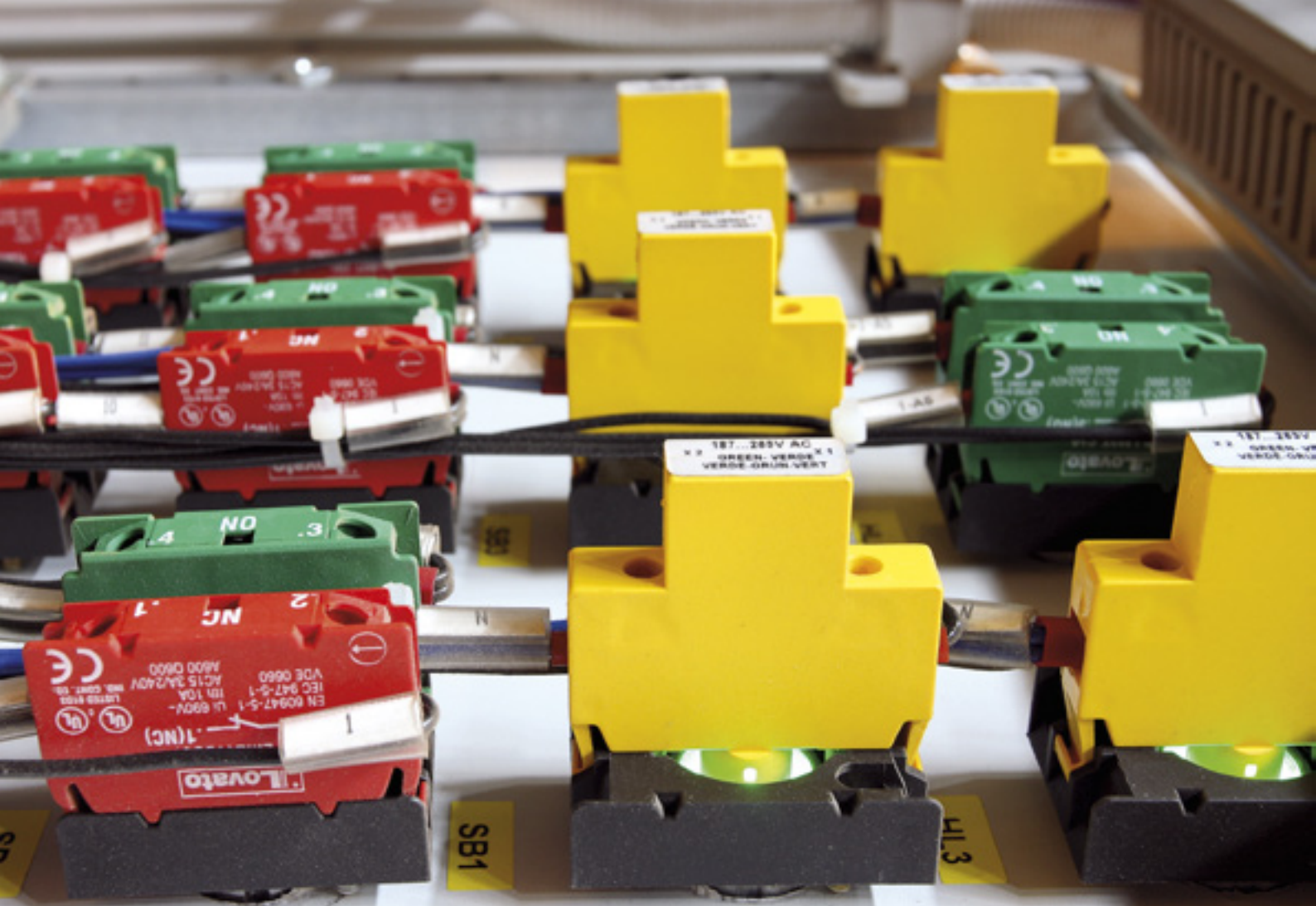
BENTLY
Nevada

The equipment can be delivered to the Customer as a package or as separate components. In such case the warranty covers ready-made items and the components included in the items.

Efficient logistics system allows us to provide over 10 000 items in stock, including:

- automation equipment and power automation;
- drives;
- electric and telecommunication cases and cabinets;
- current equipment.

distributing



We deliver uninterrupted power supplies and explosion-proof equipment, control instrumentation, and switching equipment. Information systems, combined terminal block systems, signal converters, surge voltage protection devices, soft starters, gear motors, thermal automatics systems, and individual heating plants are always available in stock.

We offer special conditions to our customers:

- partner and volume discounts;
- credit delivery to regular customers;
- deferred payment if provided for by the contract;
- partial payment and payment after the goods are ready for shipment;
- provision of warranty covering finished items and components;
- delivery of equipment to the Customer or to the Customer's facility;
- over 10 000 items always available in stock;
- arrangement of the stock depending on the Customer needs;
- engineering advice.

Our experience in sales and implementation of projects in the field of industrial automation allows us to have a large variety of equipment in stock which is needed for implementation of projects and quick replacement of failed equipment. We do our best to provide what our partners need most; we always look forward, plan our customers' orders, and foresee their needs.

Delivery of Equipment and Components

Sputnic Group includes equipment of the following manufactures in its projects:

SIEMENS

SIEMENS: steam and gas turbines, turbo-expanders, compressor units, generators, explosion-proof motors, automation equipment, control instrumentation, low-voltage and high-voltage variable speed drives, electric power distribution equipment;

Honeywell

Honeywell: industrial automation systems;



DANFOSS: frequency converters and soft starters, industrial and heat automation systems;



EMERSON Process Management: automation equipment for process industries (flow meters, pressure sensors, level sensors, etc);



RITTAL: systems of cabinet equipment and distribution cabinets;



STAHL: explosion-proof equipment;

YOKOGAWA

Yokogawa: industrial automation systems;



GE Energy / Bently Nevada: vibration monitoring systems;



PHOENIX CONTACT: switching equipment;



Liebert HIROSS: uninterrupted power supplies;



EATON: uninterrupted power supplies;



PEPPERL+FUCHS: spark-proof equipment, sensors;



KSB: equipment for liquid transportation and control;



Allen Bradley / Rockwell Automation industrial automation systems;



ABB: electric distribution equipment;



APC: electric power supply protection equipment;



LAMPERTZ: information security systems, industrial furniture;



Lovato Electric: switching equipment;



Relpol S.A.: isolation relays;



Nokian Capacitors: power-factor correction units, current limiting reactors;



GM International: spark-proof equipment;



Flowserve: equipment for liquid and gas transportation and control;



HAM-LET: top quality stainless steel components for pipeline valves;



Cabero: heat-exchange equipment;



Minimax: firefighting equipment;



INTERTEC: manufacture and integration of heating cabinets, boxes, and control instrumentation cabinets;



Eltacon: compressors;



FLENDER: reducing gearboxes, gear motors;



MTL: measuring and protective equipment;



SEW-EURODRIVE: gear motors, electric motors, frequency converters, and components;



JUMO: control and measuring instruments and automation equipment;



KTR: designing, manufacturing and marketing of couplings and another technical production for the most widespread ranges of application.

In addition to this, we use equipment made by Russian manufactures.

Project Implementation Support

Sputnic Group offers you services involving performance of special work required in the process of preparing and implementation of complex projects.

Our experts can give you professional support which will help you to concentrate your organizational, financial and human resources on performance of your business tasks and enhance efficiency of your company. We are ready to undertake designing and auditing of electric power systems and industrial facilities, enter into master contracts, provide logistics services, construction, installation, start-up, and maintenance.





Software Engineering and development

Sputnic Group develops and implements control system projects (automated process control systems, emergency protection systems, automatic firefighting system, etc.) including development of application software for automated process control systems.

The Company's specialists develop each particular project based on the following main principles:

- Use of equipment and software which comply with standards and which are manufactured by the world leading producers who have been constantly working in the market for a long period of time providing best support to their customers;
- Openness of engineering solutions allowing us to efficiently use hardware and software of different developers;

- Preparing of detailed engineering documentation and, when needed, training of the facility's staff to assure further development of the system by the Customer;
- Efficient interface with automated process control systems available at the facility. Moreover, if actually available automated process control system is based on standard open approaches, it is possible to assure its best integration with the new information system up to control command transfer from the upper level to the level of local control systems;
- Possibility of the fastest implementation of automated process control systems, particularly due to the fact that system solutions are modular and strictly structured.

Auditing of Power Systems and Industrial Facilities

Energy surveys of industrial facilities and organizations are performed based on Federal Law No. 261 - Φ3 of November 23, 2009 Concerning Energy Saving, Energy Efficiency Improvement, and Introduction of Amendments to Certain Legal Acts of the Russian Federation. An industrial facility is audited in compliance with Terms of Reference developed by the Energy Auditor and with the Energy Survey Program coordinated with the Customer.

In the process of energy auditing, a documentary survey of the industrial facility is made (documents on the use of fuel and power resources for a certain period of time are collected and analyzed) and the Customer's facilities, plants, and equipment, where energy survey with the use of instrumental methods is needed, are identified.

Project Implementation Support

Instrumental energy surveys at the Customer's facilities are carried out in accordance with the work programs developed by the Energy Auditor and coordinated with the Customer.

As a result of an energy survey, the following documents are issued:

- Report on the work done provided with results of the instrumental survey, calculations, and fuel and energy balance;
- Energy Performance Certificate executed in compliance with regulatory requirements and showing the balance of consumption and efficiency of use of fuel and power resources in the course of business;
- Program aimed at enhancement of efficiency of fuel and power resources use, at cutting down the costs for fuel and power supply, and at implementation of energy-saving practices at the facility.

The Program aimed at enhancement of efficiency of fuel and power resources use contains a list of activities (energy-saving projects) including a feasibility study and calculation of pay-off periods of energy-saving projects.

Sputnic Group has all necessary resources to make energy survey of an industrial facility to a high standard, as well as to assure implementation and support of energy-saving projects, technologies, and efforts.

Master Contracts

Consolidating design, industrial, and service departments, Sputnic Group provides additional advantages to its customers acting as a Prime Contractor.

Thanks to experience acquired, ample engineering capabilities, and skilled staff we are ready to perform a full range of contractual work under master contracts including development of design and engineering documents, integration of equipment and devices, development of software, up to adjustment, testing, and putting into operation followed by service maintenance in all oil and gas regions of Russia and neighboring countries.

We are:

- engineering Company specialized in development of automated process control systems;
- equipment manufacturing Company;
- contractor for construction, installation, start-up and adjustment of automation systems in oil and gas industry and power industry

and this allows us to apply an integrated approach to the tasks that you face.

A summary on the accomplished Sputnic Group projects is provided in the Reference List.



Logistics

The Logistics Service in the projects for oil and gas industry represents one of promising and fast growing areas of business in Sputnik Group's structure.

To meet the target, our Company has accumulated required physical and human resources including:

- our own fleet of freight and commercial vehicles;
- warehouse zone provided with all necessary equipment.

Sputnic Group offers the following transport and logistics services:

- integrated logistics service for project support;

- advice on logistics and control of manufacturing resources;
- arrangement of transportation of hazardous, oversized, and heavy goods;
- customs clearance services;
- arrangement of container-on-flat-car transportation;
- enhancement of delivery;
- warehouse services: storage of goods and handling;
- repacking, marking, sorting of orders and their batching.

Our Company provides a broad line of services to deliver goods, including forwarding, arrangement of transportation by several kinds of transport (multimodal transportation), delivery to the Customer's door, transit arrangement, finding the best transportation route by the Customer's request, management of transportation of heavy and oversized goods, charter flight arrangement. In close collaboration with leading Russian logistics operators, our Company can provide transportation of goods wherever you want.



Construction, Installation, Start-up and Adjustment

Sustaining the idea of rendering integrated services to the Customer, Sputnik Group performs construction, installation, start-up, and adjustment work.

Construction and Installation Department of the Company performs a complete set of work for installation of equipment, acceptance of the equipment at the Customer's site, arrangement of handling operations, as well as supervision of installation work and issue of delivery-and-acceptance documentation.

If the Customer prefers, it may perform installation using its own resources; in such case the Company may render equipment installation supervision services.

Sputnik Group specialists perform start-up and adjustment work of any complexity:

- tests and measurements in electric installations up to and exceeding 1000 V;
- start-up and adjustment of automated process control systems in chemical, oil and gas processing industry, and power industry;
- start-up and adjustment of low-voltage packages of gas pumping units and power units of gas turbine units;
- start-up and adjustment of 0.4 kV, 6 (10) kV electric power distribution systems;

- arrangement of the Customer's personnel training;
- arrangement of delivery and acceptance tests.

The experience gained, facilities available, and skilled professionals allow us to guarantee top quality work meeting construction deadlines.



Service Support

The services as for the maintenance of the projects of Sputnik Group are realized by the Service as for commissioning of equipment and services. The Service carries out the support maintenance of the next equipment:

- high voltage equipment and low voltage complete devices and systems of electrical distribution on the basis of technical solutions by SIEMENS, Schneider Electric, ABB, Hyndai, Danfoss and others sellers;
- Industrial control on the basis of program-technical means by SIEMENS, Honeywell, Rockwell Automation/Allen Bradley, OMRON;
- systems of fire automatics;
- transformation hardware by SIEMENS, ABB, Danfoss, Control techniques, SEW Eurodrive;

- systems of uninterrupted supply EATON, Emerson Network Power;
- gas-turbine electric stations, gas-compressor units of «Aviadvigatel» PJSC, «NPO Iskra» PJSC, «Iskra-Turbogas» Ltd. ;
- VOITH reducers;
- SIEMENS generators.

We offer next services when supporting of equipment commissioning of the Client:

1. Technical support, consultation;
2. Maintenance;
3. Metrological support;
4. Periodic electric tests and measuring of characteristics of electrical equipment;
5. Repair and replacement of failed equipment (SIEMENS, Danfoss, EATON, Control Techniques Service center).

The specialists of the Sputnik Group Service center graduated from the specialized education centers of the suppliers of equipment according to the different destinations of the SIEMENS products, Danfoss transformation hardware, EATON systems of power supply, they have required right of access, they are certified in the regional department of Rostechnadzor as for the industrial and electrical safety.

The department is fully completed with up-to-date measuring equipment, instruments, and also required specialized software.



Converter Equipment Service Centre

The Service center is authorized for the execution of repair and maintenance of SIEMENS, Danfoss, EATON, Control Techniques equipment.

We offer the complex approach for the solution of the problems appeared in the equipment of the Client. The prompt responses for the claims, prediction of the terms of elements replacement and terms of operation of spare details, well-timed delivery of the required material, the opportunity to get technical consultations as for the operation of equipment, the presence of the own store and delivery services permit to minimize the out-of-service time of your equipment.

For our clients are available:

- free delivery on the territory of the Service center with the posterior repair;
- free guarantee repair. Our Service center realizes free repair during the guarantee period;
- free replacement. Our Service center realizes the free replacement of the transformers that have any serial defect, not depending on the year of output of the devices;
- free telephone support. During working time, the specialists of our service center answer all your questions;
- Free composition of the store of spare details.

Metrological Service of Sputnik Group

Aimed at providing the unity and the required accuracy of measurements, improvement of metrological assurance of its own production, also provides comprehensive metrological service at the customers work sites.

Our enterprises are accredited to carry out work on calibration of data measuring channels.

Along with the work performed by our own resources, all necessary services involving regional CSMs are provided:

1. Examination of technical documentation;
2. Development of programs and procedures for certification of test equipment;
3. Certification of test equipment, custody transfer meters;
4. The tests in order to approve the type of measuring instruments, measuring systems and complexes;
5. Development of methods of measurement;
6. Provision of regulatory documents in the field of metrology.

Competitive advantages of Sputnik Group during the implementation of services

The evident advantages of Sputnik Group as a service organization are:

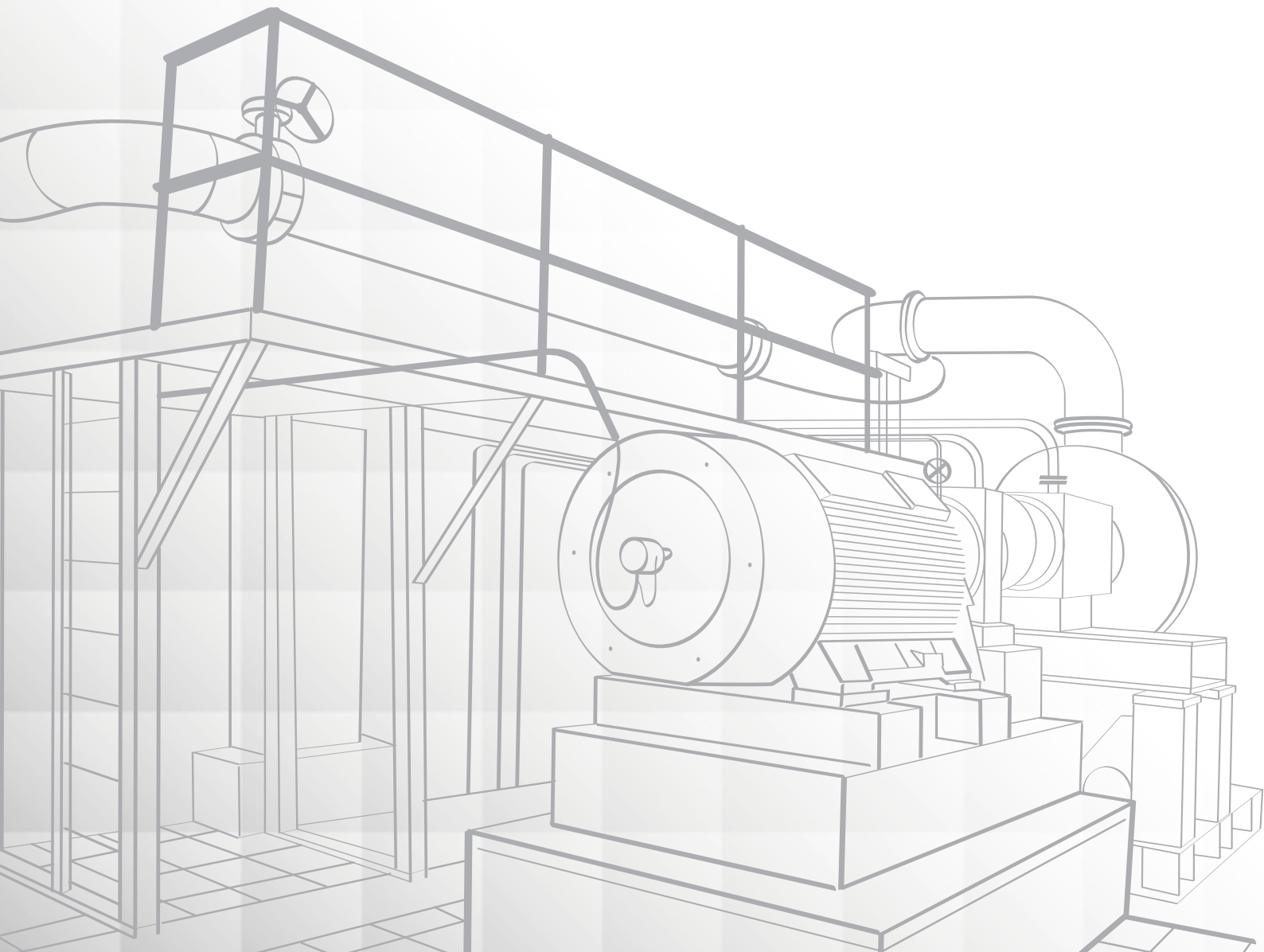
- presence of direct service contracts and accreditation of the manufacturer of automatics means, electrical distribution, fire automatics, gas transmission units;
- organized logistic circuit as for the supply of spare details and materials that significantly reduces expenses and date of delivery;
- high level of readiness of spare details set thanks to the continuous monitoring and augmentation of store bottoms. • significant experience in the commissioning and maintenance of industrial process, systems of electrical distribution, sites of oil production, oil and gas processing, petrochemistry, engineering, energetics;
- individual approach for every client (joint revision of the site\equipment with the Client, analysis and elaboration of the previous order of the execution of works considering peculiarities of the site);
- elaboration of technical recommendations as for the operation\modification of the equipment considering experience of operation; realization of modifications;
- monitoring of technical condition of the Equipment with application of instrument and parameter diagnostic methods.

Qualified service of the equipment installed by our company or other manufacturers admits:

- reduce operation expenses;
- raise of security and anti-crash operation of the equipment;
- reduce the limits of repair and out-of-time of the equipment when emergency situation appears;
- reduce expenses as for the support and education of maintenance service personnel.

Reference List

We apply the experience gained and latest technologies to develop perfect systems and see future achievements already today. Growing, Sputnik Group has implemented a lot of successful projects in various industries and each particular project means much to us.



Reference List

Supply of basic equipment for 7 power-generating units of GTES-25PA of "Aviadvigatel" OJSC: a reductor, transmission, generator, cooling system, automated control system, low-voltage package module, fire-fighting automated system, generator synchronization and protection cabinet, GECS. 3 sets are for the Yarega Deposit, and 4 sets are for the Usinsk Deposit, "LUKOIL-Komi" LLC	2014-2015
Performance of construction and erection operations as well as commissioning operations on the industrial control system of the "Development of the Eastern Lambeyshor petroleum deposit for the test run. Petroleum treating unit project. "LUKOIL-Komi" LLC (Allen-Bradley automated control system)	2014-2015
Construction of a modular unit transformer substation in a block modular building, "Tobolsk-Neftehim" LLC	2014-2015
Service and technical support for Gas Turbine Power Station, "Lukoil-West Siberia" LLC	2014-2015
Maintenance for information systems, for software of the industrial control system, for instrumentation and metrology and for communication systems in petroleum extraction facilities of "Kama-Oil" CJSC	2014-2015
Development, supply and adjustment of auxiliary systems for SCT-800 SIEMENS gas turbine unit No. 1-6 of the thermal power station of "RN-Tuapse Petroleum Refinery Plant" LLC: an oil air cooling system, anti-icing system, electric devices system, auxiliaries transformers 10/0,4, (the 1 st and 2 nd queues)	2010-2015
Production and supply of Automated group metering stations and CTS on the request from "AktauOilMash" LLP for subsidiaries of "Kazmunaigas" NC.	2014
A system of measurement of quantity and parameters of associated petroleum gas for the "Construction of Du700*10 looping: reconstruction of the gas pipeline-jumper for natural gas delivery to the "Usa-Pechora" gas pipeline" project. "LUKOIL-Komi" LLC	2014
Development of technical documentation and supply of a feeder control system for delivery of rock phosphate ore, Aleksandrovsk Machine Building Plant	2014
Packaged supply of 4 megawatt variable-frequency drives in a block-box on the "NTKR Reconstruction" project for "LUKOIL- Permneftegaz-pererabotka" LLC	2014
A modular building, including the engineering systems, of a gas boiler facility for the "Severteploservis" LLC	2014
Design and survey operations on modernization of petroleum quantity measurement system No. 391, "Usa" Terminal, "LUKOIL-Usinskneftegas" Plant	2014
Production of platforms for a line of welding of car bodies for Ford Sollers plant, for "Comau Russia" LLC	2014
Production and supply of equipment for power supply systems and for automation of "Joint Stock Company "Transneft" OJSC. Technical re-equipment of OPS. Adjustment of OPS 11, 15, 19 ESPO.	2013-2014
Maintenance of compressor units mounted on Grasso compressors, "Severneftegas" plant.	2013-2014
Block-structured pumping station for firefighting of the loading and unloading railroad rack at the PMX unit of "Sibur-Chimprom" CJSC's workshop No. 42	2013-2014
Supply of the "Ural-600" fire-fighting automatic system of the Western Kajumovsk deposit (the 1 st and 2 nd queue), EGES fire-fighting automatic system of the Yarudeysk deposit (6 sets)	2013-2014
Diagnostics automated system for technical state of generating units EGES-12 of the Southern Priobsk deposit, "Gazpromneft-Khantos" LLC	2013-2014
Development of design and engineering documentation of facilities power supply system for 0.4 kV and of power distribution control system for central gathering station's structures on the project of development of the Kharjaginsk deposit of "TOTAL" company	2013-2014
Supply and adjustment of "Bajandynsk" industrial control system, "LUKOIL-Komi" LLC (Allen-Bradley automated control system)	2013-2014
Complete overhaul of compressor units in booster stations 1,2,3,4 including supply of spare parts, Sochi thermal power station (a branch of "INTER RAO-Electrogeneration" OJSC	2013-2014

Reference List

Design, production, supply, adjustment and commissioning of equipment and systems of generating units of gas turbine power station-25 PA with the unit output of 25 MV for the Power Centre of "LUKOIL Permnefteorgsintez" LLC. The supply includes the following: a redactor, transmission (joint), generator, protection and synchronization system, automated control system and a low-voltage package module of GTS-25PA, generating unit system of gas fire detection and fighting (8 sets)	2012-2014
Supply of control cabinets of industrial control system of "Uchaly Mining and Metallurgical Combine" and "Mikhailovsk Mining and Metallurgical Combine" for "Uralmashzavod" OJSC	2012-2014
Provision of personnel for services on repair of turbines of 400 CCGT unit of the Yayvinsk state district power station "OGK-4"	2012-2012
Supply and implementation of steam turbine plants of the hydrocracking integrated unit for "ANPZ VNK" OJSC	2012-2014
Development and implementation of industrial control system of the "Pashnya" preliminary water discharge unit, "Pashshor" industrial control system. "LUKOIL-Komi" LLC	2012-2014
Implementation of the IntweLLs R3 telecontrol system (industrial control system) at petroleum extraction facilities of "LUKOIL-Komi" LLC, petroleum and gas extraction department-1, petroleum and gas extraction department-2 of "LUKOIL-Ukhtaneftegas" plant	2013
Gas transmission station's control assemblies for "Vankorneft" CJSC	2013
Development of design and engineering documentation of industrial control system of the bunker department on the "Technical re-equipment of the bunker department of BPKRU-4" project. Technical re-equipment of the ore bunkers. SKRU-3, "Uralkali" CJSC	2013
A system of control for a commissioning test bed of natural gas centrifugal compressors of "NPO "Iskra" OJSC	2013
A general contract on automation of "RN-Tuapse Petroleum Refinery Plant" LLC, the 1 st start-up facility, the Honeywell automated control system	2012-2013
Design and supply of equipment for control of fans of cooling towers in "Tomskneftekhim" OJSC	2012-2013
Design, production, supply and implementation of automated control system gas turbine power station-4 of Sysert town, "Gasprom Transgas Ekaterinburg" LLC	2012-2013
Creation of a test bed for compressors produced by "Rusturbomash" LLC	2012-2012
Construction of the "Petroleum delivery and acceptance point in the "Southern Khylochuyu" central gathering station of the "Kharyaga-Southern Khylochuyu" interfield petroleum pipeline" facility, "LUKOIL-Komi" LLC	2012-2013
Construction of a rack for rail tanker loading of light petroleum products for the Novokuybyshevsk refinery plant (M+F, Emerson, Siemens)	2011-2013
Performance of comprehensive operations on construction of the "Site of structures for export in the "Inzyrey" central gathering station of the "Kharyaga-Southern Khylochuyu" interfield petroleum pipeline" facility, "LUKOIL-Komi" LLC	2012-2013
Comprehensive operations on construction of linear telecontrol of the "Kharyaga-Southern Khylochuyu" and "Inzyrey-Kharyaga" interfield petroleum pipelines, "LUKOIL-Komi" LLC	2012-2013
A comprehensive project on creation of a petroleum quantity measurement system for the Ukhta acceptance and delivery point, "LUKOIL-Komi" LLC	2012-2013
Supply of instrumentation and a gas and liquid analysis system. Beds for pressure sensors, a low-voltage package module for the thermal power station gas turbine unit, "RN-Tuapse Petroleum Refinery Plant" LLC	2012
Supply of Honeywell Enraf fiscal tanks metering systems for the farms, "RN-Tuapse Petroleum Refinery Plant" LLC	2012
An I&C complex for research of electric drive systems of the Perm National Research Polytechnic University	2012

Reference List

Production and supply of a modular unit of the 2CTS-1600, "LUKOIL-Komi" LLC	2012
A fire-fighting and fire alarm automated system for PBK departments, dewatering and thickening of line B of BPKRU-4, "Uralkali" OJSC, Berezniki town	2012
Supply of industrial control system of the station of liquefied petroleum gas storage and delivery, and expansion, industrial control system, "RN-Komsomolsk Petroleum Refinery Plant" LLC, Yokogawa automated control system	2011-2012
Energy inspection of pumping systems and ventilation equipment of "Krasnoyarsk Plant of Synthetic Rubber" OJSC	2011-2012
Development and implementation of a fire-fighting automated system for the Power Centre No. 2 of the central gathering station of the Central-Khoreyveysk uplift, "Zarubezhneft" OJSC	2011-2012
An industrial control system of the Power Centre, a fire-fighting automated system (2 sets), automated control system and a low-voltage package module of power units of the EGES-12 Gas Turbine Power Station (3 sets), Bentley Nevada vibration control equipment, "SK "RUSVIETPETRO" LLC	2011-2012
A low-voltage package module of the technological systems (the heat-recovery boilers, steam turbine, plant-auxiliary equipment) of the thermal power station gas turbine unit, Znamensk closed town, "GK-4" CJSC	2011-2012
A gas-insulated switchgear of 10 kV, "Southern Priobsk" compressor station, "Gazpromneft-Khantos" LLC	2011-2012
Design and production of a building for electrical equipment, of automated control system, of a compressed air station's low-voltage package module for the thermal power station gas turbine unit, "RN-Tuapse Petroleum Refinery Plant" LLC (the 1 st and 2 nd queues)	2010-2012
Reactive power compensation in the power supply of "Uralorgsintez" OJSC, Tchaikovsky town	2010-2012
Supply of 10 kV switchgear for the thermal power station gas turbine unit, Znamensk closed town, "GK-4" CJSC	2012-2013
Automated fire alarm for a ABKM-1000 thermal generator module, "Surgutneftegas" OJSC	2011
Fire-fighting automated system for the gas transmittal unit 16HK of the Vankorsk deposit (5 sets), "Rosneft" NC	2011
A automated control system of the support system, low-voltage package module, fire-fighting automated system, UPS system for a piston compression unit-005 and for a complex gas treatment plant of the "Alibekmola" deposit, "KazakhOil-Aktobe" LLP	2011
Development and supply of an automated control system for ventilation of the electrical rooms of the departments, dewatering and thickening line B of BPKRU-4, "Uralkali" OJSC, Berezniki	2011
An automated control system and low-voltage package module for gas transmittal units, low-voltage package module for a heating and ventilation system, more than 50 sets for facilities of "Gasprom" OJSC	2011
Modernization of a power supply diagram, of lockdown and alarm of a continuous-handling system for the workshop and for the products loading workshop, "Uralchem" OJSC, "Azot" OJSC, Berezniki	2011
Development and supply of an industrial control system, a power unit's low-voltage package module automated control system, an engine control system of EGES-16 for the thermal power station gas turbine unit, Znamensk closed town, "GK-4" CJSC	2011
Supply of an electric power fiscal metering automated system - volume SIT Siemens, Sweden, thermal station-6 of "TGK-9" OJSC	2011
Production of block modular buildings for set-down of the electrotechnical equipment of the sewage pumping station-1 of the capture point for industrial storm wastewater at the Northern storm sewer of "Uralelectromed" OJSC, Verkhniaia Pyshma town, Sverdlovsk Region	2011
Building Management system of "SO UPS" ("System Operator of the Unified Power System") OJSC of the Perm Regional Dispatching Office	2010-2011

Reference List

Construction of telecommunications networks of the industrial control system of production of oil and gas workshop - 6 of the deposits "Northern Kozhva", "Northern Lyzha" and "Southern Terekhevey" of "LUKOIL-komi" LLC, "LUKOIL-Ukhtaneftegas" plant	2010-2011
An automated control system and low-voltage package module for power units of the EGES-12C (8sets) for the Pokachevsk and Povkhovsk deposit, "LUKOIL - West Siberia" LLC	2010-2011
The "Ural-4000" gas-turbine thermal power plant fire-fighting automated system for "Gezh" petroleum delivery point, "LUKOIL-Perm" LLC	2010-2011
A low-voltage package module of the gas transmittal unit-25M-02 No.6-10 of "Gagaratsk" CS (5 sets), low-voltage package module of the gas transmittal unit-6,3 of "Pikalevo" CS, "Gasprom" OJSC	2010-2011
An automated control system of the provision system, a low-voltage package module, transformers 6/9, 69 kV, electric engines 800 kV, frequency changers 80 kV for fiscal metering point-004 of the Neftegorsk gas-processing plant of "Samaraneftegas" OJSC, "Rosneft" NC	2010-2011
An industrial control system, low-voltage package module and instrumentation of different departments, dewatering and thickening line B of the main building of BPKRU-4, "Uralkali" OJSC, Berezniki	2010-2011
An automated control system for ventilation of departments' electric rooms, dewatering and thickening line A of the main building of BPKRU-4, "Uralkali" OJSC, Berezniki	2010-2011
A system of automated control for the break-in, adjustment and commissioning bed for HP-3 units, "Inkar" PJSC OJSC, Perm	2010-2011
Design, production and implementation of industrial control systems, emergency shutdown system and central gathering station's fire-fighting automated system for the "Southern-Khylchuyu" deposit, "Naryanmarneftegas" LLC (the 2 nd start-up facility)	2009-2011
Delivery and implementation of auxiliary systems 7 GTP 5GT-800 SIEMENS, the gas turbine electric power plant of the Priobsk deposit, "RN-Yuganskneftegas" LLC: Cooling, fire-fighting and gas detection systems, a system of automated control	2008-2011
Supply of control cabinets for the water treatment plant-240, water treatment plant-400, household waste water treatment plant KOS-160 and KOS-300 of the Boring Base of the Bovanenkovsk oil, gas and condensate deposit, "Gazprom Dobycha Nadym" LLC	2008-2011
Supply of an automated fire-alarm system and a system of automated control for the low-voltage package module of the light fractions collector for the "Gozhan" CS and "Soldatovskaya" CS, "LUKOIL-Perm" LLC	2011
Development and supply of a gas-insulated switchgear-10 kV, the gas turbine electric power plant of the Southern Priobsk deposit, "Gazpromneft-Khantos" OJSC	2010
Compressor units' fire-fighting automated system. "TNK-BP" petroleum company	2010
A system of automated control and low-voltage package module for the water cooling system's unit, for facilities of "Gazprom" OJSC (more than 20 sets), a low-voltage package module of the gas transmittal unit for facilities of "Gazprom" OJSC (8 sets)	2010
Development of supplementary parameters for the MES system of BPKRU-3, "Uralkali" OJSC, Berezniki	2010
Modernization of the industrial control system for the granulation department, BPKRU-3 and BPKRU-4, "Uralkali" OJSC, Berezniki	2010
A pumps control system for production of carbamide, "Azot" OJSC, Berezniki	2010
A low-voltage package module and current-using equipment automated fiscal system on the "Reconstruction of the styren production unit including capacity growing up to 135 thousand tons/year, the 2 nd stage" project, "Sibur-Khimprom" CJSC, Perm	2010
Design of a subsystem of group control of active and reactive power and synchronization at the plant breakers of the "Southern-Khylchuyu" deposit's Power Centre, "Naryanmarneftegas" LLC	2009-2019

Reference List

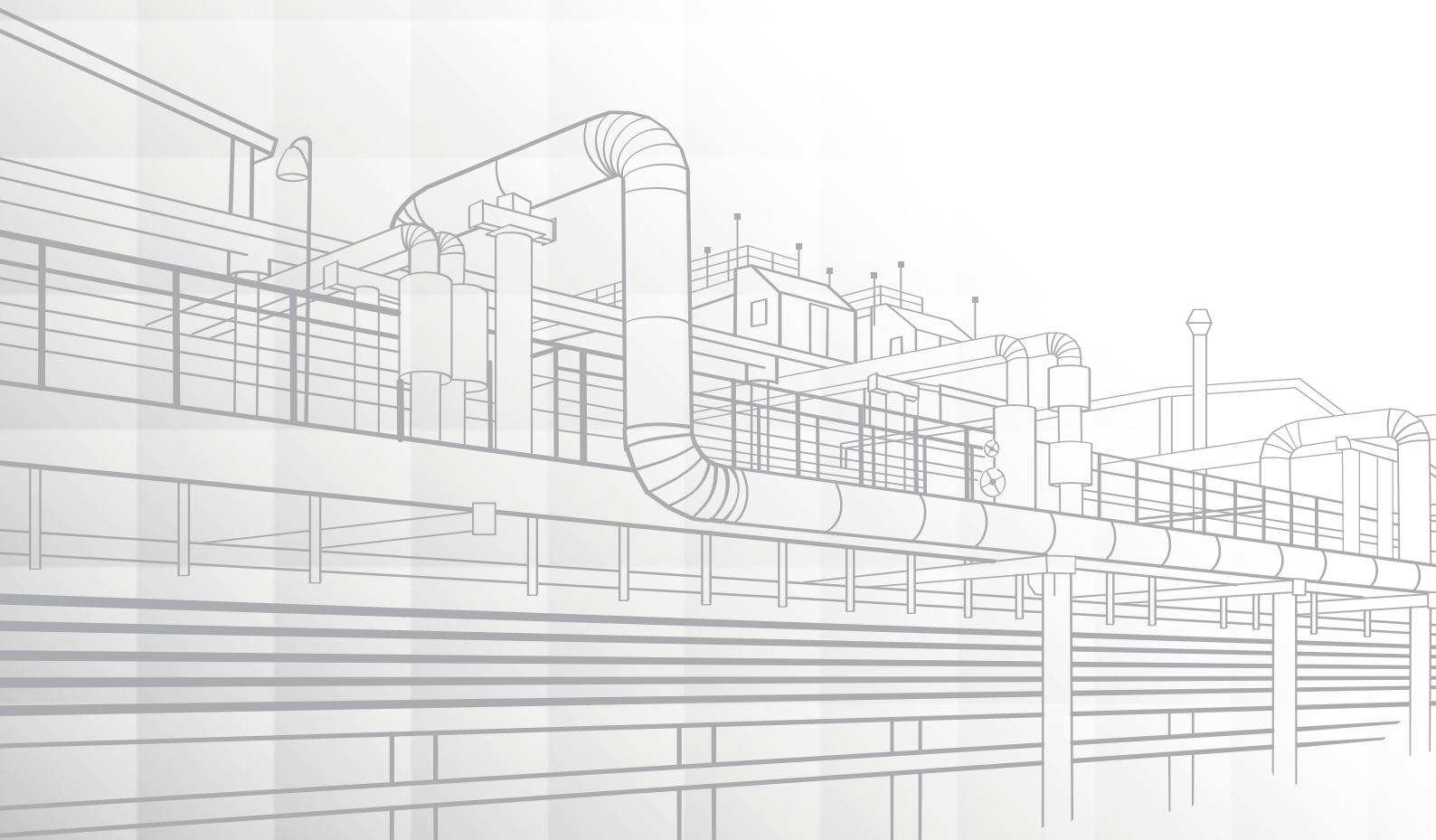
An industrial control system, low-voltage package module and instrumentation of different departments, of dewatering and thickening line A of the main building of BPKRU-4, "Uralkali" OJSC, Berezniki	2009-2010
Implementation of low-voltage automated systems for a frequency regulation of a drive in electric engines of the production and household machinery under the corporation programme, the 2 nd stage, "SIBUR-Holding" CJSC (in 8 enterprises)	2009-2010
Supply and pre-commissioning of 0,69 kV and 6 kV engines, 6/0,69 kV transformers, Sinamics 710 kW 0,69 kV frequency-regulated drives of a gas compression unit for styren production, "Sibur-Khimprom" CJSC, Perm	2009-2010
An industrial control system in source water treatment facilities of the Sredneuralsk state district power station, "Enel OGK-5" OJSC	2009
Creation and implementation of an I&C complex for the industrial control system of the Southern-Priobsk deposit's gas turbine electric power plant, "Gazpromneft-Khantos" CJSC	2009
An automated control system and low-voltage package module for power units for the EGES-12C of the Southern-Priobsk deposit's gas turbine electric power plant (8 sets), "Gazpromneft-Khantos" CJSC	2009
A system of automated control and low-voltage package module for the water cooling system's unit, for facilities of "Gazprom" OJSC (6 sets)	2009
Supply of an industrial control system for the main production building of BPKRU-4, "Uralkali" OJSC, Berezniki	2009
Electric engine control system of 250 kW for permanent belt conveyer based on the Siemens soft starter, "Belokholunitsky Machine-Building Plant" OJSC	2009
Reconstruction of pump stations of the first, second and third lifts, "Kamkabel" OJSC, development of design documentation for a low-voltage package module and an automated control system for "Monitron" LLC, Perm	2009
An automated control system and low-voltage package module for a power unit for the EGES-12C of the Tevlinsk-Russinsk deposit's gas turbine electric power plant (4 sets),	2008-2009
Modernization of an industrial control system 1 of central gathering station start-up facility for the "Southern-Khylchuyu" deposit, "Naryanmarneftegas" LLC	2008-2009
Maintenance of a technical means complex of the telemechanics and communications system of the Surgut state district power station-1 and Pskov state district power station, "OGK-2" OJSC	2008-2009
Electric engine control systems with capacity from 132 to 315 kW for permanent belt conveyers based on the Siemens soft starter for the "Aleksandrovsk Machine-Building Plant" OJSC (7 sets)	2008-2009
A research bed for dynamic pneumatic processes in a model stage of centrifugal compressors, Perm National Technical University	2008-2009
An industrial control system and low-voltage package module for Perm heat electric generation plant-6 and heat electric generation plant-13, "TGK-9" OJSC	2007-2009
A technical means complex for a system of network control and management system for the pump compressor station of the "Sakhalin 2" project, "Sakhalin Energy Investment Company Ltd" company	2007
An industrial control system and low-voltage package module for turbo generators No. 2 and 3 of Perm heat electric generation plant-14, "TGK-9" OJSC	2006-2008
A control gear-0,4 kV of the coaling plant, an industrial control system of the cooling workshop of "Gubakhinsky KOKS" OJSC, Gubakha town	2006-2007
Supply of auxiliary cooling systems 5 GTP SGT-600 of the "Southern-Khylchuyu" Power Centre, "Naryanmarneftegas" LLC	2006-2007
Development and implementation of an industrial control system for the "Southern-Khylchuyu" deposit's Power Centre, "Naryanmarneftegas" LLC (5 power units, 25 megawatt each)	2005-2009

Implemented Projects

The fact that Sputnik Group has implemented a lot of projects which are of top priority to our Customers bespeaks high reliance on our competence.

Below we describe some projects of the Reference List to make you see how the implementation of such projects helps our Customers in dealing with strategic goals at regional level.

Sputnik Group specialists are proud of the result of their efforts and ready to apply their experience when working on your long-term objectives.





LUKOIL-Permnefteorgsintez Energy Park LLC

Customer - Aviadvigatel OJSC for LUKOIL-Permnefteorgsintez LLC

Design and Implementation - Sputnik-Energetika Ltd.

Power Unit Start-Up - 2014

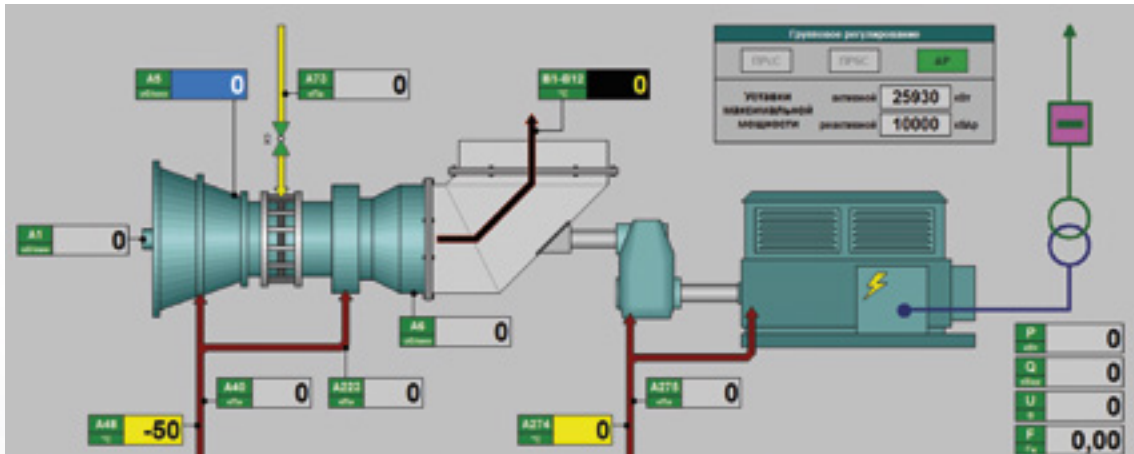
The Energy Park is designed on the basis of modern gas turbine technologies of cogeneration of electrical and thermal energy in a single cycle with the use of heat of exhaust gases in waste-heat steam boilers, which allows for high-indicators of their effectiveness. The Energy Park will provide electrical and thermal energy to the oil refinery plant LUKOIL-Permnefteorgsintez. The start-up of the Energy Park is to be in the fourth quarter of 2014.

GTES-25PA power units, which are the basis of the Energy Park, were designed and manufactured by the team of Aviadvigatel. The main equip-

ment of the power unit includes: a GTE-25PA gas-turbine plant of Aviadvigatel, a reducer by Voith, a turbine generator by Siemens with a microprocessor excitation system by Basler, a transmission gear by Flender, a cooling system on the basis of an air-cooling unit by Cabero. The power unit is equipped with an automatic control system (ACS) and a low-voltage complete device (LVCD), a protection and generator synchronization cabinet (PGSC), a system of gas and fire detection and a fire-fighting system, which have been developed and supplied by Sputnik Group on the basis of Siemens software and hardware.

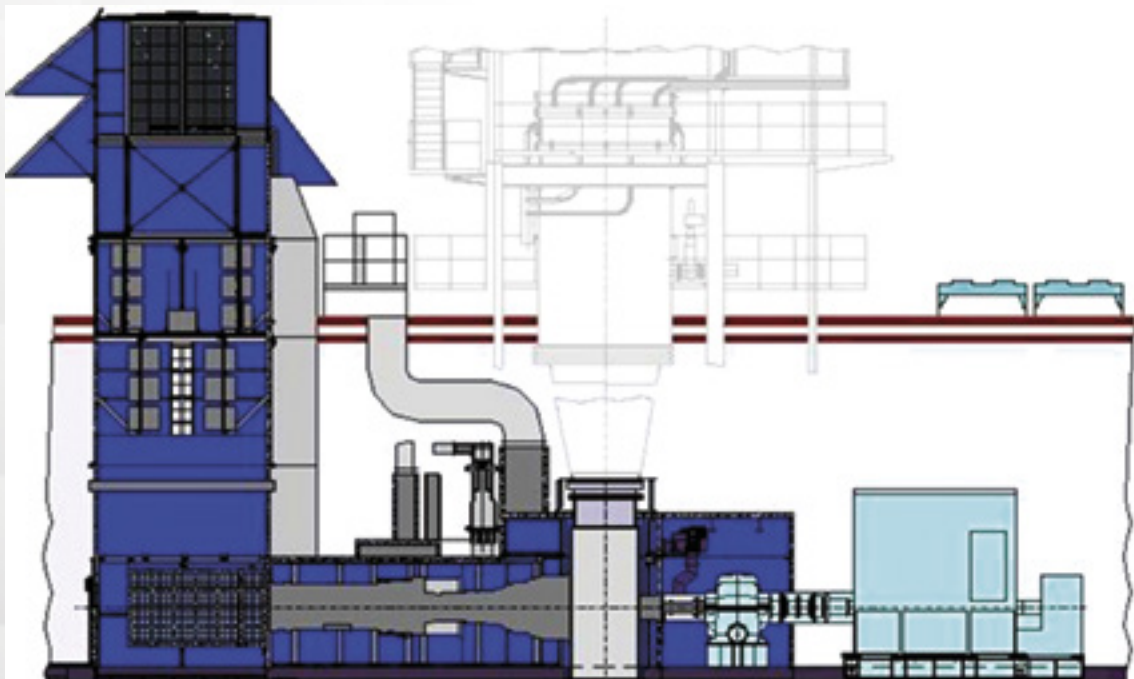
Partnerships between Aviadvigatel OJSC and Sputnik Group formed the basis for active participation of Sputnik Group in the joint project on the delivery of GTES-25PA power units for LUKOIL-Permnefteorgsintez Energy Park LLC. To provide a comprehensive responsibility for the equipment supplied, Sputnik Group performs the development, delivery and commissioning of not only automation systems, but also the main equipment of the power unit: generators with Excitation Control System (ECS), reducers, transmission gear, cooling system.

Completed Projects



The purpose of the gas turbine unit is to generate electrical energy by the generator, the rotor of which through the reducers is driven by

the shaft of the gas turbine engine using the energy of the fuel gas burnt in the combustion chamber.



GTES-25PA Power Unit Arrangement

The gas turbine unit has a modular design that provides a high level of factory readiness and significant reduction in the time of installation of equipment, commissioning and start-up.

Power Unit Equipment
 Highlighted in Color
 Is delivered by Sputnik Group

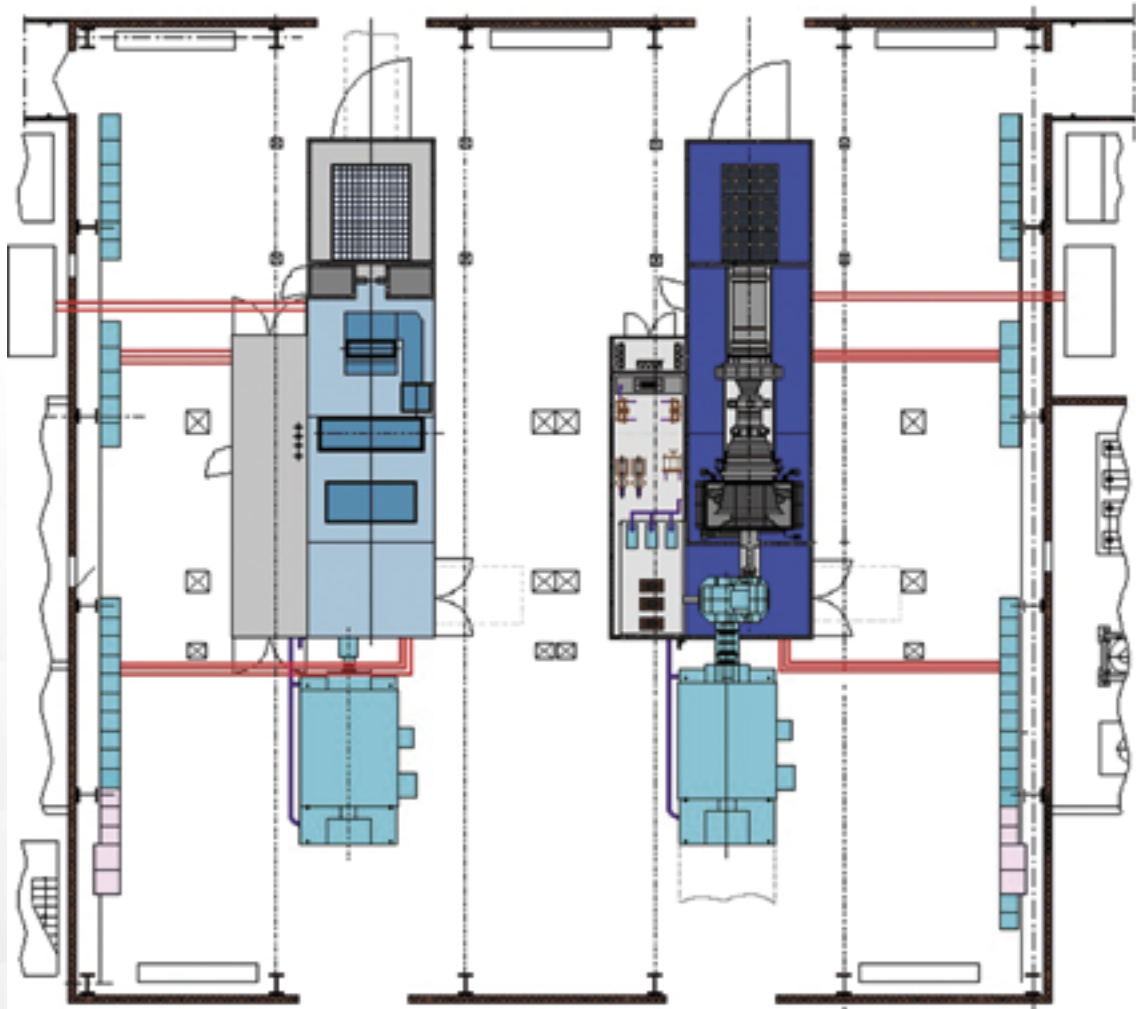


To generate electrical energy, the synchronous four-pole generator of 1DY2068-8AD02-Z type manufactured by Siemens has been used.



ACS and LVCD of Gas Turbine Plant

Completed Projects



The power unit control system integrates a variety of subsystems and equipment, which are a part of the gas turbine unit, namely as follows:

- GTE-25PA gas turbine plant;
- reducer;
- generator complete with Excitation Control System;
- oil management system of the gas turbine plant;
- united oil management system of the generator and the reducer;
- air purification system and inlet ducting;
- cooling and ventilation system of the gas turbine plant;
- cooling system of the generator and the united oil system of the reducer and the generator;
- fire alarm system and fire-extinguishing system combined with the gas detection system;
- exhaust system;
- vibration monitoring system;
- generator protection and synchronization box.

Power Unit Equipment
Highlighted in Color
Is delivered by Sputnik Group



Construction of 24MW Steam Turbine House of ANPZ VNK OJSC

Customer - ANPZ VNK OJSC (Rosneft)

Design and Implementation - Sputnik-Energetika Ltd

Power Unit Start-Up - 2014

Scope: the provision of design documentation, delivery, installation supervision and commissioning of the main process equipment of the steam-turbine compartment of the Central Heating and Power Plant, namely two turbine generators with auxiliary equipment composed of the following:

- steam turbine on the frame with the reducer and oil system integrated into the frame;
- generator;
- condenser;
- low-pressure heater;
- condensate pumps;
- steam stuffing condenser;
- steam-jet ejector;
- turbine generator ACS;
- excitation and synchronization control system;
- automated process control system;
- automated power supply control system;

- drainage tanks with drainage pumps;
- switch board of 6 KV with the auxiliary transformer;
- switchboard of 0.4 KV of turbine generators and switch board of 0.4 KV of the power plant;
- current-conducting wires of generator voltage;
- uninterruptible power supply units.

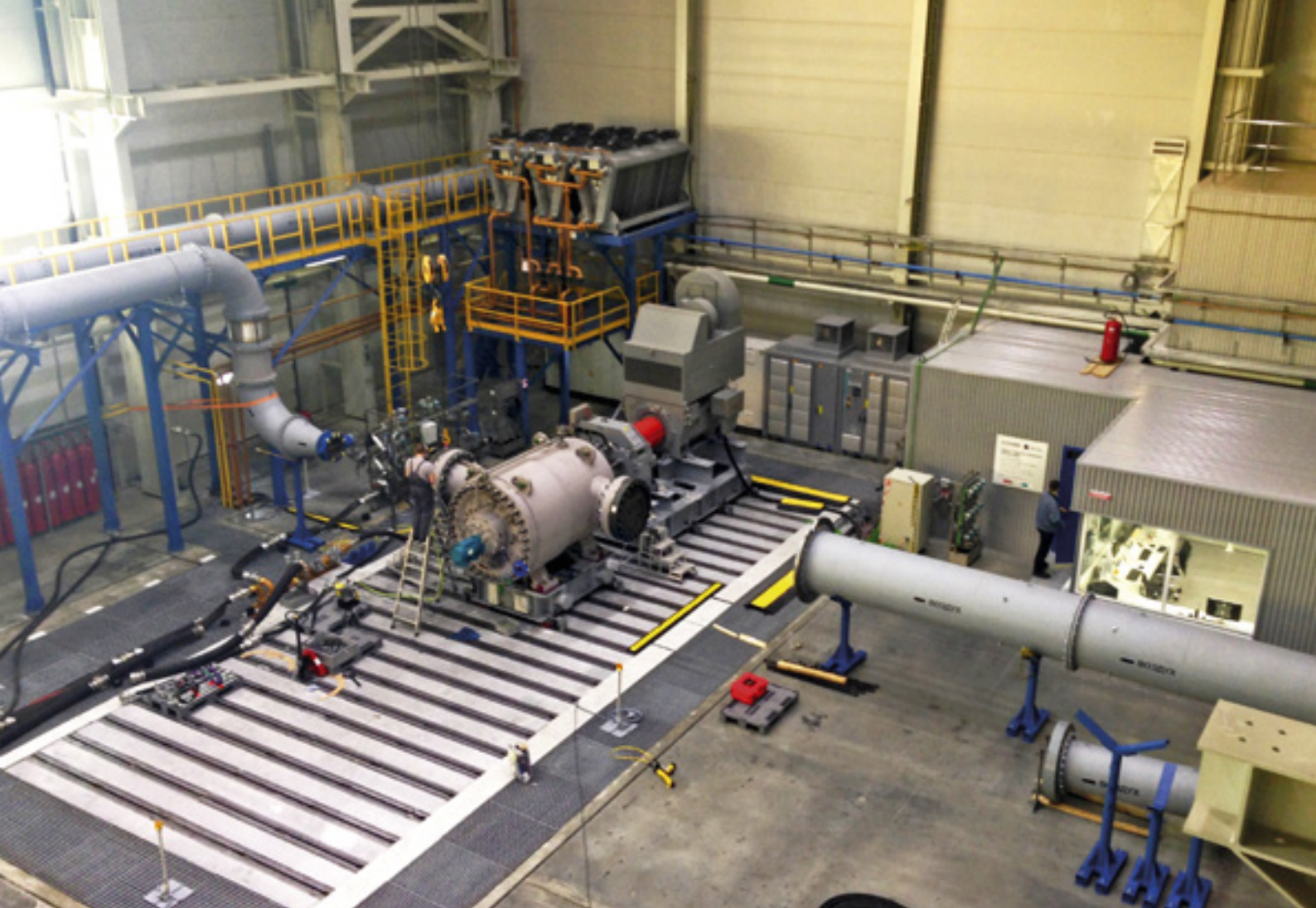
Facility Description

The steam-turbine compartment intended for the disposal of steam surplus from the hydro cracking unit. Regulation of steam parameters is carried out by existing steam boilers. To generate electrical energy, the steam-turbine compartment has two high-efficiency condensing steam turbines. The turbines have been manufactured at Siemens plant in Czech Republic. The distinctive feature of these turbines is relatively high temperature of cooling water, which required the

use of a condenser of a large heat dissipation area, and it was taken into account when choosing bearings and designing a lubrication system.

The generator has also been produced by Siemens in Czech Republic. The excitation control system has been implemented on the basis of AVV equipment and meets all the requirements for the generating capacity included in the single power supply network of the Russian Federation.

The requirements of the customer for the high level of automation appeared to be a distinctive feature of the power plant. The Automated process control system includes not only main equipment, but all the plant wide equipment, electric distribution equipment and even utilities of buildings. The Automated process control system has been executed on the platform of Siemens PCS-7. The high level of automation enables to reduce the number of operating staff.



Workbench for testing radial-flow compressors produced by RusTurboMash Ltd.

Designing and implementation by Sputnik-Integratsia Ltd.

2011-2014

The workbench is designated for carrying out open-circuit mechanical and gas-dynamic testing of radial-flow compressors produced by Rusturbomash. Carrying capacity of the workbench is 50 compressors a year (capacity calculation 7119.00.00-IOS1-RR2)

Equipment system of the workbench makes it possible to carry out both testing of compressors and testing of compressors with a package.

Substructure of the testing workbench:

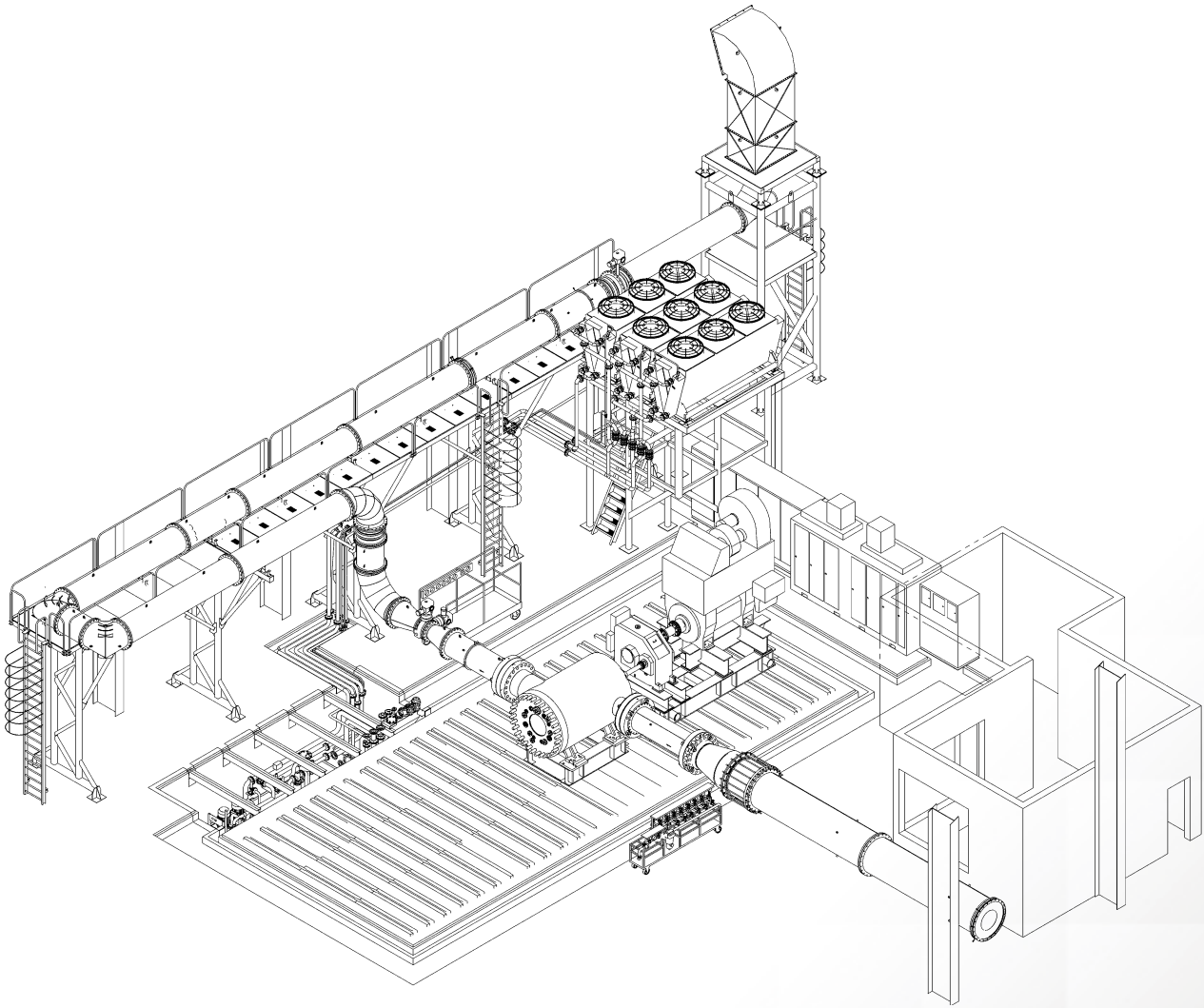
Massive substructure of the testing equipment functions as an anti-vibration boot weighing 685 tons. Dimensions: 7000x16000x3615 mm.

Upper part of the foundation: 52 guide rails with T-form slots in plan view 6000x15250 mm. Variation in plane for embedded elements does not exceed 0,5 mm.

Foundation of the oil system is a box-shaped substructure situated lower than the level of shop floor with internal dimensions 2300x7200x3115 mm with a pit for emergency collection of oil in the lower part.

Driving line:

- Frequency converter Siemens-Robicon PH Gen IV, power capacity 2640 kW, 6 kV.
- Custom-made asynchronous motor with forced air-cooling system, power capacity 2200 kW, power voltage is 6 kV. Rotation frequency 300-1800 rpm.
- Multiplier TX56, power capacity 2200 kW, gear transmission ratio 6,345, rotation frequency of a speed shaft varies from 2538 to 11420 rpm (sleeves ART-6 and ARC-8, manufactured by Flender).



Oil system:

Is designated for providing oil feed to a compressor and multiplier.

- Volume of an oil tank is 8,1 m³;
- Performance of pumps is 450 l/min;
- Weight of a module of the oil system is 4500 kg;

Three oil-cooling modules make it possible to rearrange the cooling system with regard to a type of testing, power, heat emission of the system.

Rack of the oil system is purposed for adjustment of levels of feeding oil to bearing units of the equipment.

Service air pipelines (air ducts):

Are designated for air feed from a workshop to an inlet flange and air exhaust from an outlet flange of a compressor outwards the shop.

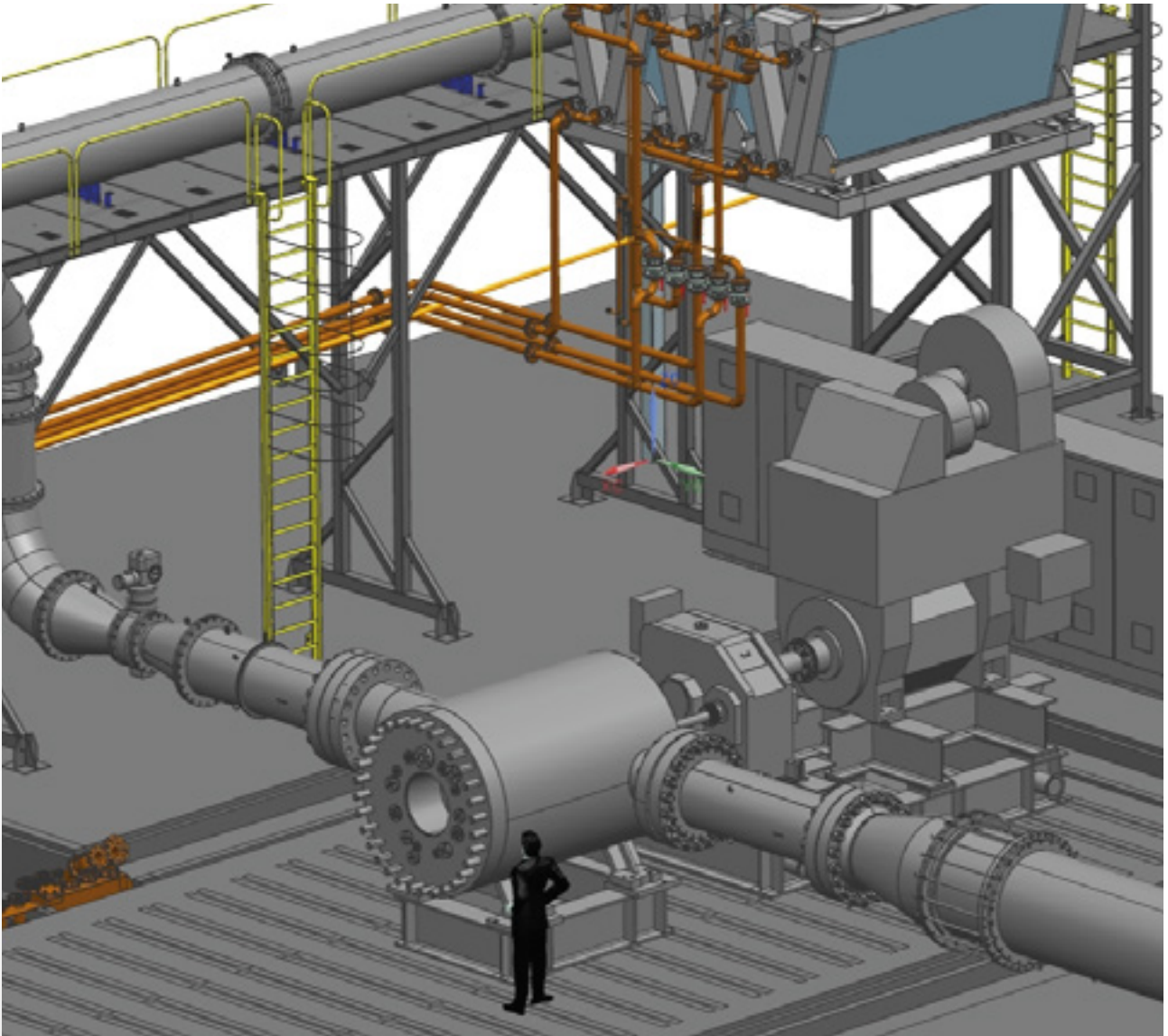
- Pipe diameter of the air duct is 700 mm.
- Material is construction steel.
- Shutoff valve which serves for exclusion of ingress of cool air during intervals between tests.
- Regulating valve for determination of the surge limit of a compressor.

Operator's room and equipment room:

- Operator's room is designated for location of workplaces for engineers carrying out testing.
- Equipment room is designated for location of the equipment for workbench automation.
- Both premises are equipped with a microclimate system.

Fire safety system:

- Operator's room and control room are equipped with an automatic fire alarm system.
- Testing area (pits) is equipped with an automatic fire-extinguishing system based on CO₂.
- Manual fire extinguishers are also provided (portable halocarbon fire extinguishers).





A Shed for Electrical Equipment of SGT-800 Gas Turbine Unit, Compressor Station to Supply Compressed Instrument Air to the Gas Turbine Thermal Power Plant of In-Plant Use at RN-Tuapse Refinery, LLC

Customer: Siemens, Ltd

Power supply system developed and supplied by: Sputnik-Komplektatsia, Ltd

Automated process control system developed and supplied by: Sputnik-Integratsia, Ltd

Years: 2009-2012

Description of the Facility

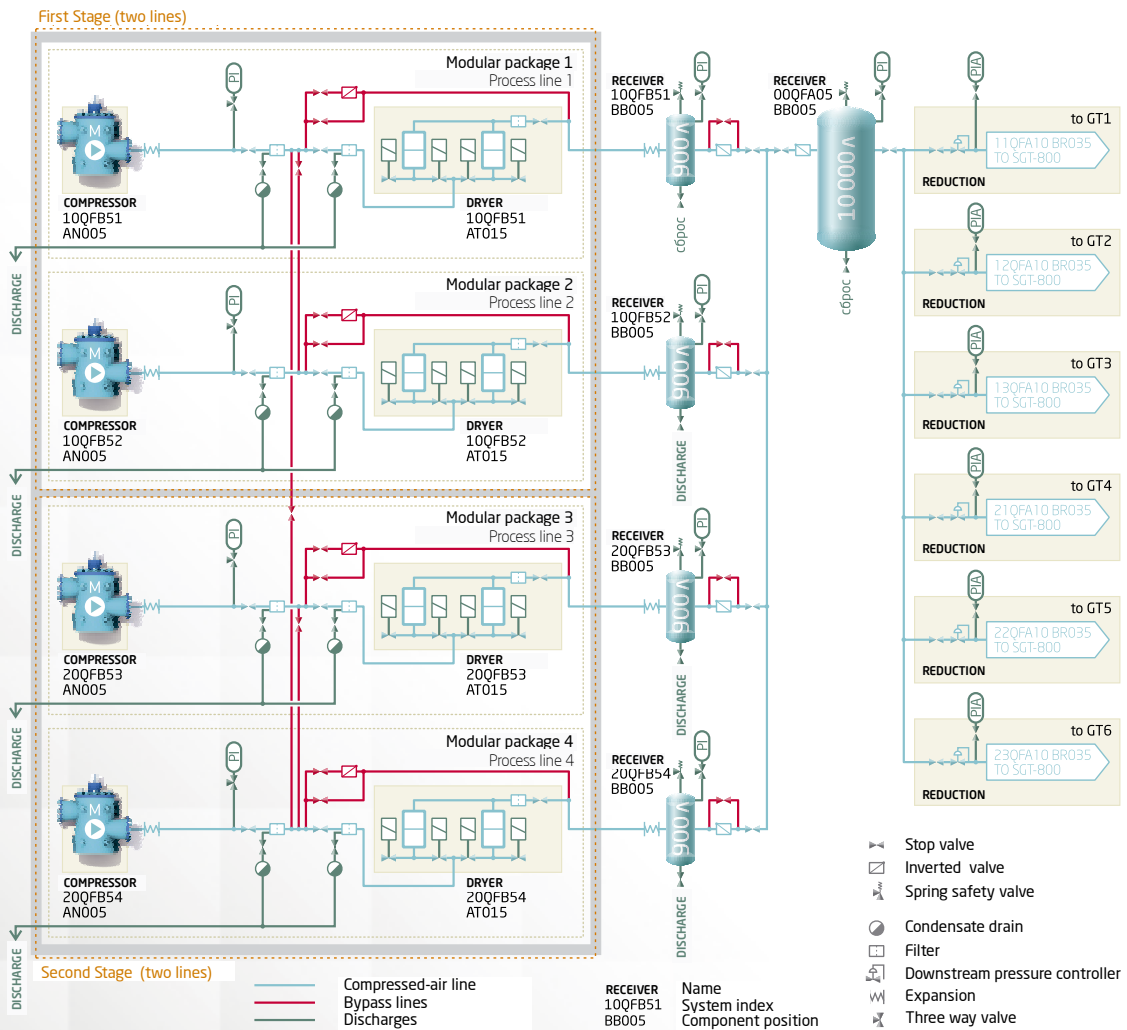
Due to large-scale upgrade at Tuapse Refinery, a Gas Turbine Thermal Power Plant consisting of 6 SGT-800 gas turbine units of Siemens manufacture was build in the territory of the factory. This project was unique due to location of the construction area in the earthquake-prone region.

To build the Gas Turbine Thermal Power Plant, turbines of outdoor design were selected, which required construction of a shed for electrical equipment of each turbine unit (generator circuit-breaker, current-limiting reactors, 10/0.4 kV reducing transformers, 10 kV and

0.4 kV auxiliary switchgears, control systems, and other packaged electrical equipment) and a compressor station for the instrument air.

Completed Projects

System Layout



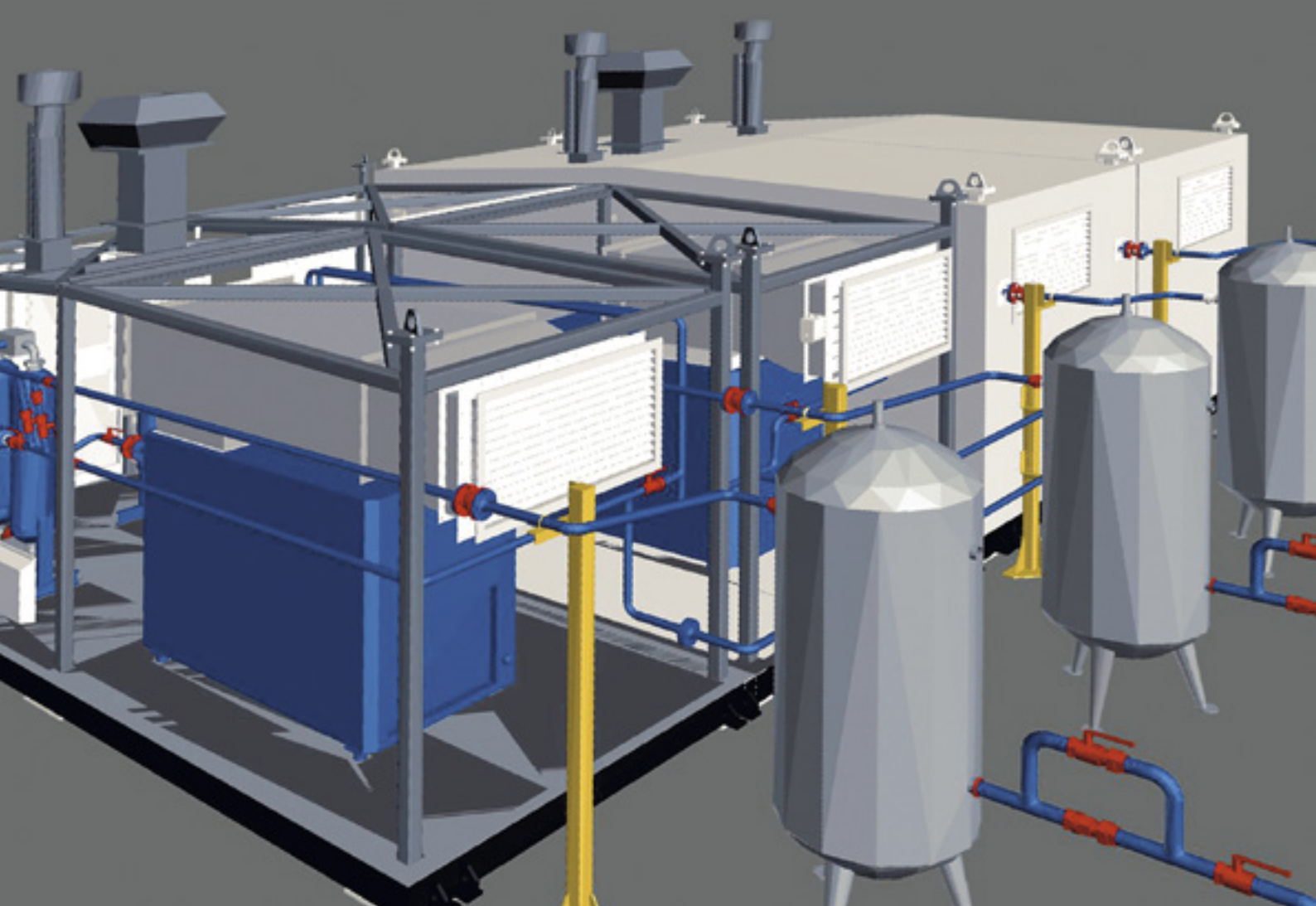


The Facility Includes:

- Generator circuit-breakers with microprocessor protection panel;
- One-phase current-limiting reactors;
- SF6 insulated 10 kV auxiliary switchgears;
- 10/0.4 kV reducing transformers with cast insulation;
- 0.4 kV auxiliary switchgears;
- 220 V control current system;
- Automatic control systems for gas turbine unit auxiliary systems (air-cooling system for oil, anti-ice systems, building life support systems);
- Sheds for electrical equipment;
- Lighting, heating, ventilation, and air-conditioning systems;
- Fire and security alarm systems;
- Compressor station shed;
- Compressed air production and conditioning system.

Shed for Electrical Equipment of the Gas Turbine Unit

The building represents a pre-engineered structure with a framework made of light metal structures and a sandwich panel enclosure. For electrical equipment there are three separate rooms within one building, a double floor, and a cable compartment.



Building Characteristics:

Dimensions: 12 x 7 x 9 m;

Number of floors: 2;

Earthquake resistance: complies with requirements for intensity of 9 as per the MSK-64 scale;

Fire resistance rating;

The building is equipped with automatic fire detection and alarm system, as well as automatic firefighting system.

Core Functions:

Arrangement of equipment to provide the following:

- power supply to electric installations of SGT-800 Gas Turbine Unit;
- short circuit current value reduction;
- monitoring and protection of 10/110 kV packaged electrical equipment;
- overload and short-circuit protection of electric installations of SGT-800 Gas Turbine Unit;
- manual and automated control of in-plant electric installations;
- monitoring of modes of operation of electric installations of SGT-800 Gas Turbine Unit;
- monitoring and maintenance of the temperature in the rooms of the building, incoming air, and the air at the exhaust of the conditioning system internal units.

Compressed Instrument Air Station

The Compressor Station includes:

- modular package type shed consisting of four modular packages;
- uninterrupted power supply and equipment control (low-voltage package);
- process system to produce compressed instrument air. Each modular package contains a complete process line;
- process control system and engineering system control system of the station (automated process control system);
- automatic firefighting and fire alarm system (integrated with automated process control system);
- external equipment of the Station, transportation and reduction system;

Building Characteristics:

Dimensions: 10.5 x 6 x 3 m;

Earthquake resistance: complies with requirements for intensity of 9 as per the MSK-64 scale;

Fire resistance rating: II

Compressed Air Production and Conditioning System

The system is intended for conditioning of the air as per the preset parameters and for automatic maintenance of the parameters irrespective of the number and modes of operation of electric installations.

The system is implemented as per 4 x 50% scheme, when two compressors completely provide rated flow demand for instrument air to 6 gas turbine units, and the third and the fourth compressors are standing ready for use.

Power Supply System (low-voltage package)

Core Functions:

- input and distribution of three-phase, 380/220 V, 50 Hz alternating current from two independent supplies;
- implementation of the Automatic Transfer Switch implying disabling of automatic switch-off of one of the inputs due to voltage reduction, in case of asymmetric voltage, voltage loss in one, two, or three phases and enabling of automatic switch-off of the second input;
- output of information on the input voltage parameters to automated control system;
- manual or automatic control (switch-on/ switch-off) of power consuming units;
- overload and short-circuit protection of power consuming units;
- receipt of control signals to and delivery of information signals from automated control system.

Compressor Station Automated Process Control System

Core Functions:

- monitoring of the process parameters: parameter measuring, monitoring of exceeding the warning and emergency limits;
- automatic control: regulation of process-dependent parameters assuring steady process;
- provision of information on the state of the process to the local control console of the operator and transmission of the information to operating and maintenance personnel via Industrial Ethernet channel.



Telemechanics system (APCS) of Oil and gas production workshop-6 of LUKOIL-Ukhtaneftgaz Territorial and Production Enterprise, LUKOIL-Komi LLCy

Designed, manufactured, and implemented by: Sputnik-Integratsia, Ltd

Facility to be automated

In the framework of the project, Intwels R-3 telecontrol system was implemented (Certificate No. 0719278, the system complies with requirements of the following regulatory documents: GOST R 52319-2005, GOST R MEK 870-4-93) based on SCADAPack hardware and Wonderware software; the system was developed by Sputnik Group specialists and is recommended for use at LUKOIL-Komi, LLC's facilities.

The system is designed for data transfer from measuring equipment of well clusters to local control rooms at the following three fields: Yuzhnyi Terekhevey, Yuzhnaya Lyzha, and Severnaya Kozhva.

The scope of automation embraces the following process facilities: oil wells, measuring group units, water supply wells, injection wells, chemical injection units, and cluster pumping station.

System Specification

The system represents a standard distributed three-level system:

Lower level:

- Primary instruments (JUMO sensors, probes, converters) at controlled facilities (single wells, well clusters, facilities maintaining reservoir pressure).

Middle level:

- Local monitoring and control systems based on SCADAPack330 ControlMicrosystems PLC.



Top level:

- Kepware IO SCADAPack I/O server based on HP Proliant ML350 (4 pcs.);
- application server with the following software: Wonderware IAS 3.1 , Microsoft SQL Server 2008, Reporting Services;
- history server with Historian Server software;
- computer workstations (9 pcs.) based on In-Touch 10.0 software for System Platform, Historian Client;
- remote computer workstation implemented based on ACER Iconia Tab w500.

Data are transmitted by means of Motorola Canopy broadband access radio equipment.

System Features

- Arrangement of remote access to telecontrol system, connection via any data-communication networks: Wi-Fi, 3G, GPRS. A remote access workstation is arranged based on ACER Iconia Tab w500;
- Flexible system of reporting and analysis of the production facility operation;
- Possibility of remote work using slow communication channels;
- The system is easy to use, administrate, and reconfigure (adding of new facilities: clusters, measuring group units, and wells can be done without the need to reprogram controllers or server).



Automated Process Control Systems of the Central Production Facility at Yuzhnoe Khylochuyu Oil Field

Customer: Naryanmarneftegaz, LLC

Designed and implemented by: Sputnik-Integratsia, Ltd

Manufactured by: Sputnik-Komplektatsia, Ltd

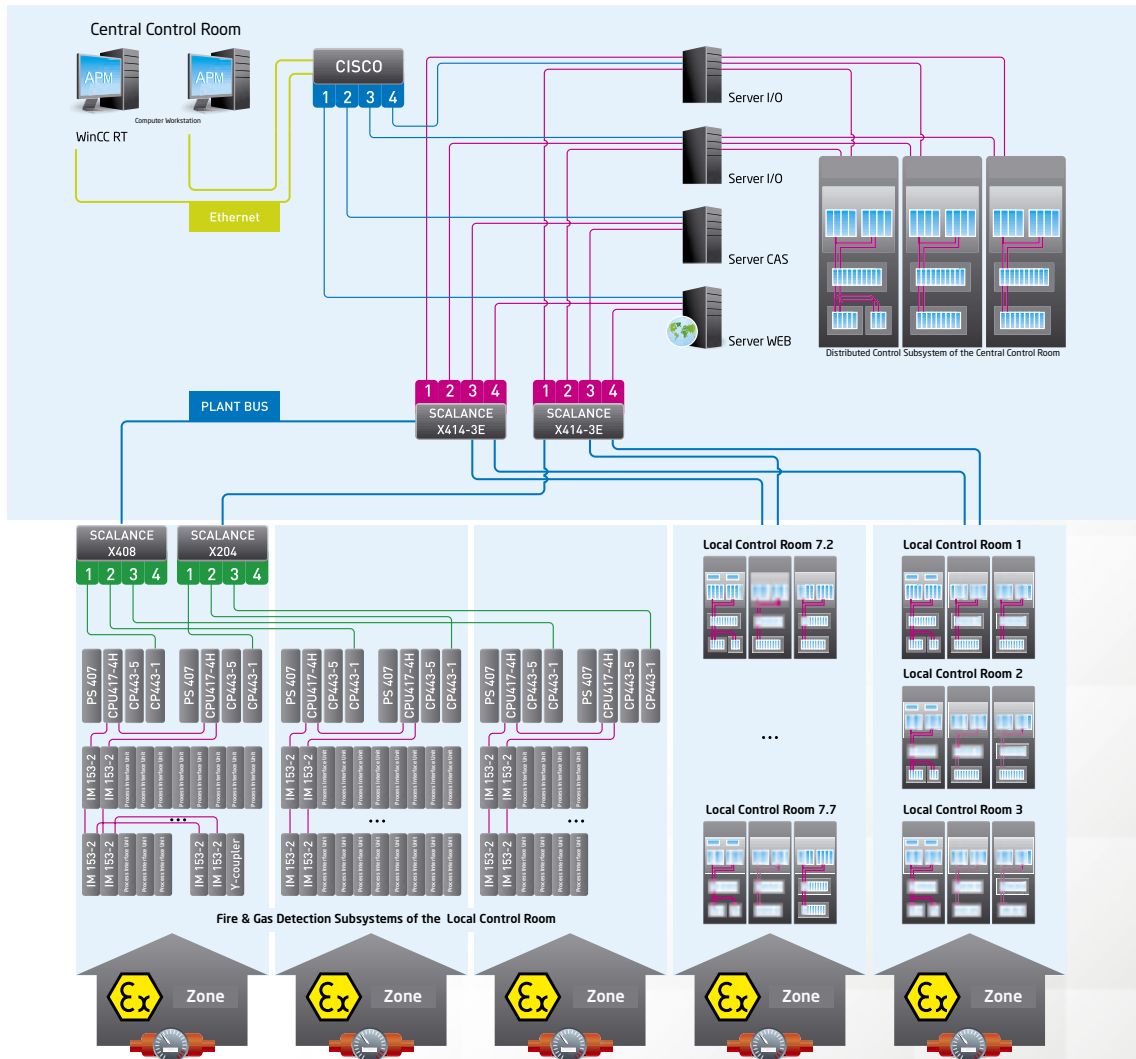
Years: 2008-2011

Solution and Specifications of the Automation System

Automated process control system of the Central Production Facility consists of four independent subsystems:

- Distributed Control Subsystem: it is designed for automated monitoring and control of the process;
- Emergency Protection Subsystem: it is designed for forecasting and preventing of possible emergencies and for emergency detection and mitigation of damage after emergency;
- Fire & Gas Detection Subsystem: it is designed for detection and elimination of fire and gas hazard at process facilities;
- AMS Subsystem: it is designed for configuring and control of documents, for diagnostics and forecasting of the need for maintenance of field control instrumentation.

System Structure



Completed Projects

Hardware and Software

- PLC: 26 assemblies of S7-417-4H redundant controllers (S7-414-4H for emergency protection system);
- HMI: each Local Control Room is equipped with Simatic touch panel with a preset program of object display and the Local Control Room parameters;
- Network: data communication to the central control room is provided by Scalance X-408 and Scalance X-204 communication modules for backup;
- Software: SCADA SIMATIC WIN CC.

Core Functions:

- monitoring and control of the processes;
- monitoring of the system and process equipment condition;
- assurance of emergency, fire, and gas protection of the process facility and the personnel;
- provision of convenient system interface to the process personnel to assure supervisory control of the processes;

- immediate warning of the process personnel of the events happening in the system and requiring human response;
- keeping of the process history and providing of historical data to the process personnel;
- issue of report documents on the processes, system operation, and actions of the process personnel;
- integration with other information systems of Naryanmarneftegaz, OOO.

Implementation of the Automated Process Control Systems Assured the Following:

- efficient operation of controlled facilities;
- improvement of the safety level and failure-free operation of processes;
- required accuracy, reliability, and timeliness of the provided operational data;
- improvement of culture of the operating and maintenance personnel;
- prevention from erroneous actions of the personnel by means of timely alarm and blocking.



Automation and Power Supply (Automated Process Control Systems and Low-Voltage Packages) for Controlled Vacuum Crystallization, Water Extraction, and Concentration of A-linein KhOF Main Building at BKPRU-4, Uralkali, JSC

Designed, supplied, and implemented by: Sputnik-Komplektatsia, Ltd

Years: 2009-2010

Facility to be Automated and Provided with Power

The automation and power supply systems under development included the following equipment:

- equipment of the redesigned concentration department;
- equipment of the redesigned controlled vacuum crystallization department;
- equipment of the redesigned water extraction department.

Automation System:

- distributed automated process control system based on SIMATIC S7-417 controller.

Power Supply System

- two 0.4 kV low-voltage packages, 2500 A collecting bus current;
- one 0.4 kV low-voltage package, 1000 A collecting bus current;

Structure of the Automated Process Control System

The automated process control system represents a decentralized system built based on SIMATIC PCS7. The basic solution is the S7-417-4 controller and process interface unit remote modules based on ET-200M. The system exercises control by means of Profibus DP of low-voltage package No. 1, low-voltage package No. 2, and low-voltage package No. 3 of the controlled vacuum crystallization and water extraction depart-

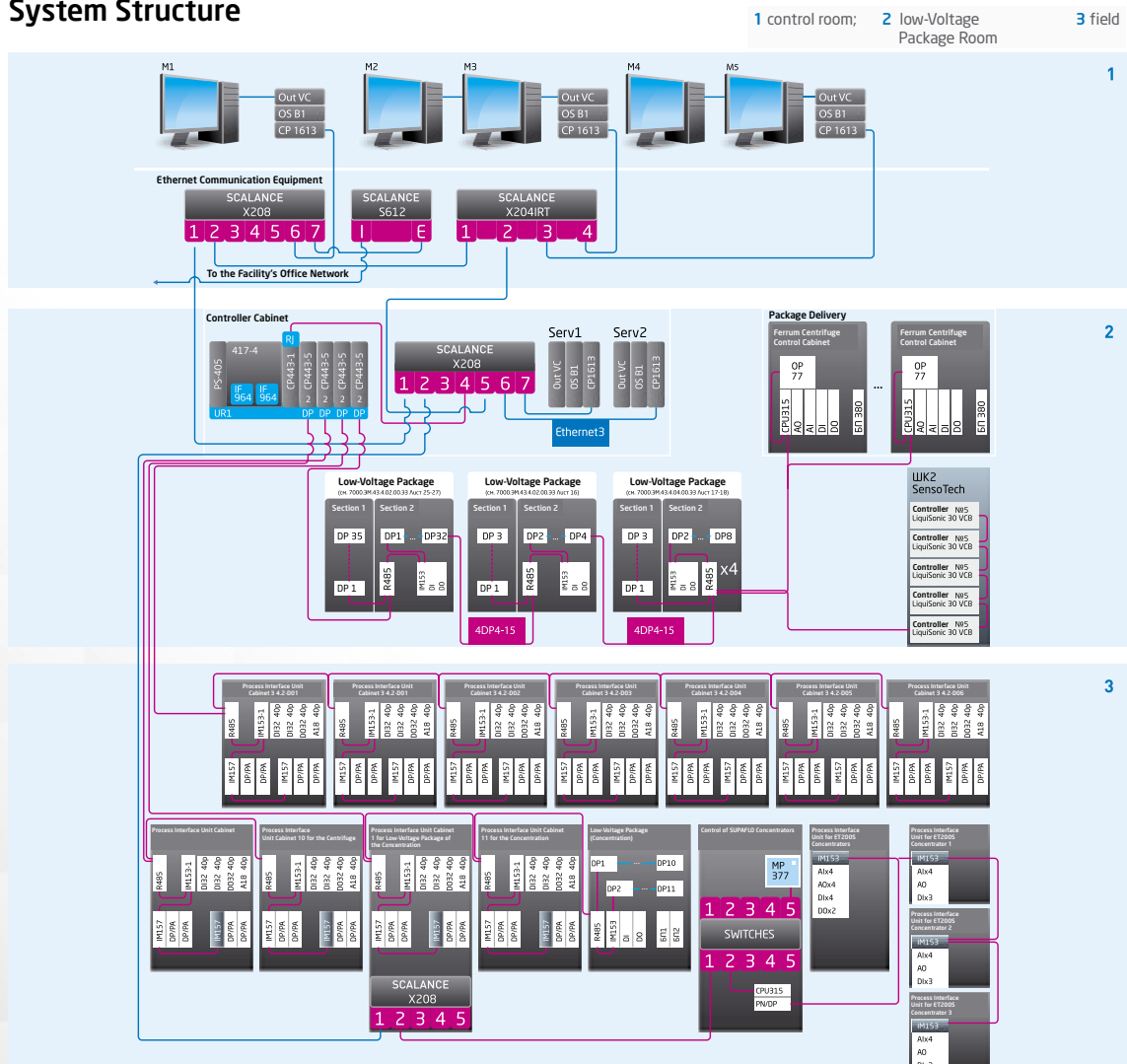
ments, as well as low-voltage package of the concentration department. The low-voltage packages are provided with SIMOCODEPRO motor protection devices, Siemens soft starters, and frequency converters.

For remote control of centrifuges of the water extraction department, the centrifuge automatic control systems (developed by Ferrum), based on Simatic S7-315-2DP controllers, were integrated in the automated process control system.

To collect information on the state of Supaflo concentrators, data exchange was arranged via the Industrial Ethernet between the automated process control system and the automatic control system of the concentrators (developed by Outotech)

Completed Projects

System Structure



Control Instrumentation Level

The following equipment was included: pressure and level sensors (Vega), temperature sensors (Siemens), flow transmitter (ABB, Siemens), physico-chemical analysis devices (Berthold, RJI, Senso Tech, Siemens), valve endpoint sensor, flow and level limit value sensors. Control valves were equipped with Siptart PSII (Siemens) positioners.

Lower Level

The cabinets of the distributed process interface unit contain ET200M stations of distributed input and output with input and output modules and equipment for arrangement of Profibus PA ring topology.

Middle level

Controller Cabinet based on Siemens SIMATIC S7-417-4 PLC.

Top level

Stand by I/O server, operator's computer workstations, engineering station based on SCADA SIMATIC WIN CC software.



Core Functions:

- collection and processing of data on the process and condition of equipment;
- displaying the process information on the operators' workstations;
- warning indication and emergency alarm;
- emergency protection and blocking of equipment;
- remote control of stop and control valves;
- remote control of pumps and mixers;
- determining the root causes of equipment shutdown;
- recording and archiving information;
- diagnostics of the software and hardware package in run-time mode.

Power Supply System Structure (low-voltage packages)

- 0.4 kV low-voltage package No. 1 for controlled vacuum crystallization and water extraction departments. Collecting bus current is 2500 A. Rated voltage is 400 V, frequency is 50 Hz. Lateral length of the low-voltage package is 19.1 m (25 cabinets excluding filtering and compensating device).
- 0.4 kV low-voltage package No. 2 for controlled vacuum crystallization and water extraction departments. Collecting bus current is 2500 A. Rated voltage is 400 V, frequency is 50 Hz. Lateral length of the low-voltage package is 9.7 m (13 cabinets excluding filtering and compensating device).
- 0.69 kV low-voltage package No. 3 for controlled vacuum crystallization and water extraction departments. Collecting bus current is 2500 A. Rated voltage is 690 V, frequency is 50 Hz. Lateral length of the low-voltage package is 9.7 m (15 cabinets excluding filtering and compensating device and frequency converters of cabinet-type design).
- 0.4 kV low-voltage package for concentration department. Collecting bus current is 1000 A. Rated voltage is 400 V, frequency is 50 Hz. Lateral length of the low-voltage package is 6.6 + 6.0 m (19 cabinets excluding filtering and compensating device).



Automated Process Control System for Yuzhnoe Khylichuyu Power Park

Customer: Siemens, Ltd

for Naryanmarneftegaz, LLC

Designed, supplied, and implemented by: Sputnik-Komplektatsia, LLC

Years: 2005-2009

The facility to be automated was the Power Park at Yuzhnoe Khylichuyu oil and gas field; the Park was located at the southern end of the Central Production and Treatment Facility in the permafrost zone. The main specifications to the power source were based on its independence, severe climatic conditions of the location area and requirements of the reservoir engineering. On the basis of the requirements specified, availability of the power supply was a key issue, which conditioned requirements to high equipment reliability and the

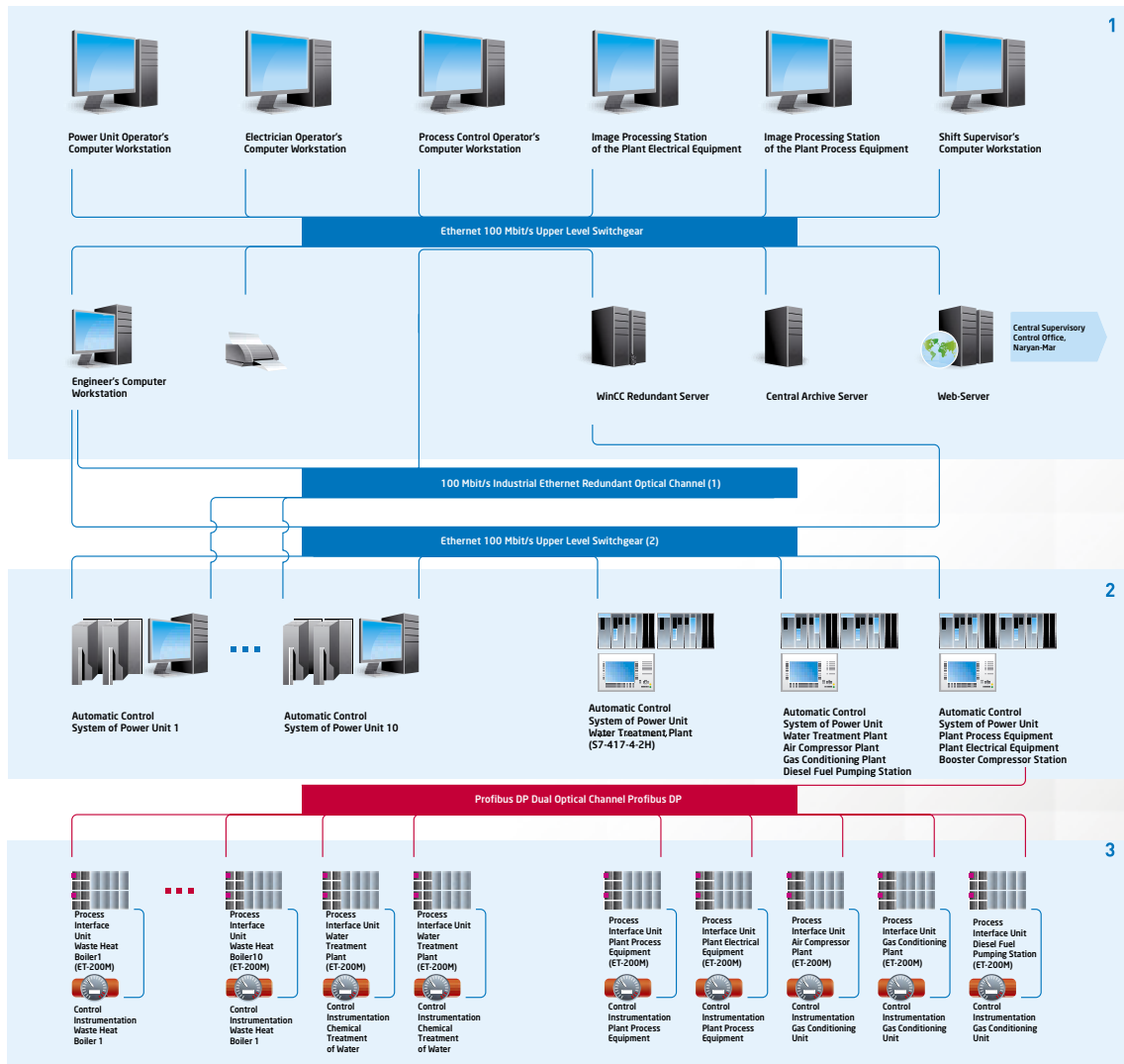
need to have redundant equipment.

Gas turbine technology implying combined generation of electric and thermal power in a single cycle corresponded to those requirements, provided that gas turbine equipment was reliable. After the Power Park reaches the designed capacity, the electric power generated will exceed 250 MW and thermal power generated will be about 150 MW. One of the features of the Power Park is operation of the main equipment, including gas turbine power units, on

three types of fuel (associated gas, natural gas, and arctic-grade diesel fuel).

Completed Projects

System Structure



Completed Projects

Purpose of the Development of the Automated Process Control System

The automated process control system of the Power Park was developed with a view to integrate different subsystems and automated facilities.

- Siemens's SGT-600 type gas turbine power units (10 pcs., 25 MW each, stages 1 and 2).
- Heat recovery hot water boilers (6 pcs.).
- Diesel generators (4 pcs.).
- Peak hot water boilers (2 pcs.).
- Water treatment plant.
- Natural gas conditioning plant.
- Booster compressor station.
- Common process equipment.
- Common electrical equipment.

Automated control system of the Power Park was implemented as a system distributed by process facilities in order to arrange local decentralized structures. Such distribution assured independent operation of groups of the process equipment. If communication with the upper level is lost, a control device continues operation on its own based on the settings available as of the moment of communication loss.

The structure of the automated control system was implemented based on the principles of multi-level hierarchical information management system and is divided into three levels:

- 1 – Top: operator's level;
- 2 – Middle: process facility level;
- 3 – Lower: field equipment level.

Solution and Specifications of the Automation System

In order to assure the required level of reliability and safety of the facility operation, Siemens hardware components were chosen due to their faultless performance.

The following solutions, allowing us to fully meet the Customer's requirements as to emergency protection, were applied:

- Use of certified explosion-protected equipment;
- Electric power supply to automatic control systems and automated process control systems was provided from two independent 220 V alternate current sources (inputs) with the use of redundant secondary power sources. For critical components additional sources with accumulator batteries were provided;
- Constant monitoring of gas content in the air under the noise-and-heat insulating case of the power unit and in the core process equipment areas;
- Monitoring of hardware of the automated process control system (including performance of the controllers); a separate controller was installed in the automatic control system of the power unit acting as a system protection (emergency shutdown);
- Ring-type structure of the local network was applied with the use of optic fiber assuring the required interference immunity of the data communication channel and high reliability of the channel. The local network integrated all automatic control systems of the power units and automated process control systems; triple backup of the automation equipment at the control level and double backup at the recording level of the incoming data flow were provided. Backup algorithms were integrated in the system software of WinCC system.



Power Unit Performance Features

Master controller implemented in the automated control system of the Power Plant, unattended, assesses modes of operation of the Gas Turbine Power Plant and the adjacent network to assure even load distribution between the generators with regard to limits imposed by the task to the master controller, network parameters, and operating limits of the gas turbine power units.

When the Power Plant is operated in parallel with external network, from the operator's computer workstation two main modes of operation can be set in group control:

- With automatic limitation of power delivery to the external network (active, as well as reactive);
- Without limitation of power delivery to the external network.

A possibility to select a synchronization mode depends on the condition of the master clock and is displayed on the operator's computer workstation. The synchronization system assures full interface with synchronization devices, as well as multi-level protection, provided by software and hardware, against non-synchronous switch-on.

The synchronization is performed with the use of automatic synchronizing tools and by means of manual precision synchronizing when the operator selects switch-on from the panel.

The Power Park is the main power source at Yuzhnoe Khylichuyu oil and gas field, including oil field production and treatment facilities, oil pipeline transportation to Varandey sea terminal, and oil pumping-over to the sea transport carriers.



Completed Projects

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