


ШКАФ ЛИНЕЙНЫЙ №2

 **SILUMIN-VOSTOK**
engineering company

SILUMIN-VOSTOK ISA LEADING
KAZAKHSTAN MANUFACTURER



RG GOLD, a gold mining company, has implemented an ambitious project in Kazakhstan having applied the complex solutions of engineering company, Silumin-Vostok, in power supply and process automation of the plants.

KAZAKHSTAN. RAYGORODOK DEPOSIT

The history of the deposit dates back to 1996, when the first geological exploration work was carried out at the Novodneprovskoye contract area consisting of the two open pits – Northern and Southern Raygorodok. However, the gold reserves were confirmed only 10 years later. At that time, the potential of Raygorodok was not completely studied.

The Raygorodok deposit is located in Burabay district of Kazakhstan's Akmola region and is considered one of the biggest deposits in the republic. The gold resources were assessed according to the international JORK classification, as 100 tonnes which makes it one of the largest gold mono-deposits in the country, and third largest gold deposit in Kazakhstan. The confirmed resources extended the term of the deposit mining from five to 20 years.

In 2014, the Verny Capital group of companies received the right to develop the contract area, and the company RG Gold was founded.

In March 2021, construction of a large mining and metallurgical complex for primary gold ore processing commenced. In a year and a half, the plant carried out smelting, and the first gold bar was produced. By the end of 2022, the full output capacity was reached which amounted to five million tonnes of ore per year.

The mining and metallurgical complex of RG Gold at the Raygorodok deposit was constructed in a record 18 months. For implementation, the RG Processing project team was created and succeeded in reaching incredible results in the short term.

It became a great challenge for RG Gold to find contractors in Kazakhstan capable of implementing such a large-scale project in reduced terms.

The design and construction firm, AAEngineering Group, undertook preparedness to fulfil all the tasks within the established deadline having become the general contractor.

Silumin-Vostok, who came forward as one of the main contractors, implemented its engineering solutions in turnkey electric power supply and

process automation of the plant using the equipment of its own production, assembled with the components of world leading manufacturers.

The advantage of Silumin-Vostok became its solid experience in mining projects for the large subsurface users on the territory of Kazakhstan and Central Asia. From 2010 to 2022, the company successfully delivered 14 projects in power supply and the automation of gold recovery plants under construction.

THE COMPLEX SOLUTION OF SILUMIN-VOSTOK

The initial stage of the project implementation was the design engineering, comprising development of the design documentation for the plant power supply and process automation. The design-engineers of the design and engineering department developed a customised solution according to the technical specification, selected the necessary equipment with consideration of the characteristics, loads, and operating conditions, and performed calculations and drawings.

The next stage consisted of the production and supply of electro-technical equipment for the complete electric power supply of the plant. The following equipment was installed: transformer substations КТПБ – 2 pcs, and КТПН – 2 pcs, switchgears HKY-SV-MCC – 17 pcs, containing 640 draw-out modules, complete switchgear 10 kV of 14 cells, switching cabinets ЩРБ, power take-off cabinets, contactor cabinets, mills blocking cabinets, and push-button control stations.

For automated monitoring and control of the production cycles, Schneider Electric Modicon 580 redundant controllers and Schneider Electric



Modicon 340 local controllers were installed. Raygorodok is a digital mine where the control and analysis of the exploration and the further ore processing are highly automated. This reduces the risk of making a mistake and excludes the human factor. The equipment of Endress+Hauser, a constant partner of Silumin-Vostok, provided the basis for the field instruments. The following equipment was installed: 50 flowmetres, 41 level metres, 111 pressure measuring devices, and about 20 devices for density, pH, ORP metering, and gas analysers. Since it was a new-built plant, it was necessary to create a process automation system green-field, using up-to-date corporate practices and standards. New ore monitoring technologies have been introduced with the application of

leading developments in the field of software. During open-pit mining, a threefold control is performed by means of the automation systems. A special mention was made to the data collection from the electric power distribution systems. The total number of the process flow parameters and data from the switchgears was about 11,000! The availability of such an extensive data assets allows the process engineers to make reasoned decisions.

To ensure control, Danfoss MD-202 and MD-302 frequency converters in the amount of 106 pcs, and MCD-600 soft starters in the amount of 11 pcs, have been installed.

To increase the production capability in all process areas, the AVEVA System Platform 2020 R2 software

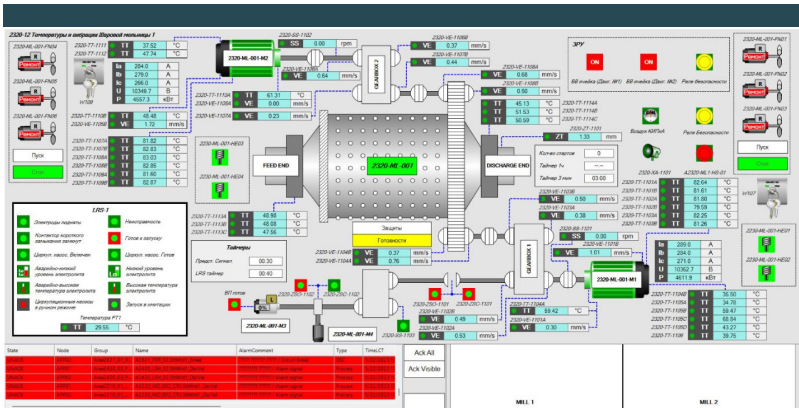
has been introduced. The software is a flexible scalable solution for dispatch control applications, which integrates the production and the plant management. It provides the basis for a multi-user operation based on standards, and integrates people, processes, and assets on all sites for continuous operation, improving and supporting decision making on a real-time basis.

Installation and commissioning work included setting up the electrical equipment, instruments, and all process machines with minimum overloads and the possibility of regulating the production capacity of the plant process equipment. For ease of operation, the process equipment was selected in such a way to ensure further fault-free operation of the plant, and resist intensive overloads and severe operating conditions.

RESULTS

The difficulty of the project itself was in the very limited delivery terms, and the restrictions imposed during the COVID-19 pandemic conditions made the work more complicated since they were affecting the material logistics and the work of the personnel.

Being a part of the RG GOLD project, the specialists of Silumin-Vostok successfully performed all the work on supply, installation, set-up, and programming, having proved their expertise once again. The project of the Raygorodok GRP became one of the key projects in the portfolio of Silumin-Vostok.



FACE PLATE of the milling area

Silumin-Vostok is more than 20 years in the project engineering market as a leading Kazakhstan manufacturer and supplier of the equipment for power, mining, metallurgical, and petrochemical industries. The developer of complex solutions that add value and marketability of the customers. Our target is to develop the best appropriate process design solution, select high-quality equipment, and deliver the project.

WE IMPLEMENT COMPLEX SOLUTIONS FROM INVESTIGATION TO TURNKEY DELIVERY:

COMPLEX ENGINEERING

- power supply and process automation

PRODUCTION OF EQUIPMENT

- electric power switchgears 0,4-220 kV
- valves (ball valves of carbon and stainless steel)
- pumps
- measuring instruments of SV Instruments trademark
- industrial cooling systems
- packaged modular buildings of various application

EQUIPMENT SELECTION AND SUPPLY

- drives (frequency converters, soft starters)
- electric motors, gear motors
- air compressors, blowers

CONSTRUCTION, INSTALLATION AND COMMISSIONING

AFTERSALES AND SERVICE MAINTENANCE

All works are carried out by qualified specialists using advanced equipment.

The company has the necessary local and international certificates and licenses for the produced products and the scope of services.

070010, Republic of Kazakhstan,
Ust-Kamenogorsk,
Kalikhan Yskak str., 10
E-mail: info@silumin.kz
For cooperation issues: +7 777 226 73 54
www.silumin.kz





Silumin-Vostok is a leading Kazakh industrial equipment manufacturer, complex engineering solutions developer, and software system integrator.



The company was founded in 1996 and is located in the city of Ust-Kamenogorsk in the east of Kazakhstan.

It is a leader in the market of the country in process automation and power supply, complex development of projects, and supply of high-quality equipment for various industries including mining, metallurgical, petrochemical, electric power engineering, construction, and heat power engineering.

The personnel of the company totals more than 400 specialists. There is a 12,000 square metre (sqm) production complex housing complete cycle production, and a 3,000 sqm warehouse.

The design and engineering department performs the development of customised engineering solutions for each specific project. The logistics department and the truck fleet, comprising about 40 vehicle units, deliver products to the customer's site.

Throughout its existence, Silumin-Vostok has proven itself as a reliable partner, responsible contractor, and qualitative producer.

Having extensive experience in implementing the projects of subsurface users, and participating in large construction projects of new ore processing plants and mining



complexes, Silumin-Vostok is able to offer solutions in the following areas:

COMPLEX DESIGN ENGINEERING

of the electrotechnical and automation parts of a project adapted for a specific customer:

- Low-voltage (0,4kV) and high-voltage (6-220kV) electrical switchgears, transformer substations
- Process automation systems
- Software development for automation and dispatch control systems

ELECTRIC POWER SUPPLY AND DISTRIBUTION

of low and medium voltage, which is customised and able to fully correspond to the design concept:

- Switchgear units of normal mining-type execution KPY-PH-SV (6 kV)
- Switchgear units with a middle draw-out circuit breaker KPY-V6a SV (6,10 kV)
- Substation relay protection cabinets
- Low-voltage switchgears HKY-Иртыш (0,4-0,69 kV)
- Operating current control cabinets ШУОТ-SV
- Complete transformer substations КТП-SV
- Substations in packaged modular buildings

INDUSTRIAL PROCESS AUTOMATION

in production process automation, direct digital control systems, data collection, control and monitoring:

- Process automation systems
- MES-system
- Software and hardware suites
- Automatic control systems
- Power distribution monitoring and control systems

ELECTRONIC AND MECHANICAL SYSTEMS OF DRIVE EQUIPMENT

according to the customer requirements, technical specifications, and operating conditions:

- Variable frequency drives and soft starters of low (0,4-0,69kVB) and medium voltage (6-10kV)

- Asynchronous and synchronous electric motors
- High-voltage power factor compensation systems and harmonic filtering systems
- Control cabinets for process installations with frequency converters or soft starters
- Liquid resistance starters up to 3000A
- Uninterruptible power supply systems of frequency converters

INDUSTRIAL COOLING SYSTEMS

for the industrial cooling of production facilities in order to ensure the necessary indoor temperature conditions:

- Industrial chillers (64 kW - 860 kW)

PUMP EQUIPMENT

for pump stations in packaged modular buildings

- Borehole pump units
- Horizontal centrifugal pumps
- Double-ended suction pumps
- Vertical multistage pumps
- Slurry pump units for abrasive media
- Sewage and drainage pumps
- Container-type complex pump stations

VALVES

ball valves of stainless steel with diameter range up to 1,000mm

COMPRESSOR EQUIPMENT AND AIR SUPPLY SYSTEMS

for providing compressed air of any grade of treatment and of any capacity:

CONSTRUCTION, INSTALLATION, START-UP AND COMMISSIONING SERVICE MAINTENANCE

+7 777 226 73 54

info@silumin.kz

www.silumin.kz

 **SILUMIN-VOSTOK**
engineering company

MADE IN KAZAKHSTAN

СИЛУМИН-ВОСТОК

СИЛУМИН-ВОСТОК

SILUMIN-VOSTOK

Tel: +7 701 874 19 80

info@silumin.kz

www.silumin.kz



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