Greetings!

We like to introduce a booklet, which will acquaint you with EKRA Research and Production Enterprise Ltd main activities and products.

EKRA Research and Production Enterprise Ltd specializes on intelligent microprocessor based relay protection an automation cubicles and cabinets production. All relay protection and automation cubicles are adapted for application in automatic process control systems. Our production line also includes: nonstandard low voltage complete devices, highvoltage engine softstart and speed control systems, highfrequency communication cabinets and equipment for automatic process control systems.

EKRA Research and Production Enterprise Ltd offer full line of 6-750kV equipment relay protection and automation cubicles performs full range of services: from design works, production and procurement to product adjustment works and guarantee/after guarantees maintenance. There is also a possibility of customer personnel training in our licensed train center.

Main goal of our company is to provide the best and efficient solution with satisfaction of customer requirements. For this goal achievement EKRA Research and Production Enterprise Ltd invest in modern technologies development and manufacture and equipment modernization. We grant our customer reliable and safe production, highquality level of service support. Hope to establish effective cooperation in near future!

WORKING ON THE ELECTRO TECHNICAL PRODUCTS MARKET SINCE 1991

FULL CYCLE COMPANY

• research and advanced development works;
• production (including metal working facility);
• factory tests;
• adjustment supervision at site;
• training;
• warranty maintenance and service maintenance;
• design works.

OUR CUSTOMERS
Electrical stations and substations, industrial enterprises (oil, gas, metallurgy, metal working, paper industry etc.) of Russian Federation, near and far foreign countries.

EKRA PRODUCTION IS IMPLEMENTED TO:
• 2020 35-110-220 kV substations
• 200 substations 330-750 kV
• 350 power plants, including 10 nuclear power plants, 64 regional hydro-electric power plants, 75 hydro-electric power station

RELAY PROTECTION PERSONNEL TRAINING
• training courses can be performed on the base of EKRA training center;
• training courses at the customer object, with departure of EKRA specialists.
MODERN TECHNOLOGIES
Specialized series cubicles, with IEC61850 support, was produced for digital substation projects.

EQUIPMENT
Modern domestic and foreign equipment:
- metal working equipment;
- automatic circuit board component mounting equipment.
All rooms are equipped with ventilation and condition devices.
All circuit boards sectors meet CECC requirement of static electricity protection.

PRODUCT QUALITY CONTROL
Control:
- primary control of electric components;
- continuous control at all production stages.

Testing:
- automated control test of cubicles, cabinets and blocks;
- temperature testing and electrical testing.

EKRA PERSONNEL
- 23 candidates of Science;
- 4 doctors of engineering;
- 14 PhD students;
- 67% with high education;
- 34% in age from 18 to 30.
Company leading specialists have 30-40 years relay protection devices research experience.

PRODUCTION SPACES
Over last 5 years our production spaces were increased more than 4 times. The first stage of a new multipurpose industrial complex of EKRA was put in operation in 2014. Input of second and third stages is planned for 2016 and 2017, respectively. The total area of the multipurpose industrial complex will be 30 000 sq. m.
POWER STATION EQUIPMENT

Type ShE111x microprocessor-based relay protection and automation (RP) cubicles are designed for use as a comprehensive system of protection of plant equipment: hydraulic power plants (HPP, PSP), thermal power plants (CHP, gas turbines, CCGT, GRES, NPP), generating plants in metallurgical, oil and gas industries and for implementing control and automation devices. ShE111x series are designed for: generator, generator excitation systems, transformers, autotransformers, generator-transformer units, auxiliary transformer, standby house transformer and generator control systems relay protection.

330-750 kV SUBSTATION EQUIPMENT

Traditionally highvoltage network relay protection and automation in Russia is performed in the form of individual versions regarding voltage classes 110-220 kV and 330-750 kV. 330-750 kV power system primary equipment is intended for power transmission, transformation and distribution over long distances: power lines, transformers, autotransformers. Primary equipment protection and automation configuration for this voltage class is characterized by the use of main and backup protection of lines, transformers and autotransformers, the variety of circuits (double breaker scheme; double and transfer busbars; different modifications bridge circuit, etc.).

110-220 kV SUBSTATION EQUIPMENT

110-220 kV power system primary equipment is intended for power transmission, transformation and distribution over long distances: power lines, transformers, autotransformers. Primary equipment protection and automation configuration for this voltage class is characterized by the use of main and backup protection of lines, transformers and autotransformers, the variety of circuits (double breaker scheme; double and transfer busbars; different modifications bridge circuit, etc.).

6-35 kV SUBSTATION EQUIPMENT

Relay protection and automation for 6-35 kV nominal voltage distribution equipment networks is implemented on the basis of a series EKRA 21X terminal.

Products

330-750 kV SUBSTATION EQUIPMENT

Typically highvoltage network relay protection and automation in Russia is performed in the form of individual versions regarding voltage classes 110-220 kV and 330-750 kV. 330-750 kV power system primary equipment is intended for power transmission and transformation over very long distances (>200km): - power lines, - transformers, - autotransformers.

Products

6-35 kV SUBSTATION EQUIPMENT

Relay protection and automation for 6-35 kV nominal voltage distribution equipment networks is implemented on the basis of a series EKRA 21X terminal.

Company leading specialists have 30-40 years relay protection devices research experience.
NEW GENERATION OF TERMINALS BE2704

In order to unify the devices of various functional purposes, all the additional and specific interfaces for functions of Differential Line Protection and Phase Differential Protection are located in a separate block. Among them low-voltage logical inputs and outputs for interfacing with the high-frequency transceiver, additional sensors for analog registration of signals of the high-frequency transceiver, optical interfaces for connection of communication channels of Differential Line Protection or for transmission of signal of remote control on other terminal. This allows to unify the terminals and to adapt one and the same device for different functions by changing the software.

EMERGENCY CONTROL AUTOMATION,
FAULT AND EMERGENCY RECORDERS, CONNECTION CONTROL

Type ShEE 22x emergency control automation cubicles are designed for use as a local and substation emergency control automation of thermal power plants (TPP), atomic power plants and hydroelectric power plants (HPP) as well as for implementation of devices designed to control emergency operating conditions of load centers. Type ShEE 23x fault and emergency recorders are designed for measurements and technological parameters registration, emergency events registration in the switching and protection system. Type ShEE 24x connection controllers are designed for collection of data and organization of switching equipment control of electric substations with the support of the requirements IEC 61850.

PROCESS CONTROL SYSTEM FOR SUBSTATION AUTOMATION

EVICON is a hardware and program set that let creation a process control system for substation and electrical part of power plant.

TIME SYNCHRONIZATION SYSTEM

Substation automation demands precise time synchronization for a variety of devices. EKRA offer a wide range of equipment to achieve the required accuracy. Different solutions are possible and can be realized using GPS/GLONASS time servers and various converters.
LOW-VOLTAGE COMPLETE DEVICES

Low-voltage complete devices realizes standard and nonstandard schemes of low-voltage equipment of stations and substations. Cabinets are made according to the specifications and schemes of the Customer or jointly developed schemes. The main technical characteristics are determined by the customer. EKRA produces a wide range of solutions for 0.4kV load distribution and control systems for power facility auxiliaries. Cabinets are made in the same form factor and design with relay protection cabinets of 110-750 kV station and substation equipment.

ELECTRIC MOTOR SOFTSTART AND SPEED CONTROL SYSTEMS

Softstart systems are designed for smooth starting and speed control of induction and synchronous motors up to 17 MW, as well as for soft switching on of power transformers up to 100 MVA, with winding voltages up to 15 kV.

"EKRA-AUTOTEST" SOFTWARE

Since 2009, EKRA ltd. is official representative of OMICRON in Russia. Based on OMICRON CMC 356 equipment, EKRA had developed a library of programs for automated own relay protection cubicles testing. The software is designed to perform automated test of relay cabinet’s series ShE2607, ShE2710 and terminals BE2502 series.

EKRA PROJECT CENTER

In November 2012 an independent structure EKRA Project Center (PC EKRA) was created. PC EKRA is engaged in the development of project documentation, not only for the projects with EKRA ltd. involvement, but also for thirdparty customers who need highquality services during the design work.
Traditional Substation

- Control Cables
- Outdoor cubicle with SAMU and RTU

- Traditional RPA devices of 110-750 kV
- Optical cables
- Outdoor cubicle with RTU

Digital control substation

- Devices of RPA with support IEC 61850-8-1 and IEC 61850-9-2 LE

- Outdoor cubicle with RTU
- SCADA
- Single time GPS/Glonass

- RPA Terminals with support IEC 61850-8-1
- Process bus IEC 61850-9-2 LE

- Optical cables
- Digital control substation process bus IEC 61850-8-1
OUR CUSTOMERS

FGC UES OJSC
Central part main power networks
Volga main power networks
North-western main power networks
West Siberian main power networks
Siberian main power networks
Ural main power networks
Southern main power networks
Eastern main power networks
Subsidiary and associated companies
Tomsk Bulk Grids OJSC
Severovostokenergo OJSC
Energoenergoeksploitat CJSC
Nurenerg OJSC
Kuban Backbone Grids OJSC

Russian Grids OJSC
Central part IDGC OJSC
Belgorodenergo
Bryanskenergo
Voronezenergo
Kostromenergo
Kurskenergo
Lipetskenergo
Kostromskenergo
Voronezhenergo
Bryanskenergo
Belgorodenergo
Central part IDGC OJSC
Kuban Backbone Grids OJSC

North-western main power networks
Subsidiary and associated companies
Sakhalinenergo OJSC
Magadanenergo OJSC
Bashkiria Grid Company Ltd
Tomsk Distribution Company OJSC
Yantarenergo OJSC
MOESK OJSC
Lenenergo OJSC
Kalmenergo
Volgogradenergo
Astrakhanenergo
Novosibirskenergo
Tyumenenergo
Yerevanenergo

Southern part and associated companies
South-Ural Mining and Processing Company OJSC
Cherepovets OJSC
Ashinskiy Metallurgical Industrial Enterprises
Magnitogorsk Metallurgical Plant OJSC
Kovdorskii mining and processing works OJSC
Uralkali OJSC
Severstal OJSC
Rosenergoatom corporation
Maynsk
Cheboksarskaya HPP
Kubanskaya HPP cascade
Gorylokshaya HPP
Mayskinskaya HPP

Nuclear power plants
Rosenergoatom corporation
Balakovsky HPP
Beloyarskaya HPP
Kalininskiy HPP
Kostroma HPP
Nizhnovorerzhitskaya HPP
Rostovskaya HPP
Smolenskaya HPP

Oil and gas industry
Lukoil OJSC
Rosneft Oil Company OJSC
Surgutneftegas OJSC
Tatneft OJSC

Tatnabstroy OJSC
SIBUR Holding OJSC

Industrial Enterprises

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OUR CUSTOMERS

Foreign utilities

Kazakhstan
Almatinskaya CHP-1
Aktinskaya CHP
Akkuskaya TPP
Astana CHP-1, CHP 2
Bakhmutskaya CHP
Zhezkazganskaya CHP
KOGCHP (Kyzylorda)
Leninogorskaya CHP
Pavlodarskaya CHP-3
Riderskaya CHP
Uralskaya CHP
Ferrocrome CHP (Aktobe)
Shaltinskaya CHP
Akkuskaya SDPP
Zhanazholskaya GTPP
Karaganda SDPP
Ust-Kamenogorskaya HPP
Ekibastuzskaya HPP
Aurora 550 kV
Aktubinskaya Substation
Alibekmola Substation 110 kV
Babaevo Substation
Barsangir Substation
Bokatara Substation
Vostochnaya Substation
Zhitiraka Substation 500 kV
Zhosaly Substation
Karbashevskaya Substation
Krasny Oktjabr Substation
Kempirsayskaya Substation
Kenkiyak Substation
Kostanay Substation 1150 kV
Kostenko Substation
Komat Substation
Novaya Dubovka Substation
Novyi Gorod Substation
Ozemnaya Substation
Pushkino Substation
Samal Substation 110/10 kV
Sokol Substation 500 kV
Stepnaya Substation
Ulyanovka - 1 Substation
Ulyanovka - 2 Substation
Uralskaya Substation 110 kV
Uralskaya Substation 220 kV
Uzlovaya Substation
Khoroshevskaya Substation
Center Substation
Chilisay Substation 220 kV
Emba Substation 110 kV
Ekibastuzskaya Substation 1150 kV
Aktas Main Step Down Substation
EKK of Zhanakorgan city
Pump station (Aktobe)
Vodokanal Karaganda JSC
Zhilnoy Munaygaz Oil/Gas Production Division
Emba Munaygaz Production Branch

Uzbekistan
Syrdaryinskaya TPP
Novo-Angrenskaya TPP
Navoiiskaya TPP
Tashkentskaya TPP (Keles Substation)
Sogdiana Substation
Uzbekistanskaya Substation 500/220/10 kV
Lochin Substation
Oji Khart Substation
Pavlugan Substation
Uparish Substation
Guzar Substation
Karakul Substation
Khandiza Substation

Tajikistan
Sangtudinskaya HPP-1
HPP-5 Barki Tochik OAHK

Kyrgyzstan
Kambartinskaya HPP-2
Samal Substation
Ayk Bakay Gold-Processing Plant

Ukraine
Dneprovsk Substation 750 kV
STIROL Concern
Boiler Unit
Makeevkoks CJSC

Georgia
Avshniani Substation
Navluchi -2 Substation

Afghanistan
Naglu HPP

Bangladesh
Siddorganchi TPP

Vietnam
SE SAN-3 HPP

Young Bi TPP

Iraq

Ushlia TPP