





SIBTECHENERGO

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On the right track


Over 60 years of experience in the energy sector of  Sibtechenergo  has gained huge experience in engineering works carried out as in the modernization of the equipment of power plants and substations , and when entering new modern units . The company s specialists have thorough knowledge of modern technologies used in the energy , commitment and responsibility for their work , are able to solve complex technical problems .




Dear friends and colleagues! .




SALIKH AGLIULIN
General Director
of the SIBTECHENERGO Joint Stock Company.
Honorary Power Engineer of Russia

JSC  Sibtechenergo celebrates the landmark date – the 60th anniversary from the Foundation day.

Our enterprise, during its long history has gained great traditions, which are carefully stored in our team. And the plans that build the Government of the Russian Federation for the near future in the field of energy development, gives us hope for future development and unlimited growth of our production. All these years we tried to work with highly qualified, led large-scale training of staff. Our company always was on the border of industry and science, and today we strive not only to meet prospective volumes of work but also to develop new directions of our activity, and if to speak more precisely – to master those skills that were characteristic of the  Sibtechenergo for many years. We actively introduce new projects and developments, and I think that in this system the area is quite well advanced. But, of course, such success would not have been possible without our people, without our friendly team of like-minded people.

The peculiarity of our team is combination of experience of veterans and the energy of youth. We have Golden veterans, a real  Golden Fund  This is thanks to their knowledge and skills, the enterprise had matured and achieved great success, they raised our today  youth, could be proud of. I wish our veterans health and well-being! Can guarantee that they will not rest, we will work together for many, many years.

In  Sibtechenergo comes a magnificent young professionals. Special thanks I would like to thank the families of our employees for their patience and understanding, because our professional activity is connected with constant load, long trip. And I can promise our young people that only we can offer such a rapid and quality growth, and our staff will be in demand always and everywhere!

In General, if to speak about the qualification of our specialists, they are almost all unique. To lead a team of such level – a huge honor for me. Congratulations to all on their professional holiday, anniversary of the company, I wish you health, family well-being, financial stability and peace of mind. Happiness to all and good luck!



OUR HISTORY

begins on new power plants.

3 November 1955 Minister of power of the USSR , G.G. Malenkov signed an order number 130 , which the All-Union Trust for the organization and rationalization of the regional electric stations and networks □ORGRES□ was entrusted to organize the Siberian Branch of □ORGRES□ with placing it in Novosibirsk. Office entrusted with the commissioning of new buildings energy, electric utilities to provide engineering assistance in the development of new technology in the regions of Western Siberia , Eastern Siberia and Northern Kazakhstan .

Order of the USSR Ministry of 03.06.1977 number 85 trust □ORGRES□ was transformed into a production association □Soyuztechenergo □Siberian department of ORGRES trust was transformed to self-financing company Sibtechenergo as a part of Soyuztechenergo.

In 1992 Self-financing State company Sibtechenergo was transformed to Open Joint Stock Company Sibtechenergo .State-owned shares (49 %) of JSC «Sibtechenergo» was transferred to RAO EES of Russia in accordance with the State privatization program
In 2008, the proportion of shares passed JSC E4Group”

With the growth of the country energy company developing and expanding production volumes . It can not avoid it and fall along with the entire industry in the nineties , to cut production by about 20 times . However, with the revival of energy significantly increased the demand for engineering services of highly skilled professionals , and now the production volumes of Sibtechenergo compared to before the crisis , grew by more than 300 % .

IN THE LAST FIVE YEARS the staff of Sibtechenergo performed commissioning of such major projects as the Krasnodar CCPP, Nyagan , Cherepovets and Serov power plants.



With the growth of the country's energy Sibtechenergo developing and expanding the volume of production.





ENERGY - In the hands of professionals

Main components of success

HIGH PROFESSIONALISM. It is this quality of Sibtechenergo managed to make a strong leap in the revival and development of production in such a short time .

CONTINUOUS DEVELOPMENT OF NEW DIRECTIONS, CONTINUOUS SEARCH FOR THE BEST, MOST ADVANCED PERFORMANCE OF PROCEDURES Over the past 10 years, decorated 14 utility model patents and inventions , filed three applications on patents.

COMPLEX APPROACH TO SOLVING THE CHALLENGES. Sibtechenergo has all the necessary professional activity units and experts competent in all technical matters of energy companies .

SOCIALLY ORIENTED POLICY. The constant growth of wages and the payment of it without delay , to provide staff with all kinds of work clothes , help young specialists there in the acquisition of apartments and payment of wage housing, care of pensioners , corporate celebration of anniversaries.

CONSTANT CONCERN FOR STAFF DEVELOPMENT AND QUALIFICATION. Over the past five years, training courses trained 85% of the engineering staff.

PROVIDENT MEANS OF MOBILE AND STATIONARY COMPUTERS Availability of necessary specialized programs that allow for calculations and simulation of processes.

EXTENSIVE PARK OF MODERN MEASURING EQUIPMENT, ensuring high quality of work.

PARTNERSHIP RELATIONS with academic and industrial research institutes, design institutes , manufacturers of power equipment.

AND THE MOST IMPORTANT THING – highly democratic relations, collectivism, mutual and unconditional attention to each employee.





Management Team

JSK «SIBTECHENERGO»



1. General Director
SALIKH AGLIULIN
2. Chief Engineer
ANDREY CIPKIN
3. Chief Operations Officer
TIMUR AGLIULIN
4. Chief Sales and Marketing Officer
VASILI VOROBYOV
5. Chief Economy and Finans Officer
OLGA POTUPCHIK
6. Chief Commom Question Officer
ANDREY CAREV



7. Deputy Chief Engineer
(Head of the turbine department)
KLIM AGALAKOV
8. Chief Accountant
JULIA KULIKOVA
9. Head of Production and Technical Department
ALEXANDER ABZYANOV
10. Head of planning and economic department
FAIMYA RAVILOVA
11. Chief of Personnel and Legal Department
ELENA KALININA
12. Head estimate and contract department
LYUDMILA OVECHKINA

13. Head of the Department of Information Technology
SERGEY TOPOROV
14. Head of labor protection
IRINA KRAVCOVA
15. Chief Power Engineer
ANDREY KOVALKOV
16. The chief metrologist (Head of the technical
measurements department) DENIS KOJIN
17. Head of Logistics
EGOR GOROBEC
18. Head of administrative and economi department
VALENTINA RUKOSUEVA
19. Altai Branch Director
VALENTIN TURCHIN



Evidence of a self-regulating organization. LICENSE. CERTIFICATES

JSC «SIBTECHENERGO» has all the necessary permits for work at the enterprises of the energy sector in the Russian Federation and the Republic of Kazakhstan, as well as special certificates confirming the competence of the company in additional areas of work.

RUSSIAN FEDERATION

- Certificate of admission to works which influence safety of capital construction projects, including the especially dangerous and technically complex capital construction projects, nuclear facilities, issued by the Self-Regulating Organization Association of organizations engaged in construction, reconstruction and repair of power facilities, grids and substations – Energostroy.
- Certificate of admission to works which influence safety of capital construction projects, including the especially dangerous and technically complex capital construction projects (except for nuclear facilities), issued by the S-ROs Association of organizations engaged in the design of energy facilities, – Energoprojekt.
- Certificate of admission to works which influence safety of capital construction projects, including the especially dangerous and technically complex capital construction projects (except for nuclear facilities), issued by the S-RO Survey organizations in Siberia.

- Certificate to carry out activities for the energy audit, issued by S-RO – Center of Energy Audit.
- License rostekhnadzor for activity on the examination of industrial safety.
- License of RF Ministry for Civil Defense, Emergencies and Elimination of Consequences of Natural Disasters to perform works on installation, repair and maintenance of fire safety of buildings and structures.
- Certificate of laboratory certification of nondestructive testing (types of work in accordance with Annex), issued by an independent certification centre for NDT laboratories of RASEK.
- The certificate of registration of the laboratory management issued by the Siberian Federal Service for Ecological, Technological and Nuclear Supervision.
- Accreditation certificate of Sibtechenergo as a regional division of the parent organization of metrological service of electric power – JSC Firm ORGRES – and the certificate of registration of Sibtechenergo as an accrediting centre.



to conduct accreditation of basic organizations of metrological service and metrological services of enterprises and organizations of electric power to the right calibration of measuring instruments.

- Certificate to carry out conformity assessment activities in the field of industrial safety, issued by the S-RO Union of Industrial Safety Expert (S-RO Energoekspert).
- Certificate of compliance with the system of voluntary certification organizations in the field of energy conservation and energy efficiency ZOND competence in the field of Development and evaluation of projects of normative and technical documentation of power plants and boiler rooms, issued by the Regional center power management.
- The certificate of quality management system in relation to the types of work performed to GOST ISO 9001-2011 (ISO 9001:2008) issued by JSC NAUSERT.
- Certificate of compliance management system of health and safety in relation to the types of work performed GOST P 12.0.230-2007 (OSHAS 18001:2007) issued by the OJSC Interregional Research Center of Comparative Studies and conformity assessment – NAUSERT.
- The certificate on the admission of Sibtechenergo as a body for voluntary certification of VTS – SOUES to conduct voluntary certification of PSU units to meet the requirements of the SRT 59012820.27.100.004-2012 and TPP units for compliance with the STO 59012820.27.100.002-2013.
- Certificate of state measurements (certification) chemical laboratory water chemistry department about the existence of the necessary conditions for measurements and tests for laboratory-fortified area of activity.

THE REPUBLIC OF KAZAKHSTAN

- State license for prospecting activities (for execution of geodetic works) issued by the Republic of Kazakhstan Agency for Construction and Housing and Communal Services.
- State license for the project activities (in the works for the technological design of production facilities, work on the design of engineering systems and networks, work on the building design and construction objects Category III), issued by the Republic of Kazakhstan Agency for Construction and Housing and Communal Services.
- Certificate for the right to carry out work in the field of industrial safety in the petrochemical and power industries, including expertise in the field of industrial safety and the development of industrial safety declarations issued by the Committee for State Control of Emergency Situations and Industrial Safety of the Ministry of Emergency Situations of the Republic of Kazakhstan.





THE TECHNOLOGY IS PROTECTED BY
PATENTS

Technology, protected by patents

PATENT on invention № 2321798 from 10.04.2008 :

• degasser (author - AM Bravikov) .

PATENT for utility model number 74963 from 20.07.2008 : • The

unit power of consumers and the needs of their own dead-end consumers while reducing the frequency of the emergency power system (the authors - ER Gorski , KA Barakin KA Agalakov , SF Nikolaev) .

PATENT for utility model number 75429 from 10.08.2008 :

• protective device in case of emergency power disconnect it from the power supply system (the authors - ER Gorski , KA Barakin) .

PATENT for utility model number 98557 from 20.10.2010 : • a

device for cleaning the surface of the heat from the ash and slag deposits (authors - SF Nikolaev AG Cipkin) .

PATENT for utility model number 99603 from 20.11.2010 : • a

device for cleaning the surface of the heat from the ash and slag deposits (authors - SF Nikolaev AG Cipkin) .

PATENT for utility model number 105404 on 10.06.2011 : •

deaeration condensate trap (authors - AM Bravikov , SV Alekseev and AA Shatunov) .

PATENT for utility model number 107288 on 10.08.2011 : • A

system of emergency protection of steam turbine power plant (the author - ER Gorsky) .

PATENT on invention № 2464493 from 20.10.2012 : • deaeration

condensate trap (authors - AM Bravikov , SV Alekseev and AA Shatunov) .

PATENT for utility model number 128245 on 09.20.2013 :

• device to start the unit (the authors - VN Baranov , SF Nikolaev , AV Rulkovsky) .

PATENT for invention number 2498159 on 10/11/2013 : • way of

burning pulverized coal (the authors - A. Koshkarov , Yuri Naumov , SF Nikolaev , AA Shinkarev) .

PATENT or utility model number 134439 on 11.20.2013 : •

flue gas cleaning device from fly ash (authors - SF Nikolaev VV Dudarev) .

PATENT for invention number 2550414 on 04/09/2015 : • the device to start and starting method propulsive power unit with the boiler (the authors - VN Baranov , SF Nikolaev , AV Rulkovsky) .

PATENT for invention number 2550596 on 04/10/2015 :

• method for measuring the mass flow rate of material in the flow (the authors - Yuri Naumov , SF Nikolaev , AA Shinkarev) .





ELECTRICAL WORK AREAS , made in 2006-2015 YEARS



COMPLEX COMMISSIONING:

- electrical equipment, relay protection devices and brushless excitation system turbo-generator 6 MW thermal power station at the Novosibirsk plant of artificial fibers - 2006;
- relay protection devices of the main circuit block generator-transformer and turbine generator excitation system of a gas turbine power generating 28.5 MW (project Tohoku, Japan) for the purposes of Uralsk - 2006 ;
- relay protection devices of the main circuit units № 1, 2, 3, 6, 325 MW Electric JSC ECE (Aksu -2, Kazakhstan) at the replacement device type SHE1111 production EKRA 2006-2013.;
- relay protection devices of the main circuit units of gas and steam turbines (together with JSC Company ORGRES, Moscow) on the unit number 2 PGU- 450 power 3x150 MW on Northwest Power Plant - 2006;
- relay protection devices at substation 110 kV Vympel Novosibirsk - 2006.;
- relay protection devices of the main circuit units №№ 3, 4, 5, 6, 7, 8 500 MW to the replacement device type

SHE1111 production EKRA Ekibastuz GRES-1 (Kazakhstan) - 2006-2015.;

- electrical equipment, relay protection and automation devices, excitation systems and PCS of three turbo-generators with capacity 3x12 MW thermal power plant of Omsk rubber - 2007.;
- relay protection and automation devices of OSG 500 kV at JSC Kazakhstan Electrolysis Plant (Pavlodar) - 2007.;
- electrical equipment and relay protection and automation devices (together with JSC Company ORGRES Moscow) power unit number 3 of PGU- 450 power 3x150 MW TPP- 27 Mosenergo - 2007 г.;
- relay protection and automation devices of the main circuit unit number 11 PGU- 450 power 3x150 MW TPP- 21 Mosenergo - 2008.;
- relay protection and automation devices reserve own needs transformer 01 T 63 MVA Ekibastuz GRES-1 replacement with devices such SHE1113 - 2008.;
- electrical equipment and relay protection and automation devices unit number 4 of PGU- 450 TPP- 27 Mosenergo power of 3x150 MW - 2008.;

- relay protection and automation devices of switchgear 35 kV and relay protection and automation devices block transformers at GTPP Tevlinsko- Russkinskoye field with four turbo-generators with capacity of 4 * 12 MW - 2008.;

- electrical equipment and relay protection and automation devices pulverized coal power unit number 3 and the excitation system asynchronized turbogenerator 330 MW Kashira power plant, including electrical and fuel supply and electrostatic filters - 2009.;

- relay protection and automation devices backup unit transformer on STK 500 kV Substation Zarya - 2009.;

- electrical equipment and relay protection and automation devices units № 1, 2, 3, 7, 45 MW gas turbine power plant Ob priobskoye field (equipment ABB, Siemens, Schneider Electric) - 2009.;

- electrical equipment and relay protection OSG 110 kV turbo-generators with capacity for seven 7 * 45 MW gas turbine power plant Ob - 2009.;

- relay protection and automation devices outdoor switchgear -35 kV relay protection and automation devices block transformers at GTPP Vateganskogo field with six turbo-generators with capacity of 6 MW * 12 - 2009.;

- relay protection devices of the main circuit unit of steam turbine of power unit No. 1 of CCGT-450 MW and protection for busbars 330 kV (replacing analog devices RPD on microprocessor) North-West TPP and replacement of generator circuit breakers three blocks on gas-insulated systems manufactured by ABB — 2010.;

- the electrical part of the automatic allocation of own needs of the Omsk CHPP-4 in case of emergency reduction in the frequency of the power system in Omsk on the base cabinets production EKRA — 2010.;

- electrical equipment and relay protection and automation devices of power units No. 7 and No. 8 of CCGT-400 with capacity of 2*400 MW Surgutskaya GRES-2 — 2011.;

- electrical equipment and relay protection devices switchgear-110 kV, and generator transformers of two power units of CCPP-120 and backup TSN of the Permskaya CHP-6 with a capacity of 2*120 MW — 2011.;

- electrical equipment and relay protection devices mini CHP North and mini-CHP Central on the island of Russian (Vladivostok) — 2011-2012.;



1. MARK FRIDMAN
Head of electrical department
2. KONSTANTIN BARAKIN
Head of Department of power plants



- electrical equipment and relay protection and excitation system blocks the gas turbine (manufactured by MITSUBISHI ELECTRIC, Japan) and a steam turbine of CCGT-410 with capacity of 410 MW in Krasnodar TPP — 2011.;

- relay protection devices of the main circuit blocks № 4 and № 6, Ekibastuz GRES-1 after replacement of software components when replacing independent of the excitation system for the excitation system of the company ABB — 2011-2012.;

- relay protection devices of the main circuit unit 7 of the Tomsk GRES-2, with the replacement for microprocessor-based protection and replacement ARV RVA-62 on ARV type VK-REM of the production of RUSELPROM-ELECTROMASH on the basis of the dynamoelectric exciter VT-1700 — 2012.;

- electrical equipment and relay protection devices of unit 3 Kharanorskaya SDPP with the capacity of 225 MW, electrical equipment and relay protection devices and PAS 220 kV switchgear — 2012.;

- relay protection devices backup TSN 30 T capacity 40 MVA ES JSC EEC(Aksu-2) — 2012.;

- electrical equipment and relay protection devices (Siemens) unit 1 CCGT Nyagan GRES 420 MW — 2013.;

- electrical equipment and relay protection devices a new part of OSG-220 kV with the commissioning of CCGT-410 MW. relay protection devices in the reconstruction of the current portion of OSG-110 kV and outdoor switchgear 220 kV Krasnodarskaya TPP — 2011-2013.;

- electrical equipment and relay protection and automation (Siemens) of the power unit № 2 CCGT-420 of Nyagan GRES 420 MW — 2013.;

- electrical equipment and relay protection devices (reconstruction) of coal-fired power units No. 4 and No. 6 of Belovskaya SDPP with turbo generators of 225 MW — 2014.;

- electrical equipment and relay protection and automation (Siemens) of power unit No. 4 of ccgtu-420 at the Cherepovetskaya GRES 420 MW, including electrical equipment and relay protection and automation switchgear 220 kV — 2014.;

- electrical equipment and relay protection and automation (Siemens) of the power unit 3 PGU-420 of Nyagan state district power station capacity of 420 MW — 2014.;

- electrical equipment and relay protection of turbine generators of gas and steam turbines, the distribution unit for internal needs 6 kV distribution unit for internal needs 0.4 kV, TSN working of two power units PGU-135 (the equipment of such companies as Rolls-royce, ABB, Siemens, Schneider Electric) thermal power plant at OOO Stavrolen (Budenovsk) — 2015.;

- electrical equipment and relay protection and automation of power unit № 2 of Ekibastuz SDPS-1 capacity of 525 MW — 2015.;

- electrical equipment and relay protection and automation (Siemens) of power unit No. 9 of CCGT-420 of Serovskaya GRES 420 MW, including relay protection and automatic connection of the autotransformer 110 kV outdoor switchgear and gas-insulated switchgear-220 kV and relay protection and PA switchgear 220 kV — 2015.

THE COMPLEX OF WORKS ON EXCITATION SYSTEMS

- set-up, testing and commissioning of thyristor excitation system of NPO ELSIB of turbo-generator type TVF-120 No. 4 of the CHPP-2 (Astana) — 2006.;

- design, installation and commissioning of system backup excitation of turbogenerators №№ 3, 5, 6, 7 with a static thyristor excitation system backup block No. 8, Tomsk GRES-2 — 2007.;

- debugging of algorithms, testing and commissioning of group management system excitation for reactive power control of three turbine generators CCGT-450 MW power unit No. 1 the North-Western CHPP — 2007

- commissioning, testing and commissioning of excitation system manufactured by ABB turbine generator No. 3 of Ekibastuz GRES-1 500 MW — 2010.;

- debugging of algorithms, testing and commissioning of group management system excitation for reactive power control of three

turbine generators CCGT-450 MW power unit No. 2 of the Kaliningrad CHP-2 — 2011.;

- set-up, testing and commissioning of excitation systems of turbine generators, three station No. 1, 2, 3 UTEC NLMK base cabinets ARV type Shuv-2-16-115 JSC Energo-Komplekt — 2012.;

- set-up, testing and commissioning of excitation system of turbo generator № 6 with capacity of 325 MW ES JSC EEC (Aksu-2) is manufactured by ABB — 2012.;

- set-up, testing and commissioning of brushless excitation systems with automatic regulator of excitation of the company Basler Electric two turbo generators TTK-25 boiler-house Central(Astrakhan) — 2013.;

- set-up, testing and commissioning of thyristor excitation system of production of JSC Energypackage of the turbine No. 13 with a capacity of 63 MW Omsk HPP-3 — 2014.;

- set-up, testing and commissioning of thyristor self-excitation systems of production of JSC Powermachines turbine-generator No. 3 with the capacity of 225 MW Kharanor SDPP 2012, turbogenerator № 4 and № 6 with capacity of 225 MW of Belovo SDPP, 2014, turbine generator No. 1 with a capacity of 120 MW Omsk HPP-5, 2014, turbine generator No. 2 with a capacity of 525 MW at Ekibastuz GRES-1 2015

THE COMPLEX OF WORKS ON PREVENTIVE INSPECTION OF GENERATOR EXCITATION SYSTEMS:

- independent thyristor excitation systems with automatic regulator of excitation turbo generators of 200 MW of the Khabarovsk CHP-3 — 2004-2014.;

- excitation system with microprocessor automatic regulator of excitation (JSC Power machines) of the turbogenerator with a capacity of 36 MW Kuznetsk TPP — 2006.;

- excitation system with microprocessor automatic regulator of excitation (production of JSC Powermachines) of turbo-generator No. 4 capacity of 200 MW Khabarovsk CHP-3 — 2006, 2009, 2011, 2013, 2015.;

- thyristor excitation systems of turbine generators № 3, 4, 5, 6, 7 500 MW Ekibastuz GRES-1 2006-2010.;

- automatic controller type automatic regulator of excitation SDP independent thyristor excitation system turbine-type TVV-160-2 No. 1 of Tomsk CHP-3 to eliminate the oscillatory instability — 2008.;

- analog and digital automatic controllers of excitation of the thyristor self-excitation systems of turbine generators with capacity of 150 MW steam turbine of power units № 1 and № 2 CCGT-450 of North-West CHPP — 2009.;

- high frequency excitation system with automatic regulator of excitation type EPA-120 turbine-generator No. 9 with a capacity of 120 MW Khabarovsk CHP-1 — 2011.;

- independent thyristor excitation system turbine-type TVV-160-2 No. 10 of Krasnoyarsk GRES-2 with automatic excitation regulator type ARV-SD — 2011.;

- thyristor self-excitation system and the turbine-generator type TGV-200 No. 2 and No. 4 Zhambyl GRES (Republic of Kazakhstan) with automatic regulator of excitation type ARV-SD — 2015.;

- excitation systems of turbo generators for gas and steam turbines of CCGT-410 of the Krasnodar CHP — 2015.

THE COMPLEX OF WORKS ON PREVENTIVE INSPECTION OF ELECTRICAL EQUIPMENT AND RELAY PROTECTION AND AUTOMATION OF POWER STATIONS AND SUBSTATIONS:

- relay protection devices of the main circuit of the unit No. 4 ES JSC EEC(Aksu-2) after replacing the turbo generator type TGV-300 TGV-325, replacement of unit transformer and a working TSN and adjustments in connection with the replacement of protection settings block — 2009.;

- relay protection ORU-220 kV Krasnodar TPP — 2013-2015.;

1. DMITRY KYSTOV Head of Department of relay protection and automation of substations

2. VLADIMIR PAPIN Head of Department of high voltage equipment

3. SERGEY DEGTYAREV Head of electrical laboratory







- relay protection devices of the main circuit blocks of gas and steam turbine at CCGT-410, relay protection and automation of distribution unit for internal needs 6 kV, relay protection and automation of distribution unit for internal needs 0.4 kV Krasnodar TPP 2013-2015r.;

- relay protection devices of the main circuit, relay protection and automation of distribution unit for internal needs 6 kV power unit No. 1 of CCGT-420 relay protection and backup TSN Nyagan GRES 2013.;

- relay protection devices of the main circuit, relay protection and automation of distribution unit for internal needs 6 kV of power units No. 2 and No. 3 PSU-420 of Nyagan GRES 2014– 2015.

THE COMPLEX OF WORKS ON DESIGNING OF DEVICES AND SYSTEMS OF POWER PLANTS (WORKING DOCUMENTATION)

- the project of replacement of relay protection devices of the main circuit units No. 1 and No. 3 with the capacity of 325 MW ES JSC EEC (Aksu-2) on microprocessor relay protection of the scientific and production enterprise EKRA — 2006-2008.;

- the project of modernization of relay protection and automation units №№ 3, 4, 5, 6, 7, 8 500 MW Ekibastuz GRES-1 (main circuit of the unit, the subsidiary, the distribution unit for internal needs 6 kV distribution unit for internal needs-0,4 kV DCB) — 2006-2011.;

- the replacement project independent thyristor excitation system the excitation system of ABB turbogenerators No. 3 and No. 7 of 500 MW at Ekibastuz GRES-1) — 2010-2011.;

- the project of replacement of relay protection devices in the reconstruction of four substations of 220 kV Altayenergo 2006.;

- the project of automatic allocation of their own needs (ASN) Omsk TPP-3, TPP-4, TPP-5, with an emergency reduction in the frequency of the power system in Omsk — 2007.;

- the project with the development of algorithms of the group management system excitation for reactive power control of three turbo generators of unit No. 1 of PSU-450 North-west CHP — 2007.;

- project backup excitation of turbogenerators №№ 3, 5, 6, 7 with a static thyristor excitation system backup block No. 8, Tomsk GRES-2 — 2007.;

- the replacement project relay protection and automation backup unit for internal needs transformer 01 T 63 MVA Ekibastuz GRES-1 — 2008

- the project of parallel operation of gas turbine power plant GTPP Varieganskoye field with the grid and the system design group excitation control and reactive power turbine generators gas turbine power plant — 2008.;

- the project of reconstruction of relay protection of 110 kV OJSC Kuzbassenergo — 2008.;

- the project of replacing the three generator circuit breakers in gas-insulated systems ABB and the replacement of obsolete analog cabinets protect the unit, a steam turbine and protection for busbars 330 kV three generator transformers of unit No. 1 of CCGT-450 MW of North-West CHP in microprocessor cabinets RZA production EKRA — 2008

- the project of automatic allocation of own needs Kemerovo CHP of JSC Kuzbassenergo in case of emergency reduction of frequency in power system — 2009.;

ELECTRICAL DIRECTION

- a project to replace the system of self-excitation of turbine-generator steam turbine 150 MW power unit No. 1 of PSU-450 North-West CHPP — 2009.;

- the project relay protection devices and the secondary switching the primary circuit of the power units №№ 1, 2, 3 UTEC (Lipetsk) power 3*50 MW — 2010.;

- the project of replacement of relay protection devices of the main circuit block and the reconstruction of the excitation system of turbo generator of power unit No. 7 of the Tomsk GRES-2 — 2010.;

- project replacement of five excitation systems of the generators of the Kolyma hydroelectric power station 180 MW — 2011.;

- the project with the development of algorithms of the group management system excitation (GWA) for reactive power control of three turbine generators CCGT-450 MW power unit No. 2 of the Kaliningrad CHP-2 — 2011.;

- the project of replacement of relay protection devices and the secondary switching the primary circuit of the unit No. 7 of the generator-transformer-reactor Novosibirsk CHP-2 — 2011.;

- the project of replacement devices AFLS Novosibirsk CHP-2, CHP-3, CHP-4, CHP Barabinsk on the basis of modern microprocessor devices manufactured by EKRA — 2011

- the project is the installation of the autotransformer at-220/110/6 kV for communication between ORU-110 kV and 220 kV switchgear of the Novosibirsk TPP-3, 2011

- the project of replacement of the excitation control cabinets type Cosur-241 brushless excitation systems of turbine generators No. 1, 2, 3 UTEC (Lipetsk) on cabinets such Shuv-2-16-115 production company Energocomplekt — 2012.;

- the project of replacement of relay protection devices and the secondary switching the main circuit of the power unit № 3 Tomsk SDPP-2 and reconstruction of the excitation system of turbo generator of 50 MW — 2013.;

- the project of automatic allocation of own needs of power unit No. 9 of PGU-420 at Serov GRES emergency reduction of frequency in power system — 2013



ELECTRICAL DIRECTION

THE COMPLEX OF EXPERIMENTAL WORKS ON THE SURVEY AND TO IMPROVE THE RELIABILITY OF ELECTRIC EQUIPMENT OF ELECTRIC STATIONS AND NETWORKS:

- the calculated and experimental determination on the reliability of power consumers of own needs 6 and 0,4 kV at power interruptions, with the development and implementation of technical solutions to improve reliability own use, on the block No. 1 of North-West CHP in St. Petersburg in 2007, Omsk CHP-2, CHP-3, CHP-4, CHP-5, 2007, the Chelyabinsk CHP-3, 2007, Yuzhno-Kuzbasskaya GRES 2013.;

- inspection of DC system, development and modernization at the facilities: TPP-6 Bratsk, Ust-Ilimskaya CHPP, CHPP-2 Krasnoyarsk — 2008.;

- test the heat of the turbo on Gusinozersky GRES (200 MW), Neryunginskaya GRES (200 MW), Berezovskaya GRES (800 MW), Krasnoyarsk CHP-1 (60-120 MW), TPP SGChE in Seversk city of Tomsk region (100 MW) — 2006-2014.;

- full-scale tests of the turbine generator No. 2 type TGV-200 M Gusinozerskaya GRES when in asynchronous mode — 2010.;

- the frequency dividing test automation with load shedding of power unit No. 2 with capacity of 200 MW Gusinozerskaya GRES — 2010.;

- examination and analysis of the technical state of electrical equipment of power units of 200 MW thermal plant Pljevlja and Montenegro TPP Kostolac Serbia with the aim of identifying opportunities to increase the generated active power — 2008-2009r.;

- examination and analysis of the technical condition of electrical equipment with the aim of improving the reliability of its work and identify ways of reconstruction at the Kama hydroelectric power station; a substation Yugo-Zapadnaya 110/10 kV

- Altayenergo Kemerovo CHP plant, Barnaul TPP-2, Yaivinskaya GRES — 2007-2009

- examination and analysis of the technical condition of electrical equipment with the aim of improving the reliability of its work, identifying further ways of reconstruction, increasing the generated electric power at Belovskaya TPP, Nazarovskaya GRES, Tomusinskiy power plant, Kuznetskaya CHPP, Novo-Kemerovo CHP plant, Krasnoyarskaya CHP-1 and CHP-2, Abakan CHP and power units of 500 MW at Ekibastuz GRES-1 — 2006-2010.;

- development of actions for increase of reliability, improvement of technology and operation of turnaround system of technical water supply and the high voltage isolation on the NPP site, outdoor switchgear 110, 220 kV Karaganda CHP-3 — 2014.;

- execution of works on inspection of grounding system and lightning protection and electromagnetic environment at CHP-27 JSC Mosenergo Reftinskaya GRES, the Kamskaya HPP, the Kolymskaya HPP, adlerskaya TPP, Novo-Ziminskaya heat and power plant, the Belovskaya SDPP, of the Novosibirsk CHP-2 and CHP-3, Tomsk GRES-2 and SS-500/220/110/35 kV JSK SIBKO MES Western Siberia, JSC FGC UES — 2006-2015





THERMAL WORK

MADE FOR 2006-2015

1. COMMISSIONING AND TESTING OF TURBINE EQUIPMENT

THE UNITS 220-225 MW

THE RANGE OF COMMISSIONING, PERFORMANCE TESTING AND COMMISSIONING OF THE UNITS:

- 225 MW station No. 3 Kharanorskaya GRES with installation of a new turbine K-225-12,8-3 P Powermachines-LMZ — 2008-2013;
- 220 MW No. 10 at Verkhnetagilskaya SDPP with an upgraded turbine K-220-12,8-M Powermachines-LMZ. Upgrading turbines to increase available capacity up to 220 MW was implemented during capital repairs of power unit No. 10 and was in the implementation of design and technical solutions aimed at improving the performance characteristics of the turbine — 2013-2014;

THERMAL TESTS PUT INTO OPERATION A NEW TURBINE UNIT K-225-12,8-3 M Powermachines-LMZ of power unit St. No. 4 of Belovskaya SDPP to determine the actual effectiveness, comparison with the safeguards of the manufacturer and obtain the data necessary for the planning and rationing of the power unit — 2014

THE UNITS 310-325 MW

COMPLEX OF COMMISSIONING WORKS AT THE POWER PLANT JSC EEC in the city of Aksu of the Republic of Kazakhstan, including integrated testing and commissioning of power units 310-325 MW new turbine K-310-23,5 (station No. 4) and K-325-23,5 (art.№№ 1, 2, 3, 6) the production of Turboatom (Kharkov, Ukraine) with the subsequent conducting of thermal tests of turbine units, which allowed to compare their actual performance with the guarantees of the manufacturer and to use technically sound benchmarks fuel — 2002-2013

THE UNITS OF 500-800 MW

COMPLEX OF COMMISSIONING WORKS AT THE POWER UNITS:

- 500 MW station No. 10 of Reftinskaya GRES with the turbo K-500-240 (Kharkov turbine factory) during the recovery period after his accident in 2006, allowed to enter the unit into operation — 2007
- 540 MW St. № 2 of Ekibastuz SDPS-1 named after Bulat Nurzhanov in the period of its reconstruction with installation of a new turbine K-540-23,5 “Turboatom” with the subsequent warranty and conducting of thermal tests of turbine — 2013-2015

THE COMPLEX THERMAL TESTS OF POWER UNITS

800 MW station No. 1 and 2 turbines K-800-240-5 LMF Berezovskaya GRES — 2015

COMBINED-CYCLE POWER UNITS MW 110-420

THE COMPLEX OF COMMISSIONING WORKS, WARRANTY AND CERTIFICATION TESTING FOR COMBINED-CYCLE POWER UNITS

410 MW at Krasnodar CHP with gas turbine Mitsubishi and steam turbine UTZ 2011-2013

- 420 MW St. № № 1, 2, 3 Nyagan GRES thermal power plant with turbine equipment Siemens; undertaken mandatory energy audit of power plants for preparation of materials which substantiate the standards of specific fuel consumption for supplied electricity and heat from a branch of the Nyagan GRES JSC Fortum in 2016 for approval in the energy Ministry Russian Federation 2012-2015;

• 420 MW station No. 4 at the Cherepovetsk GRES with turbine equipment Siemens — 2012-2014;

• 135 MW thermal plant at OOO “Stavrolen” in Budennovsk, consisting of two gas turbines the Trent 60 WLE Rolls-Royce, two of the 5 generators SGen-100A 2P Siemens AG, two heat-recovery boilers PK-93 and one steam turbine SST-400 Siemens AG — 2014-2015.;

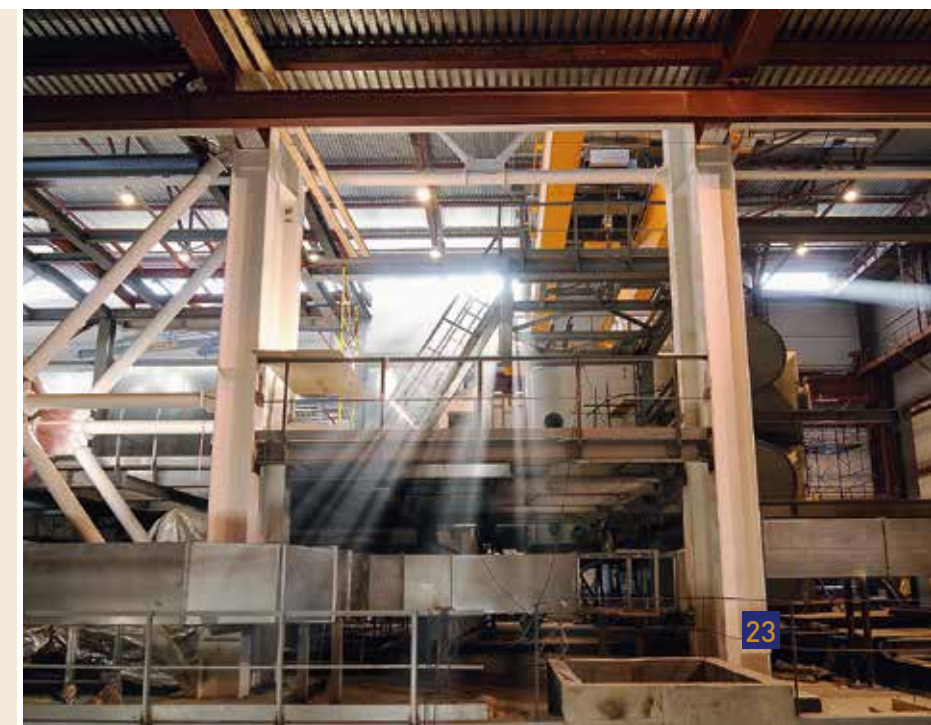
• 420 MW station No. 9 Serov GRES with turbine equipment Siemens — 2013-2015;

• 230 MW station No. 1 and No. 2 the Nizhneturinskaya GRES power plant with the gas turbines Alstom and steam turbines UTZ — 2015;

1. KLIM AGALAKOV
head of the turbine workshop

2. SERGEY ALEXEEV
head of the Department
commissioning of turbine
equipment

3. ASLAN HAJIDOGOV
head of Department
experimental-commissioning and
fuel







THE COMPLEX REGIME-UP TESTING OF TECHNOLOGICAL EQUIPMENT OF POWER UNIT CCGT-110 MW with a gas turbine of the General Electric company and the steam turbine KTZ at Vologda CHPP — 2015

GAS TURBINE POWER UNITS 6-110 MW

THE RANGE OF WORK WITH THE COMMISSIONING IN OPERATION OF GAS TURBINE POWER UNITS

- 6 MW (Kawasaki, Japan) with a steam heat recovery boiler on a CHP Novosibirsk tin plant — 2000;
- 15 MW gas turbine production of Zorya-mashproyekt and a water heat recovery boiler at the power plant-3 in Salekhard, 2004.;
- 28,5 MW (Tohoku, Japan) with a steam heat recovery boiler on the Urals TPP (Republic of Kazakhstan) — 2006.;
- 45 MW St. № № 1, 2, 3, 7 GTPP of Priobskoe oil field — 2009-2010.;
- 1.8 MW station No. 1, 2 (Kawasaki, Japan) with water-waste heat boilers at CHP North and 6 MW art. № № 1, 2, 3, 4, 5 (OPRA, the Netherlands) with water-waste heat boilers to mini-CHP Central on the island of Russian in Vladivostok preparation for APEC summit-2012 — 2010-2012.

THE COMPLEX OF THERMAL TESTS OF GAS TURBINE UNITS Gas turbine-25 MW station No. 1 and No. 2 at the Kazan CHP-1 with a gas turbine NK-37 and steam boilers — 2015.

STEAM-TURBINE PLANT 6-120 MW

THE COMPLEX COMMISSIONING, COMMISSIONING AND THERMAL TESTS OF TURBINE EQUIPMENT

- head turbine T-115–8,8 LMZ station No. 5 on South-Kuzbass GRES and TPP-30–8,8 LMZ station No. 4 on Kemerovo CHP — 2003-2004.;
- R-6–3,4/1,0 KTZ station No. 1 and No. 2 at the Achinsk refinery, R-6–3,4/1,0 KTZ station No. 1 and No. 2 at the plant Nizhnekamskshina R-6–1,2/0,5 KTZ station No. 2 on Anzhero Sudzhenskoye CHP — 2005;
- R-12–3,4/1,0 GTC art. № № 1, 2, 3 TES plant Omsky Kauchuk (Omsk) — 2007.;
- T-115–8,8 station No. 10 at the TPP of JSC Siberian chemical combine in the city of Seversk of the Tomsk region — 2008-2009.;

THE COMPLEX OF THERMAL TESTS OF TURBINE UNITS:

- PT-25 station No. 7, R-25 station No. 8, PT-60 St. № № 9, 11, 12, R-50 No. 13 at Omsk TPP-3, R-50 No. 4 T-100/120 station No. 7, PT-135/165 station No. 9 at Omsk CHPP-4, T-175/210 at Omsk CHP-5 — 2010;
- PT-85/105 station No. 1 Minusinsk CHP, PT-80/100 station No. 1 Omsk CHPP-5, PT-140/165 station No. 1 of Tomsk CHP-3 — 2011;
- PT-80 station No. 1 and the T-175/210 station No. 2 and No. 3 at Barnaul CHP-3, T-115 station No. 5 on South-Kuzbass GRES — 2012;
- T-88 station No. 6 and K-50 St. # 7 at southern Kuzbass GRES, PT-60 article No. 11 Omsk CHPP-3, PT-60 St. 1 and T-110/120 station No. 2 at the Abakan CHP, R-77 station No. 6 on Chita CHPP-1 — 2013.;
- PT-80 article No. 1 Omskaya CHPP-5, T-65 St. № 8 of Barnaul TPP-2, KT-120 station № 5 at Tom-Usa SDPS, PT-60 station № 5 at the Kazan CHP-1, PT-60/75 station № 2 and PT-135/165 station № 3 for Sterlitamak CHPP, T-180/210 station № 3 Tyumen CHP-2 — 2014-2015



2. Use of fuel

DEVELOPMENT OF NORMATIVE CHARACTERISTICS OF TURBINE AND BOILER EQUIPMENT, MODELS FOR CALCULATION OF SPECIFIC CONSUMPTION OF FUEL AND GRAPHING OF NORMATIVE SPECIFIC CONSUMPTION OF FUEL:

- Kemerovo GRES, Berezhovskaya GRES, Belovo GRES, Novo-Ziminskaya heat and power plant, Irkutsk TPP-6, TPP-9, TPP-10, TPP-11, Omsk CHPP-2, CHPP-3, CHPP-4 and CHPP-5, CHPP Minusinsk, sosnovoborskaya CHPP, boiler houses MUP Mahaganapati Barnaul CHP-1, CHP-2 and CHP-3, Ekibastuz GRES-1, CHP SCK (Seversk), Nazarovo GRES, Kirov district boiler (city of Omsk), Tomsk GRES-2 and CHP-1, CHP Zheleznogorsk, Kharanor GRES, Nyagan GRES

REVIEW AND APPROVAL OF REGULATORY POWER CHARACTERISTICS OF BOILERS AND TURBINES, INITIALLY-STANDARD SPECIFIC EXPENSES OF FUEL, MODEL OF CALCULATION OF SPECIFIC EXPENSES OF FUEL:

- Tom-Usa GRES, Chita CHP-1, Novo-Kemerovo TPP, Gusinozersk GRES, Novosibirsk CHPP-2, CHPP-3, CHPP-4 and CHPP-5, CHPP Baraba, Verkhnetagilskaya SDPP Kansk CHP in Krasnoyarsk CHP-1, CHP-3 and CHP - 4, CHP Abakan, Biysk CHP-1, TPP Kemerovo, Kuznetsk CHP, sosnovoborskaya CHPP, Ekibastuz GRES-1.

3. - COMMISSIONING AND TESTING OF BOILER EQUIPMENT

THE RANGE OF COMMISSIONING, PERFORMANCE TESTING AND COMMISSIONING:

- five boilers BKZ-75-GE-GMA JSC ANPZVVK after the reconstruction of their transfer to the combustion of fuel gas;
- four boilers E-160–1,4–250 BT Zheleznogorsk CHPP;
- boiler P-39 of power unit St. No. 2 power station JSC EEC in Aksu, Kazakhstan;
- boiler TPE-216–640 power unit St. # 3 Kharanor GRES;
- boiler P-57–3 M article No. 8 and P-57 P № 2 of Ekibastuz SDPS-1 named after Bulat Nurzhanov;
- of boiler TPE-225 article No. 9 of Cherepetskaya GRES;
- the recovery boiler EP-307 JSC EMalliance SGU-410 at Krasnodar CHPP;
- boilers EP-270 JSC EMalliance CCGT-420 St. No. 1, 2, 3 Nyagan GRES CCGT-420 station No. 4 at the Cherepovetsk GRES CCGT-420 St. # 9 Serov GRES;
- waste-heat boilers PC-93 CCGT- 135 Budennovsk TPP;
- waste heat boilers PK-87 OJSC Podolsk machine-building plant CCGT-230 station No. 1 and No. 2 Nizhneturinsk GRES.

4. EXPERIMENTAL DESIGN FOR IMPROVEMENT OF BOILER EQUIPMENT, EXPERIENCED BURNING OF NON-PROJECT COALS

THE SET OF CLEANING OF HEATING SURFACES OF BOILERS BKZ-640–140 GUSINOOZERSK GRES, BKZ-210–140 BARNAUL CHP 2, PC-38 NAZAROVO GRES:

- at Nazarovso GRES complex purification of heating surfaces of the boiler PK-38 St. № 6 And implemented turnkey ;
- Gusinozersk GRES is a complex cleaning of heating surfaces of the boiler BKZ-640–140 St. № 4



1. SERGEY NIKOLAEV
the chief of boiler workshop



THE PROJECTS OF RECONSTRUCTION OF DUST EXTRACTION PLANTS WITH INSTALLATION OF EMULSIFIERS OF THE SECOND GENERATION IN BOILER PK-10 SOUTH-KUZBASS TPP, TP-81, TP 87 NOVOSIBIRSK TPP-2:

- at Novosibirsk CHP-2 reconstruction project of dust extraction plants is implemented on the boilers №№ 7, 8, 9, 10.

THE PROJECT OF BOILER P-57-3M TO NEUTRAL-OXYGEN WATER REGIME AT EKIBASTUZ GRES-1.

ELECTROCHEMICAL TECHNOLOGY DEVELOPED BY THE IGNITION OF PULVERIZED COAL, based on the electrochemical mechanism of ignition of a fuel (Patent No. 2498159), the essence of which consists in the intensification of the ionization process zone in the boundary layer of the root of the flame (from the state of this zone depends on the combustion when flaring). The results of experimental tests on the boiler K-50 No. 3 TGC-1 in the city of Berdsk of the Novosibirsk region confirmed the technological capabilities of the system and readiness for experimental-industrial operation on coal-fired boilers. Developed by the industrial design systems, started its production

DEVELOPED ACOUSTIC PYROMETER TO MEASURE THE TEMPERATURE FIELD IN THE BOILER FURNACE. The test results of acoustic pyrometer confirmed its technological capabilities during

the experimental-industrial operation on the boiler BKZ-420 Omsk CHP 4.

EXPERIENCED BURNING OF NON-PROJECT COALS:

- Gusinozersk GRES — experienced the burning of non-project coal field of Pereyaslav;
- South-Kuzbass GRES — experienced the burning of coal company □ SouthKuzbass Coal □ ;
- Omsk CHPP-4 and CHPP-5 — experienced the burning of non-project coal of coal Department □ Borly Corporation □ Kazakhmys (Kazakhstan);
- Tom-Usa GRES — experienced the burning of coal company □ SouthKuzbass Coal □ (the intermediate product).



5 COMMISSIONING AND TESTING OF HEATING SYSTEMS

COMPLEX OF COMMISSIONING WORKS ON HEAT SUPPLY SYSTEMS, HEATING AND VENTILATION Nyagan GRES, mini CHP □ North and □ Central on the island of Russian in Vladivostok.

THE COMPLEX OF WORKS ON TESTING OF WATER HEATING SYSTEMS FOR THERMAL AND HYDRAULIC LOSSES:

- determine the actual heat losses through thermal insulation for heating mains from TEP three of the Omsk branch of □ TGC-11 (total length of the tested pipes is 92 km, with a diameter of 800-1000 mm
- determined hydraulic characteristics of thermal networks from two of the Tyumen thermal power station (total length-tested the quality of the pipelines 29 km, with a diameter of 700-1200 mm)

DEVELOPED THE OPTIMAL MODES OF OPERATION OF LARGE HEATING SYSTEMS Novokuznetsk and Tyumen — development of the electronic model based on program-settlement complex Thermo ZULU.

DEVELOPED ENERGY PERFORMANCE OF WATER HEATING SYSTEMS on five indicators for the Tomsk, Omsk and Novokuznetsk.

PREPARED PROPOSALS FOR the SCHEME of a HEAT supply of TYUMEN FOR the PERIOD up TO 2028», aimed at ensuring the reliability of heat supply.

6. COMMISSIONING OF PIPELINES, METAL TESTING, TECHNICAL INSPECTION, PREPARATION OF PASSPORTS FOR EQUIPMENT, CERTIFICATION OF THERMAL INSULATION, THE EXAMINATION OF INDUSTRIAL SAFETY

THE COMPLEX OF WORKS ON THE INPUT CONTROL METAL UNITS CCGT-420 St. No. 1, 2, 3 Nyagan GRES, station No. 4 at the Cherepovetsk GRES, St. No 9 Serov GRES.

THE COMPLEX OF WORKS ON COMMISSIONING OF PIPELINES, PREPARATION OF PASSPORTS FOR EQUIPMENT, working under pressure, initial technical inspection, certification of boiler setting and thermal insulation of power units St. № 3 Kharanor GRES, St. № 2 Ekibastuz GRES-1, St. No. 1 of Krasnoyarsk CHP-3, St. No. 4 of Gusinozersk GRES CCGT-410 of the Krasnodar CHP, CCGT-420 St. No. 1, 2, 3 Nyagan TPP, PGU-420 at station No. 4 at the Cherepovetsk GRES, St. No 9 Serov GRES

THE COMPLEX OF WORKS ON COMMISSIONING OF PIPELINES, CERTIFICATION OF BOILER SETTING AND THERMAL INSULATION OF POWER UNITS No. 2 and No. 6 power plant of JSC EEC (Republic of Kazakhstan) and units №№ 1, 2, 3 Nyagan GRES

THE COMPLEX OF TECHNICAL DIAGNOSTICS OF VESSELS AND PIPELINES AND INSTALLATION OF PIPELINES OF POWER UNITS №№ 1, 4, 5, 6, 7 Ekibastuz GRES-1 (Kazakhstan)

THE COMPLEX OF WORKS ON EXAMINATION OF INDUSTRIAL SAFETY OF EQUIPMENT, working under pressure and have worked for designated lifetime, and estimate the possibility and conditions of further operation of JSC SIBEKO and JSC Yenisei TGC (TGC-13)



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1. EDGAR YUDKIN
head of Department of heat supply systems,
PhD.

2. EVGENY CHISTYAKOV
head of reliability of power equipment.





7.COMMISSIONING OF WATER TREATMENT EQUIPMENT AND WATER CHEMISTRY

CONDITION SURVEY OF WATER TREATMENT PLANTS, AND WATER CHEMISTRY TO OPTIMIZE FLOWSHEET AND MINIMIZING OPERATING COSTS:

- Sogra TPP in the Republic of Kazakhstan, Ekibastuz GRES-1;

- SPM Irkutsk thermal power station-11, Kemerovo CHP, TC-1 of the state unitary enterprise RAS SPM Barnaul CHP-2 and CHP-3, SPM Yuzhnouralskaya GRES, Nizhnevartovsk GRES SPMS, the SPMS Kharanor GRES, Verkhnetagilskaya GRES SPMS.

COMMISSIONING OF WATER TREATMENT PLANTS AND ADJUSTING WATER CHEMISTRY OF BOILERS AND POWER UNITS:

- Water chemistry of the boiler-utilizer project company Tohoku Electric Power Co. Inc in the city of Uralsk, Republic of Kazakhstan;
- Phrm. water chemistry of boilers BKZ-160–14 St. Nos. 1, 2, 3, 4 Zheleznogorsk thermal power station (Krasnoyarsk CHP-4);
- coordination of the commissioning of the water-chemical regime of boiler and demineralization installation, commissioning of stock reagents of CCGT-410 MW Krasnodar TPP chemical laboratory;
- commissioning and performance adjustment of the water chemistry regime of the block of 225 MW station No. 3 Kharanorsk GRES;
- commissioning and performance adjustment of the water chemistry of the waste heat boiler of CCGT-420 St. # 4, commissioning in the warehouse alkali, the organization of the chemical laboratory at Cherepovetsk GRES;
- coordination of pre-commissioning on the pre-treatment and demineralization installation, installation of oil containing wastewaters treatment, BOWE; a panorama of warehouses of reagents trisodium phosphate, caustic soda sulfuric acid and ammonia, the neutralization site waste water SPM and the main building, commissioning in the installation of correctional

treatment system of the fuel Assembly, commissioning and performance adjustment of the BOW and generally units PGU-420 MW St. № № 1, 2, 3 Nyagan TPP chemical laboratory;• commissioning and performance adjustment of water chemistry of power unit St. № 2 of Ekibastuz GRES-1 after the reconstruction.

PRE-OPERATIONAL AND OPERATIONAL CHEMICAL WASHING:

- BKZ-320–140-f-2 table-3 and TPE-430–140 St. # 15 JSC AES Ust-Kamenogorsk, Republic of Kazakhstan;
- K-50–14 St. No. 1 of NZIV in the town of Iskitim, Novosibirsk region;
- KE-25/14 station No. 5 Gornovsky plant spetszhelezobeton branch of JSC RussianRailways Novosibirsk region;
- three boilers WHL TES Fria the Republic of Guinea;
- BKZ-160–100-GM station No. 5 of CHPP-1 LLP MAEK-Kazatomprom in Aktau, Republic of Kazakhstan;
- three boilers of type EP-270/316/46–12,5/3,06/0,46–560/560/237 PGU-420 MW Nyagan GRES.

HEAT CHEMICAL TESTS OF BOILERS:

- DKVR 20/13 St. № 1 and BM-35 R station No. 2 thermal power station № 2 state unitary enterprise thOEA SB RAS in Novosibirsk;• HRSG units CCGP-420 St. № 2 and 3 of Nyagan GRES.

THE ANALYSIS OF COAL AND FUEL:

- for the period from 2005 to 2015 as the chemical laboratory of the production Department of water-chemical equipment-JSC Sibtechenergo provided services to more than 500 third-party organizations for technical and elemental analysis of coal, technical analysis of liquid fuel.



1. ANATOLY DUDIN
head of chemistry Department
2. TAISIA YADRYSHNIKOVA
head of the chemical laboratory





8 COMMISSIONING of Automated control systems (ACS TP)

THE COMPLEX OF WORKS ON DESIGN:

- management systems mechanical equipment with the capacity deficit in the power system and the allocation for unbalanced load (AWSN) until the own needs of power stations with transverse relationship to the Omsk CHP-3, CHP-4, CHP-5 and CHP Kemerovo;
- ACS TP plant parts and TPP boilers Achinsk oil refinery.

SUPPLY, INSTALLATION AND COMMISSIONING OF HEAT PART AWSN OMSK CHPP-4.

RESEARCH AND DEVELOPMENT of ALGORITHMS for AUTOMATION of FUEL CONTROL NO. 3 AND CONTROL the LEVEL of COAL IN BOILERS BC BKZ-320 article No. 17, 18, 19, 20, KRASNOYARSK TPP-1.

COMMISSIONING AND PERFORMANCE ADJUSTMENT WORK FULL-SCALE ACS TP:

- coal-fired units of 225 MW st No. 3 Kharanorsk SDPP, station No. 4 and No. 6 of Belovo SDPP;
- units SGU-420 MW St. № № 1, 2, 3 Nyagan GRES, st No. 4 at the Cherepovetsk GRES, St. # 9 Serovo TPP, SGU-135 MW TPP Budennovsk;
- mini CHP North and Central on the island of Russian in Vladivostok in preparation for the 2012 APEC summit;
- boilers №№ 1, 2, 3, 4, 5 TPP Achinsk oil refinery.

THE COMPLEX OF WORKS ON TESTING OF POWER UNITS AND CHP THE OPPORTUNITY OF THEIR PARTICIPATION IN OVERALL PRIMARY FREQUENCY REGULATION IN THE SYSTEM (OPFR):

- coal-fired units of 225 MW st No. 3 Kharanorsk SDPP, st No. 4 and No. 6 of Belovo SDPP;

- units PSU-420 MW St. № № 1, 2, 3 Nyagan GRES, st No. 4 at the Cherepovetsk GRES, St. # 9 Serovo TPP, PSU-135 MW Budennovsk TPP, CCPP, a 410 MW Krasnodar TPP;
- Omsk CHP-3 and CHP-5, Tomsk CHP-3.

AN EXAMINATION OF THE PARTICIPATION IN OPFR:

- units 210 MW St. № 1 and № 2 Neryungri SDPP, st No. 7 and No. 8 of Primorskaya hydroelectric power station;
- The Khabarovsk CHP-1, TPP May, Partizansk SDPP

IN 2015 JSC SIBTECHENERGO RECEIVED CERTIFICATES FOR THE RIGHT OF CARRYING OUT OF TESTS OF PARTICIPATION OF POWER UNITS IN RATED PRIMARY AND SECONDARY FREQUENCY REGULATION.

9. WORK TO DETERMINE THE TECHNICAL STATE OF BUILDINGS AND STRUCTURES

ПРИ ВЫПОЛНЕНИИ РАБОТ СПЕЦИАЛИСТЫ ЦЕХА ЗДАНИЙ И СООРУЖЕНИЙ ПРИМЕНЯЮТ:

- modern equipment and tools, which allows to determine the condition of the foundations, the soil under the sole Foundation and means of radar techniques, the physical condition of bearing and enclosing structures (strength characteristics);
- use of radar methods of diagnosing detected leaks from pipelines and underground tanks are determined by the dimensions and location of underground facilities;
- thermal imaging measurements allow to determine the actual heat loss through the building envelope, as well as the presence of hidden defects in building structures;
- works on seismic zoning the site and passportization of buildings and structures.

SURVEY OPERATIONS INCLUDE:

- carried out high-precision geodetic settlement observations of footings of buildings, structures and equipment;
- shooting horizontal and vertical position of crane tracks cranes;
- measure values private and common trunks of rolls of chimneys and tall structures;
- measurements of stacks of loose materials with the processing of measurement results;
- deformation measurement of structural deflection of trusses, beams, columns, foundations equipment;
- determination of verticality of columns, pillars piers, foundations;
- the preparation of master plans under construction and in operation of power facilities.

OUR SPECIALISTS PERFORM:

- projects for reconstruction and technical re-equipment of existing and newly commissioned buildings and structures of TPP;
- pre-work (phase initial feasibility study and feasibility study);
- over 15 years expertise of hazardous production facilities (all conclusions are registered in Rostekhnadzor);
- examination of project documentation of a newly constructed or reconstructed buildings and facilities of enterprises.

FROM 2007 TO 2015 ACCOMPLISHMENTS:

- pre-project survey and preparation of project documentation for the rehabilitation of the tailings storage facility of the Novosibirsk chemical concentrates plant (NCCP);
- the project of reconstruction of the temporary end of Biysk CHP;
- the project is replacement of the dust extraction plant of boiler № 1 of the CHP PPGHO in Krasnokamensk city;

- calculation of seismic stability of buildings and structures Irkutsk thermal power station-10 and Biysk CHP;
- together with Novosibirsk State Building University executed a number of works at Berezovskaya GRES

INTRODUCING NEW METHODS OF DIAGNOSIS:

- one such method is the measurement of the dynamic reliability of buildings and structures existing thermal power plants.

FOR THE PERIOD FROM 2005 TO 2015 AS THE WORK ON DETERMINING THE TECHNICAL CONDITION OF BUILDINGS AND STRUCTURES IMPLEMENTED AT THE FOLLOWING: Ekibastuz GRES-1 and GRES-2 (Kazakhstan), Barnaul CHP-2 and CHP-3, Biysk TPP, Berezovskaya GRES, Minusinsk CHP, Tomsk GRES-2, Reftinskaya GRES power plant JSC JEEC (Republic of Kazakhstan), Tom-Usa SDPS, Belovo SDPP, Krasnoyarsk TPP-1 and TPP-2, TPP Kuznetsk, Kemerovo CHP, CHP PIMCU (Krasnokamensk), the Novosibirsk chemical concentrates plant (Novosibirsk), Nagan GRES, Cherepovetsk GRES, Serov GRES.

10. THE WORK OF THE ALTAI BRANCH

MAIN ACTIVITIES:

- inspection of buildings and structures;
- the development of the plan of manufacture of works on a particularly difficult and dangerous work;
- project works
- construction and installation works;
- repair of technological and energy equipment of buildings and structures.

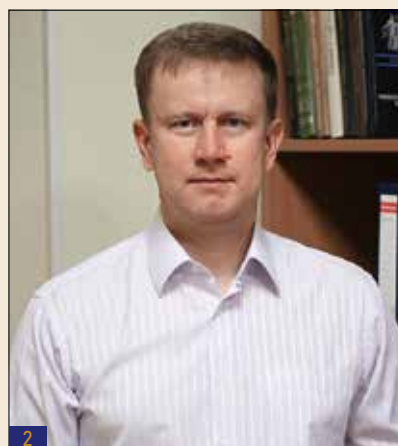
COMPLETED:

- project work at Barnaul CHP-2 and CHP-3, CHP Biysk, Ufa TPP-4, Ryazan SDPP;
- construction works at Barnaul CHP-2 and CHP-3, CHP Biysk and other objects.

1. EUGENE GORSKY head of Department of automated control systems of heat power processes

2. DENNIS KOZHIN head of Department of heat engineering measurements

3. VLADIMIR DEMIN head of Department of buildings and structures







RELEVANT TO IMPLEMENTING ENGINEERING DEVELOPMENT

AUTOMATIC SELECTION OF POWER PLANTS FOR LOAD BALANCING

- The algorithm works for stations with transverse relationship.
- performed system designs for allocating TPP cross-linked to an unbalanced load for several power plants in the Omsk energy system and Kuzbass.
- Introduction ASN at Omsk CHPP-4 (2008-2010).

PURIFICATION EQUIPMENT ON THE BASIS OF PNEUMOPULSE GENERATORS

- The development of JSC Sibtechenergo in collaboration with the Institute of theoretical and applied mechanics of a name S. A. Khristianovich Siberian branch of RAS and LLC Sibtechacadem.
- The working principle is based on short-term influence of powerful gas jets that are created with the help of special pneumopulse generators.
- The introduction effect — eliminating time-consuming and dangerous manual operations, and the transition to real preventive cleaning with a real increase in the efficiency of equipment.
- Main applications for thermal power plants — cleaning of heating surfaces of boilers and bunkers.
- Introduction: the system of pneumopulse blasting heating surfaces of the boiler PK-38 St. № 6A Nazarovo SDPP (2009-2010).



ELECTROCHEMICAL TECHNOLOGY OF IGNITION AND COMBUSTION OF PULVERIZED COAL

- In 2015 completed research and tested the technological system in the course of a month in a continuous manner To the boiler-pulverized coal boiler K-50. Confirmed all of the required characteristics of the system
- The effect of the introduction — stabilization of combustion of pulverized coal without backlighting the oil, reducing fuel oil consumption for firewood and improve the technical-economic indicators of operation of the boiler equipment.
- The complexity of implementation is the need of adapting the system to the specific design of the burner.
- JSC Sibtechenergo offers for realization of projects of introduction of experimental devices.





JSC SIBTECHENERGO

THE UNITY OF EXPERIENCE AND YOUTH



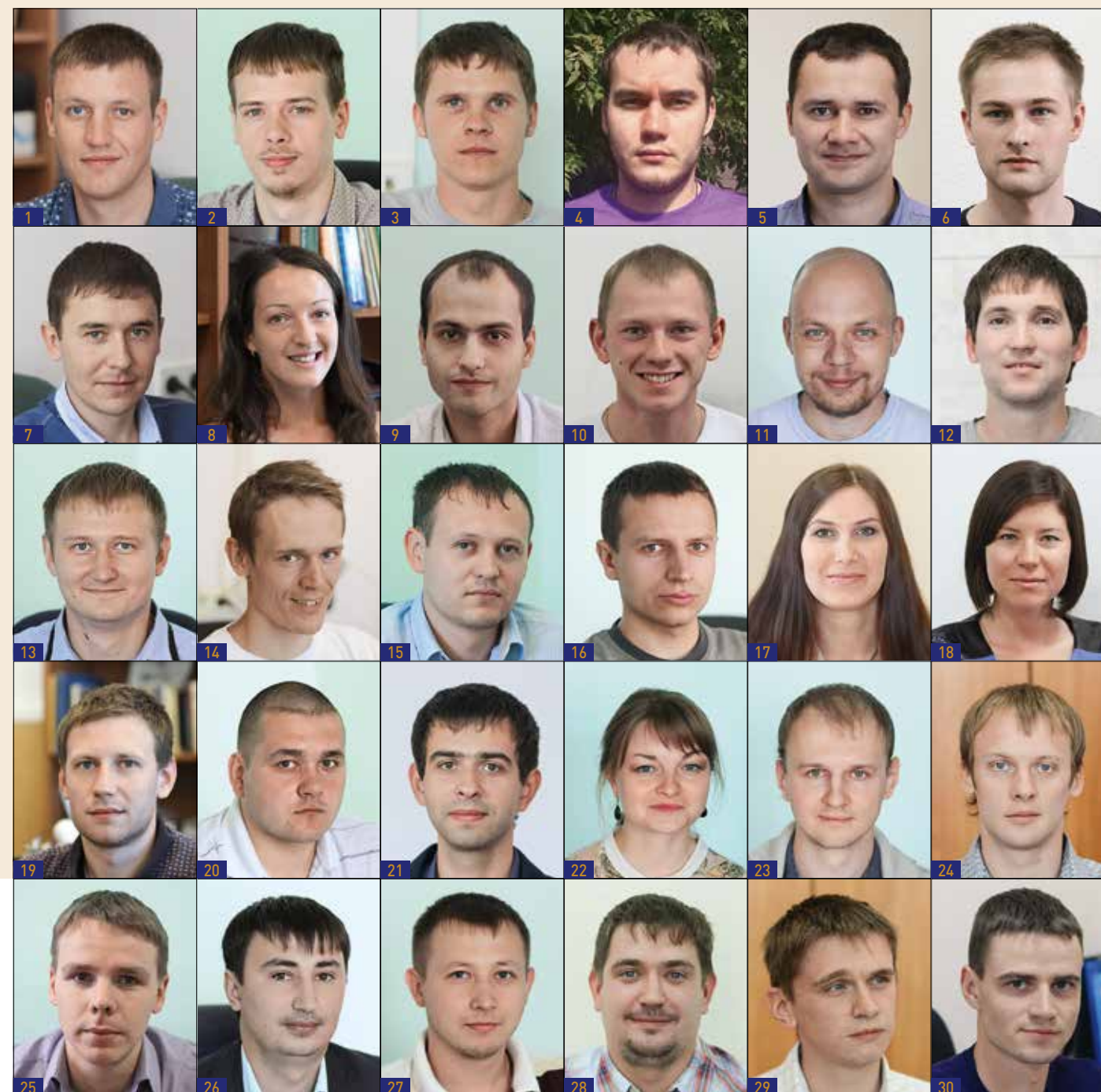
THE COMPANY A LOT OF VETERANS WHO PASS ON THEIR KNOWLEDGE AND EXPERIENCE WITH YOUNG:

- | | | |
|-------------------------------|------------------------|---------------------------|
| 1. Vyacheslav BARANOV , Ph.D. | 8. Savely CADUSEVIC | 15. Grigori STARIKOV |
| 2. Boris BELOSLUDTSEV | 9. Gennady KITAEV | 16. Nina STRIENOK |
| 3. Alexander BOGIDAEV | 10. Anatoliy KOVALCHUK | 17. Yuri USATOV |
| 4. Anatoly BRAVIKOV | 11. Vladimir LESNIKOV | 18. Gennady CHASHCHIN |
| 5. Alexey BULGAKOV | 12. Aelii RADZION | 19. Tatiana CHERNYSHEVA |
| 6. Vitaly VERSHININ | 13. Ivan ROMANCHUK | 20. Vyacheslav SHEVCHENKO |
| 7. Sergey GOLTZ | 14. Nikolai SMIRNOV | |



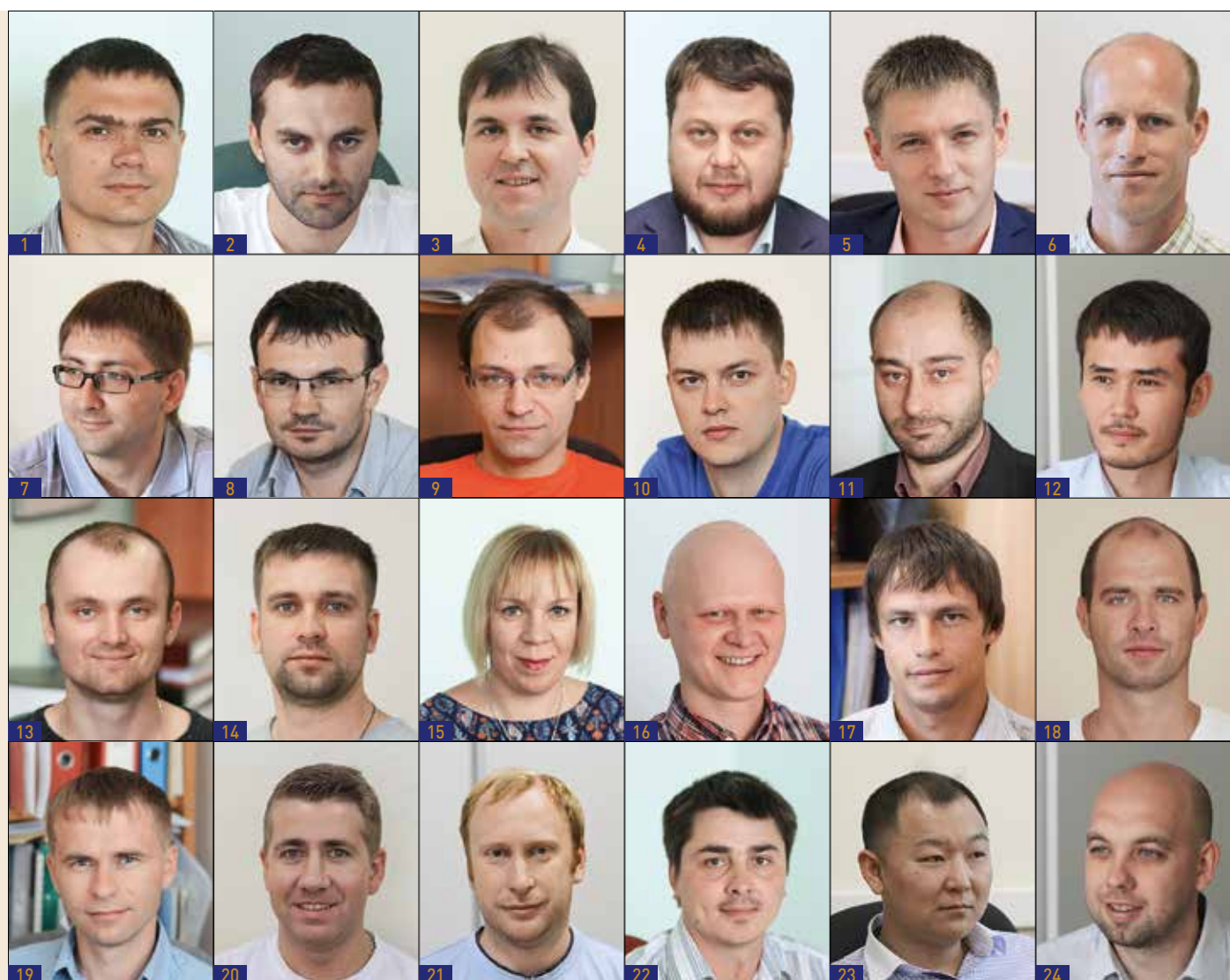
TALENTED YOUNG PROFESSIONALS UNDER THE AGE OF 30 WHO ARE QUICKLY BECOMING HIGHLY QUALIFIED:

- | | | |
|-------------------------|-----------------------------|---------------------------|
| 1. Semyon BAGRANOV | 11. Pavel ENIKEEV | 21. Valery SALNIKOV |
| 2. Alexander VISHNEVSKY | 12. Alexandr KOLBIN | 22. Lydia SAFRONOVA |
| 3. Sergey GAVRILOV | 13. Vyacheslav KORABEYNIKOV | 23. Vyacheslav SLES |
| 4. Anatoly GRIGORIEV | 14. Anton NIKONOV | 24. Andrey TUSTIN |
| 5. Alexey DMITRIEV | 15. Alexey OVCHINNIKOV | 25. Dmitry HVOSTENKO |
| 6. Danil DUBOV | 16. Zakhar PAVICKI | 26. Sergey KHOMENKO |
| 7. Dennis EGOROV | 17. Anastasia PETREIKIS | 27. Anton CHASHCHIN |
| 8. Oksana EMELYANOVA | 18. Ksenia PRUDNIKOVA | 28. Konstantin CHISTYAKOV |
| 9. Alexandr ZBITNYEV | 19. Dmitry PYZHOV | 29. Vladimir CHUKHLOVIN |
| 10. Leonid ZVONAREV | 20. Eugene RATKOV | 30. Andrey SHINKAREV |





succession pool



TALENTED PROSPECTIVE PROFESSIONALS WITH A HIGH QUALIFICATION AND ARE ALREADY GUIDING OBJECTS AND ENTIRE AREAS:

1. Vadim BADASH
2. Vasily VARIC
3. Gennady GOLOVKO
4. Victor GRIGORIEV
5. Maxim GUMILEVSKY
6. Ilya DEGTYAREV, Ph.D.
7. Anton DRUGOV
8. Andrei DRUZHININ

9. Alexander DUDKIN
10. Roman YEZHOF
11. Evgeny GILIOV
12. Yermek JUMANOV
13. Alexandr IVANOV
14. Dmitry KONOVALOV
15. Kseniya LIMANSKAYA
16. Sergey LISENKIN

17. Vasily MARTYNOV
18. Vadim NEMOV
19. Ilya RONZHIN
20. Ilya TRUSOV
21. Ivan KHALIMOV
22. Andrey SHATUNOV
23. Paul YUGAY
24. Egor YAGANOV



ACHIEVEMENTS AND AWARDS

the year 2011 The team of JSC ☐ Sibtechenergo awarded the diploma of Administration of Leninsky district of Novosibirsk city for 1st place in the regional stage of the competition for the title ☐ Enterprise of high social responsibility ☐ in the sector ☐ production and distribution of electricity, gas and water ☐.

the year 2011 Honorary diploma of the Administration of Leninsky district of Novosibirsk city awarded the General Director of JSC ☐ Sibtechenergo for great personal contribution to the socio - economic development of the region on results of work in 2010

the year 2012 JSC ☐ Sibtechenergo included in the national register ☐ Leading energy organizations of Russia-2011 ☐ on the basis of proposals by office of energy and emergency situations of the Ministry of industry, trade and entrepreneurship development of Novosibirsk region.

the year 2012 JSC ☐ Sibtechenergo was awarded a diploma of Rating of analytical group ☐ For contribution to the development of the industry ☐ with the award of honorary 2nd place among 10 120 enterprises of similar activity (☐ Activities for ensuring operability of thermal power plants ☐.

the year 2012 Diploma ☐ professional of the year ☐ Rating analytical group awarded General Director of JSC ☐ Sibtechenergo is awarding the honorary 2nd place among the leaders of 10120 enterprises of similar activity (☐ Activities for ensuring operability of thermal power plants ☐.

the year 2013 JSC ☐ Sibtechenergo issued by the Federal certificate about granting of honorable title ☐ Leader of Russia-2013 ☐ - awarding ☐ Gold rating ☐ in the TOP 10 in the Russian Federation in the sum of three categories of financial and economic activity, with rewarding wall medal ☐ Leader of Russia 2013 ☐.

the year 2014 JSC ☐ Sibtechenergo issued by the national certificate ☐ For significant contribution to the development of the Russian economy, fair taxation, the achievement of high economic indicators, reflected in achieving the 1st place in the rating of industry (☐ Activities for ensuring operability of thermal power plants ☐), with wall awarding the medal ☐ industry leader 2014 ☐.





the year 2014 Organization “all-Russian business rating” the Director General of JSC “Sibtechenergo” awarded the title “professional of the industry–2014” for significant personal contribution to the success and benefits of enterprise over competitors.

the year 2014 JSC “Sibtechenergo” was awarded the Diploma of the Novosibirsk mayor office with the rank of the winner of the competition for the title “Enterprise of high social responsibility”.

the year 2014 JSC “Sibtechenergo” issued by the Federal certificate about granting of honorable title “Leader of Russia–2014” with awarding the “Gold rating” in the TOP 10 in the Russian Federation in the sum of three categories of financial and economic activity, with rewarding wall medal “Leader of Russia–2014”.



FOR 60 YEARS JSC
SIBTECHENERGO □ COMPLETED
COMMISSIONING
MORE THAN 300 LARGE OBJECTS