



CENTURY-OLD TRADITIONS - STATE-OF-THE-ART TECHNOLOGIES

IZOLYATOR

Company established in 1896

Results of 2018

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Power Industry Beyond Borders and Distances: Results of the Year

At the 47th CIGRE session, which took place in 2018, Izolyator plant signed an agreement with an Indian company to set up a joint venture to produce high-voltage bushings. Alexander SLAVINSKY, EngD, Chairman of the Board of Directors at Izolyator is telling about the importance of the event.

— Alexander Zinovievich, why was the Russia-India agreement on cooperation signed during the CIGRE session? Why is the project of interest to Izolyator? How long was the path to the JV creation?

— The CIGRE session is a major energy forum in the world that brings together interests and demands of electrical equipment manufacturers and energy companies from all countries. Our participation in itself speaks that we are at the frontline of the world power industry. Russia has actively contributed to CIGRE throughout its participation in the organization. At the 47th CIGRE session, we communicated the position of the national energy community on current issues of power industry and electrical engineering. There is a great merit in it on the Russian National CIGRE Committee, led by Andrey Murov, Head of FGC UES.

The integral part of general sessions of CIGRE is working on the sidelines of the event, when aside from panel sitting, its participants have meetings, activities and sign agreements and contracts.

This time, a remarkable event took place at the Russian stand at CIGRE: in a solemn ceremony, in presence of top managers of the largest power grid companies of Russia and India, we signed an agreement with the Indian company Mehru Electrical & Mechanical Engineers.

Our path to that agreement was long enough. The Indian market

is of interest for any electrical equipment OEM and it is not so easy to find a place here. Entering the Indian market, we enter competition with very powerful global power equipment corporations. The key condition for staying on that market is to ensure an innovative product, which will be in high demand.

— Izolyator plant makes bushings for virtually all voltage classes, selling its products in more than 30 countries.

How competitive are Russian products on export markets?

— Capabilities of any manufacturing company are conditioned by its technical level. If it is a world-class product, it is in demand. What is «world-class» — CIGRE would give a definite answer. We also try to produce goods that meet IEC standards. At the same time, we believe it is of little use to only meet the world standards, we must be step ahead.

Standartization is a form of competition. If a company achieves tangible results in production, it must transfer that achievement into a standard - let the competitors try to keep up.

This approach is win-win solution for everyone. Firstly, the initiator of a standard will lead in the market for some time.

Secondly, the technical level of the rest of the companies is growing. Thirdly, the competition gets stronger, otherwise, any technical development is unthinkable.

— The foreign economic activities are critical in Izolyator operations. What was the com-

pany motivated by when entering international markets?

How strongly does the international cooperation influence the economic, technological and innovative activities of the company?

— With the years of experience, we have created a concept of sustainable development of our company. It stands on three whales: first — product range, second — balance between deliveries to domestic and foreign markets, third — production of equipment and transformer components for new transformers and spare parts for old type transformer equipment.

This quite specific model cannot be suitable for all. However, it works for manufacturers of ancillary equipment like Izolyator plant.

The balance of deliveries inside Russia and beyond it is a key to financial stability of the company. We found this formula long ago and try to stick to it. In 2017, the plant made and shipped over 220 pcs of 500 kV bushings to India. It is twice the volume of the demand of all Russian companies, including FGC UES, RusHydro, Rosatom, InterRAO in that voltage class.

The export orders give revenues in foreign currency. The stability of sales in Russian and foreign currency helps us maintain a high borrower's status, which is important for getting credits from the leading banks on good terms.

The energy system in Russia was formed long ago: we can invent

something new only modifying within the old system of dimensions and voltages. It puts some sort of blinkers on the eyes of designers. By all means, we can use new materials, create lighter and thinner construction designs. However, that would cost more as all new materials are expensive. While a thin construction design of a bushing does not always make sense as there is so much «hung» on a bushing normally. So, it has to stay powerful. So, when a foreign partner gives a task to the company to create a design from scratch, it provides for the space and perspective for technical creativity that are so wanting for a designer to progress. Besides, when an engineer is working on new objectives, he approaches old projects differently and finds room for improvement. Usually, while tackling new technical tasks, new ideas, new products are born. When an item is finally finished, we either put it into serial production, or wait for it to be in demand from the market.

Thus, thanks to an order from China, we put into a serial production a line of DC bushings for long-distance transmission lines. We know that our products will require to be replaced only decades later, but, fulfilling this order, we created complete documentation for production of DC high-voltage bushings. So, when they begin to build long-distance power lines some time in future in Russia, we would already have bushings in place for them.

— Do you plan to expand the export geography?

— By all means. We see good opportunities in the Middle East. We find very promising the first steps on the Turkish market. The transformer plants in Turkey are fully independent companies, without any obligations for large corporations. They have a comprehensive approach to cooperation issues, a good German engineering school. And they treat Russia quite well. We start to discuss cooperation with Syria: we already received a delegation and discussed production issues. We will continue working with our old partner — Iranian company Irantransform. We also consider other markets.

— How successful was 2018 for the company and what plans are you making for 2019?

— On domestic market, we were able to stabilize our presence and even develop it. We are regaining contacts with our old partners in Russia and CIS countries.

We have created new designs of RIN bushings — they are already installed at different facilities and will, hopefully, prove highly reliable. Soon, we should be able to certify that product with Rosseti PJSC and offer it to all our consumers.

In terms of international operations, our key achievement is creation of a joint venture with an Indian company and development of cooperation with the Middle Eastern countries.

No less important, in my view, is that we have become recognized in all corners of Europe and Asia. When meeting potential partners, we do not have to go long, telling who we are. Izolyator plant has become a brand.





«Power complex of Russia must be ready to quickly adapt to modern technological trends, connected with creation of intellectual digital systems»

Alexander Novak,
Minister of Energy of Russian Federation

Russian Power Industry: Results and Prospects



General Director, Chairman of the Board, Rosseti PJSC Pavel Livinsky and Minister of Energy of Russian Federation Alexander Novak are walking the exposition of the Power Grids International Forum in Moscow

The past year for the Russian power industry became the time to sum up the results and outline new plans of development. The replacement of fixed assets is going at an accelerating pace. The generation received 4,5 GW of new capacity in the departing year. Five new power plants were put in operation in Kaliningrad and Crimean power systems, opening additional opportunities for their economy development. In 2018, over 28 thousand km ETL and more than 12,5 MVA transformer capacity was put into service.

There is a continued trend in development of renewable energy sources in generation, which helps to cut down costs on fuel procurement for remote and isolated regions. Aside from solar generation, habitual for our country, some regions can boast to operate the first Russian wind farms now.

There are important challenges facing the Russian energy sector in terms of infrastructure and distributed generation development, modernization and digitalization, implementation of intellectual control systems in power complex management. ■

*Adapted from the Ministry
of Energy of Russian Federation*

Are Businesses Prepared for Import Substitution?

There was a meeting in the State Duma of Russian Federation to discuss prospects of import substitution. Alexander Slavinsky, Chairman of the Board of Directors at Izolyator, Head of study committee D1 RNC CIGRE «Materials and Emerging Test Techniques» participated in it.

The officially announced topic for discussion was «Import substitution development program at Rosseti PJSC in R&D, prototyping works, business and promotion of domestic electrical engineering technologies in the power grid of Russian Federation».

The sitting was chaired by the first deputy Energy Committee Chairman of the State Duma of Russian Federation, Just Russia representative Igor Ananskikh. Management representatives of Rosseti and other leading industrial companies of the country's power sector also took part in the event.

Participants of the meeting agreed that a lower dependence of Russia's fuel and energy sector on import of equipment and services of foreign compa-

nies is a priority for Russian power grid companies.

In his speech, Alexander Slavinsky emphasized that the domestic electrical engineering companies are prepared to actively engage in import substitution programs and on the example of Izolyator

plant and Rosseti PJSC cooperation told about innovative designs of electrical production.

Besides import substitution issues, the participants of the sitting discussed problems of legislation that regulate that area. ■



Sitting of the energy section of the Expert Council of Just Russia faction in the State Duma of Russian Federation dedicated to the import substitution program of Rosseti PJSC

2,3 mln km outstretch of Rosseti power lines Over 100 mln consumers

Attention to trends



The XXVIII Conference of International Association TRAVEK in Moscow

Izolyator representatives participated in the XXVIII TRAVEK Association International Conference.

The international scientific and practical conference «Prospects of power industry

and high-voltage electrical equipment development. Converter equipment, switching devices, microprocessor control and protection systems» went with support from the Russian Academy of Science, Academy of Electrical Sciences of Russian Federation, the Ministry of Industry and Trade of Russian Federation, Rosseti PJSC, FGC UES PJSC.

Management and technical specialists of high-voltage equipment consumer companies, representatives of power equipment OEMs from Russia and abroad, leading scientists, designers, representatives of R&D and design organization and universities took part in the conference.

Participants of the conference produced a summary document that reflects the key achievements, mentioned in the reports of the conference speakers, attractive directions of equipment and energy systems development, recommendations for consumer companies and manufacturers of high-voltage electrical equipment. ■

Conference on Diagnostics of Power Equipment

Izolyator plant took part in a conference on diagnostics of power electrical equipment in Surgut.

The scientific and practical conference «Systems and organization of uninterruptible monitoring of condition of main electrical equipment and power lines: methodology, instrumentation and legislation» went with support from study committee D1 of the Russian National Committee of CIGRE (RNC CIGRE) «Materials and emerging test techniques»

Specialists and technical managers of power grid and generating companies, electrical engineering plants, R&D and design organizations, maintenance and service companies, developers and OEMs of diagnostic complexes and monitoring systems from Russia, CIS and non-CIS countries took part in the conference.

At the conference, Alexander Slavinsky made a report «Key trends in monitoring, diagnostics and testing of electrical equipment, results of the 47th CIGRE session».

Sergey Kassikhin presented a report «Importance of controlled characteristics of the

insulation of high-voltage bushings during long-term operation».

Summing up results of the conference, the Community council on diagnostics of power

electrical equipment by ETC UralEnergEngi-neering in close cooperation with study committee D1 RNC CIGRE prepared a collection of reports that were read at the conference. ■



The scientific and practical conference on diagnostics of power electrical equipment in Surgut

8 | Industry Events — 2018 in the photographic lens



◀ Agreement to set up a JV between Mehru and Izolyator has been signed. L-R: Chairman of the Board of Directors FGC UES Andrey Murov, Chairman of the Board Power Grid Corporation of India Limited Indu Shekhar Jha, Executive Director Mehru Sandeep Prakash Sharma and Chairman of the Board of Directors Izolyator Alexander Slavinsky. 47th CIGRE session in Paris

▶ Trilateral meeting at the 47th CIGRE session. Center — Alexander Slavinsky, and L-R: PowerGrid Chairman Indu Shekhar Jha, Ivan Panfilov and Executive Director Mehru Electrical & Mechanical Engineers (P) Ltd. Sandeep Prakash Sharma



▶ Participants of the working meeting with EVN NPT management at the 47th CIGRE session (photo: FGC UES)



▶ Panel of the Eastern Economic Forum 2018 in Vladivostok

▶ Participants of the Russia-Vietnam workshop «Experience sharing in electric power transmission and distribution – electrical equipment of Russia». Hanoi, Vietnam



▶ Dmitry Medvedev and his party are viewing SS Sloboda of Moscow United Electric Grid Company (photo: Rosseti Group)

10 | Sustainable Energy of the Future: Digitalization of Power Sector

2018 was marked by a number of largest international forums in Moscow. On 2–4 October, Russian Energy Week took place and on 4–7 December — International Forum «Power Grids 2018».



Traditionally, the largest international energy companies, leading world experts, heads of RF regions' administrations participate in REW-2018. According to the Head of Ministry of Energy of Russian Federation Alexander Novak, over 10 thousand specialists from many segments of industry, representing 100 countries, visited the forum. In spite of the fact that the history of REW takes its start in 2016, the forum has won recognition as «presidential»

REW-2018
Over **10 000**
participants
from **100**
countries of the world

venue as it hosts meetings of OPEC representatives, forums of gas exporting countries and UN.

This year, the key topic of the International Forum «Russian Energy Week» became «Sustainable development of energy in conditions of changing world».

RF President Vladimir Putin spoke at the plenary sitting of REW, saying that it is possible to have progress in the world power industry through a constructive dialogue, without political background. The head of the state also promised that Russia's approaches to exports deliveries of energy will remain responsible and reliable despite escalating sanctions.

This time, a record number of visitors attended Russian Energy Week, including specialists and everyone interested in energy sector - about 9500 people. They came to discuss issues of the global energy agenda in an open and confiding manner.

Our country holds leading positions in oil and gas production and export, electric power generation and coal mining. It is extremely important for us to feel the trends of the global energy sector to efficiently use our competitive advantages and, together with other countries, form a common energy space and the future of the power industry», said Vladimir Putin.

There were two main blocks in the business agenda. The first one - Global Energy Agenda - mentioned aspects

of energy sector development in a changing world, ranging from problems of access to ecologically clean fuels in Asian Pacific and African countries to development of energy sector and implementation of new technologies in the Arctic. Participants discuss the global energy market, challenges facing the world power industry, the newest energy efficiency and energy saving technologies, prospects of renewable sources of energy and nuclear energy.

There were 67 events in the agenda of the forum, with 471 speakers participating. Russian Energy Week provided a unique opportunity to Russian specialists of the energy sector to share their point of view on current issues, take part in discussions about development of the industry and hear the positions of the world's leading experts.

On the margins of the forum, Chairman of the Board of Directors at Izolyator Alexander Slavinsky had several meetings with representatives of the world leading energy companies and electrical engineering companies and participated in the work of the panel session «Russian power grids: dialogue with suppliers».

The International Forum «Power Grids 2018» (PGIF-2018), organized by Rosseti, became an important sectoral event of 2018.

Over 15 000 people attended the forum — much more than initially expected and forecasted.

Over a period of four days, heads of federal and regional legislative and executive bodies (namely, heads of region administrations: Anton Alikhanov, Kaliningrad regions, Evgeny Savchenko,



PGIF-2018
over **15 000** participants
from **27** countries of the world

Belgorod region, Alexander Brechalov, Udmurt Republic, Alexander Gusev, Voronezh region), top management of the largest power grid and generating companies, power equipment OEMs, scientific organizations and associations, Russian and foreign experts in power industry were involved in forum activities.

The exhibition program comprised 402 exponents from 27 countries to make a new record. 330 experts to part in the round-tables and discussion panels.

The forum discussed issues, largely related to digital transformation of the sector. Round-table participants spoke about cybersecurity, technological innovations, cooperation with small and medium-sized enterprises, international coordination, space technologies. Those are some of the topics, raised during discussions at PGIF.

Technologies of automation, digitalization, electricity metering were

presented. Pavel Livinsky marked that using only domestic digital technologies, there are substations in Moscow and other regions of Russia already running. Representatives of Russian companies informed the Minister of Energy that domestic equipment is also exported.

Andrey Murov, FGC UES Chairman spoke about creation of conditions for industry transformation, including economic incentives for digitalization, at the panel discussion: «The role of the state in the future of the power sector: internal and external prerequisites of changes».

Several activities of the Russian National Committee of International Council on Large Electric Systems (RNC CIGRE), headed by Andrey Murov since

2015, took place at the forum venue. The committee's objectives are promotion of progress of Russia's science and technology, participation of domestic specialists in activities of the global expert community, which defines vector of power industry development globally. For instance, at the forum, they reviewed the experience of application of direct current systems and power electronics for increasing reliability of networks and realization of international projects, as well as designing and operation of aerial power lines.

International forums REW-2018 and PGIF-2018 brought practical results – cooperation agreements between world's leading energy and industrial corporations were concluded on the margins of both forums. ■





«Challenges of the modern world demand that we meet the trends of the world power industry. There is no possibility of taking us to a whole new level without outpacing the transition schedule in digitalization strategy realization»

Pavel Livinsky,
Director General of PJSC ROSSETI

On the Path to A Large Modernization



Alexander Slavinsky at the presidium of the panel session «Russian networks: a dialogue with suppliers» at the Russian Energy Week-2018 in Moscow

At the REW-2018, Chairman of the Board of Directors of Izolyator Alexander Slavinsky took part in the panel session «Russian networks: a dialogue with suppliers». Sergey Sergeev, Deputy General Director on Capital Construction at Rosseti PJSC moderated the session.

The panel discussion participants stated that the power sector of Russia needs a large modernization of equipment, with one of the gravest problem being a substantial depreciation of capital assets. The leading role in modernization process is given to the Russian manufacturers and foreign partners of Rosseti holding, experienced in digitalization of power grids. The digital transformation of the power sector opens new opportunities for the domestic business that should be seized and used. ■

Digital Transformation of Power Industry is on the Agenda

At the Forum, Alexander Slavinsky took part in the work of the panel session «Digital substation: solutions, experience, prospects of development». Deputy General Director, Chief Engineer at Rosseti PJSC Andrey Mayorov moderated the session.

The participants of the discussion agreed that the digital transformation of the power industry bring in new opportunities for the power complex and domestic power products manufacturers that can be seized and used.

The practical steps, expected in realization of the goal, set a lot of tasks before power engineers. The first one is development of a digital substation standard itself. According to Andrey Mayorov, the standard is prepared and is now under approval. Later, a stage by stage transition of substations to the digital format (there are over 14 thnds of them operated by Rosseti only) will be carried out.

At the first phase, the group of companies will build all new substations only as digital. Afterwards, it will equip the existing facilities, paying a special attention



Deputy General Director, Chief Engineer at Rosseti PJSC Andrey Mayorov (holding microphone) and Alexander Slavinsky in the presidium of the panel session «Digital substation: solutions, experience, prospects of development»

to the cybersecurity of electric networks. Many speakers are suggesting to use a cluster principle in digital substations organization.

Alexander Slavinsky also took part in the sitting of the editorial board and editorial team of «Electric power. Transmission and Distribution Magazine». The meeting went in the round-table format «In simple words about complex things:

prospective technologies of knowledge sharing about power networks digitalization trends».

Leading experts of the power complex of Russia took part in discussions of topical issues, relevant to development of the professional information environment for professionals of the power complex during the transition to digital technological platform. ■

Over
100 countries
of the world
represented
at REW-2018

15 000 visitors
attended
PGIF-2018



Participants of the meeting of FGC UES, Vietnamese EVN NPT and Izolyator plant management meeting in Moscow

Amplifying Effects of Experience Exchanges

Izolyator participated in a meeting of top management of the Federal Grid Company of the Unified Energy System of Russia and the state power grid corporation of Vietnam EVN NPT.

During the visit to Moscow, EVN NPT's delegation, led by President, General Director Nguyen Tuan Tung, met with the Chairman of the Board of Directors of FGC UES Andrey Murov, visited the control and dispatch and R&D centers of the company, as well as International Forum «Russian Energy Week».

At the meeting, the executives discussed cooperation in the frame of the Memorandum of Understanding (signed 2017), including exchange of expertise in operation of high-voltage power facilities, professional training of staff. For instance, in the 4th Q 2018, in Vietnam, several professional training events, prepared with FGC UES's programs, were organized for EVN NPT specialists. Also, the sides discussed intensification of exchanges in respect to technology, including implementation of innovations in the power industry of Vietnam.

Chairman of the Board of Directors Alexander Slavinsky, Commercial Director Ivan Panfilov and Head of International Business Development Andrey Shornikov represented Izolyator at the meeting.

The Vietnam delegation visited FGC UES's dispatch center and received an introduction to the technologies of remote control of power facilities and emergency recovery works procedures.

At the R&D Centre of FGC UES, the Vietnam delegation saw the work of research test-

ing grounds «Superconductivity» and «Digital substation», center of testing and certification, key engineering designs and competences in certification of electrical equipment, energy efficiency, project of high-temperature superconductive cable line construction in Saint Petersburg and complex solutions for intellectual networks.

At the invitation of FGC UES's Head Andrey Murov, EVN NPT delegation visited the Russian Energy Week. ■



EVN NPT delegation is on a tour at R&D Centre of FGC UES

14 | Business Meetings at International Forums



▶ Meeting with Chief Engineer of Velikoluksky electrical equipment plant Alexander Kozlovsky

▼ Alexander Slavinsky and Deputy General Director on Capital Construction at Rosseti PJSC Sergey Sergeev



▲ L-R: Oleg Bakulin, 1st Deputy General Director Chief Engineer IDGC Ural Vladimir Bolotin and Alexander Slavinsky



▼ L-R: Alexander Slavinsky, 1st Deputy General Director, Chief Engineer at Lenenergo Igor Kuzmin and 1st Deputy General Director, Chief Engineer at IDGC Center Alexander Pilyugin





▶ General Director IDGC Center Igor Makovsky and Alexander Slavinsky

▶ Meeting with business partners – representatives of the Chinese Bushing HV Electric Co., Ltd



▶ Maxim Zagrebin at the stand of Togliatti Transformer plant

▶ Alexander Slavinsky and Deputy General Director Technical Policy, Chief Engineer IDGC South Pavel Goncharov



16 | The Forum Became One of Most Important Industry Events of the Year



◀ L-R: Alexander Slavinsky, Director of Procurement, Head of Supply Chain at IDGC Siberia Valery Dubrovsky and Oleg Bakulin

▼ L-R: Yury Kukhtin, Sales Director EE at Reinhausen Power Composites GmbH Kinga Kastenberger and Dmitry Abbakumov



▲ L-R: Maxim Osipov, Alexander Slavinsky and Director of subsidiary on procurement Tajikenergосnab of Barki Tochik holding company Sodikdzhon Boboev



► Purchasing & Logistics Director at VNIIIR Hydroelectroautomation Olga Tkach and Oleg Bakulin





REW
2018

INTERNATIONAL FORUM «RUSSIAN ENERGY WEEK 2018»

Key Topic «Sustainable Energy for the Changing World»

Supported
by:



Ministry
of Energy
of Russian
Federation



Government
of Moscow



Roscongress
Fund

9500 participants

700 Russian companies



3000 representatives
of business
community

3500 experts,
government
officials,
specialists

200 foreign companies



67 activities

471 speakers



PGIF

INTERNATIONAL FORUM «POWER GRIDS 2018»

Forum of Leaders of Networks Digitalization

Supported
by:



ROSSETI

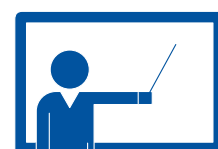
Objectives:

- ✓ Sourcing modern solutions for digitalization of grid and their implementation.
- ✓ Defining key areas of import substitution.
- ✓ Discussing prospective coordination of digital networks projects implementation.
- ✓ Development of package solutions for «intellectualization» and informatization of the industry.

>10000 participants



>400 exponents



>20 participating countries



>40 business events





«The goal of RNC CIGRE conferences is pursuit of a bigger influence that Russian specialists and companies exert in international expert community»

Andrey Murov,
RNC CIGRE Chairman, Chairman of the Board FGC UES

Andrey Murov had a meeting on key activities of RNC CIGRE in 2019



Meeting to discuss key activities of RNC CIGRE in 2019

Next scheduled meeting of the leading science and technology partners to the Russian National Committee of the International Council on Large Electrical Systems (RNC CIGRE) took place, chaired by the Head of the Russian branch of the organization — FGC UES Chairman Andrey Murov. At the meeting, there were discussions about priority research areas, including the topics of increasing flexibility of energy systems and selection of optimal solutions in digitalization as well as preparation to a sitting of the high governing bodies of CIGRE, scheduled for the first time in Russia in 2019.

Management of the base organizations of RNC CIGRE — Deputy Chairman of the Board of the System Operator of the Unified energy system Fyodor Opadchiy, President of the Moscow Power Institute Nikolay Rogalyov, Member of the Board at Inter RAO Yuri Sharov, General Director at RTSOft Olga Sinenkov and others took part in the meeting.

When discussing the results of 2018, the participants of the working meetings agreed that the key event in CIGRE activities was by all means the 47th session in Paris, where the Russian delegation became the 6th by attending delegates, presenting a record number of reports.

The Russian technologies that were exhibited and presented at the scientific sessions attracted a substantial share of attention. It is a fact that the number of companies that participated in the collective exposition of RNC CIGRE doubled comparing to 2016. Besides, this years exposition boasted new independent exponents, such as Skolkovo foundation residents and Kaspersky Lab.

The key target in the near months is preparation for having a joint meeting of the managing committee of the technical council of CIGRE, which is set to take place on 7–9 October 2019 in Saint-Petersburg. Among priority areas of technology-oriented research of RNC CIGRE are expansion of big data analysis, artificial intellect, remote operation, energy saving, demand planning and cyber security issues.

There was a brief awards ceremony of the most active contributors to RNC CIGRE. Izolyator was awarded a Letter of Recognition for engagement in the business program of the Russian delegation at the 47th CIGRE Session in Paris. ■



Chairman of RNC CIGRE — Head of FGC UES Andrey Murov is awarding Izolyator represented by Alexander Slavinsky with a Letter of Recognition for activity in the business agenda of the Russian delegation at the 47th CIGRE Session

Over
60 organizations

and above
460 power engineering
specialists are RNC
CIGRE members



SC D1 RNC CIGRE working meeting at Izolyator plant

Experts Online

SC D1 RNC CIGRE «Materials and Emerging Test Techniques» held a working meeting at the conference hall of Izolyator.

The meeting was chaired by the Head of CIGRE Russian Study Committee D1 Alexander Slavinsky.

The meeting traditionally went as a video conference, which allowed to discuss current issues and take decisions with all committee members from different cities voting in real time as well as get in touch with experts from other countries.

At the meeting, the colleagues discussed results of the 47th CIGRE Session and results of SC D1 activities in 2018.

Vladimir Ustinov made a presentation familiarizing the meeting participants with the results of the committee's work at the 47th CIGRE session, giving details about the events that the delegation attended. He paid special attention to the reports of the poster session SC D1.

Talking about the second issue, Vladimir Ustinov said that the committee's main workload is participation in Russian and international conferences. Presently, two experts are active in the international workgroups:

- Sergey Samoylenkov, General Director, SuperOx PJSC — WG D1.64 «Electrical insulation systems at cryogenic temperatures»;
- Maxim Bobryshev — Project Manager — Engineer at Supply department of technological materials at ElecTrade-M Ltd. — WG D1.70 «Functional features of modern insulating liquids for transformers and similar electrical equipment».

In closing remarks, Alexander Slavinsky thanked everyone present for participation and fruitful work, marking that with a joint effort the work of the study committee D1 was taken to a whole new level. ■

Magister Students Show What They're Worth

Ivanovo State Energy University held an International Power Industry Olympics named after A.F. Dyakov «Power Industry 2018» in the end of November.

Study committee D1 RNC CIGRE also partnered with the Olympics, funding special prizes for completed exercises in The High-voltage Equipment section.

Deputy Quality Director of Izolyator, Coordinator of CIGRE Russian Study Committee D1 Vladimir Ustinov passed the awards to the students who made it into prizes:

- 1st prize winner in the discipline R.Chuvashev (NSTU),
- 2nd prize winner M.Frolova (MPEI),
- 3rd prize winner S. Koryakina (BSTU).

Vladimir Ustinov made a report «Activities of Study Committee D1 of the Russian National Committee of CIGRE «Materials and Emerging Test Techniques» for the students.

There also was a working meeting with the administration of Ivanovo state energy university. ■



International Students Olympics n.a. A.F. Dyakov «Power Industry 2018» in Ivanovo

20 | The Future of the Power Industry Born Today



▲ Opening of the 47th CIGRE session in Paris

▼ Participants of the second regional SEERC Conference «Energy security and innovations» in Kyiv



▲ Alexander Slavinsky and Chief Designer ZTR Alexander Bass at the 2nd SEERC Conference in Kyiv



▼ Participants of activities of the International Students Olympics n.a. A.F. Dyakov «Power Industry 2018» in Ivanovo





▶ Participants of the scientific and practical conference on diagnostics of power electrical equipment in Surgut

▶ Participants of the 21st Conference «Methods of increasing reliability, efficiency and safety of energy production» (photos courtesy of KRA RSTUPET) in Gelendzhik



▶ Vladimir Ustinov is awarding prize winners of the Power Industry-2018 Olympics in Ivanovo

▶ Moscow Power Engineering Institute team ArcticEnerg is winner of one of the preliminary rounds of the Student League of the International Engineering Case-in 2018 Championship





We continuously improve technological processes of high-voltage bushings production and implement advanced manufacturing processes.

Alexander Shornikov,
Technical Director
Izolyator plant

For our company, 2018 became a year of technical reequipment and implementation of new innovative technologies of manufacturing high-voltage bushings.

Today, Izolyator plant is the largest manufacturer of high-voltage bushings and a sole maker of bushings for ultra-high voltage classes in Russia and CIS. The production shops of the plant are equipped with the most advanced equipment from the leading global and Russian OEMs. The manufacturing capacity allows for making of 12 000 high-voltage bushings annually. The company constantly expands high-voltage bushings range by introducing completely new designs and upgrading existing designs.

We continuously improve technological processes of high-voltage bushings production and implement advanced manufacturing processes, increasing labor productivity and production safety at the same time.

Our company pays a special attention to the technological process of high-voltage bushings production. Every technical specialist, worker in our team is confident of the accuracy of his/her work.

Using own patented technologies and the best in class equipment and materials, work of highly professional staff and a stage-by-stage production process control, allow us to make highly technological world-class products.

Today, Izolyator is a steadily developing innovative company that offers the most advanced solutions in high-voltage insulation technology. The company's development vector is shaped by existing and projected power industry demands in reliable, durable and easy to operate insulating equipment.

Automation is Picking Up Pace



New Equipment for making of external polymer insulation of bushings at Izolyator plant

A new equipment for making of polymer external insulation of bushings, designed by Hübers, was put in operation at Izolyator plant. The equipment — permanent-mold casting and filling machines — was installed at the organosilicone casting station of the assembly shop.

Hübers machines have been used at Izolyator plant for over 10 years and proved highly reliable, ergonomic and had a short payback period. Hübers's innovative technical solutions for the highest precision and quality of casting processes, were used in design of the equipment.

A complete process automation guarantees a high quality of produced insulation, which requires no further treatment, and a substantial time savings in production cycles. Should any deviations from set parameters be identified, the control system immediately gives an alarm signal and shows a text message to the operator about the fault reasons.

Absence of air pockets in the finished product is a key production task for silicone insulation. The traditional handicraft technique of production cannot help to fully avoid defects formation, whose absence is a key factor of product quality.

The high speed of the process will allow to quickly make even large batches in realization of the outlined production plans. ■

Over
120 year of experience in high-voltage bushings production in the range from **10** to **1150** kV

All Parameters Under Control



In October, a new CNC vertical milling machine was put in operation at the mechanical shop of Izolyator plant.

The new hi-tech machine tool is intended for manufacture of metal parts of high-voltage bushings. The high precision, speed and functionality of the machine will allow for a better part quality, raise productivity and combine several process operations on one station.

Putting into operation of this milling machine is yet another step in a regular upgrade of the plant, using the most advanced technological equipment. ■

A new CNC milling machine at the mechanical shop of Izolyator plant

Reequipment Continued

A new lathe machining center was put in operation at Izolyator plant at the end of November 2018.

The new advanced machine, equipped with a 12-position tool turret, is intended for machining of metal parts.

The computer numerical control (CNC) allows for fully utilizing the potential of the machining center. The machined parts have a high quality surface and precise dimensions, which is very important for several metal parts of a high-voltage bushing.

The new machine joined the park of modern CNC equipment, operating at the plant. ■



The New lathe machining center at the mechanical shop of Izolyator plant

24 | New Technological Capabilities



◀ The first phase of a 220 kV HTSCE device, equipped with Izolyator bushings at KERI test center in South Korea

▶ Participants of the installation works of the surge voltage generator by Haefely Test AG at the test center of Izolyator plant



◀ The new machine for mechanical treatment of 500–750 kV insulation at the insulation making shop of Izolyator plant

Timofey Ryabin, Deputy General Director R&D Centre of FGC UES

High-temperature superconductive DC cable lines are a new type of electrical equipment that is unique in our country.

Presently, superconductive power cable R&D and prototyping based on high-temperature superconductors are developed in many industrial and developing countries of the world.

The biggest projects are developed by Germany, USA, Korea, Japan and China. In 2014, 1 km long superconductive 40 MVA power line was put in operation in Essen, Germany. Superconductive DC cables for long-distance lines are raising more interest.

Development of the technology invariably leads to creation of insulators and bushings of specific configuration for cryogenic devices (BCD).

Starting from 2018, R&D Centre of FGC UES has cooperated with Izolyator plant in a project of insulation development for current-limiting devices using the high-temperature superconductivity effect.

The uniqueness of the solution is that current BCDs play a huge role in defining both technical and economic characteristics.

They carry two main functions:

- connect the electrical part of a cryogenic device with the external electric network, with temperature differential along the bushing length at least 200 °C;
- used to take in and out the cooling agent inside the device.

The construction design of BCD has to be optimized in terms of temperature distribution and electric tensions lengthways in operating and in no-load modes as it helps to find both reliability of its operation and economic efficiency of the whole device. Optimization of lead-in wires is a complex problem with tasks in electrodynamism, heat technology, high-voltage, cryogenic and vacuum technics. That is why it is a prerequisite to set up cooperation of specialized organizations to succeed in creation of highly efficient cryogenic bushings.

Furthermore, in the frame of the Memorandum of Cooperation, signed on 3 October 2018 between FGC UES and Vietnam's EVN NPT, the sides are working out possibility of join activities in implementation of innovative technologies in the power industry of Vietnam.

Cooperation between R&D Centre of FGC UES and Izolyator plant is organized on the highest level in conformity to international standards, giving an advantage in development in implementation of innovations in the power sectors of Russian Federation. The fact that the companies set up a constructive dialogue is valuable and speaking for the attention and openness to development of long-term and mutually beneficial partner relations.

R&D Centre of FGC UES was established in 2006 after the merger of the All-Russian Research Institute of Electrical Engineering JSC, The Research Center for Testing of High-voltage Devices JSC, The Design Institute of Grid and Power Facilities JSC and The Siberian Research Institute of Power Industry JSC with the purpose of increasing



The fact that the companies set up a constructive dialogue is valuable and speaking for the attention and openness to development of long-term and mutually beneficial partner relations.

their efficiency and improving research and project management in the power sector.

The company carries out scientific research in power industry related fields rendering engineering services, promoting innovations, testing and certifying equipment and designs power networks.

The key objectives of the company:

- taking a leading position on the Russian and foreign markets in rendering of scientific, project and aftersale services of electric energy and electrical engineering profile;
- higher operational efficiency of R&D Centre of FGC UES by introducing a complex approach to solution of difficult tasks;
- consolidation and improved coordination of research and scientific activities on electrical energy topics;
- improvement of the main technological business, directed at a higher reliability, quality and efficiency of power supply;
- development, implementation and promotion of new technologies of production, transmission, distribution and consumption of electric energy.

The company is a recognized leader in providing research, design and engineering solutions for the electric power and power pool system controls, generation and distribution of electric power, optimization of power transmission modes and systems, as well as design of power grids and energy facilities.

26 | Voltage Regulators — Collaboration of MPEI, ENIN and Izolyator

The National Research University MPEI jointly with Stock Company G.M. Krzhizhanovskiy Power Engineering Institute and Izolyator developed and made several AC thyristor transformer regulators (TTR), aimed at regulating and stabilizing alternating current in power supply systems of household and industrial consumers of electric power.

There is a growing importance of the problem of electric power quality in places of connection to distribution grids of consumers.

The root-mean-square value of voltage at the point of electric power transmission to consumer has biggest impact among other factors on the quality of electric power. The value and tolerance limits of the parameter are regulated by GOST 32144-2013. Mismatch of the voltage in electric network with the normative range according to GOST can cause failures in operation of technological equipment and household appliances, eventually resulting in material losses both on the end user side and his power supply utility.

It should be mentioned that the voltage level deviation problem (GOST 32144-2013) is particularly acute for the consumers based at considerable distances from main substations. It is aggravated by the gradually increasing power consumption in households in situation when no timely measures are taken to modernize power supply networks.

Regulators and voltage stabilizers are an efficient solution to the problem of the nominal voltage maintenance in distribution networks. They run on the principle of feeding of a regulated accessory voltage to a power line to balance voltage surges and long-term

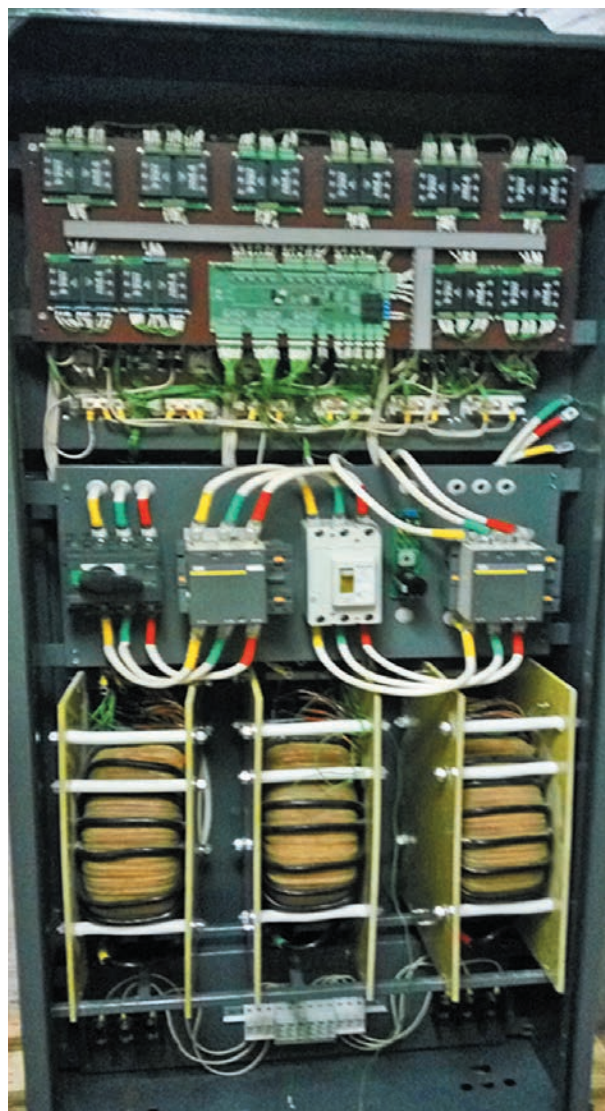
deviations of the voltage at the points of connection of separate consumers or their groups. These devices should have a fast response time, high reliability under different types of loads,

autonomous or remote control, monitoring functions to control the power line condition and run diagnostics of the device itself, possibility of application in diverse climate conditions and high performance indicators.

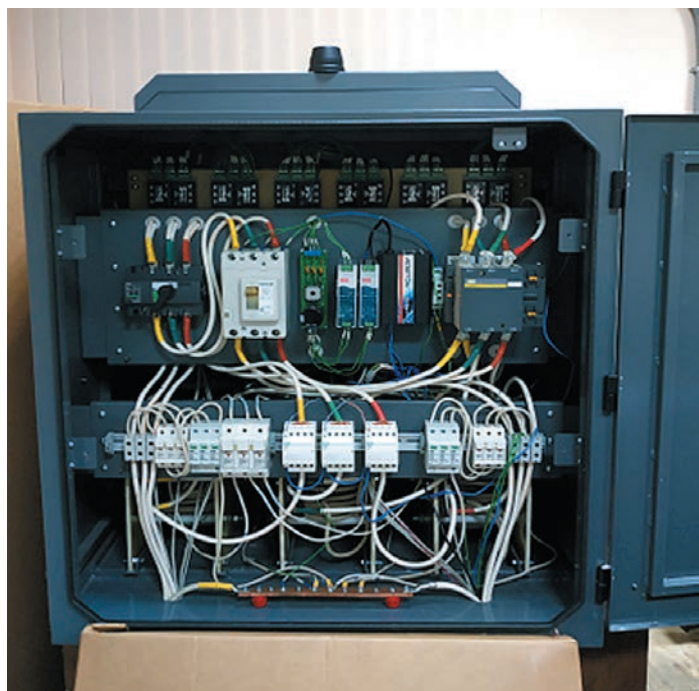
The feature set of thyristor transformer regulators of alternating current (TTR) includes:

- standalone individual phase control and stabilization of voltages in a three-phase electric network;

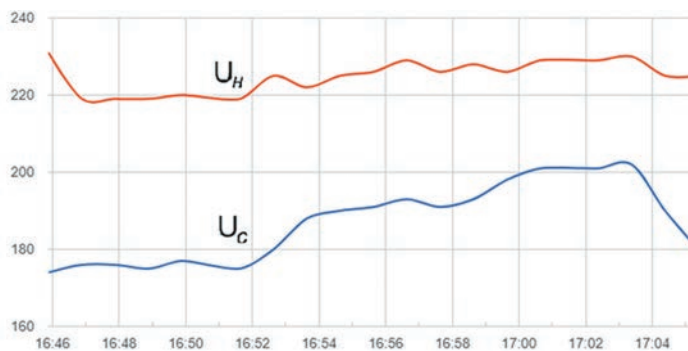
Feature	Value
Voltage classes in electrical network	0,4; 6; 10 kV
Capacity range of load	10kW-10MW
Maximum range of voltage regulation	$\pm 100\% U_{nom}$
Type of regulation	discrete
Type of execution	1 phase / 3 phase
Speed of regulation	10 ms
Climate execution acc to GOST 15150-69	U, UC, C (+40/–60 C°)
Category of placement acc to GOST 15150-69	1–4
Impact of electric energy quality	absent
Standards of distance control	RS-485, Ethernet, GSM, other
Operation algorithms	– autonomous; – external control



Regulator-voltage stabilizer TTD-B — 50/0,4 — 3



Regulator-voltage stabilizer TTD — 100/0,4 — 3



Time intervals of TTD-B — 50/0,4 — 3 operation in output voltage stabilization mode
 U_G — voltage at input, U_H — output voltage

- balancing phase voltages of a three-phase electric network;
- compensation of reactive capacity, generated by consumers' loads;
- distant monitoring and wireless transmission of data about operating modes of the device and voltage and current levels in the power line at the place of connection to the dispatch office.

Designers addressed these priorities as they developed the devices:

- ensuring reliable and sustainable operation of devices in different modes and load characteristics, including short-circuiting under load;
- increasing number of discrete levels of voltage regulation at the device output and improving accuracy of its stabilization, minimizing mass and dimensions of the devices;
- decreasing unit cost;
- usage of domestic components;
- speeding up voltage regulation at the device output.

Presently, the samples of TTD-B — 50/0,4 — 3 and TTD — 100/0,4 — 3

with installed capacity 50 and 100 kV respectively have been made in the 0,4 kV TTD product line. They are tested and are in pilot operation now.

For instance, TTD-B — 50/0,4 — 3 operates in booster mode and is used to ensure GOST 32144-2013 voltage levels in connection points of those end users who are based at considerable distances from main substations. TTD-100/0,4-3 is intended for operation as regulator of output voltage for loads, accepting voltage adjustment over wide range.

The pilot operation of TTD-B — 50/0,4 — 3 is taking place in the distribution networks of Belgorod-energo, branch of IDGC Center PJSC. The software, used in the devices, helps to effect a distance control of devices operating modes and power lines at installation point.

Notably, the application areas of thyristor transformer devices of alternating current TTD is fairly wide.

Devices can be successfully applied in a whole number of situations, for example:

- to supply energy to distant facilities in situations of big capacity losses in power lines;
- in outdoor lighting systems for energy saving purposes by decreasing supply voltage of lighting load at night time;
- for connection of powerful asynchronous motors to electric network to decrease inrush current and associated AC fails in electric network as well as compensation of reactance power, generated by asynchronous motors in steady state condition.

The technical solutions and software, used for development of AC thyristor transformer regulators, have originality and are protected by patents. The devices are created on the component base of domestic manufacturers. All the 0,4 kV product line TTD devices are certified to conform to the requirements of the Technical Regulation of the Customs Union.

Based on the article by:
Astashev M.G., Panfilov D.I.,
Petrov M.I.

Konstantin Sipilkin R&D Director

Summing up results of 2018, I should say that the design bureau of Izolyator plant created 32 new construction designs of high-voltage bushings, including 750 kV voltage class. This is an extra-high voltage class, so the fact that we are not only capable of designing such bushings, but also to make and run a complete cycle of acceptance testing, speaks for itself. Speaking in football terminology, we are playing in the premier league, have played here for quite a while, successfully, showing a good game and results.

This year has become a year of transformation of approaches to further development of the entire system, transition to a digital, intellectual model.

Well, high-voltage bushings are a quite specific type of equipment, whose construction design knows no digital integrated circuits, nor automation systems. Even sensors that we install on the measuring tap of a bushing are used for connection of means of diagnostics are purchased items. Yet, the notion of «digital energy» is also applicable to a bushing as to any other type of electrical equipment.

Naturally, digital technologies are used by us both in high-voltage bushings designing with the help of 3D programs and in production by using the most advanced manufacturing technologies, among which I can name the control over process of polymerization of the internal insulation using microprocessor units with feedback. However, it is not only for production of bushings that we use the word «digital» — over the whole service life, a bushing is directly connected with digital diagnostic systems, or it may be specifically used on a digital substation.

Designing and construction of digital substations demanded application of new types of high-voltage equipment and high-voltage bushings found a place in that row. From the perspective of digital substations, a most suitable type of bushings for them would be the new type with a solid insulation we call RIN. This type of insulation does not contain cellulose in its structure, for which reason it does not take up moist. With that said, insulation moistening is one the most widely spread bushing damage reasons and there is much attention given to their regular diagnostics, which does not fit the goals, formulated for construction of digital substations.

Digital substations are designed so that the service required to support their equipment in operation was minimal and in case of emergency, the damaged piece should rather be replaced as easy as a blown fuse. Exactly



We will continue to actively implement advanced technologies and innovative design concepts, unparalleled in Russia and elsewhere in the world.

RIN bushing with polymer external insulation fully meets such requirements. Such it even be damaged, the equipment where it is installed on is not damaged, just as bushings of neighboring phases. It is sufficient to simply replace the bushing and continue supply electric power to consumers.

As of today, RIN bushings have passed the entire testing cycle and certification, and in 2019, we plan to begin their serial production.

One more quite important feature of the high-voltage bushing is presence of a measuring tap, intended for diagnosing the bushing's condition in operation. The measuring tap can be used not only for diagnostics, but also it can be connected with equipment for measuring partial discharge level on a transformer online. This method allows to find the start of failure development internally in a transformer as a cluster of partial discharges at an early stage, when no other methods are effective enough.

Thus, the equipment, which has no digital devices and components, can be in fact a true object of the digital energy and represent a great example of advanced technologies, working as an element of the digital economy of our country.

INNOVATIONS AND TECHNOLOGIES

Over **120 years** of experience in production of high-voltage bushings in voltage range 10-1150 kV

Production of insulators for high-voltage power lines was set up

Special design bureau for development of high-voltage bushings in the range 110-500 kV created

Continued development of extra-high-voltage bushings – rated voltage 1150 kV

Izolyator plant is a leader in development, production and implementation of modern technologies in power industry

the 1920ies

the 1950ies

the 1980ies

2018

1896

Izolyator plant was established. The first products: low-voltage insulators

the 1930ies

115 and 110 kV bushings first time made

the 1970ies

Laboratory for testing high-voltage bushings was built

2002

A unique industrial production technology of RIP insulation is developed by the plant

6200000

bushings made in the entire history of Izolyator plant

More than **16 years** of experience in production of RIP bushings in 10-750 kV range

2018



32 bushing designs developed



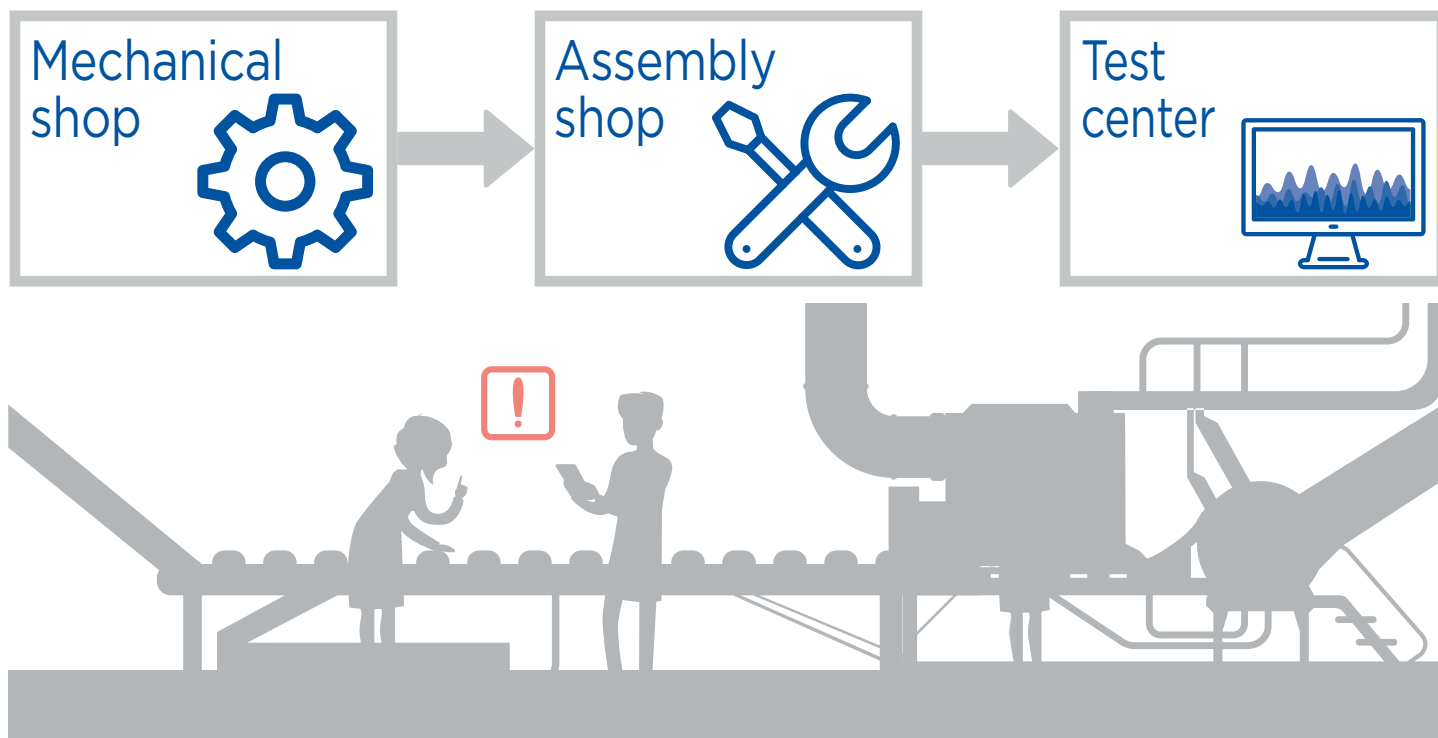
including new bushing types of extra-high-voltage class



Bushings with internal RIN insulation are certified

750 kV

Launch of new process equipment



«Do the best we can. And even more»



Keeping promises, team spirit and ability to set up a constructive dialogue are the qualities that are always valued at work and one's everyday life. At Izolyator, these qualities are key for all staff members, because it is only possible to truly develop and reach new achievements, sticking to them. Commercial Director of Izolyator Ivan Panfilov told us about the achievements that 2018 will be remembered for.

— Ivan Dmitrievich, in 2018 Izolyator was actively developing a productive dialogue and cooperation with Asian power grid companies and leading transformer and reactor equipment OEMs of that region. Could you please tell us what was achieved?

— Indeed, there is much to say and accomplishments to be proud of. In 2018, we effected a number of shipments of our products to the key power facilities of the state Power Grid Corporation of India Limited (PowerGrid) and the state power grid company Vietnam Electricity (EVN). In the first half of 2018, our company won tender of the PowerGrid for delivery of a large batch of high-voltage bushings with solid RIP insulation with rated voltages 420 and 800 kV. Power Grid Corporation of India Limited (PowerGrid) is an India-based state company, engaged in construction, operation and maintenance of the bulk power lines network. PowerGrid is one of the largest power grid companies of the

world. It is largely involved in construction and operation of power networks in India and strengthening and developing of ties with the neighboring countries: Nepal, Bhutan, Bangladesh, Sri Lanka. However, our cooperation does not end at the moment of shipment receipt: we always proudly accentuate that we are prepared to openly share our unique experience with all the partners, believing it to be a part and parcel of our mission — to create foundations for a stable and sustainable power supply in the whole world.

— How was your interaction with partners from European countries progressing?

— By all means, we kept contacting power grid companies and power equipment OEMs in France, Belgium, Germany. Besides, we worked on important destinations like countries of Middle East, Turkey and Saudi Arabia. These regions that we are greatly interested in seem very attractive also because they are rapidly developing. We engaged in active talks and witnessed that all the sides would be interested in cooperation.

— Experience sharing is an important side of any cooperation. What is specific about Izolyator's experience?

— Izolyator is a leading global supplier of high-voltage bushings for virtually all voltage classes. Our clients trust comes from a stable quality, professionalism and a full-fledged

aftersales service. As we talk to the largest companies of the international power market and state energy corporations, responsible for transmission and distribution of electricity in particular, we witnessed: Russia is a sole country in the world where RIP bushings are already a standard product, used at generating facilities and transmission and distribution power lines at the moment. Presently, the global power industry is open to proposals from all over the world, and we are pleased to offer our solutions to promote implementation of new technologies in production of electrical equipment, ensure innovative development and reliable operation of national electric networks in different countries.

— **Speaking of your thesis that cooperation does not stop at the moment of delivery, what other advantages does Izolyator offer?**

— Energy equipment, unfortunately or luckily, is not the sort of technologies that can be installed one day and left forgotten. They all require greater attention throughout the entire service life. Commissioning, warranty and post-warranty service, staff training - all that together guarantees a fault-free operation. All the issues that may arise with our partners, are addressed immediately as we understand that too much may depend on the response speed at times.

We do everything we can to make our partners confident in Izolyator and truly trust us. We carefully review all the references from our partner. We especially pleased to regularly receive recommendations from power grid companies, oil and gas enterprises, transformer plants and partners all over the world. We are prepared to devise a special approach to every partner so that the set targets were met just in time.

— **All Izolyator-made high-voltage bushings are certified to Russian and international standards. Presently, Izolyator exports its products to over 30 countries all over the world and their**

number will, evidently, grow. What steps are now being taken in this direction?

— We do a regular careful analysis of key trends on the international power market to source strategic partners for planning an efficient and long-term cooperation. Friendly relations since as early as the Soviet Union times, a positive dialogue between the Federal Grid Company of the Unified Energy System of Russia and PowerGrid as well as Izolyator's successful operation on the Indian energy market allowed to continue sharing experience between the power grid companies and industrial enterprises of the two countries. Besides, the fact that Russia is an active contributor to the International Council on Large Electric Systems CIGRE, also became an important factor in relations. India is active in the organization, too: the PowerGrid management heads the Indian National Committee of CIGRE.

« We do a regular careful analysis of key trends on the international power market to source strategic partners».

— **Could you please tell what were the key events for your company on the international market in 2018.**

— I would say that the brightest event for us was the 47th CIGRE session, which was held in the Palace of Congress in Paris. On the margins of the session, we had several business meetings with representatives of leading power grid companies and electrical engineering companies, as well as executives of study committees of CIGRE. Izolyator and Mehru Electrical & Mechanical Engineers (P) Ltd. signed an

agreement on strategic cooperation and coordination in the frame of a joint venture project realization to produce HV RIP bushings on the territory of India.

Mehru Electrical & Mechanical Engineers (P) Ltd. manufactures Instrument Transformers up to 420 kV.

Mehru is one of the leading suppliers of Instrument Transformers to numerous clients not only in India but all over the world. Exports its production in more than 30 countries around the world.

Throughout the year, we regularly organized business meetings both between FGC UES and PowerGrid and industrial companies, manufacturers of high-voltage equipment from India and Russia.

— **Do you think that creation of a joint venture with Mehru in India to make RIP bushings will strengthen Izolyator's positions at international scale?**

— We definitely use all our efforts for that. Our dialogue with international energy corporations is also developing with an active support of the Federal Grid Company. Thanks to established relations with such majors as Rosseti PJSC, including FGC UES PJSC, we were able to accumulate a unique experience of mass application of high-voltage bushings with solid RIP insulation. Our main task today is to inform as many partners all over the world as possible that we possess required expertise to transfer the experience. We are known and trusted in many countries and our status of a leader in production of high-voltage bushings with solid RIP insulation among others imposes a big responsibility on us.

On behalf of the entire Izolyator staff and personally, I would like to thank our partners and consumers for the long-standing cooperation, active work and support of Izolyator in development of international dialogue with power grid corporations and integration of innovative products on the global electric energy market. ■



The close friendship of India and Russia results from good relations of several generations of leaders and peoples of our countries.

Sandeep Prakash Sharma,
Executive Director Mehru
Electrical & Mechanical
Engineers (P) Ltd.



Let me at the outset say that I am confident, that the JV between Massa & Mehru shall usher the Indo-Russian cooperation in power sector into a new era. The collaboration would not only enable us to learn from each others experience but also boost industrial entrepreneurship between the two nations.

From the first meeting with Izolyator team itself, I was convinced that we have a lot in common especially the passion towards resilient & quality product. I am thankful to Izolyator for choosing us to be their partner in Indian Subcontinent. The CIGRE session in Paris was an encouraging step forward toward realising a shared vision of setting up state of art manufacturing facility in India.

With synergy of the two teams being put together, it will only be a natural progression for us to dominate the Indian sub continent & other markets. The JV with Izolyator will expedite our shared vision to command a position of worldwide leadership in power sector.

It is gratifying that the signing of the memorandum took place at the 47th CIGRE session in Paris in presence of the management of the largest power grid companies of Russia and India. At the signing ceremony we discussed the key priorities of the uniform strategy of development on the international market of high-voltage equipment, outlined a road map of organizational measures to have an efficient interaction and agreed to take the next practical steps in project realization.

Experience Proves: Izolyator Bushings Operate Reliably in India



Dmitriy Orekhov and Ashok Singh
at 400 kV Bamnauli substation in India

Manager of International Business Development Department at Izolyator Dmitriy Orekhov visited power grid and electrical engineering corporations in India.

He had business meetings and talks with representatives of:

- state regional power grid company of Rajasthan Rajya Vidyut Prasaran Nigam Limited;
- state power grid company Power Grid Corporation of India Limited;
- 400 kV Bamnauli substation of Power Grid Corporation of India Limited;
- state power grid company of Telangana state Transmission Corporation of Telangana Limited;
- Transformer plant Toshiba Transmission & Distribution Systems (India) Pvt. Ltd.;
- transformer plant CGT1 of CG Power and Industrial Solutions Limited.

Dr. Ashok Singh took part in all the meetings.

During the visits, our colleagues had talks with management and specialists of the Indian companies and made presentations about modern designs

of high-voltage bushings with solid RIP insulation.

Izolyator's experience of bushings operation at power facilities of Russia and other countries was also discussed.

Izolyator had talks at the state power grid company Power Grid Corporation of India Limited to discuss having type testing of 800 kV and 420 kV bushings. The sides agreed the tests schedule and PowerGrid specialists' participation.

Dmitry Orekhov also visited 400 kV Bamnauli substation, where Izolyator bushings have already operated for three years.

The achieved results will form the basis for further cooperation development with Indian partners and strengthening business ties between Russia and India.

We appreciate all our Indian partners and all meeting participants for the invitation, hospitality and active cooperation for the good of India and Russia, further strengthening of Russia-India business ties and the century-long friendship between our countries. ■



The fruitful cooperation between our companies enriches our heritage and opens new opportunities of cooperation in power sector of Vietnam and Russia.

Nguyen Tuan Tung,
President, General Director EVN NPT

On Key Trends in Dialogue With Vietnamese Partners



Participants of a technical workshop for EVN NPT specialists in Vietnam

Russian electrical products have operated on power facilities of Vietnam for over half a century and proved its reliability. Today, the cooperative ties between our companies are not limited by export only – it is also experience sharing and joint research as well as mutual goal of improving the power sector.

Russia's active contribution to the International Council on Large Electric Systems CIGRE is an important factor of our cooperation development. Vietnamese companies are also interacting with CIGRE, however, without forming a national committee. Coordination within CIGRE opens up new opportunities of scientific and technological exchanges between specialists of the two countries.

The meetings, workshops and conferences of 2018 opened new prospects for development of a mutually beneficial cooperation and integrative development of power industry through interaction between national and regional power grid systems of Vietnam and Russia.

EVN National Power Transmission Corporation (EVN NPT) was founded in 2008.

The goals of the company are: to ensure safe, uninterrupted and sustainable transmission of electric power for economic, political, social, national defense activities and national security; to develop EVN capital, invested in EVN NPT; to rationally use available resources with the purpose of profits maximization and acquiring funds for reinvestment in EVN NPT.

The main activities are: to effectively realize electric power transmission, to invest in grid development, to operate, maintain and service the network, to render consulting services in regard to construction and investment, monitoring of project realization, training and developing employees for management, operation and maintenance of the power system.

EVN NPT owns more than 100 electric power substations in Vietnam.

The company is headquartered in Hanoi.

At the end of November, Izolyator representatives had several meetings and took part in technical workshops for the specialists of the state power grid company EVN National Power Transmission Corporation and Dong Anh Electrical Equipment Corporation transformer plant in Vietnam.

The first workshop for EEMC transformer plant specialists took place on 26 November. The feature topic of the seminar — specifics of construction design, operation and maintenance of RIP bushings. In the result of the workshop, the sides decided to keep setting up a close interaction between the technical divisions for consultations on mastering the RIP products by the Vietnamese colleagues.

And, already on 28 November, a trilateral technical seminar was organized at the training center of EVN NPT with FGC UES, Izolyator and technical specialists of EVN NPT participation.

Izolyator specialists conducted a training on operation of high-voltage bushings at power facilities and told about specifics of construction design and operation of modern RIP bushings. The workshop went in the form of an open dialogue, which helped to have a closer interaction of technical specialists. ■

On the Threshold of a New Era



I feel proud seeing how two recognized in their respective sectors companies — Mehru and Izolyator — unite to pioneer in the first in history joint venture between Russian and Indian companies to manufacture power equipment.

Dr. Ashok Singh

2018 was memorable for Izolyator by many remarkable achievements. Among those defining moments, there was a creation of a new union that will foster its success in the future. The history of success in India is a product of the vision of the management splitting in two directions - it is an offering of a unique client experience and a partnership creation, which will support our obligations for customers.

Firstly, we won a tender, organized by Power Grid Corporation of India Ltd, for delivery of 800 kV–2000A and 420 kV–3000A RIP bushings. It speaks for the fact that we are focused on our priority cooperation with PowerGrid.

Analyzing Izolyator's work done for Power Grid, the plant was the most reliable partner in timely delivery of bushings to PowerGrid.

Secondly, Izolyator entered a joint venture with Mehru Electrical & Mechanical Engineers P. Ltd. in India to set a foothold on the international market. This agreement includes principles of complete production cycle on the territory of Indian and further sales of high-voltage bushings with modern RIP insulation in various rated voltages. The main know-how in the project is RIP insulation of own design, implemented by our company Izolyator. Entering a joint venture and

organization of high-voltage power equipment production with Indian companies will be the first experience for Russian companies.

Following the decision of Izolyator plant's management, we started searching potential companies in India, which we could move towards a joint venture together. We received a lot of applications from Indian and international companies, based in India. They sent us documentation to illustrate their qualifications and testing capabilities, so that considered them as potential partner for organizing a joint venture in India.

We created a shortlist of potential partners. We carefully studied their proposals according to our criteria. We made several trips with Izolyator colleagues and had talks to outline plans in all directions of joint activities.

The meetings were dedicated to coordinating joint venture and optimize common effort so that to move on towards creation of a modern and demanded power equipment. We strictly adhered to the selection requirements in the search process in India. The information that we received at those meetings helped us to consolidate our reports and to summarize our findings. In the selection process, we placed emphasis on competences and experience, taking into account principles of common vision in creation of a long-term and win-win situation for both companies by an efficient utilization of technological resources and production potentials.

Our large work gave results and after the final analysis of the short-listed candidates, Izolyator selected Mehru Electrical and Mechanical Engineers P. Ltd.

Mehru is one of the leading manufacturers and suppliers of CTPT combined blocks for numerous clients in India and abroad and a sole company in the world, approved by the Turkish power grid company aside from EMEK and Pfiffner. Also, it is a sole company in India, whose test laboratory is approved by Tenaga Nasional Berhad (TNB) in Malaysia. Mehru has the newest advanced technological equipment for making ultra-high voltage transformer up to 440 kV, while its test laboratory is equipped with the most modern equipment for doing routine tests

according to IEC/IS/BS/AS and ANSI. It is accredited by the National Council of India on accreditation of test and calibration laboratories (NABL).

I feel proud seeing how two recognized in their respective sectors companies — Mehru and Izolyator — unite to pioneer in the first in history joint venture between Russian and Indian companies to manufacture power equipment. This partnership demonstrated courage and readiness of both companies to take risks, their benevolence to share ideas, technical knowledge and expand client base as well as ability to build relations regardless of differences. We are confident that this partnership within JV ensures a solid foundation for creating a stable and sustainable energy supply in the near future and will strengthen our relations between two countries — Russia and India.

As we are beginning 2019, we understand that it will be very complex in terms of strategy and operations. However, we set up priorities and defined key directions to move forward.

First, we intend to successfully finalize all the type testing in the complete range of electric test, plus seismic test and a test for recovery of our 800 kV and 420 kV RIP bushings (needed for our current order from PowerGrid) at the Central Power Research Institute (CPRI) — a recognized independent laboratory in Bangalore and Hyderabad.

Secondly, we will proceed with our JV project with Mehru to make RIP bushings of up to 420 kV classes.

Thirdly, we will continue our expansion worldwide meeting growing demands from the sector of power transformers both in India and abroad. Our company Izolyator needs to pass approval procedures from state utilities and organizations NTPC Limited, Madhya Pradesh Power Transmission Company Ltd. (MP Power Transmission Company Limited), Research Designs & Standard Organization (organization under the auspices of the Ministry of railways of India), Punjab State Power Corporation Limited (PSPCL), Maharashtra State Electricity Transmission Company Limited (MAHATRANSCO), Maharashtra State Power Generation Company Limited (MAHAGENCO), NHPC Limited, Nuclear Power Corporation of India Limited (NPCIL), Kerala State Electricity Board Limited (KSEB), Tamil Nadu Transmission Corporation Limited (TANTRANSCO), Himachal Pradesh State Electricity Board Limited (HPSEBL),

Andhra Pradesh Power Generation Corporation Limited (APGENCO), Transmission Corporation of Andhra Pradesh Limited (APTRANSCO), Odisha Power Transmission Corporation Limited (OPTCL), Assam Electricity Grid Corporation Limited (AEGCL), Power Transmission Corporation of Uttarakhand Limited (PTCUL), Power Development Department of Jammu & Kashmir State Government (JKPDD), Karnataka Power Transmission Corporation Limited (KPTCL), Uttarakhand Power Corporation Limited (UPCL), Rajasthan Rajya Vidhyut Prasaran Nigam Limited (RRVPL), Bihar State Power Transmission Company Limited (BSPTCL), Uttar Pradesh Power Corporation Limited (UPPCL), Damodar

experienced management team and motivated and efficient staff members. There are experienced industry professionals at the lead of our company, specialized in different areas of power engineering profession. Our management's trust in the company staff and their dedicated work helped us to grow the plant's capacities. We believe that the decades long experience of Izolyator plant led to an increase of product quality and raised profitability, giving us a competitive advantage.

Our interest in innovation and a strive to meet modern quality has always been a signature feature of our company. Our strength comes from understanding the requirements of the client and our performance.



Meeting at the 47th CIGRE session, L-R: Dr. Ashok Singh, Mehru representative Vinod Kumar, Executive Director Mehru Sandeep Prakash Sharma, Alexander Slavinsky and Ivan Panfilov

Valley Corporation (DVC), Bhakra Beas Management Board (BBMB), Chhattisgarh State Power Transmission Company Limited (CSPTCL), Jharkhand State Electricity Board (JSEB), Tripura State Electricity Corporation Limited (TSECL), Nagaland State Electricity Board, Manipur State Power Company Limited (MSPCL), Power & Electricity Department of Government of Mizoram, Haryana Vidyut Prasaran Nigam Limited (HVPNL). The drawings of our transformer bushings must be approved by such private companies as Larsen & Toubro Limited, Karnataka Power Corporation Limited (KPCL), Adani, Reliance Torrent и Lanco Infratech Limited and many others.

We firmly believe that we will be able to reach our goals due to our

It allows to receive repeat orders from our existing partners and attract new customers.

Our company supports ISO certification for design, production and delivery of transformer bushings and polymer insulators to ensure proper quality and standardization. We were consistent in delivery of quality products to our clients. Our quality orientation helped us to maintain and grow our business model for the benefit of our clients.

We believe that our international presence enabled us to working with a wider client base and ensured a basis for growth of transformer bushings business. The number of our international clients is growing every day, year on year.



Taking into consideration that the demand for RIP bushings is growing every day and thanks to the strong team of Izolyator we plan to increase our orders in 2019.

Sezai Ozkaya,
TEMPEK DIŞ TİC.
LTD. ŞTİ.

2018 has become a year of our cooperation with Izolyator on the market of Turkey and the first year for the majority of local manufacturers to have an introduction to the quality of Izolyator products and the plant's widest RIP products range.

After our first visits to the manufacturing facility in Moscow region, an audit was made in a very short period of time. So, now we are proud that the Turkish companies Balıkesir Elektromekanik Sanayi Tesisleri A.Ş. (BEST), Schneider Electric and Astor Transformer AS give preference to our products.

In 2018, an open Russia-Turkey workshop also took place. The Turkish Electricity Transmission Company (TEİAŞ) was present at the event. We are confident that bushings with solid RIP insulation will be the only choice for the local market as it is happening in the rest of the world.

As agreed, the first trial batch of bushings with RIP insulation, intended for TEİAŞ facilities, is to arrive soon.

This year, we are targeting sales promotion with such manufacturers as GE, ABB and Eltas Transformer. Considering the fact that the demand for RIP bushings is growing and their evident advantages of OIP bushings, we express hope that we will see increased number of inquiries from our clients. We expect to double our sales in the first quarter of the year. It is possible thanks to a strong team of Izolyator, wide product range, high quality and short delivery terms, warranty and post-warranty support.

Complex Approach to Cooperation

Izolyator representatives visited several industrial companies in Turkey in the fourth quarter 2018. Izolyator was represented by the International Business Development Manager Yaroslav Sedov and Manager of International Business Development Department Alexander Znamenskiy.

The first meeting took place at Schneider Electric plant in Sancaktepe. The sides discussed the advantages of completing Schneider Electric's transformers with Izolyator high-voltage bushings in order to meet all the requirements of end users of power equipment.

Taking into account the existing successful experience of practical interaction, the sides expressed a mutual interest in development of business relations and outlined a plan of joint activities in 2019.

The talks at Balıkesir Elektromekanik Sanayi Tesisleri A.Ş. plant were no less productive. The sides discussed advantages of Izolyator high-voltage bushings with solid internal RIP insulation compared to counterparts of other designs.

BEST showed interest in purchasing RIP bushings and is considering Izolyator



Izolyator representatives at BEST plant in Turkey

plant as a reliable supplier of products of that type. The sides agreed to continue cooperation development on a long-term and mutually beneficial basis.

At the talks at Astor Transformatör A.Ş. plant in Ankara, there was a clear trend of

RIP bushings share increase in the overall ordered volumes of power equipment.

Representatives of the Turkish companies and Izolyator plant showed mutual interest and common intention to continue developing a mutually beneficial cooperation. ■

Over **40** bushings for voltage classes from **72,5** to **252** kV delivered to Turkey

Cooperation With Iranian Company: Breaking New Ground



Participants of Izolyator workshop at Tavanir in Iran

Business meetings and workshops are a part of work of Izolyator's employees. On 29 September — 2 October 2018, we had seminars and business meetings at the energy company Tavanir of the Ministry of Energy of Iran and divisions of Iran Transfo Corp. transformer plant.

Alexander Znamenskiy, Manager of International Business Development Department and Victor Kiryukhin, Lead Technical Support Specialist represented Izolyator. Representatives of the Iranian Fanavaran Pooya Sanat Vafa, supplier of industrial equipment, also participated in all meetings of the agenda.

The successful results of the talks and technical seminars proved a high level of mutual interest and outlined the most promising areas of cooperation between Iranian companies and Izolyator plant.

Presently, 95% of all high-voltage bushings, operating at power facilities of Iran, are oil-in-paper bushings (OIP). They have largely worn down and require regular checks of technical condition, causing increased anxiety with the operating companies. ■

Syrian Power Engineers Visiting Izolyator Plant

Representatives of the state Syrian power transmission company visited Izolyator plant.

The delegation members:

Semesmieh Mohamad Nasouh — General Manager; Abou Ghura Nour Deen — Head of R&D; Mulhem Dabbah — Assistant General Manager; Khamis Bashar — Director of International Cooperation Planning and Development Dpt. The delegation was accompanied by representatives of Novations and business in economy CJSC Konstantin Rudenko, General Director; Oxana Al-Kavuud, Head of Foreign Trade Dpt; Akram Tarraf, NBE CJSC's representative in Syria.

At the talks, the representatives of the state Syrian power transmission company familiarized themselves with the century-long history, products and milestones of Izolyator's current development.

The hosts arranged for a plant tour introducing the visitors to the modern production technology of high-voltage bushings with solid insulation. The Syrian delegates shared a high opinion of the plant's machinery and Izolyator's production capabilities for setting up an efficient cooperation.

Izolyator appreciates the Syrian colleagues for a visit and a fruitful dialogue. We are pre-

pared to set up cooperation in delivery of high-voltage bushings to power facilities of Syria. ■



Participants of the meeting of representatives of the state Syrian power transmission company and Izolyator plant

IZOLYATOR BUSHINGS IN THE WORLD POWER



- Kentau transformer plant
- Togliatti Transformer
- Vitebskenergo
- CG Power Systems Belgium NV
- ZREW Transformatory

- Balikesir Elektromekanik Sanayi Tesisleri A. S.
- Power machines - Toshiba. High-voltage transformers
- Grodnoenergo
- SVEL
- TBEA Co., Ltd.

- CG Power and Industrial Solutions Limited
- Siemens AG
- Zaporozhtransformer
- Fortum
- Uralsktransmash



INDUSTRY. RESULTS OF 2018

19 COUNTRIES

- | | | | |
|--|------------|--|------------|
| | Azerbaijan | | Moldova |
| | Belarus | | Mongolia |
| | Belgium | | Poland |
| | Bulgaria | | Russia |
| | Vietnam | | Serbia |
| | Georgia | | Turkey |
| | India | | Uzbekistan |
| | Kazakhstan | | Ukraine |
| | Kyrgyzstan | | Estonia |
| | China | | |

- | | | | | | |
|--|-----------------------------------|--|----------------------------------|--|---|
| | National Power Grid of Kyrgyzstan | | Chirchiq transformer plant | | Production Enterprise Electroavod JSC |
| | Boditchadal | | Moscow united power grid company | | Federal Grid Company of Unified Energy System |
| | Osteron | | Hydrorepair-VKK | | Electroshield Samara |
| | Electricgeneration INTER RAO | | ATEF Group | | Energy Standard |
| | Gomelenergo | | Unipro | | Rosseti |

40 | Expanding Geography of Cooperation



▶ Participants of bushings tests for Transmission Corporation of Telangana Limited and Toshiba Transmission & Distribution Systems (India) Pvt. Ltd. at Izolyator plant's test center

▶ Participants of Izolyator plant's workshop at VUJE a.s. in Slovenia



▼ Talks with business partners – representatives of the Chinese Bushing HV Electric Co., Ltd



▲ Visit of Izolyator plant by SAGIA representative Mr. Abdulrahman (Saudi Arabia)

► Chairman of the Board of Directors EVN NPT Dang Phan Tuong is receiving representatives of Russian companies in Vietnam



▼ Representatives of Russian companies at the open workshop «Experience sharing in electric power transmission and distribution – electrical equipment of Russia» in Vietnam





Russia is a reliable economic partner to us, including power industry.

Sodikdzhon Boboev,
Director of Tajikenergossnab,
subsidiary on procurement
of Barki Tochik holding
company

Russia and Tajikistan are tied with a century-long friendship and decades of common history.

Russia is a reliable economic partner to us, including power industry, and we are looking into the future of relations between our countries and peoples with confidence.

Barki Tochik holding company is a state national energy company of Tajikistan, based in Dushanbe. The company and its assets are a property of the Republic of Tajikistan. The company's core activities are electric power production, transmission, distribution and sale of electric and thermal power mostly in Tajikistan.

The company maintains partner relations with over 12 countries in areas of construction, design, equipment and materials delivery. The company trades electric power with neighbouring countries.

Tajikenergossnab is a responsible and reliable business partner of Izolyator plant in deliveries of high-voltage bushings to the power facilities of Barki Tochik holding company.

Our companies are tied with a long-standing fruitful cooperation, successful accomplishment of large-scale projects and, more importantly, — a common goal of innovative development of the power industry of Tajikistan by a wide implementation of the most modern and reliable electrical equipment.

We will carry on developing an efficient dialogue on deliveries of innovative Izolyator products for the power system of Tajikistan, and are prepared to developing friendly relations.

Power Industry is a Priority of the Strategic Partnership of Russia and Tajikistan

Director of subsidiary company on procurement Tajikenergossnab of the holding company Barki Tochik Sodikdzhon Boboev visited Izolyator plant.

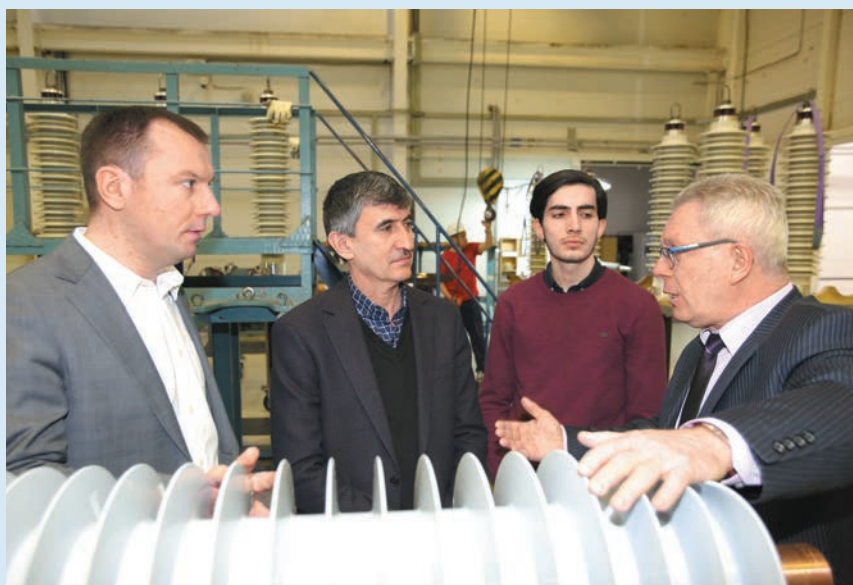
Sodikzhon Boboev arrived on invitation, received from the Chairman on the Board of Directors of Izolyator Alexander Slavinsky during a business meeting at the International Forum «Power Grids».

Sodikzhon Boboev visited Izolyator plant with his son Chahongir Boboev, student of Moscow power engineering Institute.

The hosts arranged for a plant tour with a demonstration of modern technologies of production and testing of high-voltage bushings with solid internal RIP and RIN insulation.

The guest highly praised the production and technical potential of Izolyator as a powerful and reliable factor of successful realization of large-scale projects to develop power industry in any region of the world.

Joint activities of Barki Tochik and Izolyator are an example of efficient and long-term international cooperation.



Getting familiar with the technology of assembly of bushings with polymer external insulation at Izolyator plant,
L-R: Maxim Osipov, Director of subsidiary company on procurement Tajikenergossnab of the holding
company Barki Tochik Sodikdzhon Boboev, Chahongir Boboev and Victor Kiryukhin

In the foundation of this unending and fruitful work, there lie a century-long friendship between our peoples, strategic partnership of the two countries and priorities, formulated by the presidents

of Russian Federation and the Republic of Tajikistan, among which there are all-out strengthening and development of bilateral integrative ties in power industry and construction of energy facilities. ■

Over **450** bushings rated voltage **35-750 kV** are shipped to CIS countries



Meeting with representatives of the plants entering Alageum Electric group in Kazakhstan

About Results and Plans

Senior Manager of CIS Sales at Izolyator Dmi-triy Karasev had meetings with representa-tives of Asia Trafo and Kentau transformer plant, entering the Kazakh holding company Alageum Electric, in November.

During the visit to Asia Trafo plant, he had a meeting with the General Director Sergazy Kunturov and Head of Purchasing Askar Kobdikov.

The sides discussed results of coopera-tion in 2018 and progress of joint projects on delivery of Izolyator high-voltage bushings for completing the transformer equipment of Asia Trafo.

At the meeting with representatives of Kentau transformer plant, the partners discussed planned volumes of Izolyator high-voltage bushings deliveries in 2019. ■

Alageum Electric and Izolyator Are Acting in Line With Uniform Strategy

Representatives of Alageum Electric Holding companies — Asia Trafo, Kentau Transformer Plant and Alageum Electric Rus Trading House — visited Izolyator plant.

Over a plant tour, the guests familiar-ized themselves with complete technology

of manufacturing and testing of high-voltage bushings with solid RIP and RIN insulation.

Representatives of Alageum Electric subsidiaries praised highly the technologi-cal potential of Izolyator plant. ■



L-R: General Director, Alageum Electric Trading House Ermek Erzhitov, Chief Designer, Kentau Transformer Plant Kaisar Kamalbay, Head of Purchasing, Kentau Transformer Plant Baiken Kalasov, Alexander Slavinsky, Plant Manager, Asia Trafo Sergazy Kunturov, Victor Kiryukhin and Maxim Osipov

Always Open to Questions

Izolyator held a workshop for management representatives and technical specialists of branches of Mogilyov Republican Uni-tary Enterprise of electric energy Mogilyov-energo at the end of November.

The event was organized on the base of RUE Mogilyovenergo's training center. Izolyator was represented by Head of SVN Service Dmitry Mashinistov and Deputy Chief Engineer of RUE Mogilyovenergo Stanislav Goryachko contributed as a co-presenter.

The audience studied advantages of Izolyator HV RIP bushings, methods and specifics of diagnostics, guidelines of competent operation of bushings at power facilities.

During the seminar, the specialists of RUE Mogilyovenergo's branches received detailed answers to their questions. The

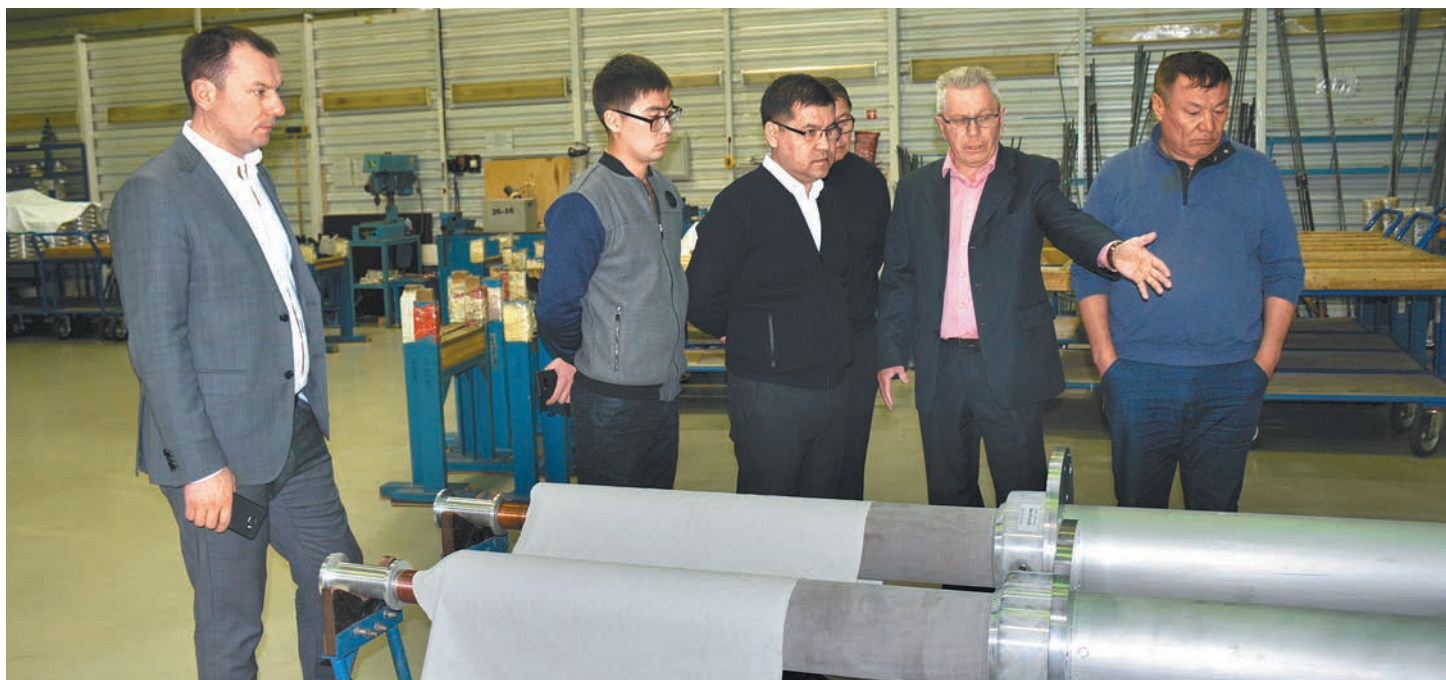


Audience of Izolyator workshop at the training center RUE Mogilyovenergo in Belarus

event went as an active dialogue with a deep interest with the audience and a wide discussion of the topics and sharing profes-sional experience. All participants of the workshop marked its exceptional mutual benefit and good prospects of such format of cooperation.

We appreciate RUE Mogilyovenergo for an invitation, high interest and excellent organization of the workshop. ■

44 | Following Century-Long Traditions of Friendship and Collaboration



▲ Representatives of Alageum Electric subsidiaries are getting familiar with the process stages of high-voltage bushings production at Izolyator plant

▼ Tattimbet Otepov, Head of Equipment Purchasing Control Dpt of Central Asian Electric Power Corporation, Maxim Osipov and Victor Kiryukhin at the 10–150 kV internal insulation winding station



▲ Viktor Kiryukhin, Chahongir and Sodikdzhon Boboev at the 220–1150 kV assembly station at Izolyator plant





◀ Discussing test results of high-voltage bushings with National Power Grid of Kyrgyzstan at the test center of Izolyator

▶ Workshop participants at 220 kV S/S Lisi of the Georgian State Electrosystem, L-R: S/S Chief Davit Chkheidze, Konstantin Sipilkin, Head of Transformer Repair Service of GSE Nodar Gavasheli, Dmitry Mashinistov and Aetos Ltd's Director Tamaz Sharikadze



▲ Business meeting at Chernomorenergo in Abkhazia: Tengiz Girdzhinba, Chief Engineer at SUE Chernomorenergo (L) and Dmitry Karasev

▶ The first in Belarus 750 kV RIP bushing by Izolyator has been installed, L-R: Dmitry Mashinistov, Lead Engineer at Riko representative office in Belarus Anatoly Tereschuk and Chief of 750 kV S/S Belorusskaya Vyacheslav Maskalik





Andrey Shornikov,
Head of International Business
Development Department
Izolyator



Yaroslav Sedov,
International Business
Development Manager
Izolyator



Maxim Osipov,
Head of CIS Sales
Izolyator



We are always open to dialogue with partners as the vector of foreign economic development of the company stayed unchanged. In 2018, we maintained dialogue with new potential partners and support trusting and mutually beneficial relations in key destinations.

Our cooperation with the Indian state power grid company Power Grid Corporation of India Limited can be an example of established relations. In 2018, Izolyator won tender for delivery of a large batch of 420 kV and 800 kV RIP bushings.

The signing of the strategic cooperation with Mehru Electrical & Mechanical Engineers (P) Ltd. (India) became a milestone.

Today, the company takes part in many tenders and learns about capabilities of the world's test laboratories. We are convinced that an unstopping development is possible only with mutual interest and apply every effort on from our side.



Never slow down and always grow turnover — this unspoken rule reigns in our team. In 2018, we followed it closely as always.

The year was marked by an active and productive work on the markets of Europe and Middle East. Thus, Turkey is a traditional strategic partner to Izolyator and we continued strengthening our relations. The workshop, organized for the state power grid company of Turkey TEIAS and dedicated to experience sharing in power transmission, advantages of Izolyator bushings, is worth a separate mention.

The market of Saudi Arabia has long been attractive for cooperation in power sector. Izolyator became active on that market following the general trend of Russia's cooperation strategy.

At the same time, we made accent on the development of such markets as Eastern Europe and gave priorities to the countries that have already had experience of purchasing Izolyator products, namely: Slovakia, Slovenia, Bulgaria, Serbia, Hungary.



In 2018, Izolyator used every effort to strengthen our partner relations with representatives of the power industry in CIS.

We paid much attention to improving relations with power grid companies of Belarus. In 2018, we saw the first direct shipments of 110 kV HV bushings to the Republic of Belarus. Our specialists also took part in a landmark event — installation of the first in Belarus 750 kV bushing with solid internal RIP insulation.

Traditionally, we met our partners at technical workshops with pleasure. Thus, we organized a seminar for the specialists of the state national energy company of Tajikistan Barki Tochik. We had a good workshop with the technical specialists of the State Electrosystem of Georgia.

We received guests and went out visiting partners. Thus, we received an inspection of high-voltage bushings testing, which were made for the needs of the National Power Grid of Kyrgyzstan.

It is an important event for us, opening great prospects.

EXPORTS



Over
30
countries
of the CIS
and other
countries
of the world

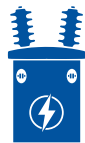
Export share
in sales



2018



Deliveries
to **19** countries
of the world



> **750**
bushings



from **40,5**
to **800** kV



> **450**



bushings in
35-730 kV range
shipped to CIS
countries

> **150**



bushings in
52-800 kV range
shipped to power
facilities of India



In 2018, our plant went through a major expansion of transformer and reactor range with rated voltage 330 and 500 kV.

Andrey Kanivets,
Technical Director,
Togliatti Transformer Ltd



2018 was a complex yet fairly productive year for our plant. We accomplished a lot of new projects that were far from typical. So, the plant expanded transformer and reactor product range with rated voltage 330 and 500 kV, made and delivered to power facilities several rectifier transformers. In general, the power equipment, made in Togliatti, is reliably operating in more than 50 countries of the world, including Eastern and Western Europe.

Our transformers are operating at power plants, electric networks of federal and regional grids, in power supply systems of industrial companies, ferrous and non-ferrous metallurgy, electrified railway transport, agriculture and other sectors in Russia and the CIS countries.

We used Izolyator HV bushings in virtually all new projects. In this respect, I would like to thank the staff of the technical service of Izolyator for their prompt response and support in creation of special design of bushings.

In 2019, there are many more complicated projects waiting and we are looking forward to a continued fruitful cooperation with Izolyator.

We visit Izolyator plant to have a personal introduction to the production cycle of HV bushings making and testing for our company. We discuss issues of further interaction under the existing and future joint projects in delivery of electrical equipment to Russian and foreign power facilities.

Open to Questions of Professionals



Participants of Izolyator's workshop for line managers of Ufa Transformer Plant

Izolyator representative Maxim Zagrebin, Head of OEM sales and Victor Kiryukhin, Lead Technical Support Specialist held a workshop for line managers of Ufa transformer plant.

Maxim Zagrebin opened the workshop with a presentation about Izolyator, covering the milestones of its development, product range and experience of deliveries and operation of high-voltage bushings on Russian and foreign power facilities.

Victor Kiryukhin led the second part of the workshop. He spoke about the advantages and construction design features of high-voltage bushings with solid internal RIP and RIN insulation. He summarized the experience of operation and diagnostics of Izolyator bushings in a wide range of geographic and climate condition. He introduced new innovations of Izolyator for keeping set technical and operational features of high-voltage insulating equipment stable. At the end of the workshop, the speakers handed certificates of training to the participants.

During the visit, a meeting with UTP management was organized. At the talks, the sides discussed organizational and technical aspects of the works that were executed this year and coordinated plans for the coming year. ■



*In all our undertakings,
we count on support
and cooperation of our
true partners — Izolya-
tor company.*

**Konstantin Stafeev,
Director of Development
and Corporate Affairs
PMTT**

This year, Power Machine — Toshiba. High-voltage Transformers plant is turning 5 years old. The project started in September 2011 with signing of a JV set up agreement and construction of power transformers manufacturing facility in Russia. The joint venture was created in symbiosis of the best Japanese and domestic traditions of transformer making. I am confident that over the 5 years of operation the company has proved that it is a subsidiary of the giants in power plant engineering for a reason. Over this time, we mastered the production of power transformers in the range from 25 MVA and 110 kV up to 400 MVA and 750 kV. The most of equipment, which was made, has already been put in operation and is operating at the power facilities. In the past 1,5 year, we successfully completed a project with Roostom Group to deliver transformers to Kalininskaya NPP and made the first in Russia phase-shifting transformer for the needs of Volzhskaya HPP, allowing for optimally distributing capacity flows in power lines. We signed an agreement and work on a long-term project of replacing equipment the needs of Votkinsk HPP, delivered transformers for Long Phu-1 TPP in Vietnam.

We are prospecting a large number of ambitious projects in the near future. Among them: production of new orders for the needs of nuclear power industry, replacement of transformer park of the largest power plants in Russia and the CIS under the long-term contracts, participation in foreign projects. There are distant future plans of mastering SF6 gas transformers production with technological support of the Japanese partner. And, in all our undertakings, we count on support and cooperation of our true partners — Izolyator company.

Talks at ATEF Group

Head of OEM Sales at Izolyator Maxim Zagrebin had talks with the management of the Azerbaijani industrial group of companies ATEF.

ATEF was represented by:
Mustafa Gunay, General Director,
Mazair Mamedov, Deputy Chairman of the Board,
Nikolay Molodetsky, Deputy Chairman of the Board.

From the Large Transformer Plant of ATEF Group, these colleagues also participated:

Eldar Abbasov, General Director,
Pavel Butyaev, Chief Process Engineer,
Subhan Jafarov, Process Engineer.

The sides analyzed organizational and technical aspects of coordination, clarified strategic objectives and tasks of creation and sales promotion of modern power equipment. ■



Participants of talks at ATEF Group in Azerbaijan



Practical steps in pursuit of the digitalization task bring up a lot of challenges for power engineers. The first of them is development of the digital substation standard.

Andrey Mayorov,
Deputy General Director,
Chief Engineer
Rosseti

Andrey Mayorov has been appointed Chief Engineer, Deputy General Director at Rosseti. Rosseti Group — the operator of energy networks in Russia — is one of the largest power companies in the world. The new manager received a task of ensuring technical accomplishment of power sector digitalization goal with regular improvement of operational indicators.

Andrey Mayorov is one of the most experienced, talented and authoritative power engineer in our country. He is not only capable of achieving any given target, but also finding an optimal and at times only possible way of doing it. United energy company transformed into a true innovations giant under his lead. The company is a pioneer in digital networks.

Over the past year, we narrowed down the key areas of the power sector development. Together with the Ministry of Energy of Russian Federation, we made a breakthrough in adaptation of the normative base in legislation, the company staff demonstrated great results at drills that went all over the country.

These actions were necessary to create a foundation for execution of a strategically important task for the economy of our country — creation of a digital power grid.

Andrey Mayorov will engage in the projects of power sector digitalization that has proved its high performance and efficiency in Moscow. He will do the rollout of the system on the federal level together with control over investment and maintenance programs and plans of accident prevention measure of Rosseti's subsidiary structures that are directed at ensuring a secure and quality power supply of consumers in all 78 regions of presence.

New Cooperation Opportunities With Rosseti

Andrey Logatkin, Director of International Cooperation Dpt at Rosseti paid a working visit to Izolyator plant.

At Izolyator, the guest was received by: Chairman of the Board of Directors Alexander Slavinsky and Commercial Director Ivan Panfilov.

Kirill Lunin, Head of Production System Development Dpt at FGC UES also participated in the meeting.

The receiving side arranged for a plant tour, familiarizing Andrey Logatkin with the manufacturing facility and the newest equipment, used in production of high-voltage bushings. At the meeting, the sides spoke about various aspects of joint international activities, set up general targets and outlined plans for 2019. Traditional and successful cooperation between Rosseti Group and Izolyator will continue to become even more efficient. ■



Participants of the meeting at Izolyator plant, L-R: Head of Production System Development Dpt at FGC UES Kirill Lunin, Director of International Cooperation Dpt at Rosseti Group Andrey Logatkin, Alexander Slavinsky and Ivan Panfilov

Our partners: **70** power grids in **81** federal subjects of RF



Oleg Bakulin is opening the workshop for the specialists of IDGC North Caucasus

Workshop at IDGC North Caucasus

Izolyator plant held a workshop for management and specialists of divisions of the Inter-regional Distribution Grid Company of North Caucasus in Pyatigorsk.

At the seminar, Izolyator was represented by Director of Partner Relations Oleg Bakulin and Lead Commissioning Engineer of SVN Service Alexey Pilyugin.

After telling about the key stages of the plant development, product range and geography of Izolyator high-voltage bushings deliveries to Russian and foreign power

facilities, Oleg Bakulin gave a detailed account of the company's operational experience with RIP bushings.

In the second part of the seminar, Alexey Pilyugin spoke about advanced diagnostic methods of high-voltage bushings, including frequency dielectric characteristic analysis.

During the visit, our colleagues also had a meeting with IDGC North Caucasus management where they discussed cooperation plans for 2019. ■

Production Certified by Rosenergoatom Concern

Izolyator received a certificate of conformity of its manufacturing process to the requirements of Rosenergoatom Concern.

The document was issued by «Agency for quality compliance» certification body in the result of a voluntary certification, specified for the companies that make equipment for nuclear power plants.

The certificate confirms that Izolyator plant is in a condition to ensure high-quality products and meets requirements of normative documentation. ■



With Interest to Suppliers

The annual forum «RZD Procurement. Open Dialogue» took part at the end of November. Oleg Bakulin, Director of Partner Relations represented Izolyator at the forum.

At the forum in Moscow, RZD JSC discussed global issues of its cooperation with suppliers. Civic organizations representatives and RZD's suppliers entered the dialogue.

At the forum, the Head of RZD reminded that the long-term development program till 2025 sees an overall investment in large-scale construction of railways in the amount of 8,7 bln rubles. In this connection, improvement of purchasing procedures and work with suppliers will be very important.

There is a growing attention given to purchasing from small and medium businesses. Thus, for example, their share over the 9 months of this year approached 44% in purchasing.

RZD is improving its purchasing mechanisms, simplifying some procedures to provide access to its purchasing to the largest possible pool of suppliers.

The open dialogue with suppliers is already the third one. This year's conference also included workshops for suppliers. ■



RZD Procurement. Open Dialogue Forum in Moscow



It is important to interact with Russian and international research and development organizations and expert communities.

Pavel Korsunov,
Deputy Chairman
of the Board FGC UES

There is a successful long-term program of innovative development in FGC UES. The company annually invests in R&D and engineering in power sector. Together with the leading scientific organizations, the company accomplished several important for the Russian science groundbreaking researches.

The achievement of breakthrough results and worldwide recognition was possible with participation of scientific community and large business. Many of our engineering projects resulted from direct collaboration between FGC and leading scientists and prominent scientific organizations. At the same time, we attract young specialists to that work.

The public listed company Federal Grid Company of the Unified Energy System (FGC UES PJSC) was established in the result of reforms in power industry of Russian Federation as organization responsible for control of the unified energy system (all-Russian) UES with purpose of its preservation and development.

The unified energy system of Russia is recognized a «national property and warrant of energy security of the state». In order to «preserve and strengthen it, ensuring the uniformity of technological operation and realization of the state policy in power industry» the state provisioned creation of FGC UES. The Federal Grid Company is a subsidiary of the power grid company Rosseti PJSC.

FGC UES PJSC operates in 77 regions of Russia, making a contribution to the achievement of strategic objectives of the social and economic development of Russian Federation and also ensuring power supply to 11 foreign countries.

Results and Plans of FGC UESD

In 2018, the Federal Grid Company of the Unified Energy System carried on with realization of the projects of federal importance: it completed the works to strengthen links between the energy systems of Center and North West, ensure supply of electricity from high-capacity generating facilities in the North West, Urals and Far East. The key FGC UES's projects till 2020 will be connected with development of Baykal-Amur and Transsiberian railways, delivery of power from the new power plants, power supply of mainline pipelines, including East Siberia — Pacific Ocean and Power of Siberia.

Among production objectives, besides traditional ones such as ensuring reliable operation and execution of investment program in time, there is active implementation of digital solutions. The projects of remote control systems implementation, construction of digital substations with complex use of digital technologies, development of digital designing of power facilities will be continued. ■

Source: FGC UES



Izolyator bushings on 220 kV transformers of SS Svetlaya FGC UES (photo: FGC UES)

Over 1100 bushings shipped in 2018 to the power facilities of FGC UES

With an Eye Toward the Future

Alexander Savinov, Director of Strategic Sales of Izolyator visited Sevastopolenergo in October.

At the talks, the sides discussed volumes of high-voltage bushings shipments to the power facilities of the region till the end of 2018 and various aspects of interaction on a long term basis.

Sevastopolenergo is a utility engaged in electric power transmission and distribution via 0,4–110 kV networks on the territory of the federal city Sevastopol. The company's key objectives are ensuring a reliable and stable power supply to the consumers of Sevastopol and provision of services with good quality. ■



Alexander Savinov by the head office of Sevastopolenergo

Turning Face to Specialists



Victor Kiryukhin is answering questions about the equipment in Sevastopol

Izolyator held a workshop for management of the technical service of the utility company Sevastopolenergo. Alexander Savinov, Director of Strategic Sales and Victor Kiryukhin, Lead Technical Support Specialist of Izolyator represented Izolyator plant.

The guests were received by Deputy Chief Engineer Maintenance Sergey Ivanenko and Head of High-Voltage Networks Sector Victor Karasev.

Participants of the workshop familiarized themselves with the century long history of Izolyator, production capacities and innovative products of the company. The technical part of the presentation described application track record of Izolyator RIP and RIN HV bushings, their operation and diagnostics on power facilities.

After the workshop, our colleagues had talks with Sevastopolenergo's management about Izolyator products deliveries in 2019.

We appreciate Sevastopolenergo for an invitation and workshop organization on a high level. ■

54 | Development of Power Sector



▲ Joint visit to PMTT transformer plant, L-R: Alexander Yuzhakov, Deputy Chief Engineer PMTT, Konstantin Balikoev, Deputy Head, Master Planning and Purchasing Dpt, FGC UES PJSC, Ivan Serebryakov, Sales Director, VO Elektroapparat JSC, Kirill Lunin, Head of Production Technology Development / Power Equipment, FGC UES PJSC, Ivan Panfilov, Sales Director, 1st Dpty General Director, Izolyator, Alexander Petrov, Adviser to 1st Dpty Chairman of the Board, FGC UES PJSC, Konstantin Stafeyev, Director of Development and Corporate Affairs, PMTT and Mikhail Melshin, Head of Sales Dpt, PMTT

▼ UETM's General Director Vladimir Kalaushchenko (L) and Maxim Zagrebin during talks at Uralelectrotyazhmash



▼ Meeting with management representatives of Power Machines – Toshiba. High-voltage Transformers in St. Petersburg, L-R: Alexander Yuzhakov, Deputy Chief Designer, Maxim Zagrebin, Izolyator, Andrey Sidelnikov, Chief Designer and Konstantin Stafeyev, Director of Business Development and Corporate Affairs



▲ Meeting of Relematica's Sales Director Andrey Finogenov and Commercial Director Ivan Panfilov at Izolyator plant





◀ Participants of Izolyator's workshop at Quadra PJSC – Kursk Generation in Kursk

▶ Participants of the talks between TGC-11 and Izolyator at TGC-11 headquarter in Omsk



▲ Plant tour for Izolyator plant representatives at Power Transformer Manufacturing Plant, part of ATEF Group, L-R: Process engineer Subhan Jafarov, Maxim Zagrebin, Victor Kiryukhin, Deputy Chairman of the Board of Directors at ATEF Group Nikolay Molodetsky and Chief of Assembly shop Abas Abasov. In the forefront – 330 kV transformer with Izolyator bushings

▶ Participants of the tests of Izolyator bushings made to the third class of safety for nuclear power plants, L-R: Dmitry Ivanov, Oleg Bakulin, Sergey Zhukov, Electric Shop Group Leader, Balakovo NPP, Tatyana Golkina, VO Safety and Alexander Novikov





Maxim Zagrebin,
Head of OEM Sales
Izolyator



The projects that we work on have to be completed just in time. We are especially proud of several fulfilled obligations. For Power Machines — Toshiba. High-voltage transformers we developed 750 kV bushings for the first PMTT's transformer of that class: it has already been delivered to a location in RF.

Successfully ended a project for delivery of Oil-SF6 bushings for Togliatti transformer units intended for the Rogun HPP project. Moreover, the bushing's commissioning was done with support of Izolyator engineers.

We maintained active cooperation with Zaporozhtransformer, especially in projects in power generation.

There is ongoing interaction with SVEL in regard to projects, requiring bushings of highest voltage classes.

We develop our relations with Uralelectrotyazhmash year on year. It is one of the most stable partners of our company.

In 2018, 330 kV Izolyator bushings were delivered for the first transformers of the class, made by ATEF Group.



Alexander Savinov,
Director of Strategic Sales
Izolyator



In 2018, our attention was concentrated on promoting the advantages of the the new type of high-voltage bushings with solid RIN insulation. With great pleasure, we ran presentations for technical specialists and spoke in detail about the advantages of bushings of the type. Thus, in Quadra PJSC's branch — Kursk generation — we told the audience about the specifics of construction design of RIN bushings and their technical features, advantages and prospects of application. The fact that specialists speak of a great use of workshops and express intention to develop cooperation only emphasizes the importance of our work.

The Federal Grid Company of the Unified Energy System expressed gratitude to Izolyator plant for timely and quality fulfilment of its obligations in delivery of equipment under long-term agreements in 2018. This praise symbolizes our ability to always meet deadline irregardless of colossal amount of shipments. There can simply be no other way. In 2019, we expect to keep up the pace and become only better and more efficient.



Oleg Bakulin,
Director of Partner Relations
Izolyator



The ultimate goal that we work to achieve is to ensure uninterrupted energy supply to consumers.

In 2018, for the first time in our history, we received experience of making high-voltage bushings conforming to the third class of safety of NPP equipment. The tests were inspected together with Balakovo NPP and VO Safety representatives according to the test program.

We followed our principle of just in time deliveries in order to provide an opportunity for power engineers to perform maintenance works. For instance, at Rosseti power facilities there 250 000 high-voltage bushings in operation with Izolyator brand, 50 000 pieces out of those — RIP. Yet, all the shipments of high-voltage bushings in 2018 in the address of power grid companies of Rosseti were sent in time.

It is very great that in the busy schedule of our partners there is always time for personal meetings. Representatives of RusHydro Group visited our plant.

We sincerely hope to continue developing our partner relations with representatives of the largest power grid and generating companies in the new year.

POWER INDUSTRY OF RUSSIA

Unified Energy System of Russian Federation (UES):



70
power grids



748 power plants



239 812,2 MW
total installed
capacity of power
plants UES Russia*



in **81** regions



>10 700
power lines



Over **1 000 000 000 000 000** kWhr
produced by power plants entering UES of Russia

2018

Over **550** bushings
delivered to transformer
plants of Russian Federation



Over **4000** bushings
in 24-750 kV range
delivered to the Unified
energy system of Russia



70-80%
of high-voltage
bushings market
in Russia and CIS

Over **1100** bushings
shipped to the
power facilities
of FGC UES



Public Listed Company
Federal Grid Company
of Unified Energy System
(FGC UES PJSC)



946 high-voltage substations
with a total installed capacity

347 000 MVA

143 600 km power lines**

Energy systems of Azerbaijan, Belarus, Georgia, Kazakhstan, Ukraine operate parallel to UES of Russia. The energy systems of Kyrgyzstan and Uzbekistan operate parallel to UES of Russia via the energy system of Kazakhstan. The energy system of Moldavia - via the energy system of Ukraine.*





Izolyator proved itself a stable, reliable and professional partner, accurately and timely meeting its business obligations.



Werner Handelsmann,
Vice President Sales / Marketing
and SCM E/A Sales Power
and Distribution Weidmann
Electrical Technology AG

Weidmann group of companies have successfully cooperated with Izolyator for 19 years. As of today, Izolyator is one of our key partners. The main area of cooperation is delivery of insulating materials, such as crape paper.

Over this long-term period of time, Izolyator has proved itself a stable, reliable and professional partner, accurately and timely meeting its business obligations. We would like to mention the flexibility of approaches, ability to quickly take decisions, activity on the market, stable improvement of technical processes in treatment of our materials. We are confident that Izolyator products meet the standards of the best global manufacturers.

Based on the above, our company witnesses a high potential of Izolyator and its determination to further successful development.

We wish Izolyator every success in achievement of their plans and targets.

Weidmann has been a leader in electrical engineering market for over 140 years. With deep knowledge in design, development and operation of electrical equipment, Weidmann is a leading supplier of complex solutions for specialized products and services in power sector. Working in close cooperation with partners, the company is leading on the international market, providing high quality, innovative products and services.

Weidmann's core competence is the development and production of tailor-made solutions for cellulose based insulation systems.

Business Visit To PPC Insulators

In December 2018, Izolyator plant representatives had business talks with PPC Insulators management in Sonnenberg, Germany.

Deputy Commercial Director Dmitry Abbakumov and Purchasing Manager Antonina Maslennikova visited PPC Insulators.

The guests were received by: Wolfgang Welsh, Global Sales and Marketing Director, Mike Zintl, Sales Director, Alexander Luthardt, HR Director, Ivo Kamen, Sales Manager CIS, Antonina Durakova, Customer Service, Andre Eisfeld, Engineering Manager Head of Design and Offering Germany.

It was the first visit of Izolyator representatives to PPC Insulators. At the talks, the sides mainly discussed purchasing of porcelain insulators, possibility to start production of sheds using Izolyator plant's drawings and other issues on instrumentation and testing on the territory of PPC Insulators production facility. In the result of the meeting, the sides agreed the planned volumes of purchasing of porcelain insulators and mapped up cooperation plans. ■



L-R: Mike Zintl, Sales Director, PPC Insulators, Dmitry Abbakumov and Antonina Maslennikova. Sonnenberg, Germany

Suppliers from **17** countries and **70** companies deliver materials and components to Izolyator plant

Keeping Good Dialogue



Welcoming the guest at Izolyator plant, L-R: Vladimir Romanov, Georgy Kaunov, General Director at Wieland-Werke Rus and Dmitry Abbakumov

In October, Georgy Kaunov, General Director of Wieland-Werke Rus Ltd that offers products of the metallurgical company Wieland-Werke AG in Russia visited Izolyator plant.

The sides summarized the preliminary results of cooperation in 2018.

Georgy Kaunov made a presentation about new technological capabilities of Wieland-Werke AG.

In the result of the talks, the partners outlined directions of development of a mutually beneficial cooperation in 2019. ■

Going into Detail

Devendra Sharma, Senior Marketing Manager at the Indian company Modern Insulators Ltd. visited Izolyator plant.

At the talks, the sides discussed cooperation prospects of ceramic sheds deliveries. At the end of the meeting, the hosts arranged for a plant tour, where the guest familiarized himself with the company products and HV bushings production process.



Talks at Izolyator plant

Modern Insulators LTD. (MIL) is an Indian manufacturer of high-voltage insulators in 33 kV – 1200 kV range, made of alumina porcelain, required for electric power lines, electric substations, railway and switching and control equipment. The company was founded in 1985 in technical cooperation with Siemens AG for production of high-voltage insulators of alumina porcelain. Modern Insulators Ltd. is a pioneer in production of insulators of the type in India. Today, it is one of the largest exporters in the country, winner of many awards from the Ministry of Trade for export promotion for four consecutive years. ■



Representatives of Modern Insulators Ltd. and Izolyator are discussing cooperation prospects

Key Topic — Quality

A business meeting with Autocom industrial group's Purchasing Director Evgeny Gutgarts and MPK plant's Deputy General Director Vitaly Kormyshenko took place at Izolyator plant in November.

The main line of the talks concerned issues of quality and volumes of delivered products — brass

terminals that are used for production of Izolyator high-voltage bushings.

The hosts arranged for a plant tour, familiarizing the visitors with the production process of high-voltage bushings with solid internal RIP and RIN insulation.

The talks ended with agreeing on prospects of further mutually beneficial cooperation. ■



Talks at Izolyator plant, L-R: Vitaly Kormyshenko, Deputy General Director at MPK Plant, Evgeny Gutgarts, Purchasing Director at Autocom industrial group, Tatyana Sheina, Vladimir Romanov and Dmitry Abbakumov

60 | Working With Best International Suppliers of Materials



◀ MPK plant management representatives at the museum of Izolyator, L-R: Dmitry Abbakumov, Marketing Director at MPK plant Nikita Olkhovsky, Deputy General Director at MPK plant Vitaly Kormysheenko, Chief Process Engineer at MPK plant Andrey Stavrov and Vladimir Romanov

▶ Talks at Izolyator plant with participation of Wacker Chemie AG, L-R: Mikhail Spirin, Sales Manager, Wacker Chemia Rus Ltd., Jurgen Izmayr, Sales Director SER, Antonina Maslennikova, Dmitry Abbakumov and Vladimir Romanov



▼ Participants of the business meeting in Moscow, L-R: Dmitry Abbakumov, Peter Huntsman, President, Huntsman Corporation and Konstantin Ilyichevsky, Regional Sales Manager, Huntsman (Netherlands) BV



▲ Talks of KME at Izolyator plant were successful, L-R: Vladimir Romanov, Dmitry Abbakumov, Commercial Director (Special Products) of KME Engineering Copper Solutions Christof M. Dratner and KME Germany GmbH & Co. KG representative in EEC Andrey Vinogradov



Dmitry Abbakumov, Deputy Commercial Director Izolyator

Purchasing and supply chain define modern procurement of material resources of required quality to a very high degree. They have an impact on the sustainable growth of a company. Costs here may reach more than 50 % share in sales revenues, so having efficient organization and procurement optimization helps decreasing costs and ensure their system management.

Procurement KPIs give a good understanding of internal company development trends. However, for their correct understanding, we should study them in correlation with others as a system. It is important to take into account influencing factors, including the market ones, as well sales forecasts and production plans. Besides, any structural shifts may lead to improvement of some indicators and aggravation of others. So we review performance indicators in the context of purchasing strategy and company targets. Share of purchasing as percentage of turnover gives understanding of structural differences in value creation in the power industry.

Purchasing costs as percentage to the volume of purchasing reflect efficiency of processes in procurement. Such indicator as costs of purchase order placement is closely connected with the previous indicator and is a part of balanced scorecard of many companies. It allows for evaluating efficiency of purchasing and operational-wise is one of the most important indicators used to assess procurement processes in an organization. This indicator is critical for measuring success and efficiency of new processes (automation).

Time and quality of deliveries are also included. According to the statistics, every fifth shipment is coming later than scheduled. The most widely used in corporate sector are over-all stock position, customer orientation and stability in purchasing in price fluctuation/decrease.

A higher degree of automation in purchasing has direct impact on its efficiency growth. This is a key trend today. Automation brings up such new indicators as purchase volume under long-term agreements, orders within frame agreements and catalogue orders share.

Our practice shows that automation for many companies incurs restart of new supplier search and revision of current contracts. Some companies also find necessary to develop and implement procurement strategy.

One has to take into account a lot of factors, influencing efficiency of the whole company. Automation of purchasing helps to have a better transparency and stability of processes, which lead to a considerable decrease of overhead costs. The market leaders almost 80 % of processes — from demand identification to



Our company is characteristic for a clear goal-setting and purchasing strategy in the context of company goals.

ordering — everything is automated. Correspondingly, there will be a stronger contribution of purchasing to creation of value and success of the companies. For example, in development projects, service sector or investment business, the profit may grow from 3 to 5 % due to timely processing of purchasing.

Our company is characteristic for a clear goal-setting and purchasing strategy in the context of company goals. We do not only pay attention to costs, but also to security of shipments, stable growth, which are decisive in measuring and assessment of procurement impact on value generation. The introduction of standardized processes helps us to cut down costs by 30–50 %. All leading companies run a regular evaluation of suppliers. This approach helps to select the best suppliers, delivery terms and decrease the share of claims.

With Care and Attention for Every Employee

Sociologists regularly measure staff contentment dependance on labor conditions and work efficiency in different companies. The results show quite unambiguous data: the more comfortable people feel at work, the better they do their job. For Izolyator, the team is a key value. General Director of Izolyator Sergey Moisseev told us about the steps that the company took to improve labor conditions and the organization structure.

— Sergey Borisovich, Izolyator plant turned 122 years old this year and 11 years have passed since the launch of the new facility in Pavlova Sloboda. Could you please tell us how the company retains its leading positions over all that time. What objectives does the company management see for itself now?

— In the past years, we were not only able to preserve our century-long experience of high-voltage bushings development, but also to build a modern enterprise, whose production facility meets the most advanced technical and technological requirements and by some indicators and characteristics surpasses similar foreign manufacturers. The efficient social and economic policy of the company combined with exclusivity of our product help us to make a solid contribution to the development of the city district of Istra, Moscow region and the entire electrical engineering.

Today, the management team is tasked with fulfilment of obligations for our partners in full volume and on schedule. To enable Izolyator to all the time improve the level of production management and expand its presence on the global market there has to be a regular analysis of all our processes in place, development and rational utilization of key competences. At the same time, our key value remains our team, for which reason it is important to develop both management system,

quality and ecological management and plan a set of activities to retain the people with the highest qualification at the company. We are targeting regular training and improving employee qualification both outside the company in specialized training centers and inside Izolyator.

There is a regular staff appraisal procedure in place, talent pool selection for development and succession to make the best use of talent in our company.

I am convinced that only a combination of economic and administrative management approaches can be efficient: material and non-financial motivation of production profitability, so that every employee knew his/her responsibility for the job and overall results of the team, knowing that he/she is financially interested and motivated.

— How are social and corporate policies are performing as programs at the company?

— The company takes care of employees and pays much attention to labor conditions. Thus, the company has annual medical inspections covering the costs. There is a regular professional assessment of labor conditional at individual work stations - a special security measure that helps to protect labor. We have a subsidized nutrition program for employees, organize transportation service for employees using corporate transport and partial compensation for those using personal vehicle.

There is great attention given to professional training of the staff. It is important for us to avoid making the training process some kind of a single-action activity - it is an regular process. A professional can only develop in such conditions. Thus, in 2018, we trained 46 executives and 41 mid-level managers in professional training programs and talent development and succession programs. Besides, we completed a training program in company management. More than 30 specialists and managers received training at educational institutions. For the course in company management, leading top managers and specialists of our company as well as professional coaches, business trainers and academic staff member of the leading universities of our country were invited.

We support healthy lifestyles of our people with pleasure: Izolyator's volleyball and football teams are training in our own sports facility and actively engage in sports life of regional and industry related leagues. It is always a perfect occasion to support the colleagues and feel the team spirit at the tournaments.

— What key activities in industrial security did the company have in 2018?

— Indeed, one of the essential measures to take a good care of the company staff members that find very important is to ensure comfortable stay of employees and guests at the company premises. This is achieved through secure environment and maximum safety of people. Our activities in fire safety are done in correspondence of norms and requirements of relevant legislation, regulating fire safety issues for industrial at facilities.

We hold it crucial to have regular fire safety drills at the plant. Thus, in the past year we drilled staff members actions at

fire outbreak inside production shops, skills to use fire extinguishers for fighting open fire at the training ground. Even such unpopular, but important measure as staff evacuation on alarm signals had to be drilled without exceptions.

Besides, we make sure that the secure condition of our facilities was not only observed on paper: we control the operation of fire alarm system. In 2018, the security alarm system was overhauled with replacement of sensors, upgrading the data of the control computer, etc.

We are very proud every time that we arrange a plant tour for our partners. This year, we designed a prospect in Russian and English with a short description of safety measures to be observed when visiting Izolyator.

— **In modern work conditions one has to perfect the means of communication all the time. What has changed in that respect?**

— This year we completed a new iteration of strategically important objective of getting an uninterruptible telecommunications channels in place. It was particularly important as it helped minimize risks of financial losses caused by unstable connection or absence of channel. In 2018, we had an optical fiber line laid as a backup communication channel. Our IT specialists installed and set up the IT network equipment that ensured an automatic switching to the backup channel should any of the channels fail. Our IT team render a permanent service support in consulting, setting up communication channels and multimedia units at the company. The uninterruptible operation of the plant largely depends on them, so our colleagues treat all their duties responsibly, making it no less but a competitive advantage of the company.

— **Finally, we would like to mention the topic of health protection of the staff of the company as it is both a social responsibility and the future of the company. What opportunities are available for employees?**

— We try to track the health condition of our people in dynamics, organize preventive measures and diagnose diseases by initial clinical findings. For example, 96 employees were checked during the annual visit of an ophthalmologist this year. We also arranged for ultrasound scans and medical examinations of staff members. We all hope that the first aid administration skills will not be required to our specialists, however it feels safer to learn them. With that purpose we organized training on administering first aid: 257 people have already passed it. We never forget our core principle - the key value of the company is our staff members. We will keep using every effort to avoid the perception of a job as a building with a selection of work stations. Rather we are making the jobs, which every person dedicates considerable part of lifetime to, a friendly environment, comfortable for every colleague. ■

Izolyator is a leading global supplier of high-voltage bushings, dedicated to innovation, and Russia's sole manufacturer, capable of designing, making and testing EHV bushings. The plant exports over 20 % of its products. In Russia and the CIS, Izolyator is a traditional leader with a market share exceeding 80 %. Since 2007, Izolyator launched a new green-field facility, specially designed and erected in the Moscow region. It is a powerful hi-tech production complex with a manufacturing floor space of about 24 000 m² employing over 300 people. The processing lines are equipped with the most advanced equipment from the leading international and Russian manufacturers, allowing to produce up to 12 thousand HV bushings per year. The company structure comprises specialized divisions that ensure a complete produc-

tion cycle of a new product from idea generation to technical service in the field. These include a specialized design-engineering and process bureau, a high-voltage equipment test center and SVN-Service center.





It is appealing that the company management are getting well-trained as it definitely helps to build a team and motivate everyone to achieve together.

**Elena Zhdanova,
Business Trainer**

Elena Zhdanova, is one of the trainers invited by Izolyator for professional training of staff. She is an expert with hands on experience in forming corporate culture, assessment, recruitment, motivation of personnel and optimization of business processes in a company, winner of «Consumer rights and quality service» award in the nomination «For input in creation of efficient culture of service» (2018), «Efficient Education» award winner (2017) in nomination «Practicing Trainer, expert in design of training products». Elena agreed to make a comment for our magazine.

«It is appealing that the company management are getting well-trained as it definitely helps to build a team and motivate everyone to achieve together. It is pleasing that managers and specialists of the company do the exercises, use new knowledge in real work-life situations and ask many questions. By all means, it helps to generate additional practical use from the trainings».

To fulfil the training program in company management, Izolyator attracted leading managers and specialists of our company, professional business trainers and university professors of the Federal State budget educational institution of higher education Moscow State Power Institute.

Generally, 46 top managers and 41 mid-level managers passed training within the program of staff training and development at Izolyator plant in 2018.

Management, specialists and employees of the company demonstrated solid and sufficient knowledge of the subject.

Talent is Key!

Presently, over forty succession candidates and twenty mentors are in the talent pool development program of Izolyator.

There are a number of training activities for personal and managerial competences development in the program, such as:

- negotiating;
- motivation, mentoring;
- efficient time management;
- stress management and EQ;
- public speaking and presentation.

The training is done by leading speakers and business trainers.

Aside from the above disciplines, we review other programs in online monitoring mode as we identify other needs during our analysis.

In 2018, a new stage of professional training took place at our company with over forty staff members of various qualification levels and professional activities participating.

These areas of general management and company management topics receive the most attention:

- Increasing the basic professional level of company employees in electrical engineering, developing personal competences, cross-functional think-



Learning in the program of professional training of company staff

ing, managerial mindset and psychology, based on acquiring an analytical approach in decision-making and assuming personal responsibility for their accomplishment, improving of legal, accounting and commercial knowledge, learning modern methods and techniques in sales activities;

- obtaining current and highly professional information about modern technological and technical condition of electrical products manufacture in the entire power industry;
- forming professional skills and developing necessary competences with talent succession candidates. ■



Regular joint fire-fighting drills done at the company increase protection level manyfold.

**Alexey Timokhin,
General Director
PFS Planet 101**

Our company has a large experience in provision of fire safety services in facilities, including industrial ones. Our work to ensure fire safety of Izolyator plant is a good example of sound understanding by the management of responsibilities in fire safety provision.

Regular joint fire-fighting drills done at the company increase protection level manyfold from and checks of technical condition of utility systems instil confidence in equipment health.

It is necessary to say that our specialists at Izolyator plant are regularly taking part in drills and staff training, so we see that the level of training of staff is growing. Joining efforts, we also support the fire fighting systems in permanent readiness. These two factors allow us to stay assured of the high level of staff protection. We express gratitude to the management and team of Izolyator plant for a big contribution to maintaining fire safety.

We will continue our active collaboration with Izolyator staff in setting up and maintaining maximum fire safety of Izolyator personnel and guests.



Clear Action Plan in Emergency

Izolyator team had a fire safety drill again. HSE Manager of Izolyator Boris Sobelman ran the exercise.

During the exercise, the team practiced at acting at fire outburst on the insulation paper winding machine of the insulation making shop employees, security service and duty staff response to the signal and raising alarm, staff evacuation on the fire alarm signal, using the primary fire fighting means and fire localization.

Representatives of the Center for Engineering Survey and Research Evgeny Borzilo and Yuriy Dubinin took an active part in localizing the fire and putting it out: according to the plot of the exercise, the fire outbreak was detected at the 220–1150 kV insulation paper winding machine.

On the fire alarm, all the staff member immediately left the premises of the plant in an organized manner and arrived at a safe zone. Evgeny Borzilo also engaged in staff members' training of primary firefighting devices application. At specially allotted ground, he managed to quickly and confidently extinguish an open fire, using a dry powder fire extinguisher OP-5.

Regular and carefully planned drills allow to acquire and maintain on a good level

firefighting skills of Izolyator plant employees to ensure prevention and liquidation of pos-

sible fire outbreaks at production and other facilities. ■



Evgeny Borzilo is practicing to use primary firefighting means

66 | Traditions and Corporate Culture Development



◀ Sergey Moisseev is announcing the awards ceremony on the occasion of the 122nd anniversary of the company open

▼ The moment of silence in commemoration of the plant workers – veterans of the front and labor in the years of the Great Patriotic War



▲ Izolyator management gives sincere congratulations to every staff member



▼ Plant tour the Union of multiple children families of Istra district «All together»





► The students of Lomonosov Moscow State University Gymnasium on a tour at Izolyator plant's museum

► Tatyana Panyukova is training Izolyator plant's staff members how to administer first aid



▲ Boris Sobelman is instructing Izolyator plant staff members before starting a fire safety drill

▼ Deputy Head of the Public Labor Inspectorate – Deputy Chief State Labor Inspector of the Moscow region – Nelly Aizitulina is giving a training at Izolyator plant



New Sports Hall and New Tournament



◀ Grand opening of the sports hall of Izolyator plant

▼ Sergey Moisseev and Alexander Slavinsky are opening the New Year volleyball tournament among Izolyator plant's teams

On the run-up to New Year holidays, an opening ceremony of the New Year Volleyball tournament among Izolyator plant's teams took place. The following teams competed: Megavolt, Lightning and Surprise.

The objectives of the tournament are health promotion, propaganda of a healthy lifestyle and team spirit strengthening. Importantly, the games of the tournament are played in the new sports facility of the company, which was opened early this year.

The teams played 6 games, with Lightning winning the cup in the result.

We are sending our congratulations to the winners and participants!



▼ The first game of the tournament



▲ Playing attacking style





◀ The New Year Tournament is opened! Spectacular games and bright wins are waiting!



▲ The high spot of the match

▼ Friendship always wins



◀ Winner of the New Year Volleyball Tournament – Lightning

Futsal for Big Goals



Izolyator futsal team – participant of the futsal cup tournament The Science of Russia 2018

The charity Futsal Cup the Science of Russia 2018 took place on 27 October 2018. Izolyator team took an active part in the contest.

In the tournament, which took place at the field of the Spartak football academy, 24 teams competed. Participants of the tournament, supporters and all football enthusiasts came from different regions of Russia. The football players traveled from many regions of Russia to compete for the cup. In the result of the games, Izolyator team passed to the quarter finals of the Golden cup of the tournament and took the fifth place in the standings.

The winners were awarded commemorative cups and medals, all the contestants received special diplomas and presents.

We appreciate the organizers and participants of the tournament and all supporters for the big sports event. ■

Better Every Year

On 6 November 2018, the team of Izolyator received award, having made it into prizes of the Nakhabino Street Football Cup, Moscow region.

As the final standings of the tournament taking place from 16 May till 23 August say, Izolyator team took the third place in the first league. It participated in the awards ceremony of the championship.

Thus, our team has significantly improved its standing as compared to the championships of 2016 and 2017. ■



Izolyator plant's team – winner of the third-place prize of the first league of Nakhabino street football, Moscow regions

Receiving the Snowman!



Opening of the New Year Futsal Tournament «The Snowman» in the sports facility of Izolyator plant

The grand opening of a newly established New Year Futsal Tournament «The Snowman» among Izolyator plant teams took place on 5 December 2018.

The event went in the sports facility of Izolyator plant, which later hosted all other games of the tournament.

The final standings after 6 games were the following:

- 1 place – Team of Mechanical shop
- 2 place – Team of Insulation making shop
- 3 place – Select Team of the plant.

The winners of the tournament received the cups, while the other participants were awarded memorable gifts.

Our congratulations to the winners and thanks to all the players for a spectacular and emotional game! ■

▼ Young supporters and growing players



► Final game of the Izolyator-2018 Spring Futsal Cup



▼ The team of insulation making shop, 2 place in «Snowman» tournament



▲ Alexander Slavinsky shook hands with every player of the winning teams

▼ Cup winners in the New Year Cup «Snowman» – the team of mechanical shop – are receiving awards



OUR PARTNERS

We appreciate all our partners



Inter RAO Group is a diversified energy holding, managing assets in Russia and European and CIS countries. The group's activities include production of electric and thermal power, wholesales of energy, international trading, engineering, export of power equipment, management of distribution networks outside Russia.



«Alageum Electric» is the largest electrical holding company in Kazakhstan, which includes more than 30 large enterprises and factories, successfully operating in the electric energy sector, electrical engineering and construction. The products of Alageum Electric meet Kazakhstan's and international quality standards and are exported to the CIS and Middle East countries.



Balikesir Elektromekanik Sanayi Tesisleri A. S. (BEST) is a manufacturer of high-quality and reliable distribution and power transformers. BEST is the largest national manufacturer in Turkey, which enjoys reputation of a reliable supplier to more than 50 countries.



Bushing HV Electric Co., Ltd. (BHHV) is a Chinese power equipment trading company. The joint activities of BHHV and Izolyator are carried out on the basis of the strategic cooperation agreement, signed on 28 September 2017.



CG Power and Industrial Solutions Limited (CG), earlier known as Crompton Greaves Limited, has received its new name on 27 February 2017. CG is an engineering conglomerate with a 2 bln USD turnover and a wide range of products, solutions and services for the power industry. It is a part of Avantha Group.



International Council on Large Electric Systems (Conseil International des Grands Réseaux Électriques – CIGRE) is the largest international non-profit Association in power industry. It is one of the most authoritative and significant international scientific and technical associations.



Founded in 1964, EMCO Limited is one of India's leading products and solutions providers up to 765 kV/ ± 800 kV for power generation, transmission, distribution utilities and industry. The products and technical solutions of EMCO Limited meet requirements of national and international standards IS, IEC, ANSI and are sold in more than 50 countries of the world.



The state power company of Vietnam EVN National Power Transmission Corporation (EVN NPT) was founded in 2008 as result of reorganization of activities of four transmission companies: Power Transmission Company No. 1, 2, 3, 4 and three power project management offices – Northern, Central and Southern.



GE T&D India Ltd makes equipment for power transmission on large distances, such as: switchgear for substations with air or SF6 insulation, circuit breakers, power transformers and measuring transformers.



IMP Powers Ltd., a flagship company of the \$120 Million IMP-Mangalam group, is a name to be reckoned with in the manufacturing of transformers and reactors up 315 MVA and up to 400 kV. This is one of the leading transformer companies of India in the equipment segment 132/220 kV with a park of over 35 000 transformers all over the world.



KME Germany GnbH & Co. KG is a European industrial concern that makes and sells semis and finished products from brass and brass alloys with leading position in the world. KME is an global compation with a developed network of representations on five continents.



Kolektor Etra d.o.o. is a manufacturer of power transformers and generators up to 500 MVA and up to 420 kV. The plant has a modern laboratory to test transformers, equipped with sensitive measurement instrumentation, allowing for making accurate measurements and provide reliable results.



Mehru Electrical & Mechanical Engineers (P) Ltd. makes measuring transformers up to 420 kV. The company is a leading supplier of measuring transformers for numerous customers both inside India and the rest of the world: the products of the company are exported to 30 countries.



Maschinenfabrik Reinhausen GmbH (MR) is a leading company within the Reinhausen Group. For 30 years, MR has designed and manufactured insulation tubes from glassfiber reinforced epoxy resin. Since 2009, these insulators are made by Reinhausen Power composites GmbH, a 100% subsidiary of MR.



Power Grid Corporation of India Limited (PowerGrid) is an India-based state power grid operator engaged in construction, operation and maintenance of inter-state transmission system. This is one of the largest companies for electric power transmission in the world. The company is largely specialized in construction and operation of electric networks in India.



TBEA Co., Ltd., based on the advanced experience of power facilities construction in China, offers ecological, intellectual, reliable and highly efficient power equipment in more than 70 countries and regions of the world.



The Transmission Corporation of Telangana Limited (TSTRANSCO) was founded in the result of India's power industry reform. In 2014, APTRANSCO was divided into regional grid companies TSTRANSCO and APTRANSCO.



Toshiba Transmission & Distribution Systems (India) Pvt. Ltd. (TTDI) is a transformer manufacturer since establishment in 2013. Toshiba Transmission & Distribution Systems group of companies is a global leader in delivery of integrated solutions for transmission and distribution of electric power.



VUJE a.s. is an engineering company, which is engaged in project, contractor, sales, research and training activities mainly in nuclear and traditional power industry. All the projects are done for the customers on turn-key basis, ie. a project is fulfilled from design documentation to completing complex testing.



Wacker Chemie AG is multinational chemical company, headquartered in Munich, Germany. Its division Wacker Silicones is among the world's biggest manufacturers of silanes through silicones. Wacker Silicones supplies components of organosilicon compound to Izolyator for high-voltage bushings' polymer external insulation making.



ZREW Transformatory is based in Lodz, Poland. The company has worked on the market of transformers for over 60 years. It manufactures, maintains, modernizes and runs diagnostics of oil power transformers.



The state production association of electric energy Belenergo (SPA Belenergo) organizes secure, reliable, economically efficient operation and innovative development of production, distribution and sales of electric and thermal energy.



VNIIR Hydroelectroautomation JSC offers its customers a complete services range in design, configuration, supply, installation, commissioning and putting into operation of power facilities. The enterprise operates as a full cycle engineering company.



JSC Georgian State Electrosystem (GSE) is a power grid system operator, rendering services in electric power transmission and exclusive dispatch services all over the country. It also controls the power lines of interstate transmission, which connect the country with its neighbours: Russia, Turkey, Armenia and Azerbaijan.



ATEF Group is specialized in the manufacture of high-quality electrical equipment and turnkey services of substation installation for industrial, utility, transportation and energy sector customers. The technologies that ATEF Group created are exported to 35 countries of the world.



SverdlovElectro Group (SVEL Group) is a leading power equipment manufacturer in Russia. The company boasts one of the impressive growth modernization rates in the industry. Cooperation of SVEL Group with the key Russian companies allows for an efficient contribution to the Government program of import substitution.



State Unitary Enterprise GC Dniestrenergo (SUE GC Dniestrenergo) services 35–330 kV substations and power lines and effects the central dispatch control function over the energy system of Transdnestr Moldavian Republic.



Zaporozhtransformator (ZTR) is the largest in CIS and Europe company to manufacture oil power transformers and electric reactors with production capacity 60 thnd MVA per year, concentrated on a single manufacturing site. ZTR trademark is well-known for an exceptional operational reliability of equipment.



The state unitary enterprise of the Republic of Crimea Krymenergo (SUEP RC Krymenergo) is the largest power company of the Crimea that was created to ensure stability of the power grid operation and energy security in the region. The service area of SUE RC Krymenergo is the whole territory of the Crimean peninsula.



National Power Grid of Kyrgyzstan (NGP Kyrgyzstan) is an energy company, which transport electric power, produced by power plants via high-voltage power lines across the entire Kyrgyzstan to distribution companies and large industrial consumers.



The Public listed company Rossiiskie Seti (Rosseti PJSC) is a power networks operator in Russia, one of the biggest power grids in the world. The company manages 2.3 mln km of power networks, 490 thnd substations with transformer capacity exceeding 761 GVA.



The Public Listed Company Federal Hydrogenerating Company – RusHydro Group – is one of the largest Russian energy holdings. RusHydro is a leader in electric power production from renewable sources of energy, which develops generation on the basis of energy of water streams, sea tides, wind and geothermal energy.



Unipro PJSC (E.ON Russia JSC until June 2016) is the most efficient company of the thermal power generation sector in the Russian Federation. Unipro PJSC consists of five heat power plants. Company's core operations comprise electric power and capacity generation and sales.



Sverdlovsk branch of T Plus Group comprises generating and thermal assets in seven cities of Sverdlovsk region. There are six power plans (TPS, SDPP, HPP) within its structure and in operational control - Ekaterinburg heat supply company, Sverdlovsk heat supply company and Engineering and technical center of Sverdlovsk region.



Power Machines – Toshiba. High-voltage transformers Ltd is a joint venture of Power Machines JSC and Toshiba Corporation. The key product of the plant are power transformers and autotransformers in 110–750 kV range with capacity exceeding 25 MVA, including three-phase execution.



SuperOx was established in 2006 by investor Andrey Vavilov for development of production technology of high-temperature superconductive second generation wires. The company has manufacturing branches in Russia and Japan.



Surgut SDPP-2 supplies electric power to the regions of West Siberia and Ural and is the largest producer of electricity in Russia and third by capacity thermal power plant in the world: total installed capacity of the power plant is 5657.1 MW. It is a branch of Unipro generating company.



Togliatti Transformer Limited is one of the largest designers and makers of electric engineering equipment in Russia and the CIS countries. As of today, the company's main business is highvoltage power transformers production.



JSC «Uralelectrotyazhmash» (UETM) is the biggest Russian developer and producer of electric power equipment for generation, transmission, distribution and consumption of energy. The company makes over 2000 items of products for 3000 customers in Russia and abroad.



Fortum JSC is a leading producer of thermal and electric energy in Ural and West Siberia. The company structure includes eight TPPs. Fortum is a part of Russia division of the Finnish state energy company Fortum corporation.



The Public listed company Federal Grid Company of the Unified energy system (FGC UES PJSC) is one of the largest public power grid companies in the world, tasked with operation and development of the Unified national (all-Russian) electric network. The company is listed as a systemic company in Russia.



Chirchik Transformer Plant JSC was founded in 1942 and for over 70 years now, has worked in machinebuilding of Uzbekistan, producing transformers and packaged transformer substations. Today, it is a leading company of electrical engineering in the Republic of Uzbekistan.



Open Joint Stock Holding Company «Electrozavod» (OJSHC Elektroavod) is the leading Russian and world-wide manufacturer of various transformer equipment being supplied for all industries including electric-power industry, metallurgy, machine building, transport, oil and gas complex, housing and utilities infrastructure.



Electroshield Samara is an advanced technology industrial company, boasting 70 years of history, and the largest domestic manufacturer 0,4–220 kV distribution equipment. This is one of the leading engineering companies comprising two design institutes, construction company, several manufacturing sites in Russia and the CIS and a well-developed regional offices network.



Energy Standard Ltd is a dynamically developing company that promotes products of the largest CIS plants on the Russian market, including products of Zaporozhtransformator. The company offers a wide range of equipment for oil, gas, chemical, ferrous and nonferrous metallurgy, rail transport and mining industries.

We appreciate our partners for any information about our companies' joint activities, which we will gladly print on the pages of the next issue of our corporate edition. We look forward to your news on this email address: n.borichev@mosizolyator.ru

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WE INVITE YOU to become a co-author — of Izolyator — corporate edition!

We appreciate everyone -
our partners - the heroes of events that have found
coverage on the pages of Izolyator edition.

We sincerely hope
that the published materials are useful in our common
work and find it critical that our contribute to the edition's
further development.

**We are
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to print materials,
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