IZOLYATOR CORPORATE EDITION

+7 (495) 727 3311 / mosizolyator.com

IZOLYATOR

Century-old traditions — state-of-the-art technologies

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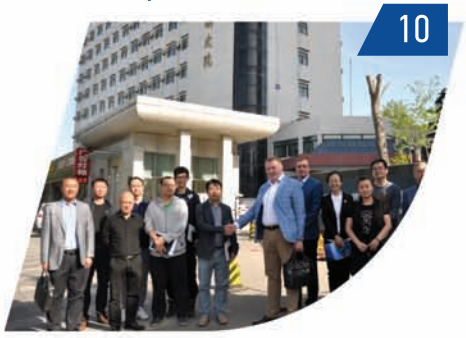

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POWER ELECTRICAL EQUIPMENT ROAD MAP — A PATH TO THE POWER INDUSTRY OF THE FUTURE!

In April 2017, the first sitting of the Multiagency Coordination Council on issues of power equipment building, power engineering and cabling industries development was held.

Representatives of more than 80 leading electrical equipment OEMs, energy and cable companies, industry regulators took part in the sitting, co-chaired by the Minister of Energy of Russian Federation Alexander Novak and the Minister of Industry and Trade of Russian Federation Denis Manturov.

The sitting resulted in definition of objectives and respective deadlines for the Multiagency Coordination Council. The key priority was set to prepare roadmaps for development of corresponding directions, with work schedule agreed, and also to define activities, called to decrease reliance on imported equipment and components in the industry. Besides, they formed multiagency workgroups with Power Electrical Equipment workgroup among them.

The first sitting of the Multiagency coordination council on issues of development of power equipment building, electrical engineering and cabling industries (photo courtesy RusCable media holding)

ALEXANDER NOVAK

Energy Minister of Russian Federation

«Creation of the Multiagency coordination council is an important step, which is called to intensify discussion between utilities and the electrical engineering. Today, the Russian-made equipment share in the power industry reaches 60-70% and keeps growing with installation of new units.

Power electrical equipment workgroup had several meetings, moderated by the Chief Engineer of Rosseti PJSC Dmity Gvozdev. The heads of directions by types of equipment developed respective roadmap projects, which were put as a basis for a consolidated Power electrical equipment roadmap till 2030 to be further approved.

For instance, the HV Bushings development roadmap was prepared by Kubanenergo PJSC with an active involvement of Izolyator specialists.

DMITRY GVOZDEV

Chief Engineer at Rosseti PJSC

«The Program is aimed at radical upgrade of the power network. It will enable us to visibly improve reliability indicators and provide an impetus to the development of the electrical engineering in Russia.

The HV Bushings workgroup included:

- Andrey Chebakov, Head, Dpty Chief Engineer on HV networks operation and maintenance, Head of Operation and Maintenance Dpt at Kubanenergo PJSC;
- Roman Zagoskin, Substations Dpt Head, FGC UES PJSC;
- Alexander Slavinsky, Chairman of the Board of Directors, Izolyator;
- Vladimir Bogdanov, Sales and Marketing Director, Transformer/Components, ABB Ltd.

High-voltage Bushings direction of the Power Electrical Equipment development till 2030 roadmap includes setting milestones for development and production of innovative products, planned production volume of various types of bushings, setting targets for component base development with a view of high-voltage bushings production, scheduled plan of development and production of

ALEXANDER SLAVINSKY

Chairman of the Board of Directors at Izolyator

«The approved roadmap is a result of a large and meticulous work of hundreds of leading companies, organizations and specialists from the electrical engineering industry. The program integrates in a single system all progressive technical, organizational and market tendencies, clearly names objectives and structures priorities in their realization. I appreciate Rosseti PJSC for an opportunity to take part in a large-scale and important for the country project!

new generation bushings and other complex measures for development of HV Bushings direction.

In general, the Power Electrical Equipment 2030 roadmap allows to form a clear vision and understanding of what Russia's power electrical equipment sector should look like in the near and remote perspective.

Alexander Slavinsky and the Head of Equipment Diagnostics at Kubanenergo PJSC Grigory Masin are contributors to roadmap development for High-voltage bushings section

220 kV Izolyator bushings in a transformer of MES North West (photo courtesy FGC UES)

IZOLYATOR HAS TURNED 121: A SYSTEM OF VALUES IN A SYSTEM OF CHANGES

The history of high-voltage bushings development in Russia is inseparably associated with Izolyator. On 6 June 2017, one of the global leaders in creation and manufacture of high-voltage bushings and Russia's sole company able to develop, make and test AC and DC bushings of ultra-high-voltage classes, turned 121 years old. On the eve of the remarkable date, reporters from the Power Industry News Magazine visited the plant and met the Chairman of the Board of Directors of Izolyator **Alexander Slavinsky.**

— Alexander Zinovievich, what is your opinion on the current level of Russian electrical engineering sector development?

— Electrical engineering companies in Russia, each and every, are competitive on the market. In the quarter century our industry has come a hard and very unpredictable way together with the country. Many companies simply failed to survive. Those that remained have learned how to live. Today, we are not only able to manufacture COMPETITIVE PRODUCTS, but to professionally work on the market, focus on marketing promotion, set up ties with foreign consumers and expand influence.

— Izolyator is actively working internationally. Which regions of the world are you comfortable to work in and vice a versa? Are you expanding your exports? What destinations are of most interest to you?

— Our company has a long history as we are bearer of traditions of Izolyator plant, which is older than 120 years. So when we talk about international cooperation, it shouldn't go unspoken that the plant had an extensive integration in the Soviet era. With the fall of the Soviet Union, we lost a lot of ties, especially in the Eastern Europe unfortunately. Nowadays, we build relations afresh, be it with our Eastern European partners or the Baltics. We have no presence in Africa. At the same time, we try to keep and DEVELOP COOPERATION with India, Vietnam, Cuba, Mongolia, China. We are seeking to enter the markets of other countries. We are planning to build a plant in India and strengthen ties with Vietnam. Usually, prior to signing partnership agreements and discuss prices, our potential partners try to get to know our products better. For instance, in Vietnam, a plant requested us to send 6 products for testing in its test center in order to verify our technical documentation. After passing those tests, we carried on with a discussion on specific positions. We have had a similar situation with plants in Begium, Iran. This is a normal practice of business.

— Do you do business on your own or use a dealer network?

— We work in many regions of our country, other countries, which are very different. All of them are specific, so are the clients. My own experience says: in every country you are unable to set up ties unless you have parnters inside it. When you enter the market on your own, suddenly you face plenty of obstacles, beginning with the language barrier, ignorance of local legislation, approaches, social customs — up to subtle mentality perceptions. We simply cannot

FAULT-FREE TRANSFORMER 4.0

The IV Fault-free transformer Seminar "The Scientific and practical solutions that work" was held in Nizhny Novgorod. Once again, it was organized by Delta Trafo.

About 100 representatives from more than 30 companies in metallurgy, machine building and electrical engineering took part in the seminar's work. Every year, the interest only grows, just as the list of the cities where the listeners come from: Novosibirsk to Taganrog and Chelyabinsk to Cherepovets.

The basis for practical knowledge sharing was ensured by the scientific community representatives. Among the speakers of the event there were PhD and EngD degrees holders who made reports about reliability of power supply and modern techniques to evaluate residual operating time of the insulation system.

Alexander Slavinsky, Chairman of the Board of Directors at Izolyators, Doctor of Engineering Sciences took part at the seminar.

Furnace transformers lifetime extension topic sparkled the biggest interest with the guests as well as transformers repair at their installation sites, evaluation of the demonstrated life of power transformers and some other topics.

Alexey Pilyugin, Lead Commissioning Engineer at SVN Service of Izolyator made a report "RIP bushings operation and control of HV bushings' condition by method of online coordination between the manufacturer and the end user". He remarked that Izolyator plant implements automated information system, whose database will keep the entire data on the high-voltage bushing. I.e. any operator would have a direct link to the manufacturing plant, enabling it to take decisions during bushings' operation with the best efficiency and timeliness. Thanks to the program, the end user would have an opportunity to obtain real-time information on the electrical tests record of the bushing. Also, with operation tests results entered, the program would signal should any deviations in the bushing's parameters be identified.

The importance of the topics, the representative expert community and positive feedback of the participants, — all speak for the fact that Fault-free Transformer seminar once again became one the most expected and useful events for professionals in power sector, machine building and metallurgy.

Alexander Slavinsky (3rd on the left) among Fault-free transformer 4.0 seminar participants

know everything. But your business companion may not give you credit for it. While dealers do not only do business development and push sales, but also PROTECT MANUFACTURERS from getting into embarrassing situations.

— The plant is actively engaged in innovation and research.

Izolyator markets new products almost every year. Just today, we saw a high-voltage bushing with RIN insulation in one of the shops. What is that?

— RIN was an innovation six or seven years ago. We have developed some fresher designs since then. However, RIN technology is interesting and is worth attention. RIN is a technology of solid insulation creation using nonwovens. It has a big future, because it brings the idea of creation of SYNTHETIC INSULATION to a whole new level. This topic is being studied within research activities of SC D1 CIGRE, which deals with development and study of properties of new materials.

Initially, solid insulation in the class of electrical products, which high-voltage bushings belong to, began with lavsan and new synthetic materials. It was conditioned by the fact that the traditional cellulose, which dominated in electrical engineering as insulating material, did not fully suit power engineers. The solid insulation was made of lavsan-based materials, which had good dielectric properties, were easily combined and had many useful features. But in the 1950s, it was a very expensive product, which couldn't compete with cellulose. Here in Russia and abroad, in the leading OEMs of the world, engineers have been waiting for the situation to change. Synthetic materials, among other merits, have a major advantage when comparing them to cellulose — they are EASILY PROCESSED, do not absorb moisture, so there is no need to buy costly drying technology.

We continue to work on RIN modifications, closely contacting with manufacturers of materials inside and outside the country. Our goal is to create a number of variations of new nonwovens for bushings of different voltages.

— You have got a wonderful test center. It makes an overwhelming impression.

— The correct testing is key for the plant's success, with our public announcements abot the necessity of SECTOR TESTS when required. We have our high-voltage bushing operating in a transformer in the Arctic. The conditions are extreme: –40 degrees outside, +70 degrees inside the transformer. One part of the bushing is outside the transformer, another one is inside. What happens with the material of the bushing in those conditions? No one would tell, because with traditional testing the unit would be heated and then cooled as a whole piece. There is no such thing in real life — heating and cooling occur in different sectors. There are no conditions for obtaining accurate electrical tests results in that situation. Therefore, there is a lot to be done in respect to testing technique.

— Alexander Zinovievich, you head the study committee D1 Materials and Emerging Test Techniques at RNC CIGRE. Last year, you took part in the 46th CIGRE Session. Evidently, the organization took a lot of important decisions. Yet, what else did the forum show?

— First and foremost, it showed difference in conceptual approaches. For instance, the main task for Russian power engineers is to ensure UNINTERRUPTIBLE POWER SUPPLY. Overseas, they are more concerned with fault

CIGRE WG D1.52 WORKGROUP SESSION IN MOSCOW

In April 2017, a sitting of the international work group CIGRE WG D1.52 Moisture Measurement in Insulating Fluids and Transformer Insulation — an Evaluation of Solid State Sensors and Chemical Methods took place.

The organizers are SC D1 of the Russian National Committee of CIGRE and Technical inspection of UES CJSC with support from RNC CIGRE.

Alexander Slavinsky, EngD, SC D1 Chairman and Russia's representative in CIGRE SC D1, Chairman of the Board of Directors at Izolyator took part in the event. He greeted the guests and emphasized the importance and scientific value of the group's work for domestic and international power industry, because the problem of moistur measurement in transformer oil still remains, with measurement techniques having scientific value.

Participants of the international workgroup CIGRE WG D1.52 meeting

free operation topics. These are totally different approaches to power industry management. Nevertheless, we are all doing the same job — delivering electricity to consumers.

The value of CIGRE is derived from the fact that the problems, demands and ideas found in the energy systems of different countries get an opportunity to sum up, integrate into common trends, set research objectives, publish topics, which are of interest to power men of many countries.

The tendencies of our priority research streams, which exist in CIGRE, concentrate, largely, on insulating and ecologically friendly materials. Ecology is a mainstream today. It is important to understand that the ecological performance of a material is evaluated not only and not so much on the raw materials level, which are later used in process stages, but rather on their ability to stay green during operation and disposal of end products. One has to calculate for years to come how this or that material will perform.

— Is there a true possibility of creating new materials or we hit the ceiling and have to settle with options based on earlier inventions?

— Our "ceiling" is the periodic table of Mendeleev. It is so high, one cannot see an end. There is much room for scientific work. It is fairly easy to invent a material. However, it should meet TECHNICAL AND ECONOMIC REQUIREMENTS. Unfortunately, developers do not always take that into account. We, at Izolyator, received a lot of requests from various scientific organizations for joint research of new materials and we always had to turn them down. The point is — with all those seemingly attractive indicators, every time we faced either lack of manufacturability and extremely high costs of development, or received designs, made-up without taking into account specifics of power equipment operation, which is under stress of snow, rain, wind, heat, temperature difference and regular phase changes. If equipment is made of innovative material to take all above into account, it is going to have enormous cost, so no one in the market would consider to buy it.

Another very important area of research within SC D1 is development of diagnostic methods for operating equipment and testing. That, in my point of view, is the most interesting work.

— How close are positions of Russian and European power men regarding diagnostics?

— There are common interests and some difference in approaches. In the west, they orient diagnostics to have the strictest requirements to fault-free operation of equipment. In connection with this, the demands to equipment suppliers grow higher, so their scrutiny begins to resemble suspicion.

It may seem that any equipment put into

POWER INDUSTRY PROFESSIONS OF THE FUTURE ROUND TABLE

In April 2017, Moscow hosted the New professions in the power industry of the digital economy round-table as part of the International Moscow Education salon.

Andrey Cherezov, Dpty Minister of Energy, Veniamin Kaganov, Dpty Minster of Education and Science, Strategic Initiatives Agency and Strategic Development Center representatives, Rosseti, FGC UES, System operator of the unified system, Rosatom, universities and industry experts took part in the event.

Alexander Slavinsky, Chairman of SC D1 RNC CIGRE and Chairman of the Board of Directors at Izolyator made a report on "Necessity of advance professional training of human resources for the power industry. Outlook of the world's sector-wide community." He gave details about attraction and professional training of young specialists at power industry companies.

Round-table "New Professions in the power industry of the digital economy"

operation is inherently poor. But that is not true. Most of the equipment on the market is of GOOD QUALITY and RELIABLE. Moreover, there exist statistics, operational conditions and a comprehensive equipment database.

CIGRE sets a goal of uniting scientific and research efforts of various countries, schools and streams in order to create such a background against which separate elements of the system will be expected to make fewer mistakes.

We find it tremendously important to share professional information. When all our ideas, works, estimates are distributed, published, put into discussion, and when any engineer has an opportunity to coordinate the positions, find something for himself, there is a possibility for the electrical engineering and power industry to develop in general.

— Alexander Zinovievich, at the round-table held at the Moscow Education Salon 2017 at VVC, there was a detailed discussion about new professions in power industry and, partially, in electrical engineering. How topical is this issue for the industry?

— The new professions and new specialists issue for our sector is very important. I think in the foreseeable future the traditional professions will remain in high demand: designers and estimators, process engineers, production management professionals. Parallelly, some qualifications will dissapear. One of them is shopfloor foreman. In modern conditions, production management processes are changing. Earlier, line personnel was in the core of the production process — foremen, in the first instance, who were engaged in planning, dispatching, distributing work assignments, making progress reports and reporting on materials, wages for the workers, etc. Yet today, this profession is practically disappearing.

They are being replaced by COMPUTER TECHNOLOGIES, which allow for all-round and detail planning of production process in real-time mode (there is still lack of required software resources remaining, but one can run own software development using existing platforms). Shop managers control their teams using computers, making foremen unnecessary for information delivery and feedback collection. The sole function this job has retained is quality checking, since one must not send a certainly defective part to the quality control department. However, a lot has changed in this respect recently: the contemporary production culture motivates workers to ensure QUALITY CONTROL on their own, so many of them would have individual "acceptance stamp".

— At the Moscow education salon you mentioned that the Power Industry and Electrcial Equipment students must have two work experience internships: one — at a power facility, another — an electrical equipment plant. Why?

— A young specialist has to know where he would later work and what type of equipment he would use. Unfortunately, sending students to internships is exclusively on the initiative of the professors who use personal networks among top management of manufacturing plants and operators. But I am sayint it again, internship must be obligatory both for universities and enterprises.

— Is Izolyator plant prepared to receive young specialists?

— We are not only prepared, but are already CLOSELY COOPERATING with the key chairs of industry universities. 90 % of young specialists at Izolyator are our former interns. Students do not simply stay for internship here, they work if their academic activities allow, they get paid.

It is important to mention, there are young people with theoretic minds who were born for academic careers. There is no need to keep them at production and they should by all means have full-time academic schedule. Firstly, we have few of those, secondly, they are noticed while fininshing high school, so they receive a different treatment, and requirements from their institutions.

Recorded by Lyudmila YUDINA

For a complete version of the interview please read #3 Power Industry News Magazine or visit Media page at Izolyator website.

JUBILEE CASE-IN CHAMPIONSHIP

Izolyator took part as a jury expert in the Vth jubilee International Case-in Championship in Moscow.

The Championship has gathered 83 student teams from 48 technical universities of Russia, Belarus, Kazakhstan and Kyrgyzstan, who presented solutions of engineering cases in five leagues: geological exploration, mining, metallurgy, oil and gas, power industry.

The Championship's finals in Moscow became a culmination of a four-month marathon consisting of 80 preliminary rounds with 3500 students participating.

The expert committee of the power industry league included Izolyator's Alexander Slavinsky, Chairman of the Board of Directors, SC D1 RNC CIGRE Chairman and Vladimir Ustinov, Deputy Quality Director and SC D1 RNC CIGRE Coordinator.

The winners in the Power industry league are Case-masters 3000 team from the Novosibirsk State Technical University. The second place was given to the Energy team from the Samara State Technical University. The third place — to the Young Energy team from Sayano-Shushensky branch of the Siberian Federal University.

Expert committee of the power industry league working at the Vth jubilee International Case-in Engineers' Championship

FROM EXPERIENCE TO MASTERY

IVAN PANFILOV

Commercial Director, Deputy CEO Izolyator

EXPERIENCE LEADS TO MASTERY — a fact that IZOLYATOR proved by practice. THE HIGHLY PROFESSIONAL STAFF, COMPETENCE, OPENNESS, HONESTY, TRUST, HIGHEST QUALITY STANDARDS, ENGAGEMENT, RESPONSIBILITY, INNOVATIVE EQUIPMENT and more than a CENTURY-LONG EXPERIENCE — these make a basis for SUCCESS and TRUST of our partners worldwide.

INTEGRATION PROCESSES IN THE GLOBAL POWER INDUSTRY

Creation of interstate energy allainces and markets is a global INTEGRATION process.

INTEGRATION PROCESSES is the world's power industry already today allow for setting up close interaction in science and technology, facilitating new technologies implementation in electrical equipment production, promoting innovative development and RELIABLE OPERATION of national electric networks in different countries. That is a key vector of development of the global power industry, fully supported by all members of energy community in Russian Federation.

The Ministry of Energy and Rosseti PJSC are strengthening COOPERATION between national and regional energy systems and form international electric ties. Export of domestic power equipment — a key objective for the Ministry of Industry and Trade — is actively promoted and stimulated.

For Izolyator, an opportunity to offer BEST SOLUTIONS to consumers in Russia and abroad is of special value. We aim at building LONG-TERM and mutually beneficial relations with partners all over the globe, and today, setting up business ties and expanding our contact network is a priority with us.

PROVING BY EXPERIENCE

Izolyator is a leading global supplier of high-voltage bushings for virtually all voltages. Our stable PRODUCT QUALITY has won trust with clients as well as professionalism and competence of our staff and an all-round service support throughout the entire product service life of equipment, made by us.

The power sector demands a lot from equipment, so our communication with partners does not end at the point of product sale, but continues during the whole operation life of the transformer and reactor equipment. Supervised installation, warranty and post-warranty service, staff training — all that together GUARANTEE FAULT-FREE operation. Any issues are ressolved instantly, as our customers' time and TRUST are our core values.

Izolyator receives a lot of positive feedback and references from power grid companies, oil and gas enterprises, transformer plants and partners from many countries of the world.

Irregardless of project complexity, we apply utmost effort in order to decrease delivery terms of high-voltage bushings of any designs, which take into account any severe and complex operation conditions. Today, Izolyator's innovative products are used in different corners of the globe and that ensures a more reliable and secure operation of power systems, being a bright example of our equipment quality, proved by time.

A TEAM OF PROFESSIONALS

HIGHLY PROFESSIONAL, tight-knit team of competent professionals makes every effort to retain and strengthen Izolyator's positions on global power equipment markets and dynamically grow volumes of units deliveries and expand our partner base.

PRIORITY in our commercial service's work is professional development of our team by an open dialogue, support and team spirit. These principles enable us to give most attention to

INTERESTS AND SUCCESS OF THE PARTNERS – OUR MAIN GOAL!

every customer, build long-term and mutually beneficial cooperation.

SUCCESS of our partners has always been the main goal in our work and a priority for Izolyator development!

OPEN DIALOGUE

Talking to the largest companies of the international power market and especially state energy corporations, responsible for transmission and distribution of electricity, we have witnessed that Russia is the most experienced country in the world to operate RIP HV BUSHINGS today. In Russia bushings with solid RIP insulation have been successfully operated in power facilities for over 15 years.

Thanks to long-term cooperation with such large companies as Rosseti PJSC and FGC UES PJSC, we have been able to get a UNIQUE EXPERIENCE of mass use of high-voltage bushings with solid RIP insulation.

With an active support from the Federal Grid Company, the dialogue with international power corporation is developing now. At the moment, FGC UES PJSC is the most experienced operator of RIP bushings. This priceless experience gives an opportunity to FGC UES to share it with other state corporations in detail about advatages, implementation and operation of HIGHLY TECHNOLOGICAL power equipment — bushings with solid RIP insulation.

DRIVE FOR DEVELOPMENT

International energy alliance becomes possible due to cooperation with power grid companies and state structures. The largest market players engage in integration projects, promote new ideas, join discussions and share experience. Russia is prepared to act as a power bridge between Europe and Asia, promoting formation of Eurasian transcontinental power pool system.

In the near future electric power INTEGRATION will become a driver of social and economic growth of neighboring sectors in Russia and the world. It requires solidary work and communication with power equipment suppliers, scientific circles and end users.

Izolyator APPRECIATES INPUT of every participant of the power market and proudly presents own innovative ideas and development.

Activization of international cooperation in creation of intellectual electric network on the Ministry of Energy and Ministry of Industry and Trade level, with active involvement of power corporation and leading electrical engineering companies, are among current business discussions. It is a step towards global energy alliance, which Izolyator pursues together with partners and colleagues from all over the world.

We appreciate partners and consumers for long-term cooperation and an active support of Izolyator in development of the dialogue with international power grid corporations and integration of innovative products in the global electric power market.

SUPPLIES RECORD IN EVERY REGION OF THE WORLD

QUALITY AND WORLD-CLASS EXPERIENCE

ANDREY SHORNIKOV

Head of International Business Development dept.

Inspection of high-voltage bushings tests by TSTRANSCO representatives at Izolyator plant's test center

For a modern production company it is very important not only to constantly upgrade equipment and train employees, but also to follow the world's trends, maintain and develop relations with partners all over the globe.

INTEGRATION PRIORITIES

Expansion of global cooperation and promotion of INTEGRATIVE DEVELOPMENT of electric power complex between national and regional power systems are strategic objectives for the state.

Development of long-term and mutually beneficial relations with foreign partners in power industry as well as entry to foreign markets are a STRATEGIC GOAL of Izolyator during last 5 years. At the moment, we have experience in design, production, delivery and a full cycle of pre- and post-sale support in more than 30 countries of the world. Also Izolyator together with FGC UES PJSC builds a constructive dialogue with state power grid companies and industrial manufacturers of European and Asian countries.

OPENING DOORS TO ASIA PACIFIC

Izolyator's strategic goal is integration of inter-state energy projects in countries of Central and Southern Asia and implementation of innovative RIP technology in those projects.

The multifaceted cooperation with countries of Asia Pacific region, among which we highlight India, China and Vietnam, is one of the key strategic objectives set for our company staff.

Today, India has a large DEMAND in high-voltage bushings of up to 800 kV voltages.

The specialists of our company organized a series of seminars for technical staff of Power Grid, regional companies APTRANSCO and TSTRANSCO and transformer plants T&R, CG, TBEA, TOSHIBA familiarizing their Indian colleagues with the technical features and DESIGN SPECIFICS of Izolyator products.

Having expanded its presence on the market, Izolyator began to work with companies distributing electric power in the states of India.

At the end of June, Izolyator received a delegation of the Indian regional grid company TSTRANSCO with inspection. The series of SUCCESSFUL tests of 30 high-voltage bushings of 52, 252 and 420 kV voltages once again demonstrated our partners that Izolyator products can be and should be trusted!

We would like to thank Mr. Surya Prakash for visiting our company and for recommending our plant as a highly qualified manufacturer of HV bushings!

The large-scale work in India resulted in contracts signing and delivery of big 52, 252, 420 kV RIP bushings shipments to various parts of India: more than 510 pcs of HV bushings, 144 pcs of those — 420 kV!

ASHOK SINGH

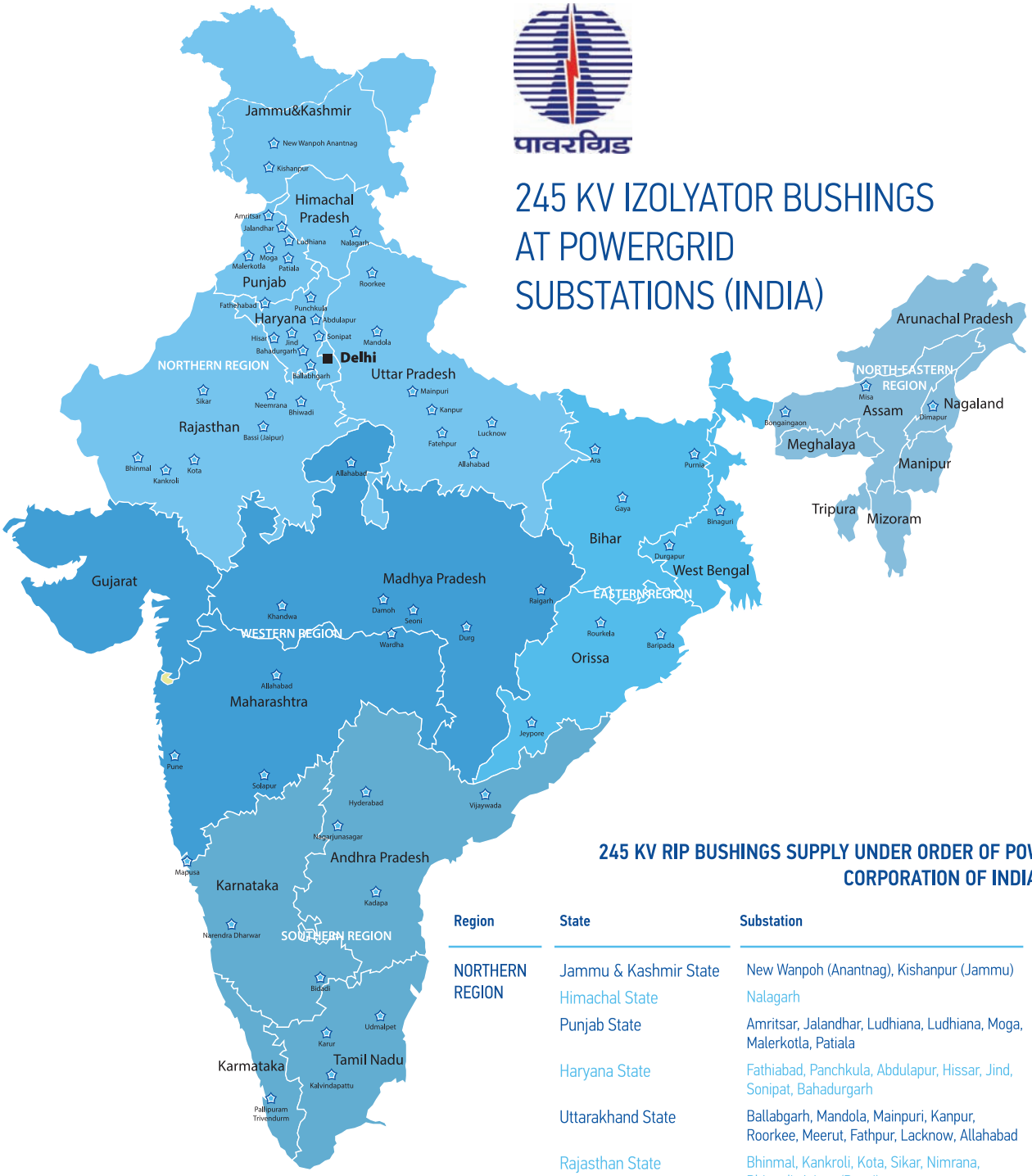
Izolyator's Partner in India

«Work on the highest level in accordance with world standards is what gives Izolyator an advantage over other power equipment manufacturers. The constructive dialogue between Russian and Indian colleagues is another valuable component, speaking for attention, openness and interest to develop long-term and mutually beneficial partner relations».

Power Grid Corporation of India Limited (PowerGrid) is an India-based state company engaged in construction, operation and maintenance of inter-state transmission system. The company's core business is transmission of bulk power across the states of India.

The regional power grid company of Andhra Pradesh state Transmission Corporation of Andhra Pradesh Limited (APTRANSCO) was founded in the result of India's power industry reform. Initially, the power company of Andhra Pradesh State APSEB, which came into existence in 1959, was responsible for generation of electricity.

The regional power grid company of Telangana state Transmission Corporation of Telangana Limited (TSTRANSCO) was founded in the result of India's power industry reform. Initially the power company of Andhra Pradesh State APSEB, which came into existence in 1959, was responsible for generation, transmission and distribution of electricity.



245 KV IZOLYATOR BUSHINGS AT POWERGRID SUBSTATIONS (INDIA)

245 KV RIP BUSHINGS SUPPLY UNDER ORDER OF POWER GRID CORPORATION OF INDIA LIMITED

Region	State	Substation	Units, pcs.
NORTHERN REGION	Jammu & Kashmir State	New Wanpoh (Anantnag), Kishanpur (Jammu)	3
	Himachal State	Nalagarh	1
	Punjab State	Amritsar, Jalandhar, Ludhiana, Ludhiana, Moga, Malerkotla, Patiala	11
	Haryana State	Fathiabad, Panchkula, Abdulapur, Hissar, Jind, Sonipat, Bahadurgarh	10
	Uttarakhand State	Ballabgarh, Mandola, Mainpuri, Kanpur, Roorkee, Meerut, Fathpur, Lacknow, Allahabad	15
	Rajasthan State	Bhinmal, Kankroli, Kota, Sikar, Nimrana, Bhiwadi, Jaipur (Bassi)	12
WESTERN REGION	Madhya Pradesh State	Khandwa, Damoh, Seoni, Gwalior	11
	Maharasta State	Aurangabad, Pune, Solapur, Wardha	12
	Goa State	Mapusa	1
	Chhattisgarh State	Kaigarh, Raipur	5
SOUTHERN REGION	Telengana State	Hyderabad, Nagarjunasagar	2
	Karnataka State	Narendra Dharwar, Bidadi	2
	Andhba Pradesh State	Kadapa, Vuaywada	2
	Kerala State	Pallipuram Trivandrum	1
	Tamilnadu State	Kalvindapattu, Karur, Udmalpet	3
EASTERN REGION	Odisha State	Jeypore, Baripada, Rourkela	3
	West Bengal State	Durgapur, Binaguri	3
	Bihar State	Gaya, Ara, Purnia	5
NORTH-EASTERN REGION	Assam State	Misa, Bongaingadn	4
	Nagaland State	Dimapur	1
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220 kV OIP wall bushings have operated for over 30 years at Hoa Binh HPC

Installation of 220 kV RIP bushings from the first lot of Izolyator's wall bushings received at Hoa Binh HCP in 2017

Cooperation with the leading power companies of Vietnam and key high-voltage transformer plants are a good example of SUCCESSFUL integration in the region. The Vietnamese power men know Izolyator products very well — the bushings, delivered to the power facilities of Vietnam more than 25 years ago, are SUCCESSFULLY OPERATING today.

Izolyator's reliable partner is the largest state power grid company and its subsidiaries, which is structurally related to the Ministry of Industry and Trade of Vietnam — Vietnam Electricity EVN.

Generation facilities, undoubtedly, play a pivotal role in the power industry in any country. Understanding the importance of COMPLEX APPROACH when entering new markets, Izolyator entered a friendly dialogue with Hoa Binh HPC. So, Izolyator 220 kV RIP bushings have successfully operated at the transformer equippment of Hoa Bonh HPP since summer 2016.

In May 2017, the first units from batch of 220 kV RIP wall bushings were installed at Hoa Binh HPP. The systematic delivery and installation are carried out in the frame of agreement between Hoa Binh HPC and Izolyator, which was reached in the result of a large joint work on evaluation of the TECHNICAL CONDITION and residual life of the power equipment, operating at the hydropower plant, including a substantial amount of obsolete oil-in-paper (OIP) bushings, delivered by Izolyator plant in the past.

Transformer plant play no less important role, having become key partners to Izolyator, e.g. Dong Anh Electrical Equipment Corporation. At the talks with Dong Anh management the partners have outlined STRATEGIC DIRECTIONS of Russia's and Vietnam's power transmission and distribution systems development, considered issues of setting up a system of cooperation with power equipment OEMs and strategic goals up to 2030. Izolyator shared experience of successful application of HV RIP bushings in the systems of electric power transmission and distribution in Russia, countries of Asia and Europe and confirmed its INTEREST in further development of close cooperation with Vietnamese manufacturers of power equipment.

The results of that work took shape in Izolyator's recommendations on power equipment modernization, including gradual replacement of OIP bushings by more advanced for today bushings with solid RIP insulation.

During the past year of activities in Vietnam, Izolyator received orders for HV RIP bushings of 72 to 220 kV voltages for the needs of power generation facilities and transformer plants.

Strategic partnership with China with its collosal market strengthens INTERNATIONAL STANDING of Izolyator. On the state level, mutual interests of Russia and China are finding their fruition

PHAM PHUC NGUYEN

Director, Vatco:

«In the modern period, reliable high-voltage equipment is needed by facilities of power complex of Vietnam more than ever. The fruitful talks and meetings with Izolyator representatives allowed us to form an understanding of how business strategies and commercial activities of Russian OEMs are realized in Vietnam. We see in Izolyator a reliable and strategic partner and look forward to a long-term and efficient cooperation».

EVN HPC HOABINH

The Hoa Binh Hydropower Plant — the Hoa Binh Hydropower Company (Hoa Binh HPC) — is the largest in Vietnam and entire South Eastern Asia comparable with Son La HPP. The power plant is located on the river Da in Hoa Binh province. The dam is 128 m high and 970 m long. The construction was done with the invitation of Russian investment and specialists.

EEMC

Dong Anh Electrical Equipment Corporation (EEMC) was founded in 1971 on the basis of Dong Anh electrical equipment repair plant and manufacturing company Dong Anh. The company has years of tradition and experience of design, manufacture, supply and maintenance of electrical equipment.

in the agreement on New Silk Road concept, put forward by President Xi Jingping under a slogan «One Belt, One Road». This GLOBAL STRATEGY, including subprojects «Economic belt of Silk Road» and «Maritime Silk Road of the XXI Century» implies creation of a vast infrastructure network along the routes from the western borders of China via Central Asia and Iran to Europe.

China is a sole country, which operates the longest ULTRA-HIGH-VOLTAGE and DC power lines. For China, Izolyator has developed a product line of DC bushings for the entire range of voltages, including a transformer bushing for 800 kV DC power lines, tested both in Russia and China.

In April 2017, Izolyator representatives visited Chinese PowerChina Beijing Engineering Corporation Limited in Beijing. They made a presentation familiarizing PowerChina Beijing staff with Izolyator plant and its product range, paying special attention to design and SUCCESSUL EXPERIENCE of Izolyator-made HV RIP bushings operation both in Russia and in the leading power networks of the world.

During their visit to China, Izolyator representatives also saw Tianwei Baobian (Hefei) Transformer Co., Ltd. plant (TWBB) in the city of Hefei. It is one of the leading transformer OEMs for 750, 500 kV and lower voltages on the domestic market of China. The guests made a tour of the plant, with the Deputy General Director at TWBB Du Hai telling about the main production stages of transformers, shop operations and applicable technologies.

In the result of talks, the sides outlined main directions of development of MUTUALLY BENEFICIAL COOPERATION and several practical steps to begin interaction.

Participants of the meeting by the head office of PowerChina Beijing

TWBB plant tour

POWERCHINA

PowerChina Beijing Engineering Corporation Limited (PowerChina Beijing) was founded in 1953. It is one of the earliest hydropower investigation and design institutes in China. PowerChina Beijing is a state-owned enterprise affiliated to Power Construction Corporation of China.

TIANWEI

Tianwei Baobian Electric (TWBB) is one of the leading domestic manufacturers of transformers of 750 kV, 500 kV and below on the domestic market of China. It is a qualified product and service suppler for nuclear power plants, thermal power and hydropower plant of 1000 MW capacity and below.

A WINDOW TO EUROPE

There is a large-scale work being done by our company on the market of Europe, which is the most stable and developed one in the world.

During the past several years, we did not only set up and strengthen mutually beneficial relations with the state power grid company of Belgia — Elia, but after rounds of multilateral talks, involving participation of the Federal Grid Company of Russia, we persuaded foreign partners that RIP insulation is more RELIABLE AND SECURE IN OPERATION. A fore said was later exampled by HV RIP bushings deliveries to Belgium, effected by Izolyator in 2016 and in the first half of 2017.

A task, no less important and strategic for Izolyator is EXPANSION of friednly and commercial relations with power grid companies from other European countries, among those: EDF, Terna, Enel, Energinet and others.

THE COMPLEX APPROACH that plays a fundamental role in strengthening our company's presence in international markets enabled our staff members to obtain a huge experience of interaction with transformer equipment manufacturers.

Over the last several years, the Belgian plant of CG has been a key partner to Izolyator with deliveries effected in its address in 2016 and the first half of 2017.

Another example of cooperation with transformer equipment OEMs is the multinational corporation General Electric, which we have been dealing with for several years.

The key partners of our company in the Italian market are Getra, Tamini and Tironi. Eastern European market receives a lot of attention: we successfully develop relations with such companies as ZREW Transformatory (Poland), Kolektor Etra (Slovenia), Koncar (Croatia) and others.

We COMMUNICATE with our partners! In June 2017, our sales team members visited several European companies in order to develop further our FRIENDLY DIALOGUE. We would also like to highlight General Electric, which Izolyator cooperates with and delivers products to. We receive regular visits of the Belgian transformer plant of CG, which has been using Izolyator HV bushings for several years for the Belgian state power grid company Elia. We have started shipments to ZREW transformer plant.

Over the past years of our work in the region «Europe» Izolyator has received orders for 110 high-voltage bushings of 52 kV, 100 kV, 126 kV, 172 kV and 252 kV.

Meeting at CG Power Systems Belgium NV

GIULIANO BERTOLAZZI

Parnter of Izolyator in Europe:

«Business visits to a number of European companies, which were made to confirm further development of partnerships and form plans of practical interaction, were comprehensive and productive. The prospects, opening for Izolyator today, are based on the highest product quality, unique tecnologies and the highest qualification of its staff».

The state power grid company Elia is Belgium's high-voltage transmission system operator and a key player in the Paneuropean energy market. Elia controls a system of 30 kV to 380 kV power lines with over 8000 km outstretch, including underground cable networks throughout Belgium.

CG Power Systems Belgium NV (formerly Pauwels Trafo Belgium NV) is a developer of innovative, high-quality, reliable products and turnkey solutions with manufacturing units in Belgium, Ireland, USA, Canada and Indonesia and several Business Units: transformers, switchgear, systems, automation, services.

GE (NYSE: GE) is a global industrial and digital technologies leader. 300 000 people work in 175 offices of this company across the globe. GE contributes to the world's industry move to a whole new level combining digital and industrial equipment.

We would like to thank all European partners for the productive dialogue and trust to Izolyator as a manufacturer of quality and reliable electrical products!

GLOBAL PARTNERSHIP

Presently, Izolyator exports to more than 30 countries all over the world. The company's staff are always OPEN TO DIALOGUE to set up friendly long-term relations with partners.

All produced high-voltage bushings are CERTIFIED to Russian and international standards, which allows to deliver our products anywhere in the world.

CRITERIA OF QUALITY AND RELIABILITY are the cornerstone of Izolyator's work as the uninterruptible power supply of consumers is at stake.

Our presence expansion on Asian and European markets was also possible, because Izolyator takes every opportunity to back up words with deeds.

In April 2017, our company was visited by partners from Siemens to confirm results of the previous audit. Our partners have always marked the HIGH QUALITY of production organization and at the company as well as following production technology in every detail. The successful audit speaks for solid technical and human resources foundation!

Learning about Izolyator KPIs during production audit by Siemens AG

Participants of the audit by BEST company at Izolyator's test center

In May 2017 one of the largest manufacturers of high-quality and reliable distribution and power transformers in Turkey Balikesir Elektronmekanik Sanayi Tesisleri A. S. (BEST) also ran PRODUCTION AUDIT of Izolyator plant. The auditors closely examined all technological operations and step-by-step quality control operations at design, manufacture, testing and preparation for shipment stages of high-voltage bushings production cycle.

Izolyator's experience in deliveries and operation of high-voltage bushings proves that the solid insulation is more RELIABLE AND SECURE, so our goal is to inform our partners all over the world about the advantages of RIP bushings application and service.

So experience sharing plays a great role in this process, since it helps to create a basis for making it possible to find solutions to most pressing tasks facing both state bodies and representatives of the world's leading power grid companies and power equipment OEMs.

Using own PATENTED TECHNOLOGIES, using only the best equipment and materials, work of HIGHLY QUALIFIED PERSONNEL and step by step control of production process guarantee a high technical level and product quality of Izolyator plant.

Creation of marketing materials and Izolyar's training video «Installation of high-voltage bushings» in English, Vietnamese and Chinese languages has become another initiative in EXPERIENCE SHARING and the new round in the wide international dialogue that is called to further strengthen long-term partner relations.

We appreciate our partners for sincere interest to Izolyator's achievements and hope that our dialogue on development of the global power industry will not only continue but will become a basis for further cooperation.

SIEMENS

Siemens AG is a German concern, focusing on the areas of electrification, electronics, power equipment, transport, medical equipment and lighting, as well as specialized services in various sectors of industry, transport and communications. The company's headquarters are in Berlin and Munich.

BEST

Balıkesir 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.

ZREW TRANSFORMATORY

ZREW Transformatory is a company based in Lodz in Poland, which has worked on the transformer market for 60 years. The company is engaged in manufacture, maintenance, modernization and complete diagnostics of oil power transformer. ZREW makes transformers for distribution networks.

STRENGTHENING RELATIONS WITH PARTNERS IN CIS COUNTRIES

MAXIM OSIPOV
Head of CIS Sales

Izolyator sets ambitious goals of entry to the global market and the CIS countries have been one of the priority destinations for marketing promotion. Relations between Russia and the countries of the Commonwealth of Independent States are reflected through geographic proximity, ethnic and cultural identity in some cases, close historical ties and long-term cooperation in many spheres including power industry. It is a large part of our work to maintain and develop those relations.

STRATEGIC PARTNERSHIP ORIENTATION

In the last seveal years, Izolyator strengthened relations with power grid companies and power equipment OEMs in Armenia, Moldavia, Tajikistan, Kazakhstan, Belarus, Ukraine, Uzbekistan and Georgia.

We actively work in tenders for high-voltage bushings delivery for power systems of CIS countries, win and SUCCESSFULLY REALIZE deliveries while continuing to build close cooperation with our partners.

Izolyator provides a complete range of services from creating new designs of high-voltage bushings with internal RIP insulation to HIGHLY QUALIFIED warranty and post-warranty technical service, consulting and diagnostical services, which makes us a future-oriented strategic partner rather than a manufacturer.

In connection with the growth of demand for high-voltage bushings in the CIS countries, Izolyator is expanding its business in the power sector as an integrated cluster (generation, transmission and distribution) and, parallelly, STRENGTHENS TIES with end users of high-voltage bushings, such as industrial facilities, transformer equipment OEMs in CIS. Talks with partners is a great opportunity to discuss plans on FURTHER COOPERATION.

In April 2017, Izolyator representatives visited Chirchiq transformer plant. They discussed commercial, technical and organizational aspects of further cooperaiton.

In May 2017, representatives of our company visited a transformer plant entering ATEF Group in the city of Baku, Azerbaijan, one of the flagship power equipment manufacturers in the Caucausus.

During the talks, Sales and Marketing Director Levent Denizchigil and the Chief Designer of ATEF Group Omar Ozkan specified technical requirements to high-voltage bushings aimed at operation in ATEF transformers and discussed volumes and Izolyator bushings DELIVERIES PLAN. Representatives of the transformer plant arranged for a tour of the production facility and discussed formed of cooperation in respect to power equipment delivery to the market of Azerbaijan Republic.

In the second quarter of 2017, our company strengthened ties with Alageum Electric JSC's subsidiary in Kazakhstan Kentau transformer plant, sole maker of 110 kV transformers in the country.

Besides, we made a delivery for the system operator of the unified power system of Kazakhstan KEGOC JSC.

One of the most important destinations in CIS region is Ukraine. We actively develop cooperation, so today we can say that we are able to maintain stable relations with Ukrainian partners.

Business meeting at ChTP

Chirchiq Transformer Plant JSC is a leading electrical engineering company in the Republic of Uzbekistan, Central Asia and CIS with strong traditions in quality management, high degree of reliability of products.

ATEF Group (Azerbaijan) is specialized in manufacture of high-quality HV/ MV electrical equipment and turnkey substation installation for industrial, utility, transportation and energy sector customers.

In June 2017, Izolyator's delegation led by the Chariman of the Board of Directors Alexander Slavinsky visited leading Ukrainian electrical engineering companies. During the visit to Stan-Complect JV in Kiev the visitors held talks with the General Director Evgeny Saprykin and the Head of Department Boris Trembovetsky.

The meeting began with discussion of electrical equipment market condition and trends in Ukraine. The main topics were prospects, priorities and development of PARTNER RELATIONS and long-term cooperation with companies of power and industrial complexes of Ukraine.

Participants of the meeting at Stan-Complect JV, L-R: Maxim Osipov, Alexander Slavinsky, Boris Trembovetsky and Maxim Zagrebin

EFFICIENT COOPERATION with energy companies and transformer and reactor equipment manufacturers from CIS is one of our key priorities today.

IN DIALOGUE WITH CONSUMER

Izolyator is open to CONSTRUCTIVE dialogue with partners in CIS countries. Regular meetings and seminars dedicated to specifics of high-voltage bushings operation.

We see interest in our work and are pleased to tell about it at meetings with our partners.

A meeting with technical specialists of Uzbekenergo JSC took place early in April 2017. At the meeting, the sides discussed design and operation perculiarities of bushings with solid RIP insulation of Izolyator brand.

Meeting at power transformer plant of ATEF Group, on the left Omar Ozkan

KEGOC

Joint Stock Company "Kazakhstan Electricity Grid Operating Company" (KEGOC) was established according to Government Resolution of the Republic of Kazakhstan in 1996.

Stan-Complect Group of Companies Ltd is a specialized company delivering non-standard, efficient technical solutions and equipment, parts and components of imported equipment.

Irregardless of successful projects in CIS countries, Izolyator continues to actively develop STRATEGIC PARTNERSHIP with consumders of our products from those countries.

Recently, cases of mala fide suppliers delivering used Izolyator equipment as new have become more frequent in the CIS countries. This practice does not guarantee secure

Izolyator's participation in an international workshop "2016 MAINTENANCE CAMPAIGN summary, objectives for 2017 and organization of high-voltage substations equipment operation» became an important event for the purposes of our presence expansion on the CIS power equipment market. The event was held on in the High-voltage power grids enterprise, branch of the National Electric Grid of Kyrgyzstan JSC in Osh.

The technical director of NEG Kyrgyzstan Zholdoshbek Achikeev, the Maintenance and repairs service Chief Murat Kalkabaev and the specialists of his department, specialists of all branches of NEG Kyrgyzstan as well as representatives of power equipment plants took part in the workshop.

In the course of PRODUCTIVE DIALOGUE, the workshop participants discussed organizational and technical aspects of maintenance and repair of power equipment used in HV substations of NEG Kyrgyzstan. The attendees of the event shared their experience in maintenance planning. Our partners also learned about new methods of monitoring of power facilities condition and maintenance. Besides, during the workshop, the hosts arranged for a group visit to the 220 kV Aygul-Tash substation of Osh branch of NEG Kyrgyzstan.

PRESENTATIONS OF IZOLYATOR SPECIALISTS for staff members of partner companies is a regular routine at our work.

We are glad to be able to sparkle interest with participants of events and always

give opportunity to ask questions from the audience, whether they are coming from technical specialists or commercial representatives of our partners.

OFFICIAL PARTNER WARRANTS

Annual deliveries of high-voltage bushings of all voltages, including 550 kV and 750 kV, made by Izolyator for CIS countries, allow us to KEEP LEADING POSITION and reach dominating market share on the CIS market.

alageum electric

Кентауский трансформаторный завод

Исх. №686
от 02.05.2017 г.

Генеральному директору
ООО «Масса»
Моисееву С.Б.

Благодарственное письмо

Уважаемый Сергей Борисович!

АО «Кентауский трансформаторный завод» благодарит ООО «Масса» за положительный опыт сотрудничества в части поставки высоковольтных трансформаторных вводов.

Настоящим письмом подтверждаем, что партнерские взаимоотношения между нашими компаниями успешно развиваются с момента начала выпуска трансформаторов от 110кВ АО «Кентауским трансформаторным заводом».

Завод «Изолятор» был и остается поставщиком №1 по поставке высоковольтных вводов для нужд АО «Кентауского трансформаторного завода». За время развития наших партнерских взаимоотношений с ООО «Масса», в наш адрес поставлено более 500 высоковольтных вводов. Претензий по поставленным вводам не имеем.

Долголетний опыт сотрудничества наших предприятий позволяет рекомендовать ООО «Масса» как надежного партнера, высококвалифицированного поставщика высоковольтного оборудования.

Данным письмом подтверждаем, что вводы соответствуют высокому качеству, имеют все необходимые паспорта и сертификаты.

С уважением,
Председатель правления АО «КТЗ» Кожабаев Х.Б.

Thank you letter of Kentau Transformer Plant

TO General Director of Massa Ltd
Sergey Moisseev
Thank-you Letter

Dear Sergey,

Kentau Transformer Plant JSC appreciates Massa Ltd for the positive cooperation experience in supply of high-voltage transformer bushings.

We hereby confirm that the partnership between our two companies has successfully developed from the moment of production start of 110 kV and higher voltages transformers at Kentau transformer plant.

Izolyator has remained a preferred high-voltage bushings supplier for the needs of Kentau transformer plant JSC.

Over the period of our partnership with Massa Ltd, we have received more than 500 high-voltage bushings. We have no complaints about the bushings.

The long-term cooperation between our companies lets me recommend Massa Ltd as a reliable partner, a highly qualified supplier of high-voltage equipment.

With this letter we confirm that the bushings are of a high quality and have all required technical certificates.

Sincerely,
K.B. Kozhabaev
Chairman of the Board of Directors KTZ JSC

alageum electric

Alageum Electric JSC is a large electrical engineering company of Kazakhstan entering Alegum holding, which supplies complex turn-key solutions to the power market.

Uzbekenergo JSC is a state-owned incorporated company of Uzbekistan. The total installed capacity of Uzbekistan's power plants exceeds 12.3 mln kW, which compares to about 50% of the entire generating capacity of the Central Asian Unified Power Network.

and uninterruptible operation of power systems. There is growing risk of faults and emergency shutdowns, so all operational risks in accident prevention are born by the power system.

We inform our partners at seminars and meetings that Izolyator warranty does not cover high-voltage bushings delivered by non-certified suppliers. Please pay attention at the

Participants of workshop meeting at 220 kV Aygul - Tash substation

companies offering high-voltage bushings and presenting themselves official partners of Massa Ltd (Izolyator company). In order to ensure SECURITY OF OPERATION of power equipment please request certificate of OFFICIAL REPRESENTATIVE of Izolyator plant. You can always verify this information with our commercial service.

We appreciate all partners for efficient and mutually beneficial cooperation! Izolyator will continue to seek expansion of partner pool in CIS countries. Quality and reliable Izolyator prod-

Presence of thermal and 0.4 - 500 kV electrical networks, hydropower plants and central heating and power plants in collectively form electric power system of the Kyrgyz Republic. The power system of Kyrgyzstan can produce, trasmit and distribute electric power for the country needs and export purposes.

The National Electric Grid of Kyrgyzstan JSC is a power company, which transports electric energy, produced by power plants via high-voltage networks across the Kyrgyz Republic territory to distribution companies and large industrial consumers.

RESPONSIBILITY AS A GUARANTEE OF RELIABLE PARTNERSHIP

MAXIM ZAGREBIN

Head of OEM Sales

Today, Izolyator has not only created an advanced manufacturing facility, but also a team of professionals, always ready to come to cusomters' aid. For that reason, leading electrical engineering companies all over the world become reliable partners to Izolyator.

TO MEET THE CHALLENGES OF THE TIME

Power equipment building as one of the key sectors in development and secure operation of power systems is extremely demanding and it is large work and responsibility to meet those high requirements. Izolyator specialists are accepting RESPONSIBILITY developing, making and testing new designs of high-voltage bushings. One of the development factors of the company in the past years was stengthening of work with Russian and foreign partners — original equipment manufacturers.

We are PROUD OF DELIVERIES of bushings to Russian and foreign transformer plants, since they deliver for the largest energy projects using Izolyator equipment. We feel that we are making an input in development of power industry of different countries.

Izolyator specialists continue to build constructive and MUTUALLY BENEFICIAL COOPERATION with transformer plants in Russia and CIS countries.

Izolyator is particularly proud of the ability to establish truely long term adn efficient strategic relations.

Among realized in the Q1 2017 projects I should highlight Izolyator bushings delivery to Kazakhstan as completing parts of Russian-made transformers and ultra-high-voltage bushings deliveries for the needs of power industry of Crimea.

For one of the key partners of our company — Togliatti Transformer Ltd — we deisgned, made and delivered a batch of high-voltage bushings aimed for projects in Russia and CIS countries.

FIRST TIME IN RUSSIA, Izolyator plant ran successful acceptance tests of a 500 kV oil-SF6 bushing. The bushing was made under the order of Togliatti transformer Ltd for replacement

Photo of Togliatti Transformer Ltd

Togliatti Transformer Limited is one of the largest designers and makers of electric engineering equipment in Russia and the CIS countries. Equipment under TT trademark is operating in more than 50 countries of the world, including Eastern and Western Europe.

POWER MACHINES TOSHIBA
HIGH-VOLTAGE TRANSFORMERS

Power Machines — Toshiba. High-voltage transformers Ltd is a joint venture of Power Machines JSC and Toshiba Corporation. The project started in September 2011 with signing of a JV set up agreement and construction of power transformers manufacturing facility in Russia.

Meeting at Power Machines - Toshiba. High-voltage transformers plant

of foreign-made bushings. The bushing passed the entire set of tests, which allowed to make the first batch of bushings in the shortest period of time and ship them to the customers in full compliance with the contract.

We made delivery of bushings for Power Machines — Toshiba. High-voltage transformers Ltd. Also, 500 kV bushings were installed in SMTT Ltd's first transformers for 500 kV Gazovaya substation of FGC UES PJSC's branch MES Ural.

Izolyator continues to actively develop a constructive dialogue with Power Machines —Toshiba. High-voltage transformers. In the second quarter of 2017, our specialists visited the transformer plant in Saint Petersburg several times. They discussed progress of ongoing orders and future projects as well as prospective cooperation.

It should be said about an important order for high-voltage bushings for transformer equipment from SVEL Group and Uraleletrotyzazhmash JSC in the first half of 2017, which in its turn helps to develop OIL AND GAS and NUCLEAR POWER facilities.

Another event important for us was contract signing with Zaporozh transformator (Ukraine) meant for Belarusian NPP. We are very pleased to deliver for the nuclear power industry, because it speaks for a high CREDITWORTHINESS and HIGH QUALITY of Izolyator products.

In June 2017, we fixed our constructive relations with Ukrainian partners. Izolyator delegation, led by the Chairman of the Board of Directors Alexander Slavinsky visited Zaporozhtransformator and held productive talks with the company management.

Zaporozhtransformator PJSC is the largest in CIS and Europe manufacturer of oil power transformers and electric reactors with a production capacity of 60 thnd MVA annually, concentrated in one manufacturing facility.

The sides discussed issues of further long-term cooperation development in respect to Izolyator high-voltage bushings delivery to Ukraine as well as efficient coordination on international markets.

We continue to constructively grow business with Siemens Transformator Ltd in Voronezh, where we agreed on a delivery of NON-SERIAL DESIGNS OF HIGH-VOLTAGE BUSHINGS for installation in transformers. The successful production audit of Izolyator, ran by Siemens recently, which was approved by the headquarter of the company, became a good prerequisite of our common success in the future.

Participants of the meeting at ZTR

Uralelectrotyazhmash JSC is the biggest Russian developer and producer of electric power equipment for generation, transmission, distribution and consumption of energy. High-voltage equipment of UETM brand are world known and enjoy a good reputation.

Zaporozhtransformator PJSC is the largest in CIS and Europe manufacturer of oil power transformers and electric reactors with a production capacity of 60 thnd MVA annually, concentrated in one manufacturing facility. Over 69 years, ZTP has gained world recognition.

In the second quarter of 2017, we continued shipment of 550-750 kV bushings lot for reactors of Electrozavod Holding in Moscow and 110-330 kV for power industry of Crimea as well as FGC UES PJSC's facilities.

Bushings deliveries are result of large cooperative work of the close-knit Izolyator team and our partners.

Noless interesting are export deliveries both as transformer parts (domestic OEMs) and transformer and reactor equipment parts (made beyond the borders of our country). We are actively cooperating with Russian and foreign electrical engineering plants, design institutes and organizations, where we regularly receive positive references and recommendations from.

ANSWERING QUESTIONS

Izolyator always with pleasure offers initiative of meetings, talks and technical seminars organization — since regular contact with specialists of various level helps understand the topics of most interest to our partners.

Seminars for design and commercial services of power equpiment manufacturers have long become one of the most EFFICIENT FORMS OF INTERACTION with customers.

In 2017 we carry on with seminar work. It is really easy to see how much our partners are interested in such events, e.g. at the recent technical seminars for technical specialists of the leading electrical engineering companies of Russia and CIS, dedicated to design and operation of HV

Electrozavod JSC photo

RIP bushings for power transformers and shunt reactors.

At seminars our specialists not only demostrate DESIGN AND TECHNOLOGY capabilities of our company, but always answer questions of customers representatives. Besides, our speakers use visual aids, including training video about installation of high-voltage bushings, which raises sincere interest with consumers of our products.

IN A PRODUCTIVE TANDEM

Watching how electrical engineering companies are developing all over the world, Izolyator does not stop and live on its past achievement either — every perfecting its technology and products.

On all stages of customer service we FACILITATE our clients' choice of required items, and if necessary initiate development of a new product or serial types modification.

We try to cater to every requirement of our products consumers, beginning with development and ending with packaging and logistics of bushings to any destination in the world.

Siemens Transformers plant (Photo Wikipedia)

Elektrozavod Holding Company is known as the leading Russian and world-wide manufacturer of various electrical equipment, focusing on complex projects realization in power industry. The equipment with Elektrozavod brand is supplied to more than 30 countries of the world.

Siemens Transformers Ltd is a 100% subsidiary of Siemens Concern in Russia. It makes, sells and services power transformers and autotransformers of up to 250 MVA capacity and up to 330 kV voltages and liquid-insulated transformers.

Logistics is an important activity of our company indeed, with an all-time control of HV bushings manufacture for shipping to Russia and CIS, coordination with customer, and in some cases with end user, shipment terms.

We view it as another factor of our company's further development — to ensure production terms and receipt of products by the customer.

Our company provides TECHNICAL SUPPORT by sending engineering supervisor to installation site and in case of 500 kV and above bushings installation. This service is offered free of charge.

The company makes every effort to prove our clients' trust and timely and with due quality fulfil contract obligtations in production of high-voltage bushings and service support of our customers.

Our own maintenance service, with full-time employees, works 24/7 365 days a year.

The possibility to stay connected with our partners and avoid failure in their operation is a guarantee of uninterruptible power equipment operation.

It is important that for some transformer plants in Russia our products are prefferred and only to use, especially for ultra-high-voltage units, which speaks for a high degree CONFIDENCE of transformer and reactor equipment OEMs in our products.

Izolyator works at all times on sending only most reliable and high quality products to power equipment OEMs in Russia and beyond.

Deputy Director of Power Standard Alexander Gumenyuk (L) and Maxim Zagrebin at talks

SVEL Group

SVEL Group is a leading Russian power equipment manufacturer. SVEL Group specialists' findings allow for making equipment enabling its industrial clients to save up to 45% on energy consumption.

Power Standard Ltd is a dynamically developing company that promotes products of the largest CIS plants on the Russian market. At present, the company offers a wide range of equipment for oil, gas and chemical industries.

ATTENTION TO DETAIL IN EVERY PROJECT

OLEG BAKULIN

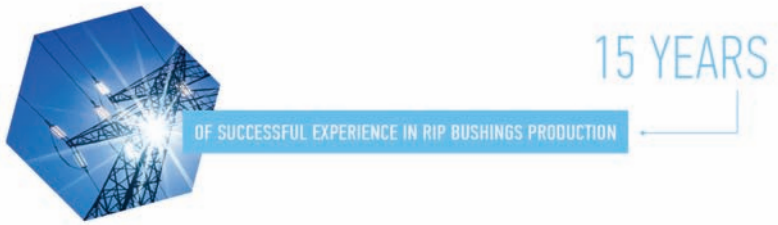
Director of Partner Relations

Power industry has always been a core activity of economy. That is why we feel it important that all deliveries to our partners were made in time and in full volume just as modernization of operating equipment — in line with the schedule. We are always in touch with our partners and ensure warranty and post-warranty service of bushings, carry on with training programs and organize technical seminars.

FOCUS OF ATTENTION ON FAULT-FREE OPERATION

In the first half of 2017, Izolyator continued to STRENGTHEN POSITION on the Russian power market, paying special attention to meeting all contract terms with consumers.

Our team proves by everyday practice that meeting TERMS OF DELIVERY of products is an important component in our work, which, at times, directly influences efficiency of our partners. Thus, we carefully follow the schedule of all realized projects.



Every year equipment becomes more complicated and we, on our side, do everything possible to make our equipment MOST RELIABLE.

We plan to expand our presence on the high-voltage bushings market, for which purpose we do a lot of R&D projects to have a higher product efficiency.

Izolyator has signed a number of agreements with key power grid companies about coordination in INNOVATIVE projects of new high-voltage bushings development, which are aimed at mutually beneficial partnership at efficient and fault-free operation of domestic engineering product in facilities of the Unified national grid.

TO BE THE BEST

Last year, we signed MEMORANDUM ON STRATEGIC COOPERATION with Rosseti PJSC and

Photo courtesy of IDGC North West PJSC

ROSSETI

The Public listed company Rossiiskie Seti (Rosseti PJSC) is 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.

Tomsk Distribution Company (TDC PJSC) is a regional energy supplier that ensures transmission and distribution of electricity to the market of the Tomsk region. TDC PJSC is a subsidiary of power grid company Rosseti PJSC.

Photo courtesy of IDGC Volga PJSC

today we work to fulfil it. First, it refers to staff training in HV bushings installation, operation and accident recovery works. The key task for all power men is not only to be able to fix identified faults, but also to prevent their occurence.

One of the main industry events in the first half of 2017 was approval of high-voltage development till 2030 ROADMAP, which was scrutinized at the sitting of Electrical power equipment workgroup at Rosseti PJSC. The roadmap was developed by Kubanenergo PJSC with an active cooperation from Izolyator specialists.

Presently, Rosseti IS OPERATING more than 250 000 high-voltage bushings made by Izolyator, over 50 000 pcs of which are RIP bushings.

We continue to build productive relations with our key partners on various directions of joint activities.

In April 2017, our company was visited by the Deputy Chief Engineer of Tomsk Distribution Company Sergey Taradanov.

During the plant tour Sergey Taradanov learned about the key stages of high-voltage RIP bushings production technology and testing process of finished goods.

In May 2017, the Interregional Distribution Grid Company of Volga considered Izolyator bushings' design and operation specifics in its facilities at a working meeting.

The Chairman of the Board of Directors of Izolyator Alexander Slavinsky took part at the meeting. We discussed preparation of Memorandum on Cooperation and staff training with IDGC Volga.

Another productive meeting was held with the management of the Interregional Distribution Grid Company of North West, branch of Rosseti PJSC. At the talks with the Deputy Chief Engineer of IDGC North West Victor Abaimov and Lead MRO Specialist Svetlana Vysogorets we discussed issues of Izolyator high-voltage bushings operation and plans of further cooperation.

Deputy Chief Engineer of TDC Sergey Taradanov (R) and Oleg Bakulin at the assembly shop of Izolyator plant

Interregional Distribution Grid Company of Volga, Public Joint-Stock Company (IDGC Volga PJSC) is the largest distribution gid company (operator of 0,4–220 kV power grids)with service areas covering the territory of seven regions of the Volga Federal Districts of the Russian Federation.

IDGC North West PJSC is a subsidiary of Rosseti PJSC, which ensures a secure and uninterruptible power supply of consumers in the Republic of Karelia, Republic of Komi, Arkhangelsk region, Vologda region, Murmansk region, Novgorod region and Pskov region.

Visit of MOESK representatives to the test center of Izolyator plant, L-R: Konstantin Sipilkin, Vasily Vychegzhanin, Alexander Yurtaev, Alexander Slavinsky, Vsevolod Ivanov and Alexander Savinov

MOESK PJSC was represented by Vsevolod Ivanov, 1st Dpty General Director, Chief Engineer, Vasily Vychegzhanin, Director, Substation and ETL Operation, Alexander Yurtaev, Dpty Director, Chief Engineer at the Eastern Electric Networks, branch of MOESK PJSC. During a plant tour with Alexander Slavinsky familiarized the guests with the key production and testing stages of high-voltage RIP bushings. R&D Director Konstantin Sipilkin demonstrated innovative designs of high-voltage bushings to the visitors, while Head of Test Center Dmitry Ivanov showed the center's equipment and testing procedure of finished goods. After the tour, the sides entered talks discussing specifics of Izolyator high-voltage bushings operation in MOESK facilities and areas of cooperation development.

In the second quarter of 2017, Izolyator took part in the open doors day at the Interregional Distribution Grid Company of Siberia.

The Public listed company Interregional Distribution Grid Company of Siberia (IDGC SIberia PJSC) transmits and distributes electric energy on the territory of Altai Republic, Buryatia, Khakassia, Altai Kray, Zabaikalsky Kray, Krasnoyarsk Kray, Kemerovo region and Omsk region.

The event, held for the third time, gathered a record number of participants: representatives of 52 companies came to get to know more about procurement procedures of IDGC Siberia and requirements for partners.

Rosseti PJSC is not only largest consumer of Izolyator bushings, but also a partner cooperating on bushings' DESIGN PERFECTION, quality and operational features improvement. Presently, all high-voltage bushings of 24 — 750 kV voltages are certified by Rosseti PJSC.

PROGRAMS OF DEVELOPMENT

With great interest, Izolyator takes part in new projects aimed at modernization and POWER INDUSTRY DEVELOPMENT in the country. Thus,

Open doors day at IDGC Siberia

MOESK

Moscow United Electric Grid Company (MOESK PJSC) is one of the largest distribution electric grid companies of Russia. Main activity types — service rendering of electric power transmission and grid connection of consumers to electric networks on the territory of Moscow and Moscow region.

IDGC of Siberia

Public Joint Stock Company Interregional Distribution Grid Company of Siberia (IDGC Siberia PJSC) carries out transmission and distribution of electricity in the Republic of Altai, Buryatia, Tuva and Khakassia, Altai, Trans-Baikal, Krasnoyarsk Territories, Kemerovo and Omsk regions.

ROSENERGOATOM

Rosenergoatom Concern JSC is a Russian power company, operator of Russia's nuclear power plants. It is a part of Rosatom corporation, which represents its energy dvision.

we are extremely interested to work with Rosenergoatom Concern JSC, where an emergency stock replenishment program started this year. The program of power equipment replacement is set to continue till the end of the year.

Besides, Rosenergoatom's high-voltage oil-in-paper bushings replacement program is at full pace. The program is going to take several years to complete.

500 kV Izolyator RIP bushing in a block tansformer at Krasnoyarskaya HPP

At the talks, held in the first half of 2017, issues of Izolyator high-voltage bushings operation in Rosenergoatom Concern JSC's facilities and their INTERCHANGEABILITY with earlier received products were discussed.

Rushydro PJSC started a complex power plants modernization program with replacement of transformer and reactor equipment. Thus, since early 2017 our company delivered 220 kV bushings for Ust-Srednekanskaya HPP.

In May 2017, we held a productive meeting with management of Krasnoyarskaya hydropower plant, entering the largest private energy company EuroSibEnergo (En+ Group).

Krasnoyarskaya HPP with 6000 MW installed capacity holds the second place in Russia and enters top ten largest HPPs in the world. At the talks, we presented most recent development in reliability improvement and OPERATIONAL MAINTAINABILITY of high-voltage bushings. We also discussed cooperation plans or the near perspective.

In June 2017, during our visit to the Vilyuiskaya HPP cascade named after E.N. Batenchuk in the Republic of Sakha (Yakutskenergo PJSC), there was an examination of the operated high-voltage equipment, which included 110 kV and 220 kV transformer and wall bushings with solid RIP insulation.

At the meeting with the Director of Vilyuiskaya HPP cascade Alexander Goryainov we discussed SUCCESSFUL EXPERIENCE of Izolyator bushings operation in various geographic areas including the most complicated natural and climatic conditions of Yakutia and set up long-term cooperation development plans.

IN THEORY AND IN PRACTICE

Today, we continue to deliver under the 2016 contracts to power grid and generating companies of Russia and the 2017 contracts. Besides, we have discussed purchasing plans for our products in the second half of 2017 with the Russian power men. We know how important it is for POWER INDUSTRY to GET READY for the winter season and make every effort to meet the delivery terms of our products.

By the end of 2017, we plan to give theoretical and practical classes to our products consumers' staff and seminars on product specifics and OPERATION of electrical equipment, made by Izolyator plant.

Oleg Bakulin (L) and Alexander Goryainov at the meeting at HQ of Vilyuiskaya HPP named after E.N.Batenchuk

RusHydro

RusHydro Group is one of the largest Russian power holdings. RysHydro is a leader in power production using renewable sources of energy, which develops generation based on energy of water streams, sea tides, sun, wind and geothermal resources.

Krasnoyarsk hydropower plant with 6000 MW capacity holds the second place in Russia and is among ten biggest hydropower plants of the world. The power station operates as part of the Unified energy system of Siberia. The average many-year production of the plant is 18.4 bln kWhr. The controlling stake is owned by the largest Russian private energy company EuroSibEnergo.

Vilyuiskaya HPP named after E.N. Batenchuk is a hydraulic power plants complex in Russia, located on the Vilyui river in Sakha Republic (Yakutia). Most of the erection works were completed in the Soviet period when the cascade construction was associated with the industrial development and tapping resources of Yakutia.

RELIABILITY IS OUR PRIORITY

ALEXANDER SAVINOV
Director of Strategic Sales

Most of humanity's best inventions appeared to make life easier and simpler. The power industry has never been easy, but we see our goal in making it as safe as possible, reliable and comprehensible. Thus, seminars and meetings with partners' staff have become just another part of our job as complete adherence to customer requirements.

BASIS FOR DEVELOPMENT

In conditions of unstopping industry development, we understand that our product need to be perfected all the time. The work on QUALITY improvement of produced bushings and accident prevention of power equipment caused by high-voltage bushings failure does not stop even for a minute. We value the opportunity to discuss all modern trends with our partners. Regularly meeting with power men, we mark a high interest not only to Izolyator's activities, but to the NEW TECHNOLOGIES of high-voltage bushings production and nuance in application of those novelties.

Due to the fact that Izolyator has an impressive OPERATIONAL EXPERIENCE of RIP bushings on power lines all over the world, we do have what to say and hope that this experience will be in demand.

PRODUCTIVE DIALOGUE

In the second quarter 2017, there was a number of talks with our partners' representatives, whom we could discuss with SPECIFICS OF OPERATION and trends in modernization of high-voltage RIP bushings.

The Chairman of the Board of Directors of Izolyator Alexander Slavinsky visited Main Power Transmission Lines of Siberia, branch of FGC UES PJSC.

During this visit, the partners had productive talks on operation and DELIVERY of Izolyator high-voltage bushings with the Deputy CEO, Chief Engineer

Engineer Alexander Terskov and Deputy Chief Engineer Maxim Smolentsev.

Izolyator plant received in its turn delegation of representatives of Main Power Transmission Lines of East, branch of FGC UES PJSC.

In April 2017, we visited the head office of the Territorial Generation Company No 2 in Yaroslavl (TGC-2). The meeting agenda was about continued cooperation in innovative solutions implementation in the power facilities of TGC-2.

In June 2017, we held talks at the Bashkir Generating Company in Ufa, Bashkortostan.

We signed a frame agreement on cooperation between BGC and Izolyator and discussed plans up to 2018.

We are pleased to answer all questions and are glad that our partners show sincere interest and intention to study specifics of high-voltage bushings.

At the meeting with representatives of the R&D Center for Power Engineering of FGC UES and Uncomtech managing company in June 2017, we told about recent trends in market development and achievements in electrical equipment design and application of new insulating materials. Having discussed common goals and long-term cooperation strategy with the Chairman of the Board

of Directors at Izolyator Alexander Slavinsky and Commercial Director Ivan Panfilov, the guests familiarized themselves with the main production and testing stages of high-voltage RIP bushings.

Meeting at MES Siberia, L-R: Alexander Slavinsky, Alexander Terskov and Maxim Smolentsev

FGC UES

Main Power Transmission Lines (MES) of Siberia is FGC UES PJSC's branch that operates on the territory of the Siberian Federal District. The service area of the company includes ten federal subjects of the Russian Federation with a total population of 19.3 mln people. MES Siberia ensures uninterruptible operation of 433 power lines.

FGC UES

Main Power Transmission Lines of East (MES East) are a branch of FGC UES PJSC operating in the Far-Eastern Federal District. There are five federal subjects with a population exceeding 5 million people in its service area. MES East ensures a fault free operation of more than 15.5 thousand km of power lines.

Representatives of Shaturskaya SDPP getting an introduction to bushings assembly at Izolyator plant

Visit of MES East representatives, test center of Izolyator plant

The public listed company Territorial Generation Company No 2 (TGC-2) is one of the largest thermal and electric power producers in the North Western and Central Russia. TGC-2 is engaged in production of electric and thermal power and sales (steam and hot water) to end users.

Shaturskaya SDPP is a condensing power plant, located in Shatura, Moscow region. The main fuel is natural gas, however the plant can run on coal, fuel oil, peat. The installed capacity of Shaturskaya SDPP is 1493.4 MW, thermal capacity — 344.5 GCal.

Visit of representatives of R&D Center of FGC UES and Uncomtech to the test center of Izolyator plant

Alexander Savinov (L) at talks with BGC

In order to realize a large-scale product-training initiative of Izolyator and support corporate programs of operators' professional level raising, we began to provide HIGH-VOLTAGE BUSHINGS' REPLICAS and INFORMATION BOARDS FREE OF CHARGE to the staff training centers of key consumers of Izolyator products. The technical seminars where our company specialists tell about design features, specifics of installation and operation of high-voltage bushings, applicable testing and diagnostics of RIP bushings have now become a regular practice.

We present the principles and standards of our work in detail and are always ready to build an efficient partnership.

CHANGES TO THE BETTER

It is no secret that a seriously worn-out power equipment leads to lower reliability and efficiency of the whole power system. According to public sources, today the WEAR LEVEL of Russia's power system is 60-70%! Replacement of all obsolete equipment simultaneously is hardly possible as it involves high financial, time and human resources.

BASHKIR GENERATION COMPANY

Bashkir Generation Company LLC (BGC LTD) is a major regional electric power generating company in Russia, and a member of Inter RAO Group. BGC LLC manages power generation assets in the Republic of Bashkortostan.

R&D Center of FGC UES (NTC FGC UES JSC) carries out scientific research in power industry related fields rendering engineering services, promoting innovations, testing and certifying equipment.

Understanding that situation, Izolyator is ready to offer SUPPORT and assistance in identification of degree of equipment wear and priority of its replacement, or, should it be technically possible, modernization of operated high-voltage bushings. This initiative would allow for getting a higher power system reliability and rationally plan financing by directing it to the areas of most concern.

It should be emphasized that as a preventive measure against power equipment failures our company completes 330 kV and higher HV bushings with DB-2 sensors for connection of online monitoring systems of bushings' condition during operation. We also provide consulting services of installation supervision free of charge for the period of time of installation works of 330 kV and higher bushings, made by Izolyator.

OPENNESS is an important principle in our work with consumers and partners!

OUR COMPANY ENSURES A HIGH QUALITY AND RELIABILITY OF PRODUCTS

In May 2017 RBC Channel broadcasted a Made in Russia program dedicated to the 15th Anniversary of the Federal Grid Company of the Unified energy system of Russia (FGC UES PJSC). Izolyator was one of the few partners of FGC UES to take part in the shooting of the program.The Made in Russia crew visited Izolyator in April this year. The Chairman of the Board of Directors of the company Alexander Slavinsky told the host of the show Vyacheslav Volkov about a long term and close cooperation of Izolyator and FGC UES in respect to supply and maintenance of modern domestic electrical equipment.

To be a part of big and common work on achievement of maximum EFFICIENCY and RELIABILITY OF POWER SYSTEM is a great honor and responsibility, so we work to meet those high requirements.

Alexander Slavinsky and Vyacheslav Volkov during the shooting of Made in Russia program of RBC Channel

Public limited company Uncomtech Managing Company (Uncomtech JSC) exercises the rights of the individual executive body of Irkutskcable JSC and Kirscable JSC. The plants are among the largest cabling products manufacturers of Russian Federation.

CREATING MUTUALLY BENEFICIAL RELATIONS

DMITRY ABBAKUMOV
Deputy Commercial Director

Using its best experience, Izolyator strives to be a global leader in development, production and implementation of modern technologies in power industry. To create high quality products proper materials and completely parts are required. So, that is the reason to consider work with Russian and foreign suppliers important.

MUTUAL ADVANTAGES

The procurement department of our company monitors the market, looks for suppliers and talks to already existing and potential partners. Our experience shows that long-tem and mutually beneficial relations allow to TIMELY SUPPLY production with completing parts and materials of HIGH QUALITY.

The expericence proves that the most efficient relations are formed with suppliers and potential partners.

The era of the price as the only defining factor has passed. Supply chain managememt for clients ecreates a new type of relations between the supplier and the user.

Exactly this type of relations creates ompetitive advantages both for business partners 'supplier» — «user».

THE VALUE OF PERSONAL COMMUNICATION

We are confident that communication in person plays an important role helping to HEAR each other.

The value of personal communication always plays an important role helping to HEAR each other and find OPTIMAL options for development of cooperation. So we are pleased to meet the guests of our company, so that they could personally witness the principles of our work in action.

In May 2017 Izolyator was visited by representatives of the Finnish TT Gaskets and Portugese Amorim Cork Composites. The partner companies were represented by:

- Eselalo Ampofo, Sales Director, Eastern Europe,
- Rui Palavra, Application Engineering Industry & Sealing,
- and Victor Hugo, Industry Sales Manager / Europe, Middle East and Africa.

During the plant tour the guests familiarized themselves with the key stages of HV RIP bushings production. The sides discussed technical features and PURCHASING PLANS for sealings, which are made by TT Gaskets of Amorim Cork Composites materials. These parts are used in designs of Izolyator high-voltage bushings.

One more event of the 2nd half of 2017, important for us, is visit of Huntsman Corporation representatives. The Huntsman Corporation was represented by:

- Hans Jelinek, Sales Director Europe/ Materials;
- Pinar Yeler, EMEA Sales Leader Electrical & Electronics;
- Konstantin Ilyichevsky, Sales Manager Huntsman Advanced Materials. The R&D Director Konstantin Sipilkin and Deputy Chief Process Engineer Svetlana Kryuchkova held talks about deliveries of epoxy compound by Huntsman. It is used by Izolyator in RIP bushings production.

The sides discussed technical aspects and the nearest and LONG-TERM PLANS of mutually beneficial cooperation.

Visit of TT Gaskets and Amorim Cork Composites representatives: at the insulation making shop at Izolyator plant, L-R: Eselalo Ampofo, Rui Palavra, Victor Hugo, Vladimir Romanov and Pavel Kiryukhin

TT GASKETS
TAMPEREEN TIIVISTEOLLISUUS OY

TT Gaskets (Finland) is one of the leading Nordic manufacturers of gaskets and shims. High-quality and customer-specific sealing solutions have led to successful co-operation with various industrial fields.

AMORIM

Amorim Cork Composites belongs to Corticeira Amorim, one of Portugal's largest industrial groups and has become the global cork industry world leader, its main business sector grouped into four fields: stoppers, floor and wall coverings, insulation and composites.

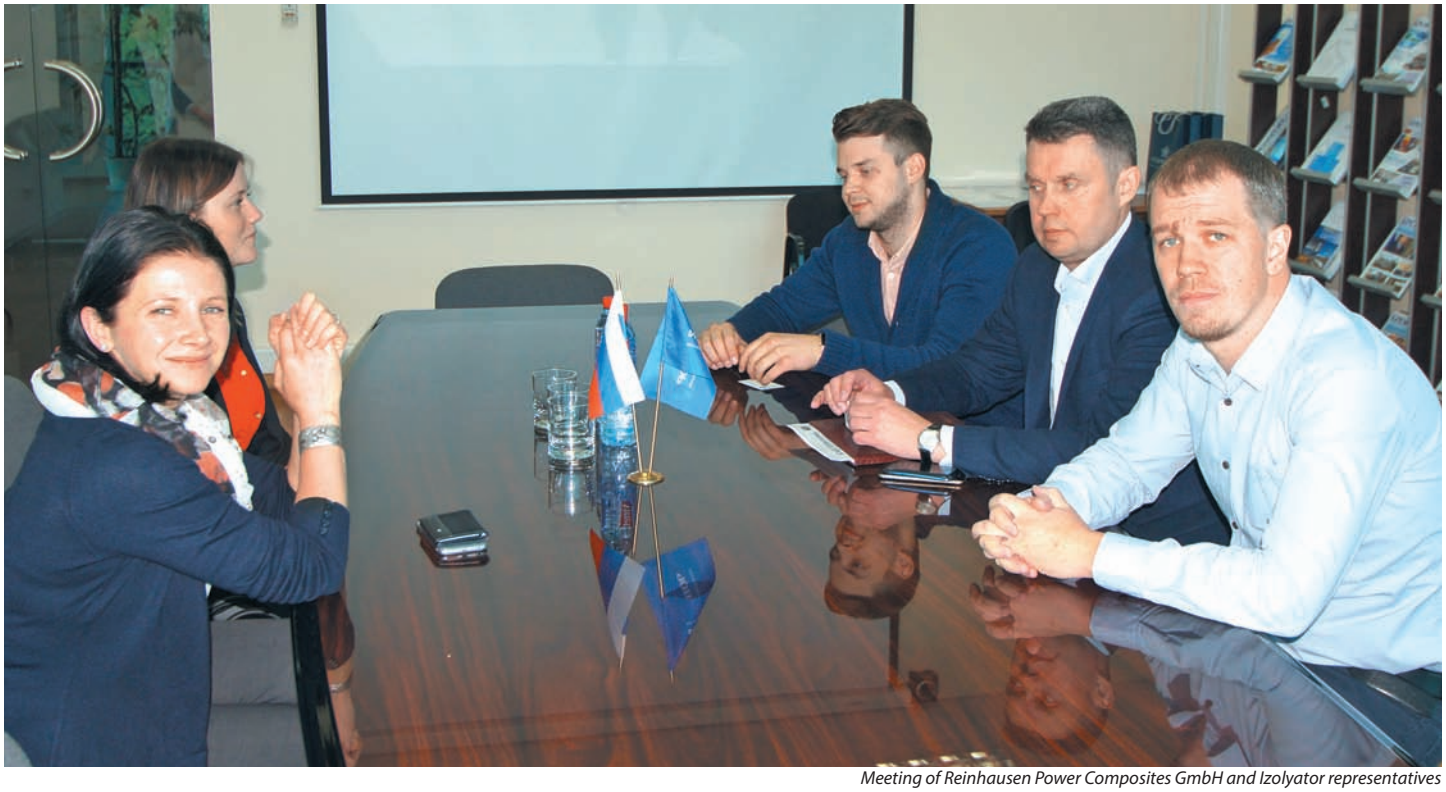
Talks at Izolyator plant, L-R: Konstantin Ilchevski, Pinar Yeler, Hans Jelinek, Konstantin Sipilkin and Svetlana Kryuchkova

In May 2017 Izolyator plant was visited by representatives of German Reinhausen Power Composites GmbH. Hollow composite insulators, which Reinhausen Power Composites GmbH supplies to Izolyator plant, were the agenda of the talks. These insulators are used as one of the types of external insulation of high-voltage bushings. The sides discussed technical characteristics of delivery volumes of those items for the near and remote prospects.

SEEKING BEST SOLUTIONS

Analysis of relations between suppliers and consumers shows that one simply cannot stay confined within supply chains. Every company enters multiple relations. It may buy raw material from a supplier, equipment — from another one, consulting — from the third one and so on. And for every type of purchasing there exist requirement, evaluation criteria and subtelties in procedure. Consequently, the company should create a system of purchasing management. We can deduct that it is a field of prospective corporate purchasing development in a company.

Building relations with partners, we always remember that suppliers are a pre-requisite of our common success!



Meeting of Reinhausen Power Composites GmbH and Izolyator representatives

HUNTSMAN
Enriching lives through innovation

The companies of Huntsman Corporation produce chemical components for various industries, namely: chemicals, plastics, automotive, aviation, footwear, paints and coatings, construction, technology, agriculture, health care, textiles, detergent, personal care, furniture, appliances and packaging.

MR

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. A specially created company Reinhausen Power Composites GmbH has made those insulators since August 2009.

PARTICIPANTS IN KEY INDUSTRY EVENTS

Improvement is an unstopping process, therefore in order to meet requirements of ever developing power industry, Izolyator seeks best solutions and practice. Our specialists always take interest in Russian and international exhibitions, forums and seminars. These are a great opportunity to share experience, learn about industry trends and network with partners and potential customers.

Electromontazh 2017 Congress

GOSZAKAZ FORUM AND EXHIBITION — FOR TRANSPARENT PUBLIC PROCUREMENT

The XIII all-Russian Goszakaz Forum and Exhibition — For Transparent Public Procurement became a bright event in April 2017. Oleg Bakulin, Director on Partner Relations at Izolyator took part in the business program of the forum. The guests of the forum discussed topics of present interest and problems, such as raising purchasing efficiency on all levels, minimizing corruption elements in procurement.

IZOLYATOR — PARTNER TO ELECTROMONTAZH 2017 CONGRESS

Izolyator partnered with the second All-Russian Electromontazh 2017 Congress: "Technologies of innovative development", which took place during Electro 2017 on 17 and 18 April 2017 in Moscow.

At "Assembly and installation of power equipment, diagnostics and service" session, Alexey Pilyugin, Lead Commissioning Engineer at SVN Service of Izolyator made a report on high-voltage equipment condition control by method of online coordination between the manufacturer and the end user.

Besides, the Congress agenda included a special visiting session at Izolyator plant. During the plant tour, the congress attendees familiarized themselves with the innovative designs and main production stages of high-voltage bushings, including those with the unique RIP insulation.

V RUSSIAN INTERNATIONAL ENERGY FORUM

Izolyator took part in the V Russian International Energy Forum in Saint Petersburg in April 2017. This year, 150 companies from 21 Federal districts of Russian Federation and 10 countries took part in the Forum and the XXIV Specialized International Exhibition «Power Industry and Electrical Engineering 2017».

During the plenary sitting «Power equipment building. A revival of traditions» the Chief

Oleg Bakulin at the XIII All-Russian Goszakaz Forum and Exhibition — For Transparent Public Procurement

Electromontazh 2017 Congress Participants visiting Izolyator plant

The annual all-Russian Goszakaz Forum and Exhibition — For Transparent Public Procurement is Russia's only discussion and exibition platform on federal level to cover the topics of state, municipal and corporate procurement, the scale of which allows to embrace interests of all market players.

Electrical Installation Congress gathers in a single venue electrical products market professionals, leading OEMs of electrical products and consumers from a variety of industries, industrial and infrastructure organization, electrical installation companies, professional associations, colleges and state bodies.

Russian International Energy Forum (RIEF) combines the experience and traditions of the two major international industry events — the International Specialized Exhibition «Energetika & Elektrotechnika» (Power and Electrical Engineering) with more than 20-year history and the Russian International Energy Forum.

Designer of Izolyator Yury Nikitin made a report «Izolyator plant: over 120 years of experience in innovative development and production of high-voltage bushings for power complext».

HANNOVER MESSE 2017

In the second quarter of 2017, Izolyator representatives visited Hannover Messe in Germany, an event that reflects global economy trends focusing on such meaningful sectors as IT and industrial automation, power saving and ecological responsibility, drive and control systems, industrial services and technologies, research and innovations.

Izolyator was represented by Konstantin Sipilkin, R&D Director, Alexander Shornikov, Technical Director and Svetlana Kryuchkova, Deputy Chief Process Engineer. During the exhibition, the colleagues learned about the latest world's trends in industrial technologies.

Izolyator representatives visited Index 2017 — International Exhibition of Nonwovens and Technical Textiles in Geneva, Switzerland.

The organizer is the International Association of Technical Textiles and relevant industries EDANA.

Izolyator was represented by R&D Director Konstantin Sipilkin, Deputy Chief Designer Pavel Kiryukhin and Deputy Chief Process Engineer Svetlana Kryuchkova. During the visit to the exhibition, they learned about the latest achievements in development of production technologies of nonwovens.

Visiting Hannover Messe, L-R: Svetlana Kryuchkova, Konstantin Sipilkin and Alexander Shornikov

XXV TRAVEK ASSOCIATION CONFERENCE

Izolyator took part in the XXV International Science and Technology TRAVEK Association Conference "Power and Distribution Transformers. Reactors. Systems of Diganostics», held on 7 and 8 June 2017.

Izolyator was represented by Alexander Slavinsky, EngD, Vice President of TRAVEK Association, and Alexey Pilyugin, Lead Supervising Engineer at SVN-Service. The participants of the conference agreed on a summary that reflects trends of equipment and power systems development, proposals of high-voltage equipment manufacturers to consumers.

Izolyator representatives working at Index 2017 exposition

The XXV Conference of the International TRAVEK Association

Hannover Messe is the largest event not only in Germany, but abroad as well. The exhibition reflects global economy trends focusing on such meaningful sectors as IT and industrial automation, power saving and ecological responsibility, drive and control systems, industrial services and technologies, research and innovations.

Index is the largest global meeting place for the nonwovens market, its suppliers and customers. Index is the premier industry platform, where senior industry professionals from around the world come together to seek competitive insights and learn about the latest technologies.

International Association on transformers, high voltage equipment, electrical ceramics and other spare parts and materials — TRAVEK — was established in order to implement the business cooperation, contributing to marketing, manufacturing and technology development, to ensure product competitiveness in world markets.

RIP INSULATION: DESIGN AND ADVANTAGES

Konstantin Sipilkin, Research and Development Director at Izolyator:
«Today, the world's leading research and development centers and electrical engineering companies are working on creation of new types of electrical equipment, based on superconductivity effect. Cable lines, voltage transformers, motors and current-limiting devices — all that equipment can use superconductivity effect in its operation. New generation high-voltage bushings, able to work at extremely low temperatures, are required for these revolutionary devices. It is the type of high-voltage bushings that our company specialists are currently working to create».

In our «Innovations» column we continue to talk about the types, designs and operational features of high-voltage bushings, made by Izolyator.

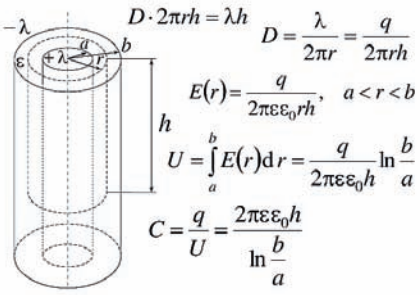
In modern days, switching on a TV or lights, few of us really think about how all the blessings of civilization became available with the invention of electricity. Today it has become something ordinary. Only specialists know that all power supply processes behind «the ordinary», from electricity generation to its consumption, are conditioned by use of special equipment, ensuring power transmission and conditioning to consumer values. Here, high-voltage bushings play a visible role, being a link between the power line and transformer or other electrical equipment.

The high-voltage bushing is an insulating device of complex design, with strong internal and external insulation, ensuring operation in the most adverse conditions and environment. Reliability and, consequently, service life of a high-voltage bushing largely depend on the internal insulation (insulation core with conductive plates, which provide optimal electric field distribution both in raidal (by thickness of insulation) and axial (by the ends of the bushing against the coupler) directions).

During operation process, the internal insulation is exposed to a whole complex of stresses, leading to its aging — worsening of electric and mechanical qualities. The electric strength of insulation, preventing punctures, depends on the insulation core design, the quality of manufacture and materials.

Together with the capacity and voltages growth, new types of transformers and reactors were created and improved, leading to significant changes in one of the key parts of transformers — high-voltage bushings. They went a long development path from a simplest pass-through insulator to high-voltage bushings with RIN insulation (in foreign sources referred to as RIS insulation). But we will go into details about this new type of insulation in later publications. For now, we will speak about another type of insulation of high-voltage bushings.

Initially, the insulation-making process looked like the paper, covered with shellack on one side, was wound under pressure on a core and simultaneously heated. When reaching required thickness, the winding turned into a paper core. The electrostatic field strength could not be adjusted in such insulations. In 1906, the German scientist Niegel offered condenser-type insulation. He suggested to put N of metallic plates of foil between the layers of paper-bakelite winding with certain intervals. The neighbouring plates formed a cylinder-shaped condenser. Thus, between the core and the flanged he received N of series condensers. Niegel presumed that if all condensers were made with equal output, and all layers with identical thickness, it would be possible to achieve an even field distribution in radial and axial directions. In 1909, he proved that it was impossible and offered plates, getting shorter with diameter growing bigger. Only in 1947, Paul Benning offered a method allowing to evaluate the influence of plates length on field distribution both in radial and axial directions. Paul Johann Benning (1887 — 1972) is a German professor of electrical engineering, author of eminent scientific research papers in the field.



A schematic depiction of insulation core of high-voltage bushing and a formula to calculate its capacitance

In our last issue we spoke about various types of high-voltage bushings insulation, produced by our company up to now. We will remind what types of bushings those were.

First, oil-barrier insulation was used, which consisted of oil-filled volume with cylinder-shaped barriers of carton dividing it for electric field regulation with foil electrodes. Those bushings had a significant weight, large radial dimensions and low short-time dielectric strength. Bushings with oil-barrier insulation were produced till 1965.

The next insulation type is oil-in-paper insulation, based on paper core, wound on conductive tube and saturated with insulating oil. There are condenser plates, used to level electric field, in the paper core. Inspite of high insulating properties of oil-in-paper insulation, its main drawback is potential fire and explosion hazard.

Since 1972 our plant has commensed to produce 110 kV RBP (Resin Bounded Paper) high-voltage bushings. The insulation core is made by winding cable paper, covered with insulating lacquer. It glues together paper layers and on the external surface the core is covered with epoxy compound. It allowed to have a higher fire safety of the oil equipment, however insulating properties of RBP insulation turned out to be worse, than those of oil-in-paper insulation. It was connected with the technology of bushings production, when during the paper winding there were micropores left between the layers, which were not filled with insulating lacquer.

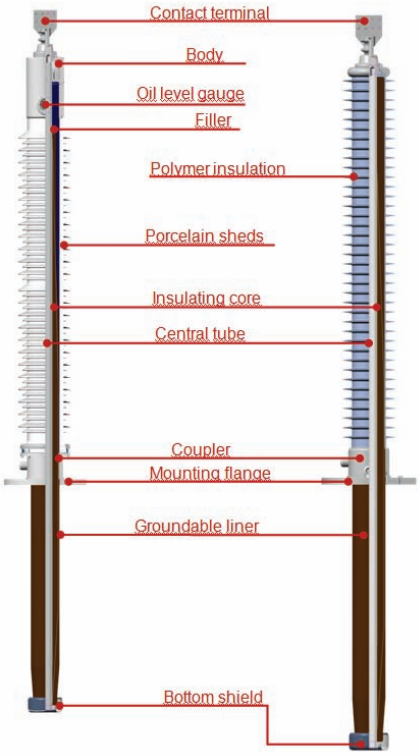
The next step in creation of solid insulation for high-voltage bushings became RIP (Resin Impregnated Paper) technology.

The foreign experience of production and operation of RIP bushings counts more 60 years. Using the latest development in electrical engineering and following the global trends of high-voltage bushings production, Izolyator has begun own RIP insulation development since 2002.

The main design feature of condenser-type bushing with solid RIP insulation is insulating core, which is made from special crepe paper, saturated with epoxy compound, with condenser plates of aluminium foil. The plates serve to level electric field and thanks to good conductivity ensure optimal voltage distribution.

The winding of the core on a tube is done on a special equipment with automatic control of paper tension for obtaining required density. The winding machine allows to have up to 12 meters long winding. Before the winding operation, the paper must be dried to required moisture level. The condenser plate set are prepared in climatized chamber, which has an even higher level of requirements compared to the one of the winding station and the assembly shop. Dimensions and positioning of the plates are computer-calculated with special software and are mentioned in the design documentation. After the core winding, they are put in the drying chambers with subsequent saturation in vacuum. The compound is prepared in the vacuum degasation installation with obligatory control of the compound composition, viscosity and other parameters for every lot. To remove remaining mechanical stresses in the core after polymerization, they are heated in accordance with the temperature chart for each voltage class.

Control over technology is particulary critical in all production cycle stages. The compound composition and processing conditions, which were optimized both by calculation and experimentally over a long time, are a guarantee of high dielectric properties of the main RIP insulation during years-long operation.



Design of high-voltage RIP bushings

Paper core winding machine up to 12 m

RIN INSULATION FOR 500 KV BUSHINGS

In June 2017, first time in Russia, Izolyator plant successfully completed acceptance tests of a 500 kV HV bushing with solid RIN insulation, intended for power transformers.

The tests became one more practical result and a significant achievement of Izolyator's technical policy, focused on ensuring high-voltage bushings reliability in any operating conditions.

500 kV RIN bushing at the test center of Izolyator plant

Thorough control over processing conditions of drying, saturation and hardening cycle ensure high quality of received insulating cores in regard to partial discharges and mechanical parameters.

After the hardening cycle is completed, the insulating core receives its form by machining operation on a lathe. The coupler is fixed on the core by hot pressing technique, being about 0.5 mm smaller in diameter in cold condition. After heating it to 300 degrees Centigrade the coupler is put on the core and cooled to the ambient temperature. Then, the porcelain insulator is put on the core or polymer external insulation is applied. You can see RIP bushings with two types of external insulation at the picture.

Based on those technologies, we mastered production of bushings series from 12 to 750 kV for alternating current and from 110 to 820 kV for direct current. The bushings passed all required acceptance tests and were certified by Rosseti PJSC with recommendation for application in power facilities of Russia.

The solid RIP insulation preserves all advantages of RBP insulation over oil-in-paper type, and its application range is expanded to 800 kV. The signature features of RIP compared to RBP are presence of insulating material of a higher temperature class with low dielectric losses and low partial dicharge level. They have other significant advantages, such as absense of pressure and fire resistance, and have higher mechanical properties. Among other benefits are possibility of transportation, storage and installation at any angle, possibility of applying voltage immediately after installation and remarkable withstand to seismic stress. All the above said allows to consider RIP insulation to be the best internal insulation of high-voltage bushings for the moment.

Yet, even the most advanced solid RIP insulation is subject to moisture attack. With thermal vacuum saturation with epoxy compound, there still remaining paper hygroscopicity.

Moisturization of solid insulation of bushings at improper storage and operation leads to a decreased service life of bushings and is usually one of the causes of bushings' failure. Therefore it is required to use water proof package for transporation and storage of bushings. After their arrival to the warehouse, the consumer must run acceptance tests, whereafter every bushing must be again accurately packed for protection against moisture. The last condition is observed in not so many cases.

The complete solution of moisturization problem and long-term storage of bushings with solid insulation can be reached with application of new type insulation — RIN (Resin Impregnated Nonwoven), which we will cover in our next publications.

Development of electric machines and devices, application of new modern materials, development of technologies open path to further big technical improvement of bushing technology.

Reliability and security of operation of contemporary industry giants, preservation and protection of environment, comfortable and healthy habitat for people — these are the problems that the humanity is facing. Since the times of invention up to this day, transformers and high-voltage bushings, as one of the most important stuctural elements in transformers, serve, efficiently and quietly, supporting power systems functioning, upon which so much depends in order modern life.

Material by the Deputy Chief
Designer of Izolyator
Svetlana Kryuchkova

APROPOS,

the word «capacitance», which is used today for referring to the nominal of modern condensers, is a tribute to the past. For initially, this element was a glass vessel (glass jar), which had a specific volume or capacity.

Leyden jar — the first simplest condenser

500 KV OIL-SF6 RIP BUSHING

Sergey Khlopotin defended his magister's thesis, dedicated to design of a 500 kV oil-SF6 bushing at the National Research University MPEI.

Sergey worked on the project for a year at the specialized design bureau of Izolyator. The KTkb-90-550/1000 O bushing for cable connection to transformers was developed by Izolyator under the order of Togliatti Transformer plant for replacement of bushings, earlier delivered by one of the foreign manufacturers.

Sergey Khlopotin made a report about his work to the state attestation commission. The members of the attestation commission unanimously resolved to award Sergey Khlopotin with a Magister's degree, giving the highest mark to the thesis.

The prototype of the bushing passed all required acceptance tests, which allowed to manufacture the first batch of the bushings and ship them to the customer in full correspondence with the contract. The bushings are intended for operation at Roghun HPP in Tajikistan.

500 kV oil-SF6 bushing's tests at Izolyator plant

THE HISTORY OF A COMPANY, CONCORDANT WITH THE HISTORY OF INDUSTRY

Management is a science, importance of which is hard to underestimate. It is not only a large work to be an efficient and successul manager, but really a work that does not stop for a second. In April 2017 winners of the regional tour of the all-Russian Manager of the Year Contest were awarded. The General Director of Izolyator **Sergey Moisseev** was named winner in the Power industry section, «Efficient management in industry» nomination. Sergey Borisovich told us how he is able to constantly improve the company operations in an interview to our newspaper.

— Sergey Borisovich, 10 years have passed since launch of a new manufacturing facility of Izolyator plant in Pavlovskaya Sloboda. Could you please tell how the large-scale project of the plant's relocation from Moscow to Istra region was completed?

— We faced an ambitious task: increasing production volume and radical TECHNICAL REEQUIPMENT of the plant, which had to be re-designed from scratch and built to make high-voltage bushings in a shortest period of time. The foundation stone laying took place on 1 August 2006, and already in December 2007 the plant was put into operation. The project re-

MANAGER OF THE YEAR 2016

In April 2017, an awarding ceremony of the winners in the regional round of the Russian Manager of the Year 2016 Contest took place in the Liberal Economic Society of Russia. 14 top managers from the Moscow region received awards in 9 nominations.

Sergey Moisseev, General Director at Izolyator received a nomination for "Efficient management in industry" and took the prize in Power Industry section.

The winners of the contest were given diplomas and Manager of the Year 2016 memorable medals.

Executives and specialists of all levels from organizations, industrial, banking, insurance, investment companies, state budget organizations, NGOs of the Moscow region became participants of the contest.

Sergey Moisseev (center) – one of the best managers of the Moscow region in 2016

ceived support from the Administration of Istra region and Pavlovskaya Sloboda village. We are thankful fo the all-round support we received. We managed to build a modern enterprise, whose production base meets the highest technical and technological requirements and by some parameters has advantage over foreign benchmarks.

— In your General Director position you achieved impressive results, which were marked by the professional community. What goals do you set for yourself today?

— First, broadly speaking, it is management of the production and finance activities of the company. Our company has certain obligations for the federal, regional and local budgets, suppliers and customers. The task of the management team is to make sure all of those are fully done in time.

In order for Izolyator to perfect its production management and expand its presence on the global market, a constant analysis of all processes in the company, development and RATIONAL USE of key competences are required.

Our team has been the main value for, that is why it is so important not only to develop the management system, quality management and ecological management, but to plan activities targeted at retaining qualified staff of our company. We are aimed at regular training of people and raising their qualification, be it in specialized professional training institutions or internally at Izolyator. We have regular personnel appraisals for management team and specialists, form talent pool to use the most of the human resources potential.

I am convinced that only combination of economic and administrative methods, material and moral drivers of profitability increase can be effective, when every worker feels responsible for entrusted work and he has moral and monetary reasons for that.

In its more than 120 year long history, Izollyator has developed its corporate values, which we support and develop. Thus, we foster DYNASTY TRADITIONS and corporate identity of our employees, paying much attention to patriotic component in upbringing younger generation and commemorating company workers fallen during the Great Patriotic War. I should emphasize that we actively support veterans who still work at the plant and those who retired. We encourage healthy lifestyles with pleasure, organizig sports teams and making arrangements for active outdoor recreation.

WITH CARE AND ATTENTION

— Indeed, Izolyator historically was known for its staff. Would you tell who works at the plant today?

— It should be emphasized again that all Izolyator's achievements were made possible thanks to well-coordinated work of HIGHLY PROFESSIONAL team. There are more than 100 labor dynasties in the company, many of which keep working todate. Altogether we employ a little more than 300 people. If we try to make a portrait of typical employee, he would be about 41 years old, residing in Moscow or Moscow region. According to our statictics, there are more than 45 % of such employees in the company, 22 % residents of Istra region. Again, more than 45 % of our people have higher education, more than 30 % have professoinal training or finished college.

— How are social and corporate programs being realized at the company today?

— The company takes care of its staff and pays much attention to working condition. Thus, the company provides daily medical inspections at its expense. Our specialists regularly perform assessment of individual work places, allowing for making them safer. We provide our workers with subsidized meals, organize corporate transportation an partical compensation for those employees who drive to the plant.

We pay a lot of attention to training and rising QUALIFICATION of our people. Last year, the company employees were trained to Company management, having learned legislation of Russian Federation, general accounting principles and process of design and management of high-voltage bushings' lifecycle. We tested the trainees in several stages. All our students completed training successfully and considerable raised their professional level. They also received individual certificates.

As I already mentioned, we maintain and develop health lifestyle with our employees: the volleyball and futsal teams of Izolyator compete in regional and industry tournaments. There is always a great opportunity to support your colleagues and really feel the team spirit.

THINGS TO BE PROUD OF

— Last year Izolyator celebrated its 120th Anniversary. What does this date mean for the staff?

— We proudly say that Izolyator's history itself is inseparably connected with origination and development of high-voltage bushings as sefl-sufficient direction in power equipment building in Russia. Few industrial manufacturers

THANK YOU FOR CONSCIENTIOUS WORK

In April 2017, Izolyator celebrated the 70th Anniversary of Alexander Bogatyrev, mechanic of the insulation shop who has worked at the plant since 1971.

Alexander Vasilievich has various awards: In commemoration of the 850th Anniversary of Moscow; Thank you Letter form the Administration of Pavlo-Slobodskoe village of the Moscow region for high professionalism and significant input in Izolyator company development; Badge of honor "For years of dedicated work" in connection with the 120th Anniversary of Izolyator plant.

The hero of the day received congratulations from the General Director Sergey Moisseev, Technical Director Alexander Shornikov, Insulation Shop Manager Alexey Sipilkin, HRM Julia Tyurina on behalf of the whole team.

Alexander Bogatyrev receiving congratulations in connection with his 70th Anniversary. Sergey Moisseev (R) and Alexander Shornikov giving Mr Bogatyrev a certificate of appreciation.

INDUSTRY FUTSAL CUP

On 1 June 2017, Izolyator successfully debuted in the futsal tournament, being held among the industrial companies, residents of Pavlo-Slobodskoe village of the Istra region of the Moscow region.

Corporate teams of Izolyator, OptiCom, Agama, President/Lactalis, Grundfos, Exist and the team of Pavlo-Slobodskoe administration will be taking part in the contest.

At the opening of the championship, Georgy Savchenko, Head of Administration of Pavlo-Slobodskoe and Sergey Moisseev, General Director at Izolyator addressed the participants of the tournament and sports fans.

On the first day of the games, Izolyator team played against Grundfos team (Grundfos Istra plant that makes pump equipment).

During that spectacular match Izolyator took over scoring 12:5. The tournament will continue till 31 August 2017.

The players of the starting games of Futsal Tournament among industrial companies of Pavlo-Slobodskoe village

culminated with a paintball contest for Izolyator —120 years Cup. It was a great example to once again demonstrate to all our colleagues the importance of acting together, keeping team spirit and spirits high.

COMPANY TODAY

— Sergey Borisovich, how would you characterize **Izolyator plant today?**

— By all means, Izolyator is a MODERN HIGHLY ADVANCED ENTERPRISE, equipped with the best equipment, capable to develop, manufacture and test high-voltage bushings for AC and DC current in 12 to 1200 kV range.

The plant adds on new equipment, modernizes existing park, upgrades automation of processes. We constantly expand our product range by introducing brand new designs and modernizing existing high-voltage bushings types.

All novelties occur in line with our ideology: equipment and technologies should correspond to the best international standards and quality criteria.

The efficient social and economic policy of the company and exclusiveness of our products enable to plant to make a considerable input not only in development of the city district of Istra of Moscow region, but the entire electrical engineering industry STRENGTHENING ENERGY SECURITY of the state.

in our country can boast such a long and rich history. There is a lot to be proud of. In over a century-long history the company has won RECOGNITION OF THE LARGEST AND RELIABLE DEVELOPER and supplier of quality innovative electrical products.

We are proud of our veterans and workers who stayed with the company for ten, fifteen, twenty and over forty years putting their effort and heart in achivement of common goals of the company. We will continue to support traditions and develop corporate values of Izolyator company.

— What did the company employees remember from the Anniversary celebration?

— In the Anniversary year the employees of the company were maked with Thank you letters and Recognition letters from the Governor of Moscow region, Administration of Istra municipal district and Pavlo-Sloboskoe village.

The highest corporate award BADGE OF HONOR «FOR YEARS OF CONSCIENTIOUS LABOR» was given to employees, with 10 to 40 years employment record in the company, who made the biggest contribution in development and flourishing of Izolyator plant. Our special thanks award «Golden Talents of the Company» were given to the plant's veterans.

The row of festive events dedicated to the 120th Anniversary of the plant was continued by a large sports festival with over 100 Izolyator employees demonstrating their talents in volleyball, soccer, pingpong, badminton, archery, arbalest and air gun shooting. The event

NEVER FORGET THE VETERANS OF THE FRONT AND HOMEFRONT WORKERS

On the eve of the great holiday of 9 May, Izolyator management and staff members held an annual flower laying ceremony to the monument on the plant's territory and remembered the plant workers and veterans of the Great Patriotic War with a moment of silence.

During the World War II Izolyator's production facilities were fully used for the needs of defense. Many plant workers volunteered to the front.

By 1945, the plant mastered industrial production of 60 new types of bushings including a specialized bushing for radio units and other defense purposes. The plant's entire product range was fully restored for mass production, for example, 154 and 220 kV oil-filled insulators that had been out of production since the first years of war were assembled.

Izolyator staff hold the memory of the deceased comrades. Their names are listed on the monument erected on the plant premises. On this day, we bow our heads to the memory of the fallen, and wholeheartedly thank every veteran living among us.

Moment of silence

QUALITY MANAGEMENT SYSTEM AUDIT

Izolyator passed the second inspecting audit of quality management system for DIN EN ISO 9001:2008 conformity.

The audit was performed by TUF Hessen in conformity with TUV PROFiCERT procedures.

The audit began with discussion about management process at Izolyator with Alexander Slavinsky, Chiarman, Alexander Novikov, QD and Tatyana Vasina, Quality service Chief. All remaining procedures went according to the approved schedule and ended in a positive result.

Quality management system audit at Izolyator

SECURITY OF PRODUCTION — OUR PRIORITY

In May 2017, there was a scheduled fire safety training for staff at Izolyator plant facilities. Civil defense expert Boris Sobelman delivered the training to Izolyator team members.

At Location 1, they had a practical exercise with the workers of the duty shifts of the plant. They were tasked with duty services coordination exercise – for situations of fire outbreaks on process equipment. The trainees drilled coordination activities and information sharing between the duty shifts of the Insulation making shop, Electric and Mechanic service and Security.

At Location 2, the trainees practiced evacuation of plant workers on the signals of the automated fire safety system. On the warning signal of the fire, the operators and engineers left their stations and arrived at the open ground within 4 minutes, which is a proficient level of readiness.

The trainer demonstrated fire-fighting means and gave a practical exercise to the workers on their application. The trainees practiced in fire extinguishing on burning liquids using dry powder extinguishers OP-5 and carbon dioxide extinguishers OU-5.

Extinguishing a fire on the combustible liquid with a OU-5 fire extinguisher during the fire safety drill

WE APPRECIATE ALL OUR PARNERS!

IZOLYATOR IS OFFICIAL SUPPLIER OF

ROSSETI
FGC UES
SIEMENS
INTER RAO ELECTRIC POWER PLANTS
elia
GETRA MATCHING ENERGIES
JST transformateurs
NTPC
ZTR ZAPOROZHTRANSFORMATOR
BEST
ROSENERGOATOM
ALSTOM

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alageum group
Bharat Bijlee
TIRONI power transformers
BHEL
EEMC
EMCO inspired by tomorrow
ETD
sea
ETRA
TAMINI ENERGY TRANSFORMERS
HYUNDAI
KONCAR D&ST
transformers & rectifiers (india) ltd
TIANWEI
TBEA
TOSHIBA
Vijai Electricals Ltd.
ZREW TRANSFORMATORY
ATEF
SVEL
DELTA TRAFO
POWER MACHINES TOSHIBA HIGH-VOLTAGE TRANSFORMERS
UETM
enel
ENERGO-PRO
Latvenergo
EVN
BASHKIR GENERATION COMPANY
GAZPROM
group
D.TEK
IRKUTSKENERGO
QUADRA
КРАСНОЯРСКАЯ ГЭС
КРЫМТЭЦ
ЭНЕРГОАТОМ


ПЛЮС
RusHydro
ТГК-2
ТГК-14
fortum
elering
ÕHENDAME ENERGIAD
MOLDELECTRICA
APTRANSCO
GETCO
Terna
TSTRANSCO
АЖК
GSE
Georgian State Electrosystem
ДРСК
ИЭСК
KEGOC
КРЫМЭНЕРГО
НЗК
РРСК
САХАЛИН ЭНЕРГО
СЕВАСТОПОЛЬЭНЕРГО
CESI
HUNTSMAN
Enriching lives through innovation
MR
PREIS
TE
connectivity
TT GASKETS
TAMPEREEN TIIVISTEETOLLISUUS OY
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WEIDMANN
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citi

SALES DEPARTMENT

IVAN PANFILOV
Commercial Director
Deputy CEO

DMITRY ABBAKUMOV
Deputy Sales Director

OLEG BAKULIN
Director of Partner Relations
Tel.: +7 (495) 727 3311, ext. 152
Cel.: +7 925 879 2232
Fax: +7 (495) 727 2209
o.bakulin@mosizolyator.ru

ALEXANDER SAVINOV
Director of Strategic Sales
Tel.: +7 (495) 727 3311, ext. 150
Cel.: +7 926 182 1942
Fax: +7 (495) 727 2209
a.savinov@mosizolyator.ru

VICTORIA LOSHCHININA
Manager of International Business Development dept.
Tel.: +7 (495) 727 3311, ext. 128
Cel.: +7 929 505 3405
Fax: +7 (495) 727 2766
v.loshchinina@mosizolyator.ru

DMITRIY OREKHOV
Manager of International Business Development dept.
Tel.: +7 (495) 727 3311, ext. 305
Cel.: +7 929 961 2445
Fax: +7 (495) 727 2766
d.orekhov@mosizolyator.ru

ALEXANDER ZNAMENSKIY
Manager of International Business Development dept.
Tel.: +7 (495) 727 3311, ext. 173
Cel.: +7 967 296 1510
Fax: +7 (495) 727 2766
a.znamenskiy@mosizolyator.ru

IRINA DAUROVA
Manager of Partner Relations
Tel.: +7 (495) 727 3311, ext. 301
Fax: +7 (495) 727 2766
i.daurova@mosizolyator.ru

BELLA KHASAEVA
Manager of Strategic Sales
Tel.: +7 (495) 727 3311, ext. 144
Fax: +7 (495) 727 2766
hasaeva.bv@mosizolyator.ru

IZOLYATOR COMPANY

MAXIM ZAGREBIN

Head of OEM Sales

Tel.: +7 (495) 727 3311, ext. 300
Cel.: +7 926 273 9297
Fax: +7 (495) 727 2209
m.zagrebin@mosizolyator.ru

MAXIM OSIPOV

Head of CIS Sales

Tel.: +7 (495) 727 3311, ext. 151
Cel.: +7 926 182 2045
Fax: +7 (495) 727 2209
m.osipov@mosizolyator.ru

ANDREY SHORNIKOV

Head of International Business Development dept.

Tel.: +7 (495) 727 3311, ext. 129
Cel.: +7 926 342 3529
Fax: +7 (495) 727 2766
a.shornikov@mosizolyator.ru

YAROSLAV SEDOV

Head of EU sales

Tel.: +7 (495) 727 3311, ext. 171
Cel.: +7 925 889 5796
Fax: +7 495 727 2766
y.sedov@mosizolyator.ru

DMITRY KARASEV

Senior Manager of CIS Sales

Tel.: +7 (495) 727 3311, ext. 156
Cel.: +7 929 627 6816
Fax: +7 (495) 727 2766
d.karasev@mosizolyator.ru

ANASTASIA KUZNETSOVA

Manager of CIS Sales

Tel.: +7 (495) 727 3311, ext. 163
Fax: +7 (495) 727 2766
a.kuznetsova@mosizolyator.ru

NIKOLAY BORICHEV

Marketing and PR Director

Tel.: +7 (495) 727 3311, ext. 149
Cel.: +7 916 782 3505
Fax: +7 (495) 727 2766
n.borichev@mosizolyator.ru

EKATERINA ZENINA

Manager of OEM Sales

Tel.: +7 (495) 727 3311, ext. 214
Fax: +7 (495) 727 2766
e.zorina@mosizolyator.ru

ANNA ZUBAKOVA

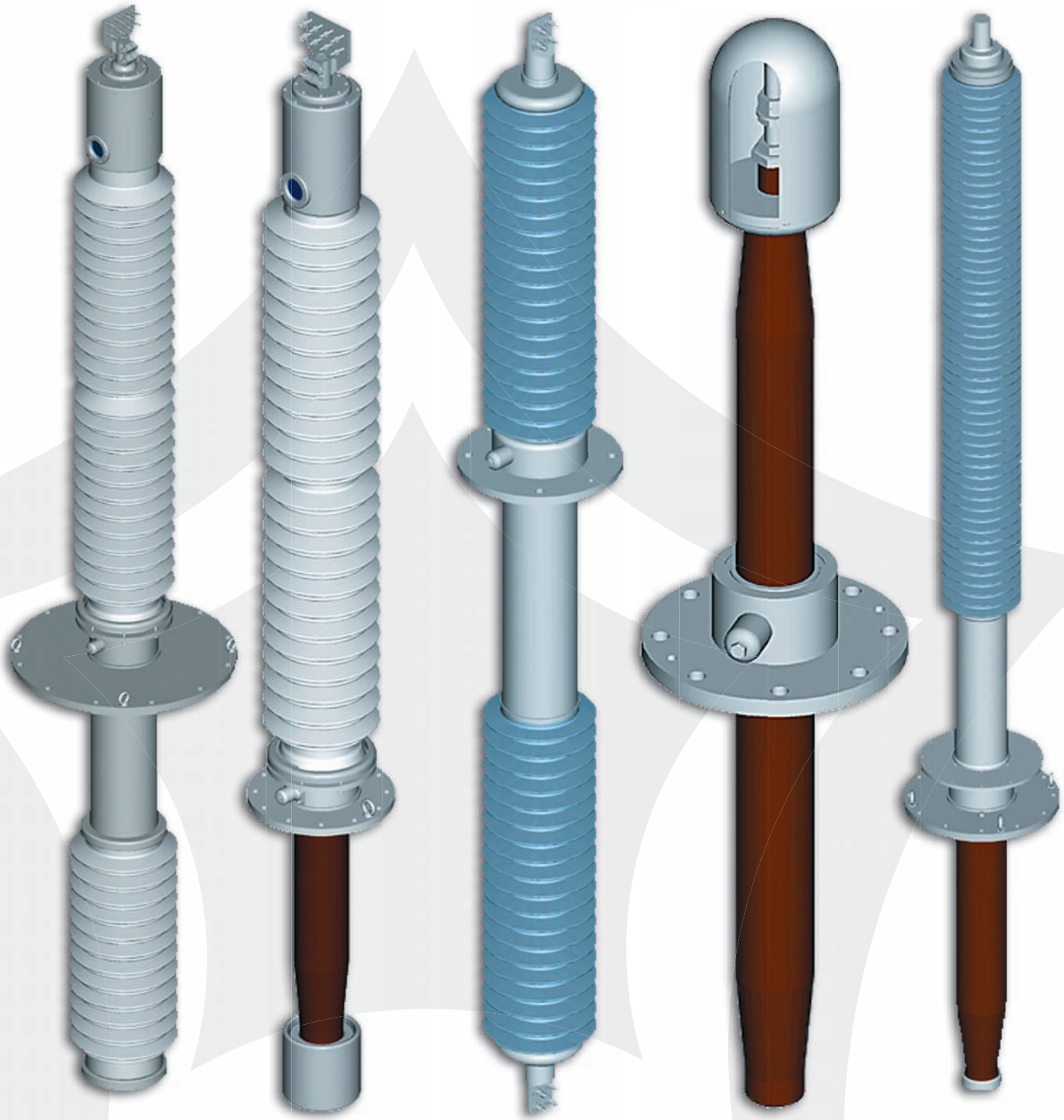
Manager of CIS Sales

Tel.: +7 (495) 727 3311, ext. 162
Fax: +7 (495) 727 2766
a.zubakova@mosizolyator.ru

120 years

IZOLYATOR

HIGH-VOLTAGE BUSHINGS WITH SOLID RIP INSULATION



Air - Oil Bushing
for oil circuit breakers
Voltage: 35 - 220 kV
Current: 1000 - 3150 A

Air - Oil Bushing
for power transformers and shunt reactors
Voltage: 10 - 1150 kV
Current: 315 - 2500 A

Air - Air Wall bushing
Voltage: 66 - 220 kV
Current: 2000 - 4000 A

Oil - Oil Bushing
for cable connection of transformers
Voltage: 110 - 500 kV
Current: 630 - 1000 A

DC Bushings
Voltage: ±126 - 800 kV
Current: 1800 - 5400 A

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Lenina Street 77, Pavlovskaya Sloboda village, Istra district, Moscow region, Russia, 143581
Tel.: +7 (495) 727 3311 Fax: +7 (495) 727 2766
E-mail: mosizolyator@mosizolyator.ru, www. mosizolyator.com