

# IZOLYATOR

Company est. 1896



## Russia — India:

wide step  
integration and  
cooperation

A Russian-Indian  
joint venture Massa  
Izolyator Mehru Pvt. Ltd.  
for making of high voltage  
bushings in India has been  
registered.

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## ★ A start into the big future

RIN bushings hit  
the mass production.  
They have been certified  
by Rosseti Group.

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## ★ Diversity of business

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# **IZOLYATOR**

**Corporate Edition**

**Izolyator**

Quarterly

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# Strategy of Development in Action

DR. ALEXANDER SLAVINSKY,  
Chief Executive Officer of Zavod Izolyator LLC,  
Head of CIGRE National Study Committee D1

Throughout the history of the Izolyator plant, one of the key goals has been and remains continuous development. Experience shows that even the most breakthrough technologies of their time become obsolete, which means that our most important task is to constantly strive to offer partners solutions are even better, more reliable, more perfect.

In 2019, we implemented a number of projects that open up prospects for us and for our partners. I would especially like to note that a new milestone in the development of the company was the creation of a new business line of production of Izolyator-AKS cable couplings and the registration of a joint Russian-Indian enterprise for the production of high-voltage bushings Massa Izolyator Mehru Pvt. Ltd., which is a big step, and I'm sure that it not only emphasizes our achievements, but also paves the way for new accomplishments.

## Breakthrough collaboration

We set ourselves the goal of producing products that are competitive not only in Russian market, but also around the globe - and we are confidently moving in this direction. Of course, the memorandum of cooperation with the Indian company Mehru and the ensuing joint venture establishment for the production of high-voltage bushings with modern RIP insulation in India

became our next important step towards the implementation of these ambitious plans. Thanks to the development of a joint venture of the Izolyator plant and the Mehru company the most advanced technologies will be receive access not only to the Indian market, but also to the space of the entire Southeast Asia.

**«In the near future, new types of solid insulation will receive a wider market penetration, such as high-voltage RIN (RIS) bushings»**

Among our partners, both potential and

those with whom we have ongoing projects, there are representatives of Saudi Arabia, China, Syria, Turkey, Iran and many other countries.

Moreover, a special role in the development of dialogue with international energy corporations is associated with an active engagement of Russian power engineers. Due to the well-organized work with such large companies as Rosseti PJSC, including FGC UES PJSC, we managed to accumulate a unique experience of mass use of high-voltage bushings with solid RIP insulation. We have an extensive track record of successful operation, which we are ready to share with partners around the world.

## Things to be proud of

Entering a new market has always been a challenge - firstly, for oneself. That is why we are proud to tell about a bilateral cooperation development between Russia and Saudi Arabia, which we became a part of. In April 2019, the Saudi state energy company Saudi Electricity Company (SEC) entered Izolyator plant in an official supplier list of high-voltage bushings for the country's transformer plants. It is expected that Izolyator would deliver bushings of all critical voltages for the power facilities of Saudi Arabia up to 380 kV inclusive.

It is an excellent opportunity for us to also grow professionally: we enter competition with successful and well-established players. However, Izolyator plant possesses a unique century-old experience and manufacturing culture, strong processes and makes a truly advance product, so there is something in our offering to be proud of.

## Unique technologies

In the near future, new types of solid insulation, such as RIN (RIS) bushings will receive a wider market presence. Today, bushings of the type have passed the entire testing process, received certificates and are under operational testing on Russian and foreign power facilities.



This is a unique technology, a truly innovative product that has the features, aimed at the maximum efficiency of the equipment. Excluding paper from solid insulation of the bushing, it is possible to significantly increase resistance to moisture and thereby

significantly reduce the requirements for the storage conditions of bushings. Thanks to the highest hydrophobic properties, the dielectric loss coefficient becomes absolutely stable and not depending on exposure to very high humidity. This ensures ease of transportation, lack of special requirements during storage, as well as reliability during operation.

Considering that we deliver both to regions with extremely low and extremely high temperatures, we created a technology with an emphasis on high thermal conductivity and low coefficient of thermal expansion, which leads to a decrease in stress between mechanically connected elements of a bushing. It is important for operation at extreme temperatures - both high and low. In turn, similar properties of RIN insulation open up opportunities to create equipment using superconductivity effect.

I would also like to specially note the reliability of performance at extremely low temperatures. In this case, the lower part of the bushing may constantly work in liquid nitrogen at a temperature around  $-196^{\circ}\text{C}$ , and the upper part - at an ambient temperature. The RIN insulation made of synthetic non-woven material provides for a possibility to make bushings that can withstand all given electrical and mechanical loads in such extreme operating conditions.

Presently, Izolyator is the world's sole high-voltage bushings manufacturer to successfully accomplish acceptance tests of 110 and 220 kV bushings with the positioning of bushings' bottom part in the liquid nitrogen medium at a temperature of  $-196^{\circ}\text{C}$ .

Izolyator Plant has won trust with partners in many countries, constantly reaffirming a stand of leader in the field of high-voltage bushings production. We prove by our daily work that we wish and we can create technologies, changing life to the better.

The fact that our partners from all over the world are sharing and adhering to our idea of sustainable development is truly inspiring.

I am convinced that there are a lot of fascinating discoveries and large-scale projects waiting for us in the new year.





«Russian power industry is a sector that influences absolutely all processes of economic growth and social development, while the integrated power grid is an important component, which is closest to consumers».

Alexander Novak  
Minister of Energy of Russian Federation



## Russian Energy Week 2019



President of the Russian Federation Vladimir Putin is opening the plenary session of the International Forum «Russian Energy Week 2019» in Moscow

Izolyator participated in the International Forum Russian Energy Week, which took place in Moscow on 2 - 5 October. The key theme of the International Forum «Russian Energy Week» was «Energy Partnership for Sustainable Development». The plenary session was opened by the President of the Russian Federation Vladimir Putin.

Among the participants in the current forum are executives of the largest Russian and foreign energy companies, world leading experts. As part of the official program REW held more than 70 business events. Sessions were dedicated in particular to digital industry transformation, coal mining development, nuclear power, new trends in pricing in international markets of oil.

Chief Executive Officer of Zavod Izolyator LLC Alexander Slavinsky took part in the work of the panel session «The trajectory of energy systems' development: a global perspective», organized with the support of FGC UES PJSC (Rosseti FGC UES) and CIGRE. ■



## Joint Colloquium of CIGRE Study Committees in India

The CIGRE National Study Committee D1 (CIGRE NSC D1) participated in a joint colloquium «On Recent Trends and Innovation in SC A2, B2 and D1 CIGRE» in New Delhi in India.

The Indian National Committee of CIGRE invited research committees A2 «Power Transformers and Reactors», B2 «Air lines» and D1 «Materials and the Emerging Test Techniques» to annual meetings. In this regard, research committees A2, B2 and D1 organized a joint colloquium, training programs and exhibition.

CIGRE NSC D1 at the colloquium was represented by the Head of the committee, CIGRE Study Committee D1 Regular Member, CEO at Zavod Izolyator LLC, Dr. Alexander Slavinsky.

Also, Olga Parnyuk, Assistant of International Business Development Department at Izolyator and Dr. Ashok Singh, Deputy Chairman of Board of Directors of Russian-Indian joint venture Massa Izolyator Mehru Pvt. Ltd. participated in the col-



Joint colloquium «On Recent Trends and Innovation in SC A2, B2 and D1 CIGRE» in New Delhi in India

loquium. A total of about 70 reports from 29 countries of the world was listened at the event.

Joint colloquium is a great opportunity for the exchange of knowledge and experience with a lot of industry

experts from around the world, opportunity to take part in training programs, get acquainted with the latest results of research, identify areas of cooperation, and also visit the exhibition of equipment and technology. ■



Industry  
investment  
totals

2,6 trn  
rubles

Commissioned

165 thousand MVA  
transformer  
capacity and

250 thousand  
km of ETLs



## *The First All-Russian Congress «Leaders of Power Industry»*



Chelyabinsk hosted the All-Russian Congress of managers and specialists of electric power grid "Leaders of Power Industry", organized by Rossiiskie Seti group jointly with non-commercial organization "Russia - a country of opportunities". It is for the first time in Russia that an event of such scale and reach took place gathering over 2000 power engineers from all over the country.

◀ Inspection of expositions of the Rosseti Group's partner enterprises, L-R: Governor of the Chelyabinsk Region Alexey Texler, Minister of Energy of the Russian Federation Alexander Novak, Director General of PJSC Rosseti Pavel Livinsky

▼ Getting acquainted with the innovative products of Izolyator plant, L-R: Alexander Slavinsky, Director General of PJSC Rosseti Pavel Livinsky and Deputy Director General, Chief Engineer of PJSC Rosseti Andrey Mayorov



▼ Director of Strategic Sales Alexander Savinov (L) and Lead Commissioning Engineer at SVN-Service Alexey Pilyugin (C) are demonstrating new products of Izolyator plant to our partners



▼ A warm meeting of long-standing cooperation partners, R - Head of Department - Deputy Chief Engineer of PJSC Rosseti Vasily Rozhkov







«The main goal of digital transformation is to increase efficiency and investment attractiveness of the power grid by changing the logic of business processes»

Pavel Livinsky,  
Chairman of the Management Board, Director General of PJSC Rosseti



## Power Grids International Forum 2019

Power Grids International Forum (PGIF) in Moscow is a key event in the electric power industry to demonstrate the latest equipment and technologies, exchange ideas and innovations for their further implementation in the electric grid complex of Russia and the formation of a uniform technical policy.

► Minister of Energy of the Russian Federation Alexander Novak and Director General of PJSC Rosseti Pavel Livinsky visiting exhibition exposition before the official opening of the Power Grids International Forum 2019



▼ Technical session «Innovative equipment of electric networks» during the Power Grids International Forum 2019



▼ Alexander Slavinsky is making a report at the technical session «Innovative equipment of electric networks»



► Plans are to further develop cooperation.  
R – Deputy General Director for technical issues,  
Chief Engineer at the Interregional Distribution Grid  
Company of South Pavel Goncharov



PGIF 2019: 17 888 participants 405 exponents from 31 countries of the world



At the exhibition stand of Togliatti Transformer (TT), L-R: Deputy Chief Engineer on Innovations and standardization at TT Andrey Anufriev, Sales Director at TT Artem Bogodyazh, Head of OEM Sales at Izolyator Maxim Zagrebina and Technical Director of TT Andrey Kanivets

Meeting with management representatives of Kazakh Group of companies Alageum Electric, L-R: Director of Procurement and Logistics Department at Alageum Electric Mahsathan Burylbaev, Development Director at Alageum Electric Sultan Ilyasov, Alexander Slavinsky and Head Sales CIS and Baltics of the Izolyator plant Maxim Osipov



There is always something to discuss with representatives of supplier companies, L-R: Marketing Specialist of the polish manufacturer of electrical porcelain ZPE ZAPEL S.A. Leonid Lisovsky, Alexander Slavinsky and Deputy Commercial Director at Izolyator Dmitry Abbakumov



The sides are satisfied with results of cooperation, L - Kubanenergo's CEO Sergey Sergeev







# Key Events, Facts 2019

The CIGRE National Study Committee D1 (NSC D1) «Materials and Emerging Test Techniques», which uses Izolyator plant as its base enterprise, has worked for four years under the lead of Dr. Alexander Slavinsky, CEO at Zavod Izolyator LLC, CIGRE Study Committee D1 Regular Member.



Alexander Slavinsky is making a report at the reporting conference on the results of participation in the 47th CIGRE session in Paris

The committee representatives annually participate in Russian and international exhibitions and conferences. The committee takes an active part in CIGRE sessions. Thus, during the 47th CIGRE session, SC D1 presented three reports from Russia. Presently, the committee is getting prepared for the 48th CIGRE session, planning to introduce already 5 reports in SC D1 research areas.

In 2019, representatives of the NSC D1 took part in the 5th International CIGRE Colloquium "Scientific Approaches to Transformer Research and Asset Management", organized by the National Committee CIGRE of Croatia, together with the Study Committee A2 CIGRE "Power transformers and reactors", held in Opatija (Croatia). 54 reports were presented for discussion from 16 countries: Croatia, Russia, France, Portugal, Sweden, Poland, Switzerland, Germany, USA, Canada, Slovenia, Australia, Austria, Bulgaria, Netherlands, UK. Two poster reports from Russia were presented at the colloquium.

Head of NSC D1 Alexander Slavinsky took part in the work of the Joint International Colloquium «On Recent trends and innovations in A2, B2 and D1» in India, New Delhi. Within the framework of the colloquium, a meeting of the Study Committee D1 took place. At the colloquium NSC D1 presented the report "Definition of degree of polymerization of paper insulation of transformers by direct measuring of its spectral characteristics" by A.Kh. Sabitov, V.K. Kozlov, Kazan State Energy University, Russia.

In October in St. Petersburg, a joint meeting of the Steering Committee and Technical Council of the International Council on Large Electric Systems - CIGRE took place. Alexander Slavinsky, Head of NSC D1 participated in the meeting.

Strategic issues of organization management and global industry development trends were discussed at the meeting. One of the key topics is preparation to the 48th CIGRE Session to

be held in Paris in 2020.

In December, the leadership of the National Study Committee D1 attended a meeting of the Technical Committee of RNC CIGRE in Moscow. The meeting was chaired by CEO of Inter RAO - Engineering by Yury Sharov. The leadership of NSC D1 submitted for approval by the Technical committee a proposal to establish Problem Work Group D1.1 «Definition of markers of degradation of mineral transformer oils using IR spectroscopy».

The problematic work group was initiated by Dr. Sc. Marcel Garifullin, Professor of Electrical Networks and Systems department at Kazan State Energy University, Deputy Chair of the department on scientific work. NSC D1 not only takes active participation in events but also advocates as an organizer and partner to research conferences, seminars and exhibitions, held in Russia. The organization of the 25th Jubilee Scientific and Practical Conference «Production, Operation, Diagnostics and Repair of high-voltage bushings and measuring transformers. Requirements to transformer oil for high-voltage electrical equipment» should be specially mentioned.

The conference was held by the Public council of specialists in diagnostics of power electrical equipment at ITC UralEnergEngineering jointly with Izolyator plant and Public council of specialists in diagnostics of electrical installations of Siberia and the Far East with the support of the NSC D1. 112 participants attended the conference (6 Doctors of Sciences and 11 candidates of technical sciences), including representatives from Sweden, the Republic of Uzbekistan, People's Republic of China.

In accordance with its goals, tasks and activity areas in 2019, NSC D1 expanded international activities by contributing to operation of international work groups. In April 2019, a sitting of CIGRE WG D1.70 on the topic "Functionality of modern insulating liquids for transformers and similar equipment" was held in Ljubljana, Slovenia. The RNC CIGRE was represented by Maxim Bobryshev, Project Manager – Engineer at Department of material supplies at ElecTrade-M Ltd. NSC D1 base





Olga Parryuk, Chairman of the study committee D1 CIGRE Ralph Pitch (C) and Alexander Slavinsky at the joint colloquium of SC A2, B2 and D1 CIGRE in New Delhi

organization Massa LLC (Izolyator) sponsored the visit. 34 specialists from 15 countries, working in production and operation of power equipment and dielectric liquids, lab research and R&D took part in the sitting of the workgroup. As initiative to attract youth to participate in the work of NSC D1 with the aim of forming a talent pool of RNC CIGRE among students, young specialists, graduate students of leading technical universities the committee takes active participation in events held through the CIGRE Youth Section. The "Electrical Engineering 2019" International (All-Russian) Student Olympics in Theoretical and General Electrical Engineering named after M.O. Dolivo-Dobrovolsky was held in the Ivanovo state University of Energy (ISEU). It was organized by ISEU and OJSC SO UES with the support of the fund Reliable Change, Izolyator Plant and NSC D1.

The 10th Anniversary International Scientific and Technical Conference 'Energy Industry through the eyes of youth 2019' was hosted by the Irkutsk National Research Technical University. The conference both in sectional and poster presentations was attended by 300 young specialists from 20 energy companies of Russia; students, graduate students and young scientists of 25 Russian and foreign universities. Representatives of the NSC D1 took part in the conference as experts of section

No. 2 'Operating modes and equipment of electric networks and systems'. The Head of NSC D1 Alexander Slavinsky pays a lot of attention to working with young specialists not only participating in the event of the Youth section of RNC CIGRE, but also initiating events for students and school students at Izolyator plant and leading sectoral universities. In 2019, at the production base of Izolyator plant, our company held

excursion classes for students of the TEHV department of FSBEI HE «NRU MPEI. From the TEHV department more than 40 students and faculty members of the department participated in the event. In November, Alexander Slavinsky spent a meeting with students of the National Research University of Electronic Technology (MIET). As part of MIET project «Open Lecture-room», the host gave a lecture-conversation "From the formula in the lecture book to the formula for success."

An opening ceremony of Izolyator plant's classroom (the plant is a leading science and technology partner to RNC CIGRE) at the Moscow Power Engineering Institute was held. The spacious, bright corporate-style room equipped with modern interactive and multimedia easily transforms for different learning tasks.

This article focuses on major events in which National Study Committee D1 participated or came out as organizer. The year report will provide more details about the activities of NSC D1. NSC D1 successfully achieves the main goals, expanding international relations on scientific and technical exchange and current issues of development of the world electric power industry.

With joint efforts, the NSC D1 work is entering a new level, so the results will be focusing primarily on the activities of Russian specialists under the topics of the Study committee D1.



Alexander Slavinsky is opening the Izolyator plant's classroom at the Moscow Power Engineering Institute



# 12 | CIGRE Events in Photo Lens

▼ Participants of joint meeting of the Steering committee and Technical council CIGRE in Saint-Petersburg



▲ Deputy Quality Director, Coordinator at CIGRE National Study Committee D1 Vladimir Ustinov (C) at the 5th International Colloquium CIGRE «Scientific approaches in transformer research and knowledge management» in Opatija, Croatia

► Sitting of the Technical committee of Russian National Committee of CIGRE at Inter RAO Group in Moscow



◀ Business meeting at the joint colloquium of study committees A2, B2 and D1 CIGRE in New Delhi, India, L-R: Director Asset Management at the state Indian corporation Power Grid Corporation of India Limited R.P.Tiagi, Alexander Slavinsky and Deputy Chairman of the Board of Directors at the Russian-Indian joint venture Massa Izolyator Mehru Pvt. Ltd Dr. Ashok Singh





◀ The work of the panel of the 25th Jubilee Conference on diagnostics of power equipment in Moscow region

▶ Participants of the first meeting of the Women in power industry discussion club in Moscow (photo: Rosseti Group)



◀ Meeting of the CIGRE National Study Committee D1 at Izolyator plant in videoconference mode



# Russian — India: wide step integration and cooperation



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IVAN PANFILOV,  
Commercial Director -  
First Deputy CEO at Izolyator

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## **Growth in all directions**

For us, being an open company means not just sharing our experience with pleasure but also to strive as much as possible to expand our presence, thereby creating the foundation for stable and sustainable power supply in the world.

The Izolyator brand today is well known not only in Russia but and in many countries abroad. We have always emphasized that our goal is leadership in production of high-voltage bushings in the global scale. So we apply our best effort in order to win trust with partners around the world and prove it year after year.

From the side one can't often see the large-scale work done in the company, the number of employees involved in a series of processes and tasks.

Expanding and improving our reach and communication, we always strive to improve business performance. And the most important step along this path was the establishment of Massa Izolyator Mehru Pvt. Ltd. (MIM) joint venture with an Indian partner Mehru to manufacture RIP bushings on the territory of India.

Creation of a manufacturing facility on the territory of India using the Izolyator technologies would allow to meet the growing demands of the entire Asian market in this highly technological product, considerably decreasing delivery terms of products to Indian power facilities.

## **A combination of experience and innovation**

Creation of the joint venture MIM is indeed a specific project not only for the Indian electric energy market and Izolyator but also for the international professional community. We are



proposing to share a unique experience combined with the most advanced technologies of our production, such as HV RIP and RIN bushings. Our expertise has formed over many years of successful partner relations with power grid and generating companies as well as transformer plants all over the world.

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**«In October this year, the Ministry of Corporate Affairs of India issued a certificate of registration in compliance with the Indian laws of the Russian-Indian joint venture Massa Izolyator Mehru Pvt. Ltd»**

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The first meeting of the Board of Directors of the Russian-Indian joint venture Massa Izolyator Mehru Pvt. Ltd.



**Vikram Singh Bhal, Sr.General Manager (Engg.) at Power Grid Corporation of India Limited**

**«Izolyator company has passed the test of time and organized a joint venture to product bushings with the Indian company Mehru. This is a strong achievement of Izolyator on the Indian market».**

We thoroughly work on regulatory issues and technological base of the joint venture operation, discuss site placement details and practical steps for organizing production with Mehru management.

In 2019, our company and the Indian transformer plant Mehru Electrical & Mechanical Engineers (P) Ltd. presented Massa Izolyator Mehru Pvt. Ltd. (MIM) JV to the wider public for the first time at the 6th International exhibition and conference GridTech 2019, held in New Dehli, India. The guests of



**Dr. Ashok Singh, Deputy Chairman  
of the Board of Director at JV MIM**

**«We held a full-cycle testing including seismic tests of Izolyator 420 kV/3000A and 800 kV/2000A RIP bushings at CPRI laboratory. It was a historic moment to witness the first in India's history tests of 420 and 800 kV bushings for seismic withstand!»**

the exhibition had an opportunity to learn about the goals, tasks and plans of the new company on the Indian electrical engineering market. By all means, it is critical to run a regular analysis of where the modern international market of electric power is going to, proactively creating technologies, able to meet every emerging demand.

### **Under personal responsibility**

Energy sector has always been and remains one of the most responsible areas of activity. We treat with great attention all products manufactured at enterprises of the Izolyator group to meet world standards of quality and safety. The new types of bushings go through thorough type testing with invitation of world's leading experts. 2019 was no exception: we aim at creating a product of top quality, testing and improving it if required till the moment when every my colleague is prepared to personally vouch for its reliability. Indeed, this is a characteristic feature of the big Izolyator team, where committed people work, real professionals, truly caring about the results of their labor. It is the feeling of every employee's involvement in the accomplishment of our global mission that allows the company to continuously go forward, achieving new goals.

### **Open to dialogue**

We always draw attention of our partners to the fact that we are always open to dialogue and heartily receive guests, showing our plant and aiming at maintaining personal contacts. Our meetings with partners is a specific format that helps to raise opportunities to hear pressing questions that may not be pronounced offline for any reasons.

Over the past several years, we had a number of business meetings both between Russian and Indian power specialists and industrial manufacturers of high-voltage equipment in India and Russia. On the territory of India, our company organized a series of technical conferences in electric power sector between Russia and India. As a word of proof of our openness, we can mention this May's international conference and a complex of type tests of high-voltage bushings with solid RIP insulation of ultrahigh voltage classes, which were held at the premises of the Central Power Research Institute (CPRI) in Bangalore and Hyderabad in India. The open technical conference provided an excellent opportunity to discuss all aspects and technical features of operation, installation and technical maintenance of high-voltage bushings

with RIP-insulation of ultrahigh voltage classes designed and manufactured at the Izolyator plant.

As pertains to our openness and readiness to dialogue at such events, we invited consumers of high-voltage equipment - electric power grid and industrial companies from Russia, Asia, Europe and Middle East. During the visit to the Central Power Research Institute, there was a meeting of Izolyator, PowerGrid and Mehru Electrical & Mechanical Engineers (P) Ltd. with the institute's administration, headed by Director General V.S. Nandakumar.

### **New technologies — new opportunities**

Presently, we maintain an active cooperation with both Russian power specialists and foreign colleagues. I would much like to note that thanks to our well-coordinated cooperation with such large companies as Rosseti including FGC UES PJSC we have been able to accumulate a unique mass use application expertise of high-voltage bushings with solid RIP insulation. The new designs of Izolyator bushings with solid RIN insulation have already appeared on power facilities of Russia and other countries. In the end of the second quarter 2019, we certified the product at Rosseti PJSC and are prepared to offer it to all our consumers. We appreciate all our partners in Russia and the world, whom we so actively worked with in the passing year - representatives of power grid and generating companies, transformer plants. I am convinced that all our projects work not only for our fruitful cooperation but also for the better of global relations internationally.

✧ **These clients have demonstrated readiness to equip their facilities with RIN bushings: power companies of the Crimea, RusHydro Group, Gazprom power unit, T Plus Group, IDGC South, IDGC Center, power grid company Kubanenergo, a number of generating and industrial companies.**

✧ **We held more than 40 workshops on construction design and operation of RIN bushings for technical specialists of partner companies this year.**



# 17 | Fruitful Work With Indian Partners

► Operations Director of the Indian state company Power Grid Corporation of India Limited Sima Gupta is heartily welcoming the guest at the corporation's headquarter in New Dehli



► Participants of the meeting at Power Grid Corporation of India Limited headquarter, 3rd on L - Executive Director at HVDC A.K.Arora

▼ Meeting of Russian and Indian management representatives of the joint venture Massa Izolyator Mehru Pvt. Ltd. in India, L-R: Marketing, Sales and Procurement Director Mandeep Prakash Sharma, Olga Parnyuk, Alexander Slavinsky, Managing Director Sandeep Prakash Sharma and Deputy Chairman of the Board of Directors Ashok Singh

▼ Talks of the management of the joint venture Massa Izolyator Mehru Pvt. Ltd. and Sberbank's branch in India were successful, 2nd on the L is Ivan Nosov, Branch Manager, Sberbank in India





## Andrey Shornikov, Head of International Business Development Department at Izolyator

The Izolyator company is actively developing and in many ways it happens due to the fact that we are not afraid to take over responsibility in large-scale tasks. We set ambitious goals, including active promotion in the countries of near and far abroad. So, in 2019, together with the Indian transformer manufacturer Mehru Electrical & Mechanical Engineers (P) Ltd. we widely presented for the first time Massa Izolyator Mehru Pvt. Ltd. (MIM) JV at the 6th International GridTech 2019 Exhibition and Conference, which took place in New Delhi in India, as well as at the International conference in Bangalore as part of a series of type tests of Izolyator bushings for high and ultrahigh voltage in CPRI. The first meeting of the board of directors of the joint venture took place in the fourth quarter in India with primarily organizational and legal issues on the agenda.

We are actively promoting our projects in Europe and Asia. The Turkish market is very interesting. In addition, Izolyator has many years of experience in the electrical market of the Middle East, for example, in Iran. At the same time, in new markets for us, such as Saudi Arabia, we strive to establish ourselves as reliable and punctual partners.

A lot of work was carried out in Asian countries. The status of Hyosung Corporation's (South Korea) vendor was our special achievement in the IV quarter of 2019. It was preceded by a successful audit from the transformer plant of Hyosung.

We hope that our successful cooperation with Hyosung Corporation will serve as a basis for concluded delivery contracts already in 2020.



*We set ambitious goals for ourselves, including active promotion in the countries of near and far abroad.*



# Tests in India Successfully Completed

We have completed the full cycle of type tests of 420 kV/3000A and 800 kV/ 2000A HV RIP bushings.

The testing was organized at the Central Power Research Institute (CPRI) - the world-recognized leader in specialized testing of electrical equipment and products. The tests program included a full cycle of high-voltage current and special seismic tests.



Participants of impulse tests of an Izolyator 420 kV bushing at the Central Power Research Institute, India





Participants of seismic tests of 420 kV Izolyator bushing in India



Setting of a 420 kV Izolyator bushings on a rack from seismic tests in India



Measuring of a 420 kV Izolyator bushing's parameters before impulse tests



Installation of an 800 kV Izolyator bushing for seismic tests at the Central Power Research Institute of India



Type tests of 420 and 800 kV RIP bushings in India are completed



# 20 | Ambitions goals in the international arena



Participants of the meeting with management representatives of Saudi companies Electrical Industries Company, Saudi Power Transformers Company Ltd. and Saudi Arabian General Investment Authority at Izolyator plant

## Exceeding Expectations

Management representatives from Saudi Arabian companies visited the Izolyator plant in early October. The purpose of the visit was to discuss long-term cooperation on supplies of high-voltage insulating equipment to Saudi Arabia.

The management representatives of Saudi companies: Managing Director of Electrical Industries Company Tariq Mohammad

Al Tahini, CEO of Saudi Power transformers Company Hosam A. Al-Sheikh, Saudi Arabian General Investment Authority Director of International Office - Russia Abdulrahman D. Al Mutlak. Specialists in the development of business cooperation with Saudi Arabia Arthur Baykov, Andrey Tarasov and Ruslan Naimanov took part in all the events of the visit.

Before sitting at the negotiating table, the guests got acquainted with the history of the establishment and development of the enterprise, which is presented in the Izolyator corporate museum. At the meeting, the sides exchanged experience of operations on the international markets and outlined markets for products promotion. ■

## Joining Effort in Modernization



Huang Quoc Wuong, Deputy Minister of Industry and Trade of the Socialist Republic of Vietnam (foreground left) and Alexei Gruzdev, Deputy Minister of Industry and Trade of the Russian Federation, at a meeting of the Russian-Vietnamese Subcommission for Industrial Cooperation

Izolyator took part in the meeting of the Russian-Vietnamese Intergovernmental

Commission on Trade, Economic, Scientific and Technical Cooperation, which

was held in Hanoi on 28 and 29 October 2019. The meeting was chaired by the Deputy Prime Minister of the Russian Federation Maxim Akimov and the Deputy Prime Minister of the Government of the Socialist Republic of Vietnam Chin Dinh Zung. The meeting was attended by Deputy Minister of Industry and Trade of the Russian Federation Alexey Gruzdev. Izolyator was represented by the Commercial Director Ivan Panfilov.

Alexey Gruzdev during his speech announced the importance of industrial cooperation for the development of trade and investment relations between countries. ■





Participants of the business meeting at the transformer plant of Astor Transformör A.Ş. in Turkey, L-R: Alexander Znamenskiy, Purchasing Manager at Astor Transformör A.Ş. Arda Yilmaz, Tempek Foreign Trade Co. representatives Sezai Özkaya and Murat Özen

## Discussing Development of Joint Projects

The business meeting took place at Astor Transformör A.Ş. plant in Turkey in early October. Foreign Trade Specialist Alexander Znamenskiy represented Izolyator. He was received by Purchasing Manager Arda Yilmaz and Purchasing Engineer Nilufer Gencturk.

The meeting went with support and direct involvement of Tempek Foreign Trade Co., which was represented by Sezai Özkaya and Murat Özen. The business meeting was a logical result of the business relations development and practical coordination of the two companies.

The visitor made a presentation about the Izolyator plant and its product range, paying special attention to the advantages of the high-voltage bushings with internal RIP insulation and the successful operation of the company on the global market.

As the parties discussed possibilities of using Izolyator HV bushings on Astor Transformör A.Ş. transformers, the representatives of the Turkish plant expressed a strong interest in development of cooperation in that direction. ■

## Mutual Interest



Participants of the talks at the transformer plant Balikesir Elektromekanik Sanayi Tesisleri A.Ş. (BEST) in Turkey, L-R: Power Purchasing Manager at BEST Ali Riza Deniz, Trade Team Leader at BEST Ozlem Aksoy, Alexander Znamenskiy and Tempek Foreign Trade Co. representatives Sezai Özkaya and Murat Özen

Manager of International Business Development Department of Izolyator plant Alexander Znamenskiy had talks at the transformer plant Balikesir Elektromekanik Sanayi Tesisleri A.Ş. in Turkey on 3 October 2019. The guest was received by Trade Team Leader Ozlem Aksoy and Power Purchasing Manager Ali Riza Deniz.

The meeting went with support and direct involvement of Tempek Foreign Trade Co. representatives Sezai Özkaya and Murat Özen.

The parties mainly discussed the advantages of Izolyator HV RIP bushings and plans for 2020.

Representatives of Balikesir Elektromekanik Sanayi Tesisleri A.Ş. expressed interest in purchasing high-voltage RIP bushings from Izolyator as a reliable supplier of that type of electrical equipment.

Reaching all the objectives of the talks, the sides expressed a shared intention to continue cooperation development. ■

## Business Meetings in Poland

Alexander Znamenskiy, Manager of International Business Development Department at Izolyator had business meetings in Polish companies: engineering company Trafo-Technika Sp. z o.o. in Lodz, transformer plant EthosEnergy Poland S.A. in the city of Lubliniec, ZUT Energo Audit in Radom in Poland.



Participants of the business meeting at the plant EthosEnergy Poland S.A. in Lubliniec, Poland, L-R: Chief Engineer at EthosEnergy Poland S.A. Maciej Wilk, Alexander Znamenskiy, Head of Procurement dpt Maciej Drynda and Purchasing Manager Bartosz Szremski

The guest was received by the Chairman of the Board at Trafo-Technika Sp. z o.o. Andrzej Gadulya.

At the meeting, the sides discussed modern trend on the electrical engineering market of Poland from the viewpoint of optimal directions and development of a mutually beneficial cooperation.

The sides spoke about the need to intensify interaction in technical data exchange, including direct communication of specialists of the two companies.

This May, the plant EthosEnergy Poland S.A. conducted an audit of Izolyator, which resulted in a high appraisal of technical equipment of the enterprise. The Polish state power grid company Polskie Sieci Elektroenergetyczne S.A. approved the purchase of Izolyator RIP bushings for replacement of bushings of obsolete design.

This time the guest was received by Maciej Wilk, Chief Engineer, Mateus Drynda, Head of Procurement Dpt, Bartosz Szremski, Purchasing Manager.

The parties discussed the demands of EthosEnergy Poland S.A. in high-voltage bushings in the near and mid-term perspective.

In the end, the hosts gave an inquiry to develop a custom design of HV bushings meeting the requirements of EthosEnergy Poland S.A. ■



# 22 | Developing Cooperation With CIS Countries



Participants of Izolyator plant seminar for specialists of the Belarus State Production Association of electrical industry Belenergo

## Mutual Benefit and Development of Competences

Izolyator plant representatives held a seminar in Minsk for technical specialists of the Republican Unitary Enterprises of the Belarusian State Production Association of Electric Power Industry Belenergo on 22 November.

The head office of Belenergo was represented at the seminar by Sergey Podolets, Lead Engineer of the Electrical Equipment Operation Department.

The organizational support of the seminar was provided by the Sagrat Commercial Private Unitary Enterprise (Sagrat), which supplies energy equipment and electrical products to Belarus. Ali

Churaev, the founder of Sagrat and Dmitry Melnik, Director General of Sagrat also took an active part in the seminar.

All participants agreed that the seminar was held with great mutual benefit, significantly expanding the professional competencies of its participants.

Representatives of Belenergo and Izolyator expressed their intention to develop this and similar forms of cooperation.

We appreciate Belenergo for the excellent organization and hosting the seminar! ■

## Seminar for Representatives of Electric Energy Companies of Donetsk People's Republic



Participants of Izolyator plant's seminar in Donetsk for representatives of republican enterprises of Donetsk People's Republic: Energy of Donbass, State Main Power Grid Company and Regional Distribution Company

Izolyator gave a seminar for representatives of electric energy companies of Donetsk People's Republic: Energy of Donbass, State Main Power Grid Company and Regional Distribution Company.

Izolyator was represented by Head of CIS&Baltics Sales Maxim Osipov and Lead Technical Support Engineer Victor Kiryukhin. The seminar went in the atmosphere of strong professional in-

terest and open dialogue. The audience received exhaustive answers to given questions.

In the result of the seminar, the management of the companies spoke about its importance for selection of proper directions of modernization of energy system of the republic.

The talks revolved around cooperation development on systematic and long-term basis. ■

## Considering Demands of Power Specialists of Kazakhstan

In Almaty, Kazakhstan, a working meeting between Anna Zubakova, Manager of CIS & Baltics Sales at Izolyator and Murat Botabaev, Director of the ASA-snab trading company, took place.

Trading company ASA-snab delivers power equipment and electrical products to Kazakhstan. Izolyator plant and ASA-snab are tied with successful long-standing cooperation. At the meeting, the partners discussed results of the two companies' joint activities over the past year, and also marked common goals and streamlined interaction in the implementation of joint projects.



Seminar arranged by Izolyator for technical specialists of Kazakhstan Electricity Grid Operating Company. July 2019

The parties outlined a plan for further joint work, taking into account prevailing trends in the technical equipment of the energy system of Kazakhstan and the most effective forms of cooperation.

118 power plants of different forms of ownership generate electric energy in Kazakhstan.

The plants are subdivided into power stations of national importance, those of industrial purpose and those of regional importance.

Electrical networks of Kazakhstan are a complex of substations, distribution devices and ETLs of 0.4 - 1150 kV voltages, intended for transmission and/or distribution of electricity. ■



# Strategy for the Present and the Future

Executives of the industrial Uzbek company Uzelectroapparat - Electroschield General Director Vladimir Royuk and Head of Representative office in Russian Federation Leonid Faenhold paid to visit to Izolyator plant.

During the meeting, the visitors also saw the production and familiarized themselves with the key production and testing stages of modern HV bushings with solid internal RIP and RIN insulation.

After that, the guests met with the historical milestones and present-day accomplishments of Izolyator plant.

The visit ended with talks, where the parties discussed directions and strategy of a mutually beneficial cooperation between the two companies in the near and remote perspective. All the events of the visit went successfully. The sides agreed to develop cooperation based on common interests and goals. ■



Participants of the talks of the management of the Uzbek company Uzelectroapparat - Electroschield and Izolyator plant, L-R: Maxim Osipov, Victor Kiryukhin, General Director at Uzelectroapparat - Electroschield Vladimir Royuk, Alexander Slavinsky and Head of Representative office in Russian Federation Leonid Faenhold



Management representatives of Uzelectroapparat - Electroschield at the assembly shop of Izolyator plant



Learning about the history and accomplishments of Izolyator plant in the corporate museum



Getting familiar with the test center of Izolyator plant



Talks of management representatives of Uzelectroapparat - Electroschield and Izolyator plant





**Maxim Osipov,**  
Head of CIS & Baltics Sales



To solve emerging problems and at the same time quickly is an important condition for successful business development in the modern world.

In 2019, many significant events in the course of cooperation with partners from the CIS were held. Among them - participation in the solemn opening and meeting with management of the new transformer plant Asia Trafo in Shymkent in Kazakhstan, a seminar for representatives of the management of technical departments and the supply of 110 and 220 kV bushings for the needs of the Kazakhstan management company of electric networks (KEGOC), meeting with management of the industrial company from Uzbekistan

Uzelektroapparat - Electroshield, participation in a single presentation day at National Electric

Network of Kyrgyzstan in Bishkek, workshop for technical specialists of republican unitary enterprises of the Belarusian state production association of electric energy Belenergo, seminar for representatives of energy companies of Donetsk People's Republic.

One of the key topics, which was actively discussed at those events, were the advantages of application of RIN bushings.

I believe that in the future we will have a fruitful cooperation in all directions of our joint activities.



**Alexander Znamenskiy,**  
Manager of International Business Development Department



The signature feature of our company is a combination of a century-long experience with unique technologies. At the same time, we strive to maintain and develop relations with our current partners staying open to the dialogue with new potential customers.

Among meaningful accomplishments of 2019 on European market, I can mention: expansion of our presence in Eastern Europe, successful audit by the Polish state power grid company Polskie Sieci Elektroenergetyczne S.A, acquisition of new business partners in Poland and Slovakia. We effected the first delivery of 500 kV bushings to the European market. Besides, we continue to promote the RIP technology on the Turkish market.

We plan that in 2020, we will discover new markets in Europe, for example, in such countries as Croatia, Hungary, Portugal. Besides, we are interested in organizing a full scale promotion of Izolyator products in the power grid companies of Europe - and together with our colleagues in the market department we are making big plans about that destination.



**Dmitriy Orekhov,**  
Manager of International Business Development Department



Izolyator, with its active approach to the new markets, respects greatly its partners, whom it has worked with for a long period of time. We have had a fruitful cooperation with electrical engineering companies and power grid companies in India. Over a thousand Izolyator high-voltage bushings are reliably operating on power facilities of nearly all states of India. A number of big deliveries to the key power facilities of Indian Power Grid Corporation of India Limited and Transmission Corporation of Telangana Limited were sent.

In 2019, we reached a whole new level by successfully passing type seismic tests and electrical tests of 420 and 800 kV bushings in Indian cities Bangalore and Hyderabad.

We sent large shipments of bushings in the address of Toshiba Transmission & Distribution Systems (India) Pvt. Ltd. and Prime Meiden Ltd. The first contract for delivery of bushings with the Indian state transformer manufacturer Bharat Heavy Electric Limited became yet one more milestone.

I am convinced that there are many new interesting and promising projects waiting ahead.



# EXPORT in 2019

## DELIVERIES OF BUSHINGS



### NON-CIS

India, Turkey, Poland, Vietnam,  
China, Belgium, Czech  
Republic, Estonia, Latvia



### CIS

Tajikistan, Kyrgyzstan,  
Belarus, Kazakhstan,  
Ukraine, Moldova,  
Armenia

SHIPPED IN 2019

Over

350 Bushings



35-800kV

REST OF THE  
WORLD

200 Bushings



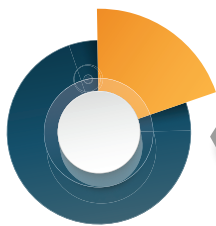
52-800kV

POWER FACILITIES  
OF INDIA

480 Bushings



CIS  
COUNTRIES



EXPORT  
SHARE IN SALES

20-30

DELIVERIES  
TO MORE THAN  
30 COUNTRIES  
OF THE  
WORLD  
%





# Superconductive Technologies Open Up New Prospects for Russian Power Industry

In December 2019, a high-temperature superconductive current-limiting device made by SuperOx was put in operation on SS Mnevniki of the United Energy Company in Moscow.

The mayor of Moscow took part in the event Sergey Sobyenin, together with UEC CEO Evgeny Prokhorov and Chairman of the Board of Directors of SuperOx Andrey Vavilov took part in the event.

"Here, in Mnevniki, a unique technology has been created, no analogues of which there exist anywhere - neither in Russia nor abroad.

This is a superconducting technology that improves the quality and reliability of power supply," -noted Sergei Sobyenin during the inspection of the substation.

Sergei Sobyenin congratulated workers on the upcoming Power Engineer's Day and handed memorable gifts to distinguished employees from the mayor's office.

"Thank you for the reliable professional work," he said. - In the homes of moskovites every day the light turns on, heat is supplied, and now, before the New Year, garlands and Christmas trees are lit. We are used to it and we think that is all happens as if by itself. This is actually not the case. In a huge city, complex engineering systems, huge teams are behind."

"SuperOx has developed, manufactured, delivered, installed current-limiting devices of the superconducting type. Inside reactors there are superconducting modules which ensure a nominal mode of this device, immersed in liquid nitrogen with a temperature of  $-200^{\circ}\text{C}$ . The temperature of liquid nitrogen is maintained by the cryosystem," said Chairman of the Board of Directors of SuperOx Andrey Vavilov.



Putting in operation of the high-temperature superconductive current-limiting device at the substation Mnevniki in Moscow  
L-R: Chairman of the Board of Directors at SuperOx Andrey Vavilov, Mayor of Moscow Sergey Sobyenin and CEO of United Energy Company Evgeny Prokhorov

The mayor also noted that Muscovites are accustomed to the fact that there is heat in their homes, lights are on, but this is more difficult huge engineering systems and team collectives of power engineers to ensure that.

"Everything works in automatic mode. In the network management center, the dispatcher has all the information about what is happening with this device and how it ensures protection against short circuit currents," said the Chairman of the Board of Directors of the company Andrey Vavilov.

The high-temperature superconductive current-limiting device (HTSC CLD) is an innovative development. A typical Moscow substation was selected for its implementation. The total transformer capacity of SS Mnevniki is 300 MVA. It was commissioned in 2012 and provides power supply to the West administrative district of the capital. Among consumers of the substation are Moscow-Kievskaya railway substation, four metro stations, Moscow city business community and residential area of 120 thousand square meters. There are three power transformers, 100 MVA

each, which serve to distribute capacity stepping down voltage from 220 to 20 kV. 8 more high-temperature superconductive current-limiting devices are expected for installation on substations Gorkovskaya, Meshchanskaya, Magistralnaya and Krasnoselskaya. Application of HTSC CLD would allow to realize the ring connection of electric power system of Moscow, ensuring uninterrupted supply of electricity and decreasing terms of connection to the grid. The project does not involve consequences in tariffs for end consumers and has a long-term economic effect for the Russian capital. Commissioning of new capacities, construction of power lines and substations will help to meet the growing demands of Moscow inhabitants and the capital's business. However, there is a reverse side of those processes - growth of short circuit levels, which could lead to damage of equipment and disconnection of consumers from the grid. Presently, short-circuit currents in the Moscow power system may reach 60 kA, with a perspective of hitting 100 kA.





Moscow Mayor Sergey Sobyenin:

**“A unique technology has been created, no analogues of which there exist anywhere - neither in Russia nor abroad. This is a superconductive device that improves the quality and reliability of power supply.”**

So, the traditional methods of limiting short-circuit currents in the electric grid are becoming inefficient. Their key disadvantages are temporary current limitation in short-circuit in the future development, reduced power flow when increasing the resistance of the current-limiting reactor to 12 Ohms, unregulated power flow in electrical networks and excess permissible values of transient recovery voltages at the contacts of the switch during communication. To quickly turn off equipment in case of short circuit, circuit breakers are used. But such equipment, which operates at currents of more than 60 kA, is not mass-produced either in our country or abroad. Therefore in complex power systems sectional and current-limiting devices are applied: they reduce current levels of short circuit. Partitioning is the division of the power system into parts and the creation of points of physical breakdown of the network. But this method has disadvantages: decreased reliability and controllability of the power system, power lines and substations are becoming less



Electric substation Mnevniki of the United Energy Company in Moscow

efficient. Current limiting devices (CLD) are connected to the network in series, and their resistance at operating current is extremely small.

But with a short circuit resistance grows exponentially - in proportion to the increase in current strength. As a result, CLD eliminate the short circuit and let the switches operate normally. Conventional current-limiting devices lead to the flow of power in the network 5 types of such equipment: HTSC CLD, electromechanical AC insert based on an asynchronous frequency converter,

DC insert for combining power systems, superconducting cable with current limiting effect and explosive current limiting device.

The use of such technologies will allow companies to abandon transit power lines decommissioning plans, replacement of circuit breakers with a capacity of 220 kV and further division of the network of such voltage. It can also improve reliability and manageability of such an electrical network and improve the efficiency of use of electric grid assets.

The main function of HTSC CLD is the almost instantaneous short-circuit current limitation and reduction at the same time, of loads on other elements of the system, which radically reduces the requirements to the stability of all equipment of the power system in emergency conditions.

In 2014, the Government of Moscow initiated implementation a project of current-limiting devices based on high-temperature superconductivity to ensure high reliability of of power supply of the city. At the end of 2017, by the decision of the working group



High-temperature superconductive current-limiting device of SuperOx at the electric substation Mnevniki of the United Energy Company in Moscow





Deputy Director General, Chief Engineer of Rosseti  
Andrey Mayorov:

“The main function of the device is almost instant limitation of short circuit current and at the same time reduction of loads on other elements of the system to radically reduce durability requirements for all equipment in a power system in emergency conditions.”



Test of a 220 kV RIN bushing in a liquid nitrogen cryostat at Izolyator plant

under the Ministry of Energy of Russian Federation joint project of the United Energy Company and SuperOx on the implementation of superconducting technologies to the Moscow energy system received the status of a national project. A high-temperature superconducting current-limiting device is a superconducting tape, able to retain its properties at supercooled temperature of liquid nitrogen ( $-201^{\circ}\text{C}$ ). This temperature is maintained by a cryogenic cooling system consisting of three coolers. The neon gas ( $-205^{\circ}\text{C}$ ) is used for this purpose, which is fed through a heat exchanger. Even with the operation of one cooler out of three the system will be working properly.

If a short circuit occurs HTSC CLD goes into current limiting mode in 0.003 seconds. Resistance sharply increases, leading to a decrease of the short circuit current level. After the problem is solved, within 30 seconds the resistance of the device drops to zero and it returns to superconductor mode. HTSC CLD reduces the short-circuit current by 5-10 times, and does it ten times faster than any existing power circuit breaker.

The technology opens up new opportunities to power engineers in reduction of forced network partitioning and optimizing power flow, and also reduces dependence on the purchase of increasingly powerful imported circuit breakers.

HTSC CLD has a voltage class 220 kV, its power is enough to maintain super reliable power supply of three districts of the metropolis with a population of 500 thousand people.

Current limiting device is an innovative Russian development and has no analogues abroad in its voltage class. It is the first superconducting device in the Moscow power network.

The device was developed by Engenergoproject. Among equipment manufacturers - Russian enterprises SuperOks and Izolyator, a South Korean company Cryogenic & Vacuum Engineering and Japanese Taiyo Nippon Sanso.

Within the framework of the project, Izolyator plant designed and manufactured high-voltage bushings for HTSC CLD. In 2017, in the testing center of the company with the participation of colleagues from SuperOx for the first time in Russia, specially designed bushings were successfully tested at a temperature of  $-200^{\circ}\text{C}$  with internal RIN insulation of nominal voltage classes 110 and 220 kV. Unlike with serial bushings, to achieve the necessary cold resistance, special technical solutions were applied that





Tests of the first phase of high-temperature superconductive current-limiting device SuperOx at the Korean Electrotechnology Research Institute (KERI)

allowed the bushing to withstand the differential of temperatures from  $-200^{\circ}\text{C}$  in the bottom part to  $+10^{\circ}\text{C}$  in the upper point.

In the same year, Izolyator ran tests to determine the operability of a 220 kV HTSC CLD by SuperOks filled with liquid nitrogen. The tests of the device, equipped with Izolyator high-voltage bushings, completed successfully. Also, the specialists of the Izolyator plant took part in the acceptance tests of the first phase of HTSC CLD at the largest international testing center - Korea Electrotechnology Research Institute (KERI) in South Korea.

The HTSC CLD, commissioned for the first time in the Russian energy sector, became a milestone achievement in fruitful the collaboration of SuperOx and Izolyator enterprises.

The HTSC CLD technology is the result of more than 25 years of scientific and technical work. Under the supervision of SuperOx, the device development and testing has involved more than 400 specialists, including leading world experts. The project lays the groundwork for the development of superconducting energy in Russia.

*Based on materials of the official website of the mayor of Moscow, United Energy Company, SuperOx Enterprise, Electricity. Transmission and Distribution Magazine, TV Center and City Information channel m24.ru.*



220 kV Izolyator RIN bushings on a high-temperature superconductive current-limiting device SuperOx, installed on the electric substation Mnevniki in Moscow





«In the future, digital solutions in the energy sector open up great opportunities for improving production and economic efficiency»

**Andrey Murov,**  
Chairman of the Management Board, FGC UES, PJSC

## RIN Bushings Will be Delivered to Rosseti

Izolyator participated in a meeting of the Technical Council of Rosseti PJSC specifically accented on discussion on high-voltage bushings with RIN insulation.

Representatives of the electric grid companies entering the Rosseti Group stated they have successful experience of operating high-voltage bushings with RIN-insulation and

reconfirming intentions of future purchases. Taking into account all the above, as well as successful certification of high-voltage Izolyator RIN bushings by Rosseti PJSC, the Technical Council decided to purchase such 35–750 kV bushings for installation on transformers, autotransformers, oil circuit breakers and reactors, and also to form emergency reserve. ■



Meeting of Technical Council of Rosseti PJSC

## Evaluating Joint Accomplishments

Director of Strategic Sales at Izolyator plant Alexander Savinov had a working meeting at Main Power Systems of North West. The meeting took place in the head office of MPS North West in Saint Petersburg.

The parties praised the results of the joint work achieved so far and high level of coordination.

The new product designs of the Izolyator plant were also discussed - high-voltage bushings with solid internal RIN insulation, including the prospects for their widespread use in the electric grid facilities of MPS North-West.

Much attention was paid to plans for joint activities for 2020 and the further development of long-term cooperation. ■



Transformer of the Main Power Systems of North-West with Izolyator HV bushings (Photo: FGC UES)

## From Results to New Prospects

The talks at the Main Power Systems of East took place in Khabarovsk on 23 October. Roman Gudin, SS Operation and Diagnostics Chief received Director of Strategic Sales at Izolyator Alexander Savinov.



Alexander Savinov (L) and Head SS Equipment Operation and Diagnostics at MPS East Roman Gudin by the head office of the Main Power Systems of East, Khabarovsk

The sides discussed the interim results of collaboration under the existing agreements. Much attention was given to discussing possibility of equipping the power facilities of the company with the high-voltage bushings with internal RIN insulation.

The sides expressed a shared intention to develop cooperation. ■



Power sector  
of Russia

over **2,6** bln km  
of ETLs approx **6000** thnd  
substations

totally **80** bln kWh of  
electric energy  
supplied to  
consumers

## Fault-Free Operation

Main Power Systems of Center sent a positive reference about their operating experience of Izolyator RIP bushings up to 750 kV on 20 November. ■



Izolyator bushings on an autotransformer at 750 kV SS Belozerskaya of MPS Center, Vologda region (Photo: FGC UES)

## IV Annual Procurement Forum of the Moscow United Electric Grid Company



Alexander Savinov is speaking at the IV Annual Procurement Forum of the Moscow United Electric Grid Company

On 18 December, 2019 Izolyator plant participated in the IV Annual Procurement Forum of the Moscow United Electric Grid company for its suppliers and contractors.

This year, the format of the event was chosen as forum: for the first time, the main speakers were not representatives of the customer company, but participants from supplier companies - manufacturers of products for the energy sector.



Panel of the IV Annual Procurement Forum of the Moscow United Electric Grid Company

The Izolyator plant was represented at the forum by Director of Strategic Sales Alexander Savinov, Senior Manager of Partner Relations Irina Daurova.

Among the key topics of the panel discussion there were issues of limitations in existing procurement procedures; issues related to the certification procedure by the Rosseti Group and others. ■

## In Nominal Mode

Our colleagues had a working meeting in Interregional Distribution Grid Company of South in Rostov-on-Don at the end of October. Director of Strategic Sales Alexander Savinov was received by Deputy CEO on Technical Issues Chief Engineer at IDGC South Pavel Goncharov.

The parties discussed operating experience of HV RIN bushings, results of collaboration and incentives to further improve daily coordination in realization of existing agreements. ■



Transformer of IDGC South with Izolyator HV bushings (photo: IDGC South)

## Productive Meeting

1st Deputy General Director - Technical Director of Regional Electric Networks Vladimir Gerasimov visited Izolyator plant early in October.

At the meeting, the sides had talks, where they discussed construction design, application benefits and operational features of high-voltage bushings with internal RIN insulation.

Vladimir Gerasimov saw the production facility, where he familiarized himself with the process of RIN bushings manufacturing and the advanced equipment that ensures output of quality products enjoying a high demand. ■









Transformer of Regional electric networks with Izolyator HV bushings (photo: REN)




# 2019 COOPERATION



-  Kentau transformer plant
-  Togliatti Transformer
-  Vitebskenergo
-  GK Dnistrenergol
-  ZREW Transformatory
-  Elia Group

-  Balıkesir Elektromekanik Sanayi Tesisleri A. S.
-  Power machines - Toshiba. High-voltage transformers
-  National Electric Network of Kyrgyzstan
-  SVEL Group
-  TBEA Co., Ltd.

-  PowerGrid
-  Siemens AG
-  Zaporozhtransformer
-  Fortum
-  Uralsvyelektromash



# NETWORK

# 17 COUNTRIES



- |                |            |
|----------------|------------|
| Armenia        | Latvia     |
| Belarus        | Moldavia   |
| Belgium        | Poland     |
| China          | Russia     |
| Czech Republic | Tajikistan |
| Estonia        | Turkey     |
| India          | Ukraine    |
| Kazakhstan     | Vietnam    |
| Kyrgyzstan     |            |

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



# Raising Qualification - Increasing Reliability



Participants of seminar for raising qualification of Mosenergo's technical specialists at the test center of Izolyator plant

A seminar in the field of installation, measurement of characteristics and operation of high-voltage bushings to raise the qualifications of technical specialists of Mosenergo was held at the Izolyator plant.

It went as part of a package of measures to improve the reliability of Izolyator bushings operation.

The audience of the seminar included the Chief Specialist of Electrical Equipment Service of the General Directorate of Mosenergo Andrey Snetkov and technical specialists of the Mosenergo branches. At the Izolyator plant, the seminar was held by Director of Partner Relations Oleg Bakulin, Head of SVN-Service Department Dmitry Mashinistov, Lead Chief Engineer Alexey Pilyugin.

The seminar started with a tour of the production facility with a fairly detailed examination of all stages of modern manufacturing technology and testing of high-voltage bushings with solid internal RIP and RIN insulation.



Presentation of Izolyator plant at a seminar for advanced training of Mosenergo technical specialists

The visit continued with a visit to the corporate museum, where visitors learned a lot of interesting things about the centuries-old history of Izolyator and the current role of the

enterprise in the development of the electric power industry.

The final event of the seminar was presentation of the Izolyator plant and its products, in which special attention was paid to the relationship between the design of the high-voltage bushing and its technically competent operation.

A new product of the company was presented separately — high-voltage bushings with internal RIN insulation: advantages, design and operation features, prospects for widespread use at generating and power grid facilities. In the final part of the presentation, which took place in the form of a free dialogue, Mosenergo specialists received detailed and comprehensive answers to all questions that arose.

The seminar went with great practical benefit for both Mosenergo technical specialists and Izolyator plant. All set educational goals were achieved. ■



Mosenergo technical specialists get acquainted with the modern technology of the production of high-voltage bushings at the Izolyator plant



# Giving Comprehensive Answers



Technical workshop of Izolyator plant in the Far-Eastern Generating Company in Khabarovsk

Izolyator representatives gave a seminar for technical specialists at the Far-Eastern Distribution Grid Company and its branches in November. Our colleagues from FEFG actively engaged in the workshop's activities: Vitaly Andriyanov, Head of the Electrical Equipment Maintenance department of FEFG, representatives of the Khabarovsk Generation branch of the FEFG and the Far Eastern Distribution Grid Company.

In the videoconference mode, the seminar was attended by technical specialists from power plants that are part of the subsidiaries of FEFG.

Izolyator plant was represented by Oleg Bakulin, Director of Partner Relations, and Aleksey

Pilyugin, Lead Commissioning Engineer. In the first part of the seminar, the construction design features and range of Izolyator high-voltage bushings were considered, the main provisions of factory instructions for storing, operating and diagnosing bushings were discussed. The second part of the seminar was devoted to a more detailed study of the advantages, design and operation features of high-voltage bushings with especially moisture-resistant internal RIN insulation.

In conclusion, comprehensive answers were given to all questions from the audience on the operation of Izolyator high-voltage bushings. ■

## Specificly, at Large

A presentation of HV RIN bushings was organized at the Far-Eastern Distribution Grid Company in Blagoveshchensk. The event, which was attended by Alexander Bichevin, Head of the Technical Operation Department of FEFGC, technical specialists of the FEFGC and its branch - Amur Electric Networks, was led by Director of Partner Relations at Izolyator Oleg Bakulin. The presentation detailed the advantages, design

features and prospects for the use of high-voltage bushings with particularly moisture-resistant internal RIN insulation in the electric grid sector.

At the end of the event, an open and informative dialogue was held to cover all the questions from FEFGC specialists regarding the experience gained in operating Izolyator high-voltage bushings. ■



A 110 kV aerial power line of Neryungi region electric networks of the Far-Eastern Distribution Grid Company

## Presentation of Best Practice

Director of Partner Relations at Izolyator plant Oleg Bakulin made a presentation about the company products at the Komi branch of T Plus Group in Syktyvkar on 31 October. The Electrical Service Chief Albert Babochkin received the visitor.

The visitor made a presentation on the topic "Operation of high-voltage bushings made by Izolyator plant. RIN bushings. Advanced designs".

The technical specialists of Komi branch learned about the modern technology of Izolyator HV bushings production, their technical and operational advantages, key research areas and further construction design improvement.

According to the shared opinion of the participants of presentation, such activities



Sosnogorsk TPP of Komi branch of T Plus Group (photo: T Plus Group)

expands professional knowledge of specialists considerably, increasing the quality of high-voltage equipment operation.

Komi branch of T Plus Group includes generating and heat supply assets in five cities: Inta, Sosnogorsk, Uhta, Syktyvkar and Vorkuta.

Branch operates Inta CHPP, Sosnogorsk CHPP and Syktyvkar heating networks as well as Vorkuta CHPP, which is in operational control thereof.

The total installed electrical capacity of the branch is 395 MW, Vorkuta CHPP Ltd – 295 MW. The total heating capacity of the branch is 1804.8 GCal/hr, Vorkuta CHPP – 1001 GCal/hr.

The executive office of the Komi branch is in Syktyvkar. ■



# In Positive Dynamics



Tests of transformer at Power Machines — Toshiba. High-voltage Transformers equipped with 500 kV Izolyator bushings

Head of OEM Sales at Izolyator Maxim Zagrebin had a working meeting at Power Machines — Toshiba. High-voltage Transformers in Saint-Petersburg.

The parties discussed issues of coordination during the joint projects realization and clari-

fied on the work schedule. The partners shared a high opinion of the achieved results, the dynamics of business growth and cooperation prospects of the two companies. ■

## Technical Workshop at Togliatti Transformer



Izolyator plant's workshop at Togliatti Transformer

In December 2019, Izolyator held a technical workshop at Togliatti Transformer.

The topic of the seminar was dedicated to the specifics of Izolyator HV RIP and RIN bushings operation.

The Izolyator plant was represented by the Head of OEM Sales Maxim Zagrebin and Lead

Technical Support Specialist Victor Kiryukhin.

An interesting and open dialogue took place at the seminar with detailed explanations and comprehensive answers to all questions from the technical specialists of the Togliatti Transformer. The event ended with great practical benefit for both parties. ■

## On Current Matters and Prospective Plans

Head of OEM Sales at Izolyator Maxim Zagrebin had a working meeting with the management of Ufa Transformer Plant. On UTP side, the guest was received by The sides had talks, with Ufa transformer plant represented by: Sergey Kononov, General Director and Oleg Kuklin, External Cooperation and Procurement Chief.

Our colleagues made acquaintance with the new CEO of UTP, following up the official part by summarizing the interim results of cooperation between the partner companies and agreeing on further practical steps to fulfil the existing agreements.



Participants of the working meeting at Ufa Transformer Plant, L-R: Maxim Zagrebin, UTP CEO Sergey Kononov and External Cooperation and Procurement Chief at UTP Oleg Kuklin

Based on the successful cooperation track record, UTP and Izolyator representatives expressed intention to further develop business ties on a long-term and mutually beneficial basis.

Ufa Transformer Plant is a modern enterprise with specialization in development and production of power and distribution transformers.

The plant was built by Electro-zavod JSC in 2009 and today is the largest power equipment building facility in Russia.

Ufa Transformer Plant makes a broad range of power transformers of up to 500 kV voltages and up to 267 MVA. ■



# Firmly Based on the Past, Building Relations in the Future



Participants of the talks at ATEF Group of companies in Azerbaijan, L-R: Director Strategic Sourcing & Logistics Department at ATEF Group Hussain Nayani, Director - Oil filled Transformer / Transformer Design at ATEF Group Anagha Dixit and Maxim Zagrebin

Maxim Zagrebin, Head of OEM Sales at Izolyator plant, held talks with the executives of the ATEF industrial group of companies in Baku, Azerbaijan on 19 November 2019. This time, the guest was received by: Deputy Chairman of the Board Nikolay Molodetsky, Director Strategic Sourcing & Logistics Department Hussain Nayani, Sales Director Farid Aliyev, Director - Oil filled Transformer / Transformer Design Anagha Dixit, Procurement Specialist Zaka Ismayil Bayli.

Our colleague made an acquaintance and established business contacts with new representatives of management of the ATEF Group of companies.

Then the parties discussed the results of the joint activities achieved so far, noting the successful pace of the mutually beneficial cooperation. This year, for the first time, 126 and 252 kV transformer bushings with internal RIP insulation were delivered to the group.

The ATEF Group of companies and Izolyator plant are tied with strong and constantly developing business relations. Thanks to the constructive policy of the group's management, the effective interaction has been established that opens up broad prospects for the implementation of joint projects of any scale. ■

## Stages of Future Achievements

Head of OEM Sales at Izolyator Maxim Zagrebin had talks at Power Machines in Saint-Petersburg in October. Konstantin Stafeev, Chief Strategy Officer received the visitor.

The talks were dedicated to the issues of strategic partnership between Power Machines and Izolyator in the long-term perspective.

The sides mapped necessary stages and a pool of practical measures to gradually develop cooperation of the two companies. ■



Chief Strategy Officer at Power Machines Konstantin Stafeev (L) and Maxim Zagrebin at the headquarter of Power Machines in Saint-Petersburg

## Working Moments

Head of OEM Sales at Izolyator plant Maxim Zagrebin had a working meeting at the electrical engineering plant Electroshield Samara. Lead Specialist of Non-Serial Equipment Anton Akimov received the visitor.



Lead Specialist of Non-Serial Equipment at Electroshield Samara Anton Akimov (L) and Maxim Zagrebin

The sides discussed progress of the project that the companies execute in collaboration under the order of energy companies as well as current topics of efficient interaction with customers meeting the entire set of their requirements.

The partners marked the successful cooperation progress and outlined further steps to develop it. ■

## Coordinated Interaction



Photo: VO Electroapparat JSC

There was a working meeting at the Joint stock company of high-voltage equipment Electroapparat in Saint-Petersburg. Izolyator plant was represented by Head of OEM Sales Maxim Zagrebin, the receiving side - Project Director Alexander Pogonov and Head of Sales Department Ilya Arsenyev.

The sides shared new information on the work progress in joint projects, analyzed the results and discussed further interaction.

In conclusion, the both companies representatives expressed a shared opinion that such business meetings are a critical factor of a seamless interaction and development of an efficient cooperation. ■





**Alexander Savinov,**  
Director of Strategic Sales



Innovative thinking and invaluable historical experience, the highest competence and professionalism, engineering and technological perfection are the most recognizable features of the Russian brand Izolyator. From year to year, in cooperation with reliable partners, Izolyator is achieving more and more large-scale and impressive accomplishments, steadily raising the bar and invariably remaining the benchmark of product quality.

The fact that the Rosseti Group certified Izolyator bushings with RIN insulation for use in its facilities, is a logical and natural event on the most difficult path of implementation of innovation ideas to the electric grid complex of Russia.

At the moment, many companies have already expressed their readiness to use bushings with RIN insulation, for instance: energy enterprises of the Republic of Crimea, energy division of Gazprom, IDGC of South, IDGC of Center, electric grid company Kubanenergo, as well as large generating and industrial country cluster players.

I am convinced that this is the beginning of a long way and ahead of us there are many large-scale projects with the bushings with innovative internal insulation being the key element of which.



**Oleg Bakulin,**  
Director of Partner Relations



Reputation is one of the most important achievements in professional life of both a person and a company. Of course, it is pleasing that our reputation of responsible, reliable and punctual suppliers of electrical equipment helps us not only to successfully develop cooperation, but also generally expand presence.

Large market players of electric power market show great interest in the new product: thus, the first delivery of RIN bushings was already made in the address of PJSC T Plus and we signed contracts for the supply of bushings with RIN insulation to PJSC RusHydro in 2020.

Throughout the year, we held business meetings with representatives of the companies of RusHydro Group, both in the Far East and at Izolyator plant. We also held productive negotiations with representatives of TransneftElectroService.

One of our key principles - never stop and sit one's achievements. We set ambitious goals in 2020. Among the important strategic goals is the delivery of RIN bushings of higher voltage classes for the needs of generating companies.



**Maxim Zagrebin,**  
Head of OEM Sales



The status of a reliable and responsible partner is the result of the work of the entire Izolyator team. We value this reputation constantly improving work processes.

Thanks to a number of workshops on RIN-insulated high-voltage bushings held in 2019 for the specialists of partner enterprises the first deliveries of such bushing have actually taken place.

We sent the first batch of 110 and 220 kV bushings to the Azerbaijani ATEF group of companies. A transformer equipped with Izolyator bushings, was successfully tested in KEMA Laboratories Prague in Czech Republic.

We completed joint projects of equipping transformers with Izolyator bushings on ultrahigh voltage classes: 500 kV oil-SF6 PMTT transformer, PMTT's project for RusHydro Group, Electroavod's project for Rosenergoatom, SVEL group project for RusHydro.

We agreed on joint projects in 2020 with PMTT, Togliatti Transformer, SVEL Group, Electroavod and other power equipment manufacturers.

We will continue to strengthen and develop mutually beneficial cooperation with our reliable partners.



# POWER INDUSTRY OF RUSSIA in 2019



ROSSETI



Over

3600

BUSHINGS

10-750 kV

delivered in 2019 to the power  
system of Russia

IZOLYATOR

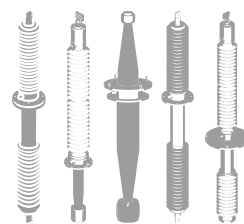
70-80%  
MARKET SHARE

high-voltage  
bushings  
Russia and CIS countries

Over

420

BUSHINGS



delivered to transformer  
plants of Russian Federation  
in 2019



## Yaroslav Sedov, Head of Marketing Department at Izolyator plant

In 2019, Marketing Department was formed to carry out the primary function of researching new markets and preparing their integration. The first results are market trends analysis after economic and marketing research that we did to develop a number of recommendations for selection of areas of targeted sales promotion.

We are currently focused on working with external markets. Our interest in international market is explained the trends towards globalization of markets. Multinational corporations, associations, governmental and non-governmental organizations play an increasing role in the world politics and economics. The tendencies of the interdependent world, Westphalian system of international relations acquires a hybrid character in which interstate relations are integrated into a wider system of interactions.

Within that type of interaction, the markets are merging, so it becomes possible to consider different countries, while combining them into a single market, in which uniform marketing strategies can be applied. Many markets are expanding their borders, remove barriers, remove restrictions. On the example of turnover of commodities, you can see that the intensity of domestic relations is several times lower than the effectiveness of foreign relations.

One of the main advantages of this approach is the ability to expand the borders of the market while significantly saving on the scale of production.



*As part of the tasks to expand our presence on export markets we have researched Malaysia, Korea and Saudi Arabia.*

Our main tasks in the next year are regular study of foreign markets, as well as analysis of our possible responses to globalization, which is especially important for development and maintaining strong international relations.



South Korea

Saudi Arabia



Malaysia





Among the most interesting to for study and analysis destinations are the Asia-Pacific region (APR) and the Gulf countries.

As part of the tasks to expand our presence on export markets we have researched Malaysia, Korea and Saudi Arabia. Comprehensive analysis of economic, political and technological sides showed that these regions have a high potential. In the above countries energy sector is one of the most important sectors of the economy. So, in Malaysia, energy makes up about 20% of the GDP share, in South Korea the economy is based on oil refining, and in the economy of Saudi Arabia, 45% of GDP accounts for the oil industry.

It is worth mentioning that from a political stance, Russia plays an important role in international integration of Asian-Pacific countries. APR appears today as one of the largest centers of international trade and modern production, where there is growth of integration processes that enhances trust between countries.

As for the Arab countries, one of the most memorable events in 2019 is the state visit of Vladimir Putin to the Kingdom Saudi Arabia for discussion of cooperation, including in the field of energy. He emphasized that Saudi Arabia, thanks to its capabilities and the scope of energy activities is a key player on the international energy market and has influence on the entire global energy industry. Coordination within the OPEC (Organization of Petroleum

Exporting Countries) holds a large share of focus in Russian - Saudi Arabian relations.

One shouldn't forget about the importance of other international economic organizations and energy unions that the earlier mentioned countries enter.

For example, ten countries entering ASEAN (Association of Southeast Asia Nations) together with Malaysia are cumulatively the seventh largest economy in the world and play a central role in the Asia-Pacific forums. One of the largest projects of the association is creation of a single network that is set to link all the participating countries into a single energy ring by 2030. Collaboration in this direction takes relations between participating countries to a new level, allows them to become deeper, more complex and multifaceted. Priority is given to promoting continuous movement of goods, services, investment, capital and skilled labor within ASEAN to expand trade and production networks Associations, as well as create a single market for firms and consumers.

Thus, the countries of Southeast Asia will live as a dynamically developed system and competitive geoeconomic community with a wider vector of cooperation than most of the existing organizations.

Saudi Arabia seeks to upgrade its entire energy sector to reduce oil consumption in electricity production. Besides a mere increase

of capacity, not associated with oil extraction, the country aims at replacing its obsolete distribution infrastructure, implement digital network technology and connecting to international power networks. With the finalization of connection of UEA to Saudi Arabia, in 2011, all the power systems of the Gulf area were linked into the GCC - unified network that is tasked with promoting economic cooperation and peaceful development in the region.

GCCIA (Gulf Cooperation Council Interconnection Authority) includes 6 countries: Saudi Arabia, Kuwait, Bahrain, Qatar, UAE and Oman. Electricity trade between GCC countries is mainly carried out through bilateral contracts, including cash and resource exchanges, since 2016 has been showing an upward trend. And by 2025, unification is planned with Egypt and Jordan that will lead to increase of the total projected capacity.

Updating existing and developing new infrastructure as a result of the construction of new cities in these regions are another factor capable of changing the situation of suppliers of high-voltage bushings. In this regard, the needs in the organization of additional production of high-voltage equipment on the territory of the consumer are actively analyzed.

With proper integration with Malaysia, Korea and Saudi Arabia, we can count on further cooperation with countries that are members of OPEC, ASEAN, and GCCIA.



**GCCIA**

Bahrain  
Qatar  
Kuwait  
UAE  
Oman  
Saudi Arabia



**ASEAN**

Brunei  
Vietnam  
Indonesia  
Cambodia  
Laos  
Malaysia  
Myanma  
Singapore  
Thailand  
The Philippines



**OPEC**

Algeria  
Angola  
Venezuela  
Gabon  
Iran  
Iraq  
Kongo  
Kuwait  
Libya  
United Arab  
Emirates  
Nigeria  
Saudi Arabia  
Equatorial Guinea  
Ecuador



# 42 | Japan: Implementation of RES and Development of Market Mechanisms

As part of a joint project of the ELECTRIC POWER Transmission and Distribution Magazine and the System Operator of the Unified Energy System, implemented with the support of Association of system operators of the largest energy systems GO15, we continue to acquaint readers with system operators of the world. A series of interviews is here continued by a conversation with Yoshinori KANEKO - President of TEPCO Power Grid, Inc., one of the ten system operators in Japan.



— Mr. Kaneko, could you tell please what constitutes TEPCO and describe the power system it controls.

— TEPCO Power Grid, Inc. is owner and operator of transmitting and distribution networks of the eastern Kanto region of Japan, including the capital of the country Tokyo. Being one out of ten system operators of the country, we are also responsible for transit of electricity.

We manage the power system, which covers the main industrial part of Japan, as well as the entire metropolitan area with suburbs, which is a political, economic, informational and cultural center and at the same time a place of concentration of office and residential buildings. Due to these circumstances, the density of load distribution in this region with an area of about 40 thousand km<sup>2</sup> is high. In past years, the maximum power consumption here was approximately 64 GW, or about 1/3 of the maximum load throughout Japan.

In order to promote widespread cooperation in power facilities operation, the Interregional Organization on coordination of system operators in Japan (Organization for Cross-regional Coordination of Transmission operators, OCCTO) was created. As part of a new reliability level of power supply in a high-density metropolis TEPCO

Power Grid, Inc. created a 500 kV double ring electrical network around Tokyo, distributed load of large power plants and built 275 kV transmission networks, providing energy supply to the capital region. However after the great eastern Japanese earthquake (occurred in March 2011, notorious for causing the accident at the nuclear power plant Fukushima — ed. note) concentration of power plants in southeast coastal zone of the country remains high.

That's why we continue to work on elimination of overloads in the transmission network in connection with large power flows due to uneven distribution of power plants. To facilitate large-scale cooperation in operation of energy facilities Japan's Organization for Cross-Regional Coordination of Transmission operators, OCCTO) was established. All power companies in Japan must join the OCCTO.

The organization monitors production and consumption of each OCCTO member company and adjusts them as necessary, and also plans development of power transmission and distribution systems throughout the country.

In preparation for the Olympic and Paralympic Games in Tokyo in 2020, TEPCO Power Grid, Inc. in interaction with the International the Olympic Com-

mittee solves the problem of improving the reliability of energy supply of sports facilities, such as infrastructure strengthening to transfer electricity to locations holding events.

— What challenges have you been facing lately?

— From the date of entry into force in 2012 of the law on preferential tariffs, in order to stimulate green energy, the total number of solar power plants (SPP) in our energy system continues to increase significantly. At the end of March 2019, the installed capacity of the solar power plants approached 13 GW. SPPs are concentrated like other power plants in the southeast of the power system, which aggravates the situation with large flows of electricity, I mentioned above.

Most noticeably SPP affect the line of supply and demand of electricity, forming a "duck curve" on the daily load curve.

Supply and demand mismatch is especially pronounced in the evening hours. Pump-storage power plants are used to balance daily loads.

In order to increase sustainability of power systems, some measures to strengthen electrical connections between operating areas of various system operators, including the construction



of conversion substations are implemented.

— What business models and changes are necessary to ensure the economic viability of the energy system?

In order to increase sustainability of power systems, some measures to strengthen electrical connections between operating areas of various system operators, including the construction of conversion substations are implemented.

— What business models and changes are necessary to ensure the economic viability of the energy system?

— As regards the amplification of the electric networks because of the large volumes newly introduced renewable energy generation, such schemes as “request for proposals” were applied, within which a significant amount of costs on network infrastructure construction is shared between electricity providers. In addition, there is a discussion underway to reform payment system for the transit of electricity, which allows for the reimbursement of investment costs of the construction of intersystem connections and backbone networks by using transit tariffs for users as well as providing incentives to transmission companies to reduce costs.

It is estimated that the utilization of the energy system will decrease due to a decrease in the population in the future, therefore, not only the issues of strengthening the electric network are considered, but also the issues of rational formation of energy facilities, such as for example, reductions in generating assets.

— How is the mechanism of modernization of generating and network equipment in your power system built?

— One of our recent tasks was setting rules for non-guaranteed access. Previously, we made plans to strengthen transmission and distribution guaranteed access network infrastructure to track changes in placement of energy resources in our operating zone, which is facilitated by the policy of turning renewable energy sources into the main source of energy. Reform of traditional scheme will provide opportunities to use the power of renewable energy generation and its management without serious investment. Now a possibility to test the mechanism of non-guaranteed access in a specific area is considered.

— In recent years, traditional energy is changing under the influence of new technologies. How does the system of operational dispatch control of the energy system in your country change?

— It is imperative to acquire knowledge about new technologies in order to be ready for the formation of a new

electric grid, oriented to the energy system of the future. Therefore, network digitalization gets more and more spread with the use of the Internet, which increases the efficiency of its work, but at the same time complicates the operation and maintenance.

To achieve the goal of turning renewables into the main energy source before opening a balancing market, there has to be a demonstration of ability of the energy aggregator to provide consumers with the opportunity to respond to balancing market offers.

— With most power systems a problem of integrating new types of resources into the traditional power system has been discussed recently. Is it relevant for you? How do you resolve the issue of the operational dispatch control of those resources as part of a traditional power system?

— Integration of new energy resources into a traditional structure of energy sector is a priority objective for system operators. In Japan, distributed energy resources, mainly RES, have become widely used. In the future, this trend will continue.

To ensure integration into the power system of a large volume of renewable energy generation and solve the problem of frequency regulation caused by this, we carry out technological developments and demonstrations in terms of energy management using batteries and equipment for the storage of thermal energy.

Also, in order to fully contribute to the integration of renewable energy resources into the energy system, we are developing, demonstrating and implementing technologies to reduce voltage fluctuations and ensuring the reliability of energy supply when connecting RES generation to a distribution network.

— The term “Energy system of the future” is getting a wider recognition in the world power industry. What is there for you in this concept?

— The conditions, in which our business operates, begin to change dramatically in connection with the introduction of energy-saving technologies and the integration of renewable energy sources, as well as the spread of electric vehicles and internal migration of the population, which causes network congestion.

In addition, in recent years, with the increased risk of accidents at power facilities due to natural disasters caused by climate change, the sustainability of energy system has grown a more important issue.

— The conditions, in which our business operates, begin to change dramatically in connection with the introduction of energy-saving technologies and the integration of renewable energy sources, as well as the spread of electric vehicles and internal migration of the population, which causes network congestion.

In addition, in recent years, with the increased risk of accidents at power facilities due to natural disasters caused by climate change, the sustainability of energy system has grown a more important issue.

With extensive knowledge and experience gained through the activities of the world's leading system operators GO15, TEPCO Power Grid, Inc. is trying to turn these challenges into opportunities and create new values in the future energy industry, and also ensure the sustainability of our business.

*Based on materials of SO UPS JSC  
press center*



# A start into the big future

**Konstantin Sipilkin,**  
R&D Director at Izolyator

Summing up the year 2019, it is necessary to note that the design office of Izolyator has developed 33 new designs of high-voltage bushings, including 800 kV ones for our Indian customers. This is an ultra-high voltage class and the fact that we are able to not only develop such products, but also to manufacture and conduct a complete range of acceptance testing speaks for itself. The full scope of type tests of 420kV / 3000A and 800kV / 2000A bushings with internal RIP insulation including unique seismic tests that we had in India showed the highest level of quality and reliability of our products.

Design and construction of digital substations required application of new types of high-voltage equipment, among which high-voltage bushings also found their place. Based on the challenges facing digital substations, the most suitable type of bushings for them is a new design with solid RIN insulation. This type of insulation does not contain cellulose in its structure and for this reason is not able to moisten. Whilst the moistening of insulation is one of the most common causes of damage to bushings. The diagnostics of bushings condition receives quite a lot of attention and that does not correlate with the goals as declared in the purposes of construction of digital substations.

To check and confirm the operability of the new type of insulation at the Izolyator plant, we did a huge amount of research work. Over 100 high-voltage bushings of various types and classes in the voltage range 35 to 550 kV were made for testing. First of all, here at our local premises we conducted own tests that confirmed non-exposure of RIN insulation to moisture.

In addition, all samples of RIN bushings also passed standard acceptance tests in accordance with GOST R 55187 and IEC 137 (IEC 60317: 2017). Some samples were subjected to lengthy life tests, as well as thermal stability testing and nominal current testing.

Considering that bushings are operating in different countries, in territories with all kinds of climate conditions, to confirm the presence of the necessary crack resistance and sufficient ductility of the RIN insulation material we also ran climate tests and seismic tests.



*Already today, Izolyator bushings with internal RIN insulation are in operational testing at Russian power facilities are raise a great interest among our overseas partners*

So as early as this year, our plant commenced mass production of such bushings according to the HV Bushings till 2025 Road map, created by Power Electrical Equipment workgroup of the Interagency coordinating council on issues of development of power engineering and cable industry.

At this moment, we finalized the certification procedure of RIN insulation at Rosseti PJSC. Such companies as energy enterprises of the Republic of Crimea, RusHydro Group of companies, energy division of Gazprom, T Plus Group of companies, IDGC South, IDGC Center, power grid company Kubanenergo, several generating and industrial companies expressed readiness to equip their power facilities with high-voltage bushings with RIN insulation.





Certificates of conformity of Izolyator HV RIN bushings with Rosseti Group's requirements



110 kV RIN bushings for oil switches at the assembly shop of Izolyator plant



500, 330 and 220 kV RIN bushings on technological racks at the assembly shop of Izolyator plant



# 46 | Selecting the Best Technologies in the World

## *The Future is in the new materials*

On 17–19 October 2019, Izolyator plant representatives visited the 21st International Specialized Exhibition for the Plastics and Rubber Industry in Dusseldorf, Germany.

Izolyator representatives got acquainted with the latest achievements in technologies for the development and production of plastic and rubber products at the exhibition.

Our colleagues visited a plant of the chemical company Momentive Performance Materials Inc. in Leverkusen as part of their agenda at the exhibition.

Izolyator was represented by: R&D Director Konstantin Sipilkin, Deputy Chief Designer Pavel Kiryukhin, Lead Process Engineer Svetlana Kryuchkova.

The guests were received by Vice President Elastomers Business Unit Albrecht Holger, Senior Account Manager / Elastomers Andrey Romanov and their colleagues at the plant.

Izolyator representatives learned about new innovative silicone materials, including silicone elastomers, special purpose silanes and coatings.

The visit went productively and ended in success: the sides agreed to develop cooperation.

We appreciate Momentive Performance Materials Inc. for the invitation, eventful program of the visit and a warm welcome. ■



Participants of the visit of Izolyator plant representatives to the plant of Momentive Performance Materials Inc. in Leverkusen, Germany

## With a View of Modernization

Izolyator plant representatives visited a company in Switzerland – supplier of process equipment Tuboly-Astronic AG in November.

The guests were received by Reinhold Bauer, Technical Director of Tuboly-Astronic AG and Waldemar Koch, Director of Elsitech.

Izolyator representatives got acquainted with the latest development for manufacturers of high-voltage bushings – a modern fully automated 12-meter winding machine, which is equipped with the latest monitoring systems, implements automatic cutting and laying of plates, is equipped with a diameter compensation system and an effective paper drying system with the ability to reduce moisture content in paper to a minimum.

During a visit to the production, the parties considered the possibility of modernizing the Tuboly-Astronic machine, operating at the Izolyator plant, and also discussed other areas of cooperation. ■



Representatives of Izolyator plant at Tuboly-Astronic AG in Switzerland, L-R: Pavel Kiryukhin, Svetlana Kryuchkova, Technical Director of Tuboly-Astronic AG Reinhold Bauer, Konstantin Sipilkin and Elsitech Director Waldemar Koch



# Comprehensive consultation and productive conversation

Izolyator received the visit of the representatives of the Czech chemical company Spolchemie with a working meeting in November. Spolchemie was represented by Socha František, Chief Specialist in Casting Systems and Jiri Viktora, Chief Specialist in Electrical Insulating Materials. Also, the Head of the Marketing department of Baltic Service Olga Bubarenko took part in the working meeting. Baltic Service is the official sales representative of Spolchemie's Resins division in Russia.

During the meeting, the guests presented new Spolchemie products and new solutions in the field of targeted application of the produced resins. Spolchemie specialists provided a comprehensive consultation on the selection of resins in accordance with the technical requirements for insulation of high-voltage bushings.

The meeting participants also discussed topical issues related to the daily use of Spolchemie products in the manufacture of bushings and further development of cooperation. ■



Working meeting at Izolyator plant with representatives of the chemical company Spolchemie from Czech Rep. L-R: Yury Kukhtin, Konstantin Sipilkin, Pavel Kiryukhin, Svetlana Kruchkova, Head of Marketing dpt at Baltic Service Olga Bubarenko, Chief Specialist in Casting Systems at Spolchemie Socha František and Chief Specialist in Electrical Insulating Materials at Spolchemie Jiri Viktora

## To Learn So That To Know



The specialists of TransoilElectrosetService are getting familiar with the construction design and production technology of high-voltage bushings with internal RIN insulation

Izolyator plant gave a technical training to the specialists of TransoilElectrosetService on 5 December 2019. The training on the topic "Diagnostics of high-voltage bushings of power transformers" was held in accordance with the approved plan for technical training of TPP personnel and pursuant to the decisions of the meeting with TPP representatives at the Izolyator plant in July this year.

At Izolyator, the training was conducted by Dmitry Mashinistov, Head of SVN-Service

department, and Dmitry Ivanov, Head of Test Center. In the first part of the event, a study tour of production took place. In the second part of the training, the TransoilElectroset-Service employees were familiarized with the report "High-voltage bushings with solid insulation: operating experience, the future of their production and test methods".

The report ended with detailed answers to all clarifying questions of the audience. The training went in full accordance with the approved plan. ■

## Of Special Interest

Izolyator plant was first visited by German engineering company Strescon GmbH management. Among the guests there were Managing Director, Dr.-Ing. Thomas Klein and Head of Administration Karin Krüger.



Management of Strescon GmbH at the test center of Izolyator plant (L-R: Managing Director at Strescon GmbH, Thomas Klein, Dr.-Ing. Alexander Slavinsky, Karin Krüger, Head of Administration at Strescon GmbH and Konstantin Murzin General Director at Izolyator ACS LLC)

During the meeting, the guests visited the enterprise's workshops and observed Izolyator advanced technologies of RIP and RIN high-voltage bushings manufacturing process. The guests were particularly interested in the Izolyator Test Center – one of the most modern in Russia.

The guests also visited the site of the future workshop for high-voltage cable accessories manufacturing, where they studied the scheme of production equipment placement in order to further optimize technological processes.

At the talks the sides discussed the development of design documentation, production of samples for testing and the subsequent organization of mass production of cable accessories for voltage classes 110–550 kV.

The parties emphasized that the cable accessories under development should meet not only local standards, but also the global market requirements. Much attention was paid to the possibilities of further cooperation development. Both parties praised the achieved progress and expressed their readiness for active cooperation during the implementation of the cable accessories manufacturing project. ■



# Diversity of business

**Dmitry Lopatin,**  
Technical Director at  
Izolyator-AKS LLC

The knowledge of the power market of Russia and foreign countries accumulated over the past years, experience in working with materials and various compounds, RIN-insulation and organosilicon silicones enabled the Izolyator management to create a new and at the same time related business line - production of high-voltage cable fittings of all types (connecting sleeves, end coupling and plug couplings) for voltage classes range 110-500 kV.

The ongoing diversification logically complements the established product line of the enterprise, the core of which is made up of bushings for cable connection of transformers, and is a practical answer to the requirements of the state policy of localization and implementation of innovations while ensuring the highest level quality and reliability.

In 2019, Izolyator created a new division — Izolyator-AKS LLC, which at the initial stage is faced with the tasks to as soon as possible develop design documentation, establish serial production of cable accessories and start selling such in domestic and foreign markets.



*The ongoing diversification complements the product line of the enterprise and is a practical answer to the requirements of the state policy of localization and implementation of innovations*

At the moment, Izolyator-AKS has begun to directly implement the project. New leadership of the enterprises is focused on deployment of key factors of successful formation and development, which, among others, include:

- design of modern day cable fittings branded Izolyator-AKS, procurement and commissioning of modern equipment from the leading OEMs;
- ensuring a maximum possible localization with the highest quality and reliability;
- availability of sufficient storage stock for meeting short delivery terms;
- high level of quality and product reliability;
- organization and implementation of lean production, certification of business processes.

The above mentioned competitive advantages will allow Izolyator-AKS to reach the goal: to offer the Russian and global markets a high quality product, meeting the strictest requirements of customers and possessing an optimized cost by means of highly advanced technologies and processes, leading to decreased costs on all stages of product lifecycle.

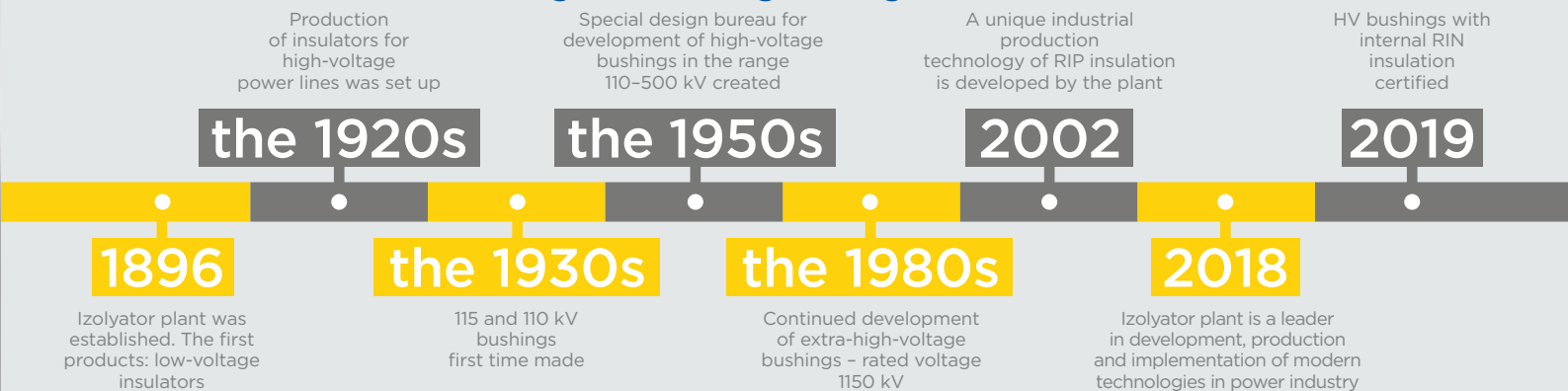


Stress cones of connecting and end couplings at the exhibition stand of Izolyator plant



# INNOVATIONS AND TECHNOLOGIES

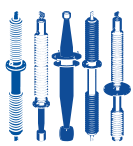
Over **120 years** of experience in production of high-voltage bushings in voltage range 10-1150 kV



**6200000** bushings made throughout the history of Izolyator plant

Over **17 years** of experience in production of RIP bushings in 10 - 750 kV range

## 2019



Designed **33** construction designs of bushings

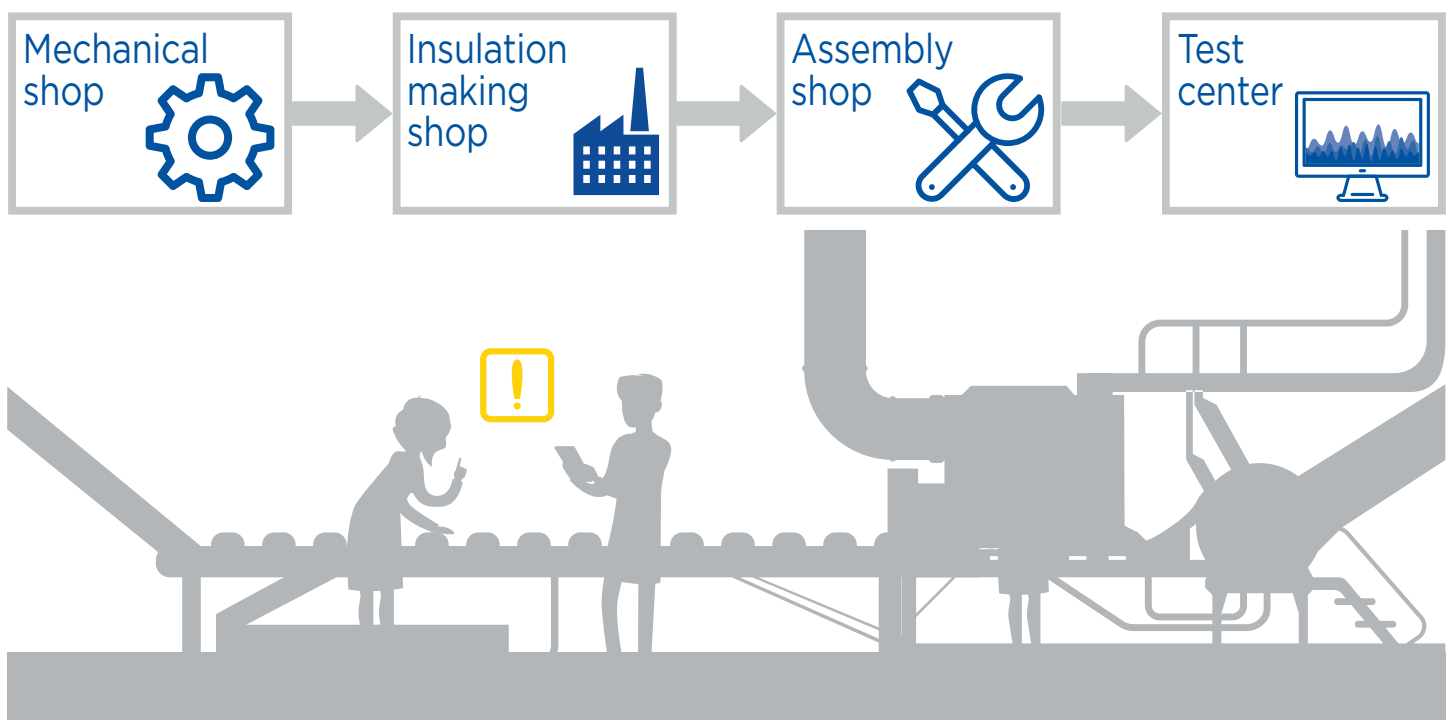


**800 kV** new types of ultra-high voltage bushings



New products! Cable fittings **110-500 kV**

## Serially launched production with RIN insulation



## SUPPLIERS

### Dmitry Karasev, Head of Procurement Department at Izolyator

The key goal we are working towards is to ensure uninterrupted power supply to consumers. The company has undergone structural transformation, and it has already served as momentum to optimize available processes and search for new growth points and, in addition, to obtain more lucrative bids.

In 2019, we took part in a number of important events. One of the highlights was a visit to the K-2019 exhibition in Dusseldorf, Germany, where we held business meetings with the management of Wacker Silicones. We very fruitfully discussed the main trends in the rubber and plastics market. Wacker Silicones executives unveiled new company products and gave the highest praise to the many-year partner relations with the Izolyator plant.

In November, we visited the 25th Metal-Expo International Industrial Exhibition in Moscow, and this also became a great opportunity to strengthen dialogue with major metal suppliers.

We pay special attention to working with porcelain suppliers. We are interested in acquiring experience in reaching arrangements with suppliers from China. We spent a series of tests of Chinese porcelain and according to the results already received the first delivery. We also cooperate with



*Our primary focus is on keeping the quality and reliability of deliveries while working the their improvement and ongoing cost optimization of procurement*

suppliers from Slovakia and Germany and we will be happy to expand the list of reliable counterparties.

The outgoing year has allowed us to take the right path of transformations, and I sincerely hope that they will be a truly breakthrough!

## Strengthening of International Partnership With Wacker Silicones



Participants of the business meeting at the 21 International Specialized Exhibition for the Plastics and Rubber Industry in Germany, L-R: Vice President at Wacker Silicones Christian Gimber, representative of Euro Chemicals Victor Gesko, President of Wacker Silicones Robert Gnann and Dmitry Karasev

The Head of Procurement Dpt at Izolyator Dmitry Karasev had a business meeting with Wacker Silicones's management representatives as he visited the K 2019 exhibition in Dusseldorf, Germany.

Wacker Silicones was represented by: President Dr. Robert Gnann, Vice President Christian Gimber, Sales Director Dr. Jurgen Ismeier, Sales Manager Russia Mikhail Spirin. Representative of Euro Chemicals, which is an official distributor of Wacker Chemie AG, Victor Gesko.

The partners discussed the key trends on the market of rubber and plastics from the point of view of suppliers of materials and components for the production of high-voltage bushings.

Wacker Silicones management representatives made a presentation of new products and share a high opinion on the long-term partner relations with the Izolyator plant.

In conclusion, the sides discussed the measures of further cooperation development in the coming year. ■



## Confident Outlook in Perspective

Izolyator plant held a working meeting with representatives of the supplier company TT Gaskets from Finland in October. Key Account Director Jukka Sunila and representative of the Moscow office Yuri Konovalov visited the plant.

The parties discussed the progress of deliveries of sealing parts for high-voltage bushings, which Izolyator orders from TT Gaskets.

The sides also discussed the product range and delivery scope in 2020 and outlined plans of further cooperation of partner relations. ■



Representatives of the Finnish TT Gaskets at Izolyator plant, L-R: Dmitry Karasev, Key Account Director Jukka Sunila, Representative at the Moscow office of TT Gaskets Yuri Konovalov and Goup Leader Procurement at Izolyator plant Tatiana Sheina

## New Horizons of Cooperation



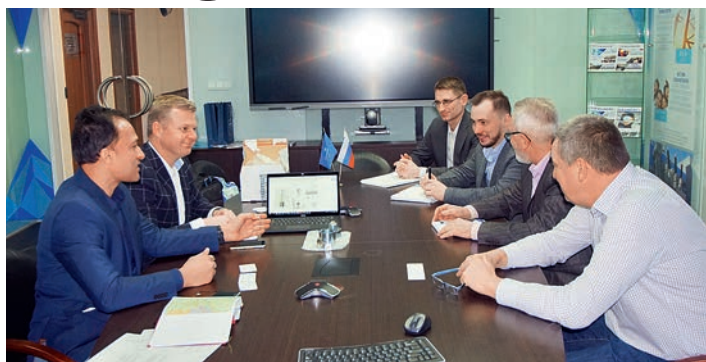
Global Insulator Group's First Vice President Jean Mezentsev (R) and Dmitry Karasev at Izolyator plant

Representatives of the industrial company Global Insulator Group First Vice President Jean Mezentsev and Head of the Department of Electrotechnical Porcelain Sergey Kalashnikov visited Izolyator plant at the end of October.

During the talks, the directions and prospects of cooperation between the two enterprises regarding the use of GIG products as an external insulation of Izolyator high-voltage bushings were discussed.

The parties praised the potential for cooperation and outlined a joint work plan for 2020 inclusive. ■

## Dialogue with reliable suppliers



Market Development Manager at the Swiss company Staubli Electrical Connectors AG Rajiv Kapur (L) and the Head of Sales Department at Schtauble RUS Sergey Migush (2nd on L) at the talks at Izolyator plant



Participants in a business meeting at the 25th Metal-Expo International Industrial Exhibition in Moscow, L-R: Dmitry Karasev, General Director of Alfa-Metal Industrial Supply (Alfa-Metal IS) Dmitry Trishchenko, Commercial Director at Alfa-Metal IS Irina Borunova, Alexander Pankratov and Deputy General Director of Alfa-Metal IS Valentin Borunov



Participants of the working meeting at the Izolyator plant, L-R: Yuri Kukhtin, sales representative of Enpay Endüstriyel Pazarlama ve Yatırım A.Ş. Murat Acar and Dmitry Karasev



Representatives of Slavyansk High Voltage Insulators Works get acquainted with the technology of Izolyator high-voltage bushings manufacturing, 2nd on L - Deputy R&D director of SZVI, Yuri Shumilov Eng.D. A



## PULSE OF THE COMPANY

### Julia Turina, Human Resources Manager at Izolyator

Professional and close-knit team of like-minded, committed to common mission and sharing universal and corporate values people is the sort of atmosphere that we manage to preserve and develop.

Today we are committed to continuous development, training and staff development both in specialized educational institutions and within the company. Certification of managers and specialists of the enterprise is regularly conducted, just as we keep working with the succession pool candidates in order to ensure the most effective application of the competencies of the personnel of our company.

In 2019, the training was organized at educational institutions for 22 specialists and managers of the company, 52 specialists were trained in the process approach, 16 people - in supply chain management.

More than a hundred specialists and managers passed occupational safety training and knowledge testing involving testing by an IGL inspector, 2 managers - civil defense and emergency situations, 24 employees - a fire-technical minimum.

10 workers of production shops of the enterprise were trained in related professions and 41 workers - in worker specialties. 74 employees of the company passed training with exams in the state supervisory authorities.

During this year, 16 students of specialized universities completed internships at the enterprise, including 2 students of the National Research Institute MPEI, 2 students of the National Research Technological University MISiS, 1 student of the All-Russian Academy of External Ministry of Economic Development of the Russian Federation, 1 student of the Ryazan branch of the Moscow Polytechnic University and 10 students of Krasnogorsk College.



### *The staff succession and development program of the company was highly praised by company management and the team*

Currently under the federal program "Older Generation" 16 employees of the enterprise of pre-retirement age are trained in English language.

In addition to employee training and development, HR administration and documentation support of the enterprise constitute an important part of our work. In the IV quarter of 2019, our company was tested with an assessment "Excellent" in maintaining military records, the correctness and completeness of the reservation of citizens staying in reserve.

Much attention was paid to succession planning of the company this year. Personnel reserve is specially formed group of high potential staff members created on the basis of established criteria that possess necessary professional, business and moral-psychological qualities for promotion and who have positively proved themselves in their positions, who have undergone the necessary training and are intended to fill vacant posts.

The main task of developing a talent pool is ensuring quality continuous multilevel training of highly qualified personnel for the company. The program personnel reserve of the Izolyator plant can now announce its first graduates:

- Ilyin D.N. - appointed to the post of chief transport workshop;
- Karasev D.E. - appointed to the post of Head of Procurement department;
- Smurygin M.A. - transferred to the position of master;
- Goncharova M.V. - transferred to the position of manager in the procurement department.

Currently, we are actively working on the implementation of the project to create the Corporate University of the company and create a strategic and operational personnel reserve.



General Director of Massa Ltd Sergey Moiseev is congratulating HR team staff members with the Professional Day of Human Resources Managers



# Lifelong Learning is the Key to Success



Training of managers and specialists of Izolyator plant under the program Process Approach. Building a process evaluation system. Identification of key performance indicators and efficiency of processes and subprocesses of an integrated management system of quality, ecology, labor safety and health protection

In accordance with the Action Plan for the processes reengineering of integrated quality management system of ecology, safety, labor and health protection there was a training organized for managers and specialists of the enterprise under the program "Process approach. Building process evaluation systems. Identification of key performance indicators and the effectiveness of IMS processes and subprocesses" in November.

In October, 2 employees of the enterprise - Deputy Director of Quality Marina Vladimirova and the Head of the development and quality control of management systems Tatyana Simakova were trained in LLC TKB INTERSERTIFICA



The training of Izolyator employees is systematic and continuous

## First Aid Skills Give Confidence



The medical worker of the Izolyator plant Tatyana Panyukova trains the employees of the enterprise in providing first aid

At the Izolyator plant, classes were held to train employees of the enterprise in practical skills in providing first aid.

First aid training is conducted in accordance with the standards of the Labor Code of the Russian Federation and the Order of training on labor protection and verification knowledge of labor protection requirements for workers and organizations approved by decree of the Ministry of Labor and Social Development of the Russian Federation and the Ministry of Education of the Russian Federation in 2003.

The course of theoretic and practical classes was delivered by the medical specialist of Izolyator Tatyana Panyukova. In the result, the staff members of Izolyator plant learned the algorithms of rendering the first aid. They also learned to evaluate the condition of injured persons, administer first aid at trauma, wounds and bleedings and learned about ways to improve the human body.

Knowledge and skills of first aid gives confidence to the actions of the employee in various extreme situations and can play a crucial role in saving human life. ■

## No Misfortunes, Ever

Fire safety routine The next scheduled fire safety drill took place at the Izolyator plant in October. Assistant General Director on Security Boris Sobelman ran the exercise.



Assistant General Director on Security Boris Sobelman is giving the task for the fire safety drill to Izolyator plant employees

According to the exercise plan, the staff of the washing section of the mechanical shop studied and practically worked out the algorithm of actions when one of the spray booths ignites. Specialists of the energy-mechanical department from the electricians staff on duty were involved in the class, who practiced operational shutdown of emergency room power supply. ■



# 54 | For Those In the Beginning of the Way



Students of Istra branch of Krasnogorsk college passed a practical training at Izolyator plant

► Students of Istra branch of Moscow region Krasnogorsk college at the practical training at Izolyator plant



◄ The mentor of the trainees - the mechanical shop foreman Ruslan Zaurbaev received high praise from the trainees

► Thoughtful mastery of profession - the key to the future success





# Always Welcome Our Future Specialists!



Izolyator received the visiting excursion for magister students of the Department of Physics and Technology of Electrical Engineering materials and components of the Institute of Electrical Engineering of the National Research University MPEI

► Participants of the visiting excursion to Izolyator plant for magister students of the Department of Physics and Technology of Electrical Engineering materials and components of the Institute of Electrical Engineering of the National Research University MPEI



► The magister students of the Department of Physics and Technology of Electrical Engineering materials and components of the Institute of Electrical Engineering of the National Research University MPEI are getting familiar with the history of Izolyator plant in the corporate museum of the company



▲ Alexander Slavinsky is acquainting the magister students with promising Izolyator products

▼ Lead Technical Support Specialist Victor Kiryukhin is addressing to magister students





# 56 | Partnering With Universities — Working With Prospects



An opening ceremony of Izolyator plant's classroom at the Moscow Power Engineering Institute on the occasion of the Knowledge Day and the start of new academic year was held.

► Opening of the classroom of Izolyator plant at the Moscow Power Engineering Institute, L-R: CEO at Zavod Izolyator LLC Alexander Slavinsky, MPEI's President Nikolay Rogalev and Deputy Minister of Energy Yuriy Manevich

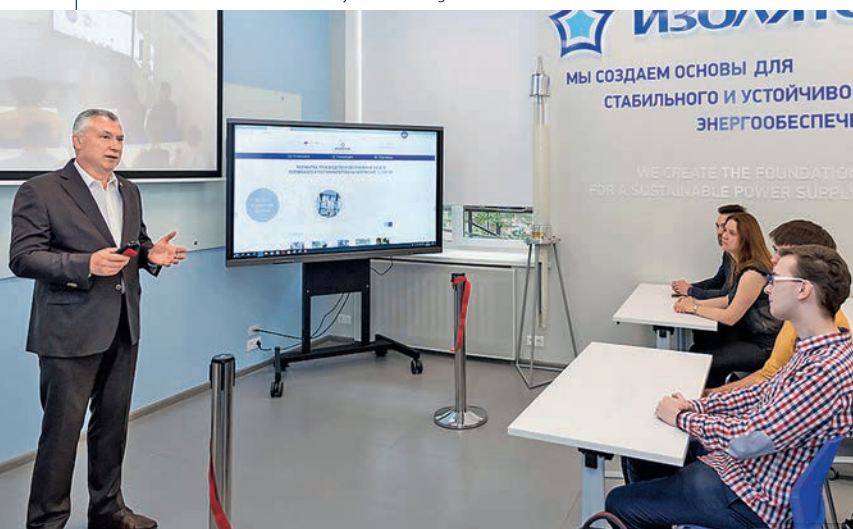


► Entrance to the classroom of Izolyator plant at the Moscow Power Engineering Institute



▼ Alexander Slavinsky is addressing to the students of MPEI

▼ Students master a new modern classroom of the Izolyator plant





Chief Executive Officer of Zavod Izolyator LLC, Alexander Slavinsky met with students of the National Research University of Electronic Technology (MIET). In 1985, Alexander Zinovievich being in-service graduated from the Department of Evening Studies of the Physics and Technology Faculty of MIET with the qualification of engineer-physicist.

► Talks at MIET, L-R: Alexander Slavinsky, Vice-Rector for Research at MIET Sergey Gavrilov and Vice-Rector for International activities and work with youth at MIET Dmitry Kovalenko



◀ Alexander Slavinsky is addressing the students of the National Research University of Electronic Technology with a welcome word



▲ Alexander Slavinsky and students of the National Research University of Electronic Technology at the lecture-conversation 'From formula in lecture notes to formula of success'

▼ Izolyator plant virtual tour for students of the National Research University of Electronic Technology





# 58 | In a Friendly Atmosphere

► Participants of the friendly volleyball match MIET faculty team and Izolyator plant team



On 12 December, a friendly volleyball match was held in the sports hall of the Izolyator plant with a team of faculty members from the Moscow Institute of Electronic Technology. The match is dedicated to the 12th anniversary of the launch of the new Izolyator production complex in Pavlovskaya Sloboda, Moscow Region.

This time it was a return visit: in November of this year, the CEO of Izolyator Plant LLC Alexander Slavinsky, a graduate of MIET in 1985, held negotiations with the university's

administration and met with students of MIET.

The volleyball team of MIET staff members arrived at the plant, accompanied by the national cheerleading institute team. Before the match, Alexander Slavinsky introduced the guests to the main milestones of the century-old history of the enterprise, its traditions and today's achievements.

A tour of the production facility was organized, where visitors were presented with advanced industrial technologies for the

manufacture of modern high-voltage equipment. The main event of the visit - a friendly volleyball match was held in a dynamic and offensive manner.

Graceful and sparkling performances of the MIET cheerleading team gave a special flavor to what is happening on the playground. And, of course, what a competition without fans, whose energy was transmitted to the players throughout the match. The friendly meeting on volleyball ended with a well-deserved victory for the guests.

▼ A vibrant performance of the MIET cheerleading team



▼ MIET faculty team and Izolyator factory team greet each other before a friendly match





► The select team of Izolyator is attacking



▼ Struggle over the net



▼ Fans are completely absorbed in an exciting game



▼ Izolyator in defense



▼ The winner's cup is awarded to the MIET faculty team





## OUR PARTNERS

# We appreciate all our partners



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



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



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



Kazakhstan Electricity Grid Operating Company - KEGOC was established in accordance with the decree of the Government of the Republic of Kazakhstan in 1996. KEGOC is a system operator of the Unified Electric Power System of the Republic of Kazakhstan.



Gazprom is a global energy company. The main areas of activity are geological exploration, production, transportation, storage, processing and sale of gas, gas condensate and oil, the sale of gas as a motor fuel, as well as the production and marketing of heat and electricity.



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



Saudi Electricity Company (SEC) is a state-owned electricity company with a monopoly on the production, transmission and distribution of electricity in Saudi Arabia.



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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





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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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

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



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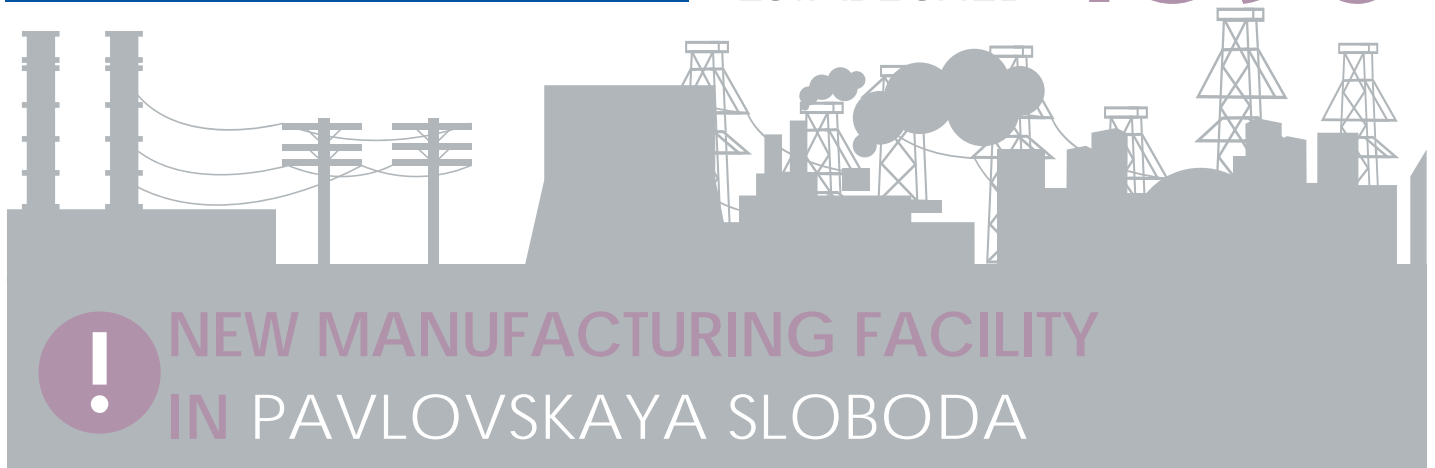


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