

IZOLYATOR

Established in 1896



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Corporate Edition

Izolyator

Quarterly

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25 years of creation!

**DR. ALEXANDER SLAVINSKY,
CHIEF EXECUTIVE OFFICER OF ZAVOD IZOLYATOR LLC,
HEAD OF CIGRE NATIONAL STUDY COMMITTEE D1**



April 2020 marks 25 years since the day when the Chief Executive Officer of Zavod Izolyator LLC, Dr. Alexander Slavinsky headed the Izolyator plant.

In the difficult conditions of the 1990s the young, energetic leader immediately took a firm course towards the powerful and steady development of the Izolyator plant. It takes time to simply list those comprehensive qualitative transformations through which the enterprise has successfully passed over the past quarter century.

Alexander Zinovievich told the BUSINESS-DIALOGUE Magazine's reporter about the plant's history, the traditions and principles of its development and management.

- Alexander Zinovievich, you have managed the plant since 1995. What traditions help the company to retain leadership?

- Our whole history suggests that the main thing in development is investment.

At the very beginning of the journey at the end of the 19th century, the founders of the plant who were merchants already at that time understood that the best way to invest capital was to constantly master new things: not only equipment and technologies, but also management methods.

Coming into the lead of the enterprise, I continued to implement this principle. During the difficult period of the country's transition to a market economy, the production was reconstructed and we renewed the product range, creating new designs of electrical insulating technology.

A large amount of work has been done in terms of labor optimization. I'd like to note right away that the staff was pleased with the changes. We offer employees to master related professions, if a person really wants to develop and is ready to take on more functions.

- What is the secret of successful competition of the enterprise with international manufacturers in foreign markets?

- There is no such secret. Domestic and foreign markets are not fundamentally different. Except for some norms, the rules are the same: work, develop production and technology, try to understand what the customer needs.

- Do you always know what to offer your client?

- The main thing for us is to delve into his needs, because the customer does not always know how advanced a solution should be and what kind of products he needs. Therefore, we always work ahead of the curve. We are trying to be one step ahead not only in Russia, but also in other countries.

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

- How do you manage to work ahead of the curve?

- In the mid-2000s, we realized that the plant would no longer be able to work effectively at the existing premises. We started construction of a high-tech complex of the latest generation with an area of about 24 thousand square meters for the production of modern high-voltage equipment in Pavlovskaya Sloboda, Moscow Region.

Today, we have a conveyor production with two testing laboratories for high and low voltage. You will rarely find such a set of equipment. We simulate the voltages that the products will have to withstand during operation, including testing with lightning impulse voltages using a pulse voltage generator.

In addition, we are conducting research work - studying the properties of new materials and non-standard effects on them.

- You do not stop there, do you?

We have 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 enterprise was the creation of Izolyator-AKS, a new production of cable accessories, and the joint Russian-Indian enterprise for the production of high-voltage bushings Massa-Izolyator-Mehru - this is a big step and I am sure that it not only illustrates our achievements, but also paves the way for new accomplishments.

Thanks to the development of a joint venture for the production of high-voltage bushings with modern RIP insulation in India, there is a possibility for Russian advanced technologies to enter not only the market of India, but also the entire Southeast Asia.

Among our partners, potential ones and those with whom joint projects are already underway, there are representatives of Saudi Arabia, China, Syria, Turkey, Iran and many other countries.

- What innovative projects are being implemented now?

- In the framework of the High-Voltage Bushings Roadmap until 2025, we created new advanced designs of high-voltage bushings with moisture-resistant solid internal RIN insulation. To date, bushings with this insulation have passed the whole range of necessary tests, relevant certification and are already undergoing trial operation at Russian and foreign power facilities.

«Live, study, grow on yourself, and most importantly - work hard, friends! Work as hard as you can, and then a little more than that! Then everything will become real for you»

This is a unique technology, a truly innovative product that has properties aimed at maximum equipment efficiency. By eliminating paper from the solid insulation of the bushings, we significantly increased their moisture resistance and thereby significantly reduced requirements for the storage conditions of the bushings.

Izolyator plant took part in the project of the Super-Ox, which created a 220 kV three-phase HTSC-CL, which is installed at the Moscow substation Mnevniki. Not a single company in the world undertook to make bushings capable of working in liquid nitrogen at a temperature of minus 196 °C, and we did.

Today, we do not just know how to produce competitive products, we can work in the market, conduct marketing activities, establish relations with foreign consumers, and expand the boundaries of influence.

- Does it require a high level of technical training?

- Of course. Now production and technology are at the stage of development when workers need a higher technical education. If a person has a good base, then he will certainly be able to use it in production.

Today, Izolyator is a reliable partner and official supplier of the largest Russian and foreign energy companies and manufacturers of power equipment. The plant is a member and base enterprise of such authoritative organizations in electrical engineering as the International Council on Large Electric Systems (CIGRE), Academy of Electrical Sciences of the Russian Federation, International Association of Business Cooperation on Transformers, high-voltage equipment, electrical ceramics and other components and materials (TRAVEK).

All these are the natural results of the 25-year journey under the leadership of Alexander Slavinsky with the continued support of like-minded colleagues, unconditional trust and true respect of the entire staff.

We warmly and cordially congratulate Alexander Zinovievich on his professional and personal anniversary! We are sending wishes of new accomplishments, achievement of all goals, inexhaustible energy and good health!



« The fuel and energy complex should make the maximum contribution to the socio-economic development of our country, help strengthen Russia's position in the global energy industry

Mikhail Mishustin
Prime Minister of the Russian Federation

Rosseti took special control of reliability of the power supply to key infrastructure and social facilities in Russia



Beginning 24 March, Rosseti are taking special control of reliability of the power supply to key infrastructure and social facilities in

the area of responsibility of the company. The Head of the power grid holding company Pavel Livinsky signed the order.

Rosseti group does everything possible to minimize risks of a new coronavirus infection spreading in Russia as well as other respiratory diseases among its employees, their families and among customers. At the same time, our companies create the most comfortable conditions for life and work of all our consumers in a difficult time, "emphasized Pavel Livinsky.

The power supply to medical institutions, call-centers receiving applications from residents, facilities that ensure public

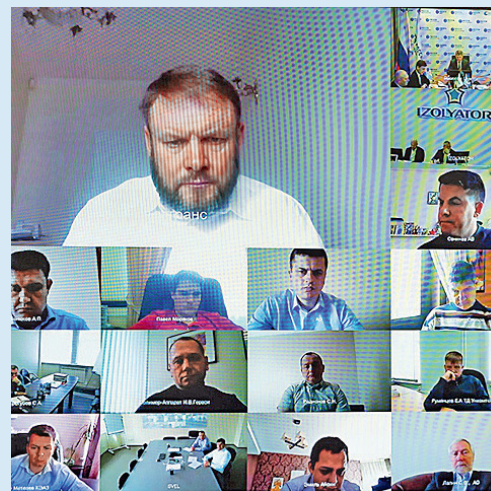
services, cellular communications and internet access, computational equipment has been taken under special control. The company pays special attention to the organizations rendering online services (banking, e-commerce, online cinemas) and large logistic operators and courier services.

Director general of PJSC ROSSETI Pavel Livinsky also instructed to conduct an analysis of the reliability of power supply schemes and unscheduled inspections of power grid infrastructure in order to identify and promptly eliminate defects and deficiencies. ■

Meeting of Rosseti with suppliers



Alexander Savinov and Alexander Slavinsky at the video conference meeting of the Rosseti Center and Rosseti Center and Volga companies with suppliers



Remote meeting participants

Izolyator plant took part in a video conference of the power grid companies Rosseti Center and Rosseti Center and Volga Region with suppliers - manufacturers of electrical equipment and materials. The meeting, which took

place in a videoconference mode, addressed the issues of stability of supplies of electrical equipment and materials in the context of the spread of coronavirus infection COVID-19. The meeting was attended by CEO at Zavod

Izolyator LLC Alexander Slavinsky and Director of Strategic Sales Alexander Savinov.

The Izolyator plant continues to operate normally and fulfills its obligations to customers in full. ■

Rosseti: **2.35** mln km of ETLs, **507** thou substations with transformer capacity over **792** GVA



Alexander Slavinsky (R) and Dmitry Abbakumov (3rd on L) at the joint meeting of the State Duma and the Russian Engineering Union on issues of energy security of the state

Joint Meeting of the State Duma and the Russian Engineering Union

On 5 March 2020, Izolyator took part in a joint meeting of the State Duma and the Russian Engineering Union.

Energy security of the state in view of current problems and prospects of the fuel and energy complex, was discussed at a meeting of the Expert Council on power equipment engineering, electrical and cable industries by the Committee on Economic Policy, Industry, Innovative Development and Entrepreneurship of the State Duma and the Commission on Development and Implementation of Technologies in areas of energy efficiency and energy conservation of the Union of Russian Machine Builders.

The doctrine of energy security of the Russian Federation as part of the system of ensuring national security was approved by Decree of the President of the Russian Federation Vladimir Putin on May 13, 2019. It defines the main directions of threats, challenges and risks of energy security, the ability to counter which ensures the security of the country's economy from threats to national security in the energy sector. Among them are ensuring technological independence of the fuel and

energy complex of Russia and increasing its competitiveness, especially considering the tasks of digitalizing the industry.

Participants in the meeting noted that despite the measures taken by the state, domestic manufacturers of power equipment and components continue to feel serious dependence on foreign suppliers. According to experts, in a number of market segments the share of imported products reaches 80%. That is why the strategic goal today is the priority of the domestic market. Until recently, the Russian power facilities in terms of equipment were actively using among all the resources of foreign equipment manufacturers. However, given the overall effort, the situation is starting to change.

Given the state's current energy strategy, the main issue for all sectors is the problem of training personnel who are ready to work under the conditions of upcoming renovations. In this regard, it is important to build up close cooperation with universities and research organizations that can hear the needs of manufacturers in terms of training specialists. ■

100 Years to GOELRO

On 21 February 1920, the State Electrification Commission of Russia (GOELRO) was formed, headed by a well-known revolutionary and Soviet party activist and concurrently a scientist, power engineer and economist Gleb Krzhizhanovsky (1872–1959) - one of the closest associates of Vladimir Lenin.

The commission developed a plan of the same name, which was implemented under the motto: "Communism is the Soviet government plus the electrification of the whole country."



The grinding shop of Izolyator plant in 1924

The GOELRO plan was designed for 10-15 years and provided for the construction of 30 regional power plants with a total capacity of 1.75 million kW. Among the first, it was planned to build Kashira, Nizhny Novgorod and Shatura thermal power plants, as well as Volkhov and Dnieper Hydroelectric power stations. One of the main technical innovations of the GOELRO era was the "Illich lamp" - the very same incandescent lamp that is still in use today.

In this regard, the Izolyator plant was tasked with the most difficult objective - to quickly master the production of porcelain insulators for high-voltage power lines.

Solving this problem, in 1922 - 1924, the plant's design bureau developed the first designs of wall bushings, and in 1927 the plant mastered the production of suspended insulators. Over the ten-year period from 1919 to 1929, the output increased almost 100 times. ■

8 | The 17th Conference of Dimrus



On 12 – 14 February 2020, Izolyator participated in the 17th annual Conference of Dimrus “Methods and means of control of HV equipment insulation condition” in Perm. The key topic of this year’s conference is “Diagnostics and monitoring of high-voltage equipment. Modern technical and software solutions”. More than 200 specialists from Russia, CIS and non-CIS countries took part in the conference. These are the cities: Perm, Yekaterinburg, Cheboksary, Novosibirsk, Moscow, Snezhinsk, Kolomna, Obninsk, St. Petersburg, Novocheerkassk, Taganrog, Krasnodar, Sulz (Austria).

▼ Izolyator’s report on the results of CIGRE colloquium’s in Croatia and India in 2019



▼ Vladimir Ustinov at the podium of the 17th conference of Dimrus in Perm

▼ Marina Vladimirova actively engaged in all activities of the conference



◀ Partner meetings at the 17th Conference of Dimrus in Perm



◀ Vladimir Smekalov, Head of the Reliability and Assets Management Center of the Scientific and Technical Center of FGC UES (left) at the meeting with Izolyator representatives

▶ Exhibition of equipment during the 17th Conference of Dimrus in Perm



▼ The latest and most demanded diagnostic equipment is exhibited

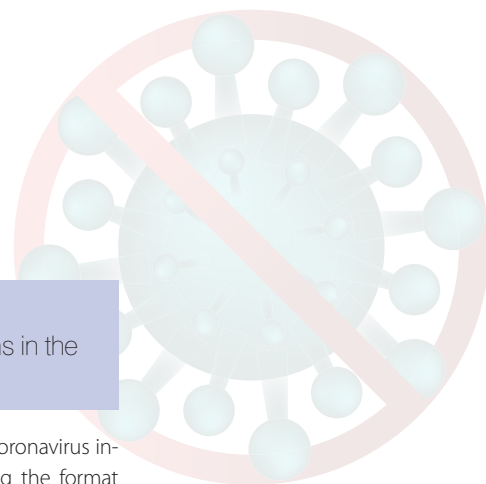


▼ Much of the exhibition is a practical result of the import substitution policy implemented at the state level in Russia



New reality - new challenges

On 25 March 2020, in his address to the nation, Russian President Vladimir Putin announced the introduction of unprecedented measures to protect Russian citizens in the country from the epidemic of a new coronavirus infection COVID-19.



The epidemic of coronavirus infection is changing the format of work, making adjustments to the usual business processes. How do manufacturers of power equipment feel in current conditions? What lesson does COVID-19 teach the business community? Alexander Slavin, Chief Executive Officer of Zavod Izolyator LLC answers these and other questions in an interview for @rosseti_official.



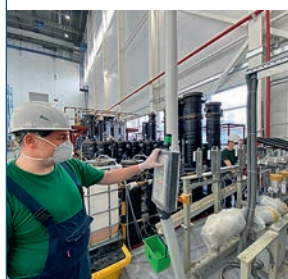
Experts call the situation with COVID-19 the largest global economic catastrophe since the World War II, while somebody call it a perfect storm. How does Izolyator assess the situation?

- The history of the Izolyator plant totals more than 120 years. At different times, the staff of the enterprise survived several revolutions and more than one world war, the difficult years of the restoration of the national economy, the eras of change and different socio-economic systems in the country. There is no doubt that Izolyator, with the support of our strategic partners, enterprises of the Rosseti Group, will withstand this situation with COVID-19 with flying colors.



Are there risks of disruptions in equipment supplies due to the pandemic?

- The situation has sharply shown that the country's economy depends on the stability of domestic manufacturers. Following the problems of equipment supplies from abroad related to political sanctions, paralysis of many industries in Asia and Europe came due to COVID-19. Rosseti has carried out a systematic work on import substitution since 2018 and was able to build a pool of reliable manufacturers that cover all the basic needs of the company. I believe that in current situation, neither the maintenance nor the critical part of the Rosseti investment program will suffer.



Is the government's bid on Russian suppliers justifying itself?

Everyone witnessed that the country's energy and economic security is directly dependent on the effective work of domestic manufacturers of power equipment.

How are production and the company as a whole working now?

Since March 18, the enterprise introduced a high-readiness regime. Currently, all services, production and administrative staff are working full time. The electric power industry is one of the key sectors for providing the country's energy and economic security. It is logical the enterprises that ensure it should not stop for a minute. We are ready to provide our partners around the clock with any information about our products and the operation of the plant in the current conditions! Everything necessary has been done to protect the health and life of employees. Izolyator plant fulfils the obligations for customers in full.



The Rosseti Group is the anchor customer of Izolyator. How important do you consider such interaction right now?

We are grateful to Rosseti for the trust and support they are giving our company. Understanding the importance and responsibility, Izolyator plant does and will do everything to be worthy of this trust. In our person, Rosseti group has a dedicated, reliable supplier of modern high-tech products with confirmed track record of cooperation exceeding 100 years. The Rosseti company gives light to every home. The Izolyator plant, its staff are proud that there is also a piece of our input in this big work.



Take care of yourselves and your loved ones!



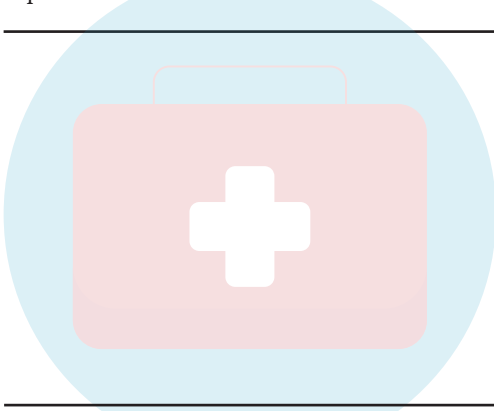


Pavel Livinskiy
CHAIRMAN OF THE MANAGEMENT BOARD,
DIRECTOR GENERAL OF PJSC ROSSETI

“For the Rosseti group, the health of employees and their relatives and loved ones have always been and remain in the first place. We implemented new formats of work, employees are provided with various means of prevention and protection against the infection. I would like to address the production and operating personnel, who, as always, under any conditions is at the forefront, providing

reliable and quality power supply to all consumers. Your work every day brings light to the homes of Russians, hospitals, housing and communal services, transport and logistics centers. Thanks to you, the country continues to live, and the infrastructure and socially critical infrastructure operate stably.

Rosseti is a large family of wonderful, close-minded people and true professionals. There is no doubt that we will pass the test with honor and we will come out endowed with unique experience and wisdom”



Alexey Kishko
CEO, SVEL Group

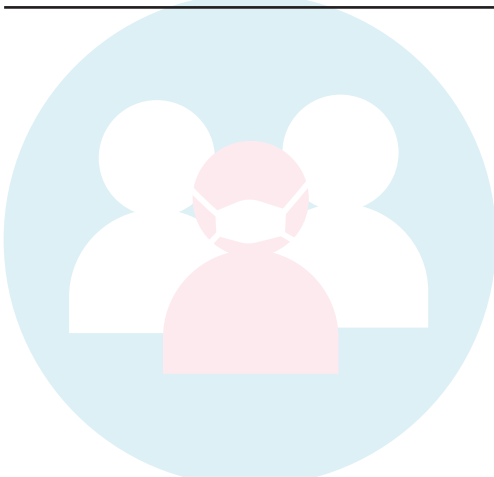
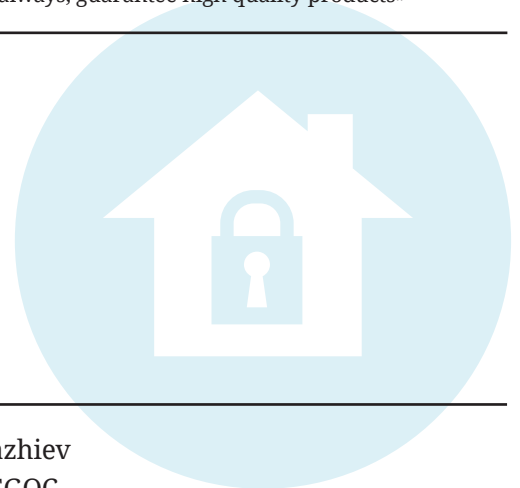
«SVEL Group calls to remain calm and not give in to panic due to external circumstances. We guarantee that we will do everything possible on our side to fulfil all our obligations to customers in full.

A crisis is a time of concern. We take care of stability of our partners and, as always, guarantee high quality products»



Andrey Vagner
CEO, T Plus PJSC

«T Plus continues its work under no timeline - as before, we deliver heat, light and hot water to millions of our customers in the Urals and in the Volga region. Our activity does not stop 24 hours a day, regardless of changing situation. The company understands how serious and extraordinary the circumstances are, so we pay a special attention to the needs of consumers these days»



Bakytzhan Kazhiev
Chairman, KEGOC

“Unfortunately, the infection is spreading fast and reached almost all regions of Kazakhstan. Due to this fact, the state emergency committee took a decision on the enhanced measures, primarily in the cities of Nur-Sultan and Almaty, as the main epidemic foci. The measures, undertaken by Akimats of these cities, are believed to be justified and timely.

Our company is an enterprise ensuring the country activity by reliable power supply to enterprises and the population. In such a difficult time, when a state of emergency exists, the importance of uninterrupted energy supply is growing invaluable!”



Alexander Chuvaev
CEO, Fortum

“All power facilities of the company are now operating normally. Over the past week, we took some precaution measures, aimed at our employees’ and contractors personnel’s health protection and also developed an action plan that will allow maintain critical business processes in case of expansion of epidemiological measures, undertaken by the authorities to prevent distribution of COVID-19 in the cities of our presence»



Monitoring and diagnostics of high-voltage equipment following the results of colloquiums in Croatia and India



In October 2019, the 5th International CIGRE Colloquium 'Transformer Research and Asset Management', was held in Opatija, Croatia. And, in November - the joint Colloquium «On latest trends and innovations in A2, B2 and D1», in New Delhi, India. This article will provide an overview of keynote speeches on the topics of Study Committee D1 "Materials and Emerging Test Techniques".

Today, it is absolutely clear that power industry is a critical global sector, and transformer and reactor equipment, which plays an important role in the transmission and distribution of electricity, must be safe and reliable. Significant growth in the transformer industry is faced with the problem of transformer aging, issues of monitoring and their diagnosis. The subjects of the presented works cover the whole spectrum of problems of the functioning and development of energy systems and electric power markets.

In the report "Future Trends in Online Monitoring of Transformers," authors T. Auronen, T. Hanninen (Finland), I. Murat, S. Keitoue (Croatia) presented trends in online monitoring of transformer equipment based on the latest developments and in accordance with the concept of maintenance of power transformers. Possibilities for reliable online monitoring of transformers already exist, but there are several limitations to achieving a true goal, namely transformer monitoring that supports maintenance based on operating conditions.

In the near future, the existing monitoring systems will be supported by advanced artificial intelligence and will process all the data collected from the fleet of transformers, analyze them in real time, provide equipment condition assessment and recommend maintenance. This will not only reduce maintenance costs and increase the reliability of the transformer, but also provide feedback to manufacturers to create even better and more reliable units in the future.

The report "Surge analysis in power transformers registered by the surge monitoring system" B. Filipovic-Grcic, B. Jurisic, S. Keitoe, I. Murat, D. Filipovic-Grcic, A. Zupan, (Croatia) provides an example of using an online power transformers monitoring system for measuring overvoltages at the bushing of the transformer. The report focuses on the analysis of overvoltages caused by lightning strikes recorded at the terminals of a power transformer.

The registered overvoltages, their amplitudes and frequency spectrum are analyzed. The data collected includes the number, amplitude and duration of the recorded transient overvoltages and can be used to assess the transformer insulation condition and evaluate the "health index". In the report "Measurement and modeling of lightning surges in power transformers" B. Jurišić, T. Župan, G. Plišić, B. Filipović-Grčić, G. Levačić (Croatia), Xemard (France) there are three models of broadband transformers that have been



Fig. 1 Connecting to the measuring tap

studied in the high-voltage laboratory, the results of the simulation of transients recorded at the substation 220/110 kV are presented, and their comparison with the results of measurements in the laboratory is made.

Emerging overvoltages must be constantly measured to detect changes in the bushing capacitance and dielectric loss tangent (C , $\tan \delta$). The connection to the measuring tap of the high-voltage bushing of the transformer and the transient voltage monitoring system are shown in Figure 1. The connection to the measuring tap shown in Figure 1 is made using

a specially designed adapter, while the connection between the adapter and the impedance matching circuit is done using a coaxial cable.

The report "Identification of Surges and Transients in Online Bushing Monitoring Mode" W. Gil, W. Masłowski, P. Wronek, (Poland) demonstrates that the operational control modules of bushings must collect statistical information about the type and amplitude of overvoltages. Such information can help in resolving the issue of frequency of technical service, changes in operating conditions or replacing the bushing.

Overvoltages and transients are often the cause of rapid failure of bushings and the occurrence of dangerous resonant phenomena in the transformer windings. Bushing control systems based on the "voltage method" can be successfully used for this purpose.

The report "Using a 15 MVA 33/11 kV Mobile Power Transformer to Improve



Fig. 2 Visual effects on different bushings. OIP with ceramic insulation (L), OIP with composite insulation (mid) and RIP with composite insulation filled with gel (R)

Network Reliability and Availability” by M. F. M. Rozi, A. Saadin, I. Hashim, Z.A.Bakar, (Malaysia) studies design criteria of mobile power transformers to ensure the efficiency and reliability of operation, as well as recommendations for working with it. Many energy companies in the world use mobile power transformers to increase reliability and network availability for such purposes as scheduled maintenance, forced shutdown in case of transformer repair, power recovery due to transformer failure and temporary power pending completion of repairs at the substation.

Mobile power transformer is one of the latest technologies used to ensure uninterrupted power supply to consumers. Mobile power transformers are equipped with a prime mover for uninterrupted operation and to restore power in short time.

In the report “Fire prevention and protective aspects from sparking in high-voltage transformer bushings” by L. Jonsson, R. Hedlund, A. Andersson, H. Skoogh, P. Mindikowski, M. Försth, (Sweden), the authors study the thermal effects on the ignition of various materials (epoxy coating, silicone rubber, cable insulation, oil, etc.).

High-voltage bushing is one of the main components in electrical networks, the failure of which can have serious consequences. Although a breakdown between phase and ground can have many reasons: both failure of the bushing itself, and due to electrical, mechanical and thermal influences arising in the power system. A breakdown in the bushing often leads to an explosion.

Bushings were designed specifically for the arc gap, located in a highly stressed area, where the probability of internal breakdown is high, based on the experience of many failure analyses. Exact test parameters and electrode shape were established based on detailed studies and experimental tests and are designed in such a way that the arc burns for an exact time, thereby creating excessive internal pressure, arising in case of actual failure.

Findings of the study show that the thermal effect of two oil-filled OIP bushings affects other components: epoxy coating, silicone rubber and cable insulation may not necessarily ignite, but at least they will be seriously damaged, and the oil released from the main tank of the transformer may ignite.

On the other hand, resin-impregnated bushings with a composite insulator (RIP) have a heat flux that is significantly lower than oil-filled bushings, which indicates a significantly lower impact on the components of the substation.

In the report “Checking the reliability of electrical equipment using ultrasound diagnostics” by Manohar Chidurala from UE Systems, Inc. issues of ultrasound technology and its application for testing electrical equipment, such as transformers, switchgears and other substation equipment are discussed.

When ultrasound and infrared light are used together, it is more likely that anomalies can be detected that could potentially be skipped using only one technology.

In the report, “Data Analysis for Decision Making on Preventive Replacement and Assessment of the Condition of Obsolete Assets,” R. ROSS and P.A.C. YPMA, (Netherlands), the authors provide an analysis of data on preventive measures to assess the condition of transformers. Service styles are discussed: corrective, periodic, conditional, and risk-based service.

In the report «Transformer failure modes during short circuit» Prabakara n T, B M Mehra, Sum bul Munsh i, Hima ngshu Roy, Saumitra Patha k and Vipul Sharma Central Power Research Institute, STDS, Bhopal some typical cases of transformer failure during short circuit tests are detailed.

All structural elements of the transformer are checked during tests for resistance to short circuit currents. In addition to this, the design process must also take into account the forces and voltages generated by the short-circuit current. Transformer tank contains oil that may catch fire or the tank may burst due to strong pressure inside the tank caused by a short circuit current, which may cause

damage and malfunction of neighboring equipment. Therefore, short-circuit transformer testing is a method of improvement of the transformer reliability. Following the results of the reports of the Colloquiums, the following key issues can be accentuated:

- the effect of synthetic ether used as insulating liquid on the electrical and thermal design of the power transformer, problems of compatibility of materials and differences in the production process;
- short circuit test for high-voltage transformer bushings;
- measurement and modeling of lightning overvoltages in power transformers;
- basics of calculating transformer parameters for high-frequency transients using finite element method (FEM), and the proposed method of equivalent circuit transformation based on the analysis of transient measurement results;
- determination of natural resonant frequencies of windings of powerful power transformers;
- identification of overvoltages and transients in the online monitoring mode of high-voltage bushings;
- fire and protective aspects in the bushings of high-voltage transformers of various designs;
- future trends in online monitoring of transformers;
- long-term maintenance strategy for power transformers;
- development of a new philosophy of dielectric testing of gas-insulated HVDC systems;
- modes of transformer failure during short circuit;
- advances in the detection of partial discharges at DC voltage;
- modular DC test systems for testing long DC cables;
- dielectric characteristics and tests of gas-insulated HVDC systems.

Based on materials of report of Dr. A.Z. Slavinsky, CEO of Zavod Izolyator LLC, V.N. Ustinov, Deputy Quality Director

On the path of import substitution

Izolyator is launching 110-500 kV cable accessories production

In April 2019, a new company in the structure of Izolyator, Izolyator-AKS, was incorporated and started operating activities. It combined the functions of development, production, testing and sales of 110–500 kV connecting, end sleeves and coupler plugs.

At the moment, the development stage of an independent cable accessories construct has been completed, a new production site is receiving the latest batches of equipment, installation and commissioning are being carried out. The production, which is scheduled to begin in the second half of 2020, and the testing of couplings will be carried out on the latest high-tech equipment



Stress Cone Injection Molding Machine



Acceptance tests of a 220 kV IKM-245 external end sleeve in the All-Russian Research, Design and Technology Institute of The Cable Industry Test Center in Podolsk

from leading European manufacturers. The production capabilities of the enterprise are able to fully satisfy the needs of the entire Russian market in high-voltage cable accessories, ensuring a deep localization and quality that meets the highest international standards. The key consumers of the company's products will be federal grid companies (Rosseti company), cable plants, transformer plants and switch-gear manufacturers.

For successful and timely implementation of the project, Izolyator-AKS management developed an appropriate program and schedule, and formulated the most important objectives:

- selection of qualified personnel who are able to work in a team and aimed at the result
- development of proprietary (independent) design documentation for high-voltage connectors, terminals and plug couplers, and production of prototypes
- organization, coordination and control of design and construction works of the cable accessories workshop;



220 kV connecting sleeve with screen cable transposition

- selection and purchase of modern production and testing equipment, including molds that meet the highest quality standards;
- organization of acceptance tests, type and life tests of the developed cable accessories;
- sourcing and contracting domestic suppliers of materials and components for cable accessories.

Currently, the company has completed certification acceptance tests of products and is proceeding to conducting type tests for 220 kV voltage class with parallel preparation for 500 kV tests to create a domestic cable system as its input in ensuring the country's energy security. Izolyator-AKS LLC is currently Russia's sole company that has ongoing development in this category on the level and quality that allow proceeding directly to mass production.

The production facilities of the new enterprise are located on the territory of the Izolyator plant.

Despite the difficult epidemiological situation, in parallel with the construction works, Izolyator-AKS employees, under the supervision of the equipment manufacturer, are carrying out a set of works on the assembly, connection and commissioning of commissioning of injection molding machines, which are the «heart» of the new production. This equipment is necessary for the production of silicone semi-conductive and insulating parts,

representing stress cones and control bodies of cable accessories. In order to pass the necessary certifica-

tion already in March 2020, on the basis of the VNIKP test center, a test loop was mounted to conduct type tests for the 220 kV voltage class (cable system: cable of Kirscable and accessories of Izolyator-AKS). Before the start of type tests, acceptance tests were successfully carried out, proving the quality of the design and manufactured prototypes.

In order to maximize localization of production, as well as optimize the cost of production and reduce delivery time, the company ran component-wise market analysis of suppliers for each type of cable accessories. As a result of this work, internal resources were found to organize the production of the most important components at our own production sites, and for most of the remaining positions the company managed to find domestic suppliers.

Given the above, Izolyator-AKS has a high potential to become not only a key player in the market of high-voltage cable accessories and a supplier of the largest energy projects on a federal scale, but also to ensure successful entry into industry markets of neighboring and overseas countries.



220 kV plug-in connectors in a gas-insulated test system

Visit to Mnevnik Electric Substation

Izolyator and SuperOx management visited the 220/20 kV electric substation Mnevnik in Moscow. The visitors examined the substation equipment, HTSC-CLD unit in particular, which was created in close collaboration of SuperOx and Izolyator. The current limiter is an innovative Russian development, unrivalled in its voltage class elsewhere in the world. This is the first superconducting device in the Moscow power system.

It is planned that in the future eight more SFCLs will be installed at the substations of the United Energy Company in Moscow.

The use of SFCL will make it possible to implement a full-fledged ring power supply scheme for the city of Moscow, guaranteeing uninterrupted power supply and shortening the time for technological connection. ■



SuperOx high-temperature superconducting current limiter with Izolyator high-voltage bushings at the Mnevnik electric substation of the United Energy Company in Moscow (photo: United Energy Company)

Working meeting with SuperOx representatives



SuperOx representatives are getting familiar with the technological cycle of manufacturing of bushings at Izolyator plant

A working meeting with SuperOx representatives took place at Izolyator plant.

The first part of the meeting was devoted to the discussion of a significant event that resulted from a great joint work - the ceremonial commissioning of the high-temperature superconducting current-limiting device, which took place in December 2019 in Moscow at the Mnevnik electrical substation of the United Energy Company.

In the second part of the meeting, the parties discussed the organizational and technical aspects of the upcoming work on the creation and joint testing of high-voltage bushings for new current-limiting devices based on superconducting technologies.

Thus, the past meeting marked the beginning of a new stage in the successful and fruitful cooperation of the two enterprises. ■

Developing a comprehensive cooperation



Meeting at Izolyator plant with representatives of the German company Hübers

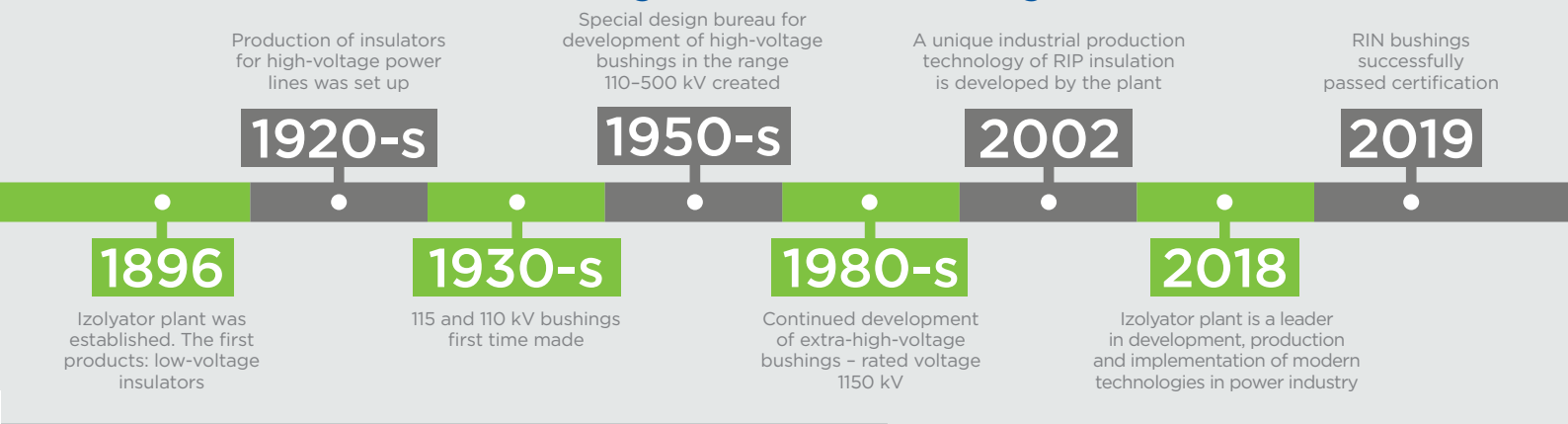
A working meeting with representatives of the German process equipment supplier Hübers took place at Izolyator plant. The purpose of the meeting is support of the partners that are using Hübers equipment by rendering services and developing technologies.

Hübers was represented by Dipl-Eng, Project and Sales Engineer Peter Kats and Dipl-Ing, Sales Management Hanno Steinzen.

Hübers representatives visited the production facility where they examined the equipment, made and delivered under the order of Izolyator plant. At the talks, Hübers demonstrated new developments and technologies and discussed progress of joint projects and directions of cooperation development. ■

INNOVATIONS AND TECHNOLOGIES

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

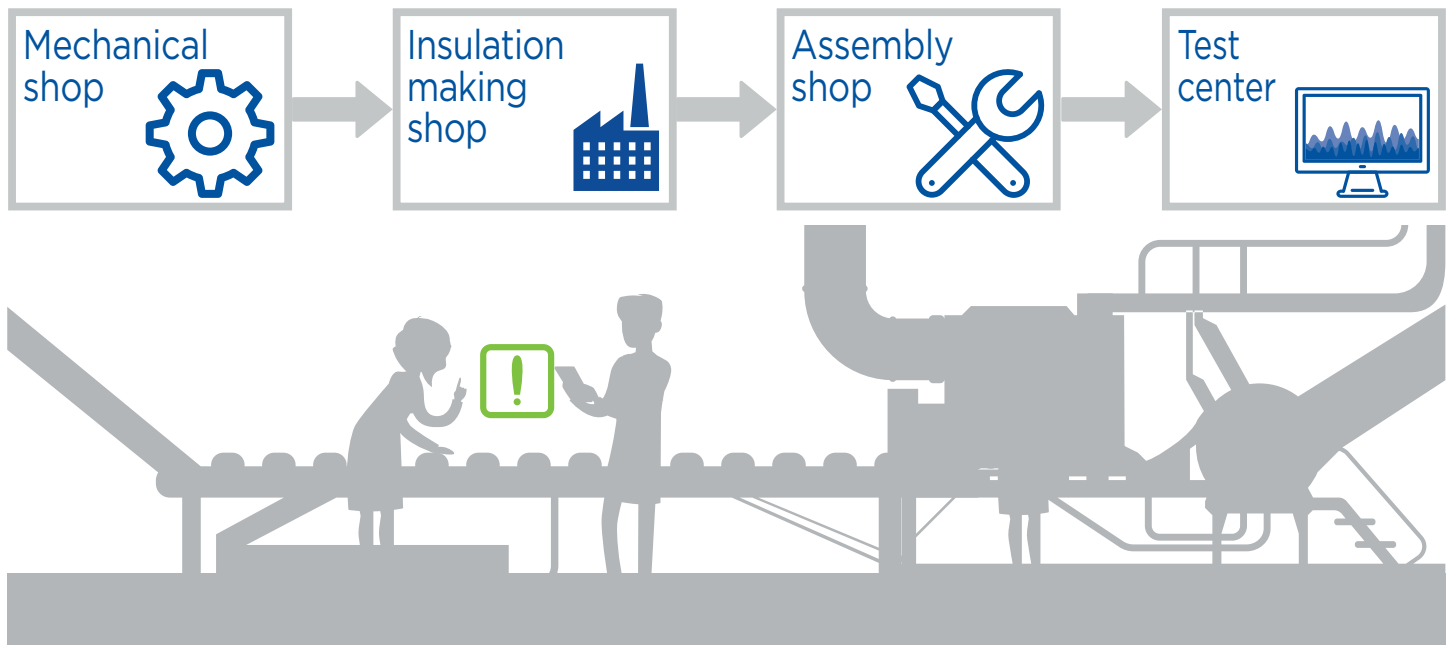


620000 bushings made in the entire history of Izolyator plant

Over **18 years** of experience in production of RIP bushings in 10-750 kV range

2019

RIN bushings a mass produced



2020

Izolyator-AKS launching cable accessories production

Launch of HV RIP bushings production in India. JV Massa – Izolyator – Mehru

Ivan Panfilov, Commercial Director, Izolyator

The current coronavirus pandemic did not leave uninvolved - in addition to hundreds of thousands of cases worldwide, it touched the life of each of us this way or other.

We, Izolyator employees, have identified for ourselves three global objectives, the implementation of which is the top priority for us.

First and foremost, creating the most secure and safe working conditions to ensure the smooth operation of our company, including informing employees of the enterprise and their relatives on ways to prevent new coronavirus infection COVID-19.

Secondly and just as importantly, fulfilling all our obligations in production of high-voltage bushings. Izolyator plant continues to operate normally and fulfill all our obligations for customers in full.

The third task is to develop the investment projects that we initiated in the past year: launch a joint Russian-Indian production of bushings in India and a new cable sleeves production in Russia.

Despite the prevailing unfavorable epidemiological situation in the world, in the 1st quarter of this year we delivered high-voltage bushings to energy companies and electrical companies in more than 10 countries, including power facilities of the Unified Energy System of Russia, Poland, China, Lithuania, Estonia, Azerbaijan, Belarus, Kazakhstan and Moldova.

We continue an active work on launch preparation in India of the production, created by us jointly with the Indian company Mehru Electrical & Mechanical Engineers (P), of high-voltage bushings with solid RIP insulation.

In January of this year, we presented a new joint venture at the International Electrotechnical Forum Elecrama 2020 in New Delhi in India. At the exhibition stand, during the events and on the sidelines of the forum, many meetings took place, where we had an active and interested dialogue with partners and new business contacts were established with potential customers of products and suppliers of materials and components.

Joint participation of Mehru and Izolyator in the Elecrama 2020 Forum became a bright and convincing demonstration of real achievements in introducing advanced technologies in the electrical industry of India, equipping the country's energy sector with modern equipment, and, ultimately, in further strengthening and developing economic cooperation and friendship between the peoples of Russia and India.

Visitors to the stand showed great professional interest for the full-size high-voltage RIP bushing replica demonstrated at the exhibition. The audience received detailed answers and necessary visual demonstration were given to all the many questions regarding advantages and prospects of application, design feature, rules and operating experience of such bushings. A lot of mutually beneficial meetings at the booth, at events and on the sidelines of the forum, took place. We had an active and interested dialogue with partners, set up new business ties with potential customers and suppliers of materials and components.

There were particularly representative and interesting talks with a delegation of the Indian State power grid company Power Grid Corporation of India Limited (PowerGrid), headed by the Chairman and Managing Director of



«The leading positions in development, manufacture and implementation of modern technologies in power industry place a great responsibility on our company»

PowerGrid, Chairman of the Indian National Committee of CIGRE I.S. Jha.

In recent years, Izolyator has carried out a number of large shipment of high-voltage bushings to key power facilities of the state-owned Indian grid company Power Grid Corporation of India Limited. Already today, several thousand high-voltage bushings of various voltage classes produced by the Izolyator plant reliably serve at electric grid facilities in almost all states of India.

The leading positions in development, manufacture and implementation of modern technologies in power industry place a great responsibility on our company. We emphasize that we are ready to share openly the unique accumulated experience with all of our partners, considering it an integral part of our mission - to create the foundations for a stable and sustainable power supply worldwide.

We are very attentive to every feedback received from partners. It is especially pleasant that we regularly receive recommendations from electric grid companies, oil and gas enterprises, transformer plants, as well as partners from around the world.

We are prepared to seek a special approach to every partner, so that all objectives were met on time.

Promoting MIM on the global arena

Izolyator and the Indian transformer plant Mehru Electrical & Mechanical Engineers (P) Ltd., took part in the International Electrotechnical Forum Elecrama 2020 in New Delhi in India. The Massa - Izolyator - Mehru Pvt. Ltd. - MIM - joint venture, created to organize the production of high-voltage bushings with solid RIP insulation in India, was widely represented at the joint exhibition stand.



All the objectives set for the International Electrotechnical Forum Elecrama 2020 in India were fulfilled!



Meeting with partners at the exposition of the joint venture Massa - Izolyator - Mehru



Talks with the top management of the State Indian Power Grid Company Power Grid Corporation of India Limited (PowerGrid), C - Chairman & Managing Director of PowerGrid, Chairman of the Indian National Committee of CIGRE I.S. Jha



Managing Director of Massa – Izolyator – Mehru Sandeep Prakash Sharma) is giving answers to the questions of visitors concerning the advantages of HV RIP bushings



The joint exhibition stand of Mehru Electrical & Mechanical Engineers (P) Ltd. and Izolyator at Elecrama 2020 in New Delhi in India

Andrey Shornikov, Head of International Business Development Department, Izolyator

The new reality that the planet has faced brought most people to their plans and capabilities revision. For ourselves, we determined that there is nothing better and more reliable than to continue working, staying optimistic as our plant does not stop and carries on fulfilling its obligations.

In the first quarter, we continued to send shipments of bushings to our partners in the CIS and non-CIS countries, held a series of productive meetings and negotiations, entered into new high-voltage bushings supply contracts. In March, Izolyator plant was visited by a group of technical specialists from Mehru Electrical & Mechanical Engineers (P) Ltd., an Indian transformer plant. During the visit, a meeting of the Board of Directors of the Russian-Indian joint venture Massa-Izolyator-Mehru was held. The meeting discussed plans for developing the business of high-voltage bushings production in India and promoting the new enterprise in the Indian electrical market.

One of the key activities that we are engaged in is the development of a joint venture with our Indian partner. Currently, work is underway to prepare technological and design documentation, together with our colleagues we are developing marketing plans and tools for active promotion of the products of the new enterprise.

We hope that in the near future the situation in the world will stabilize, all logistics routes will be restored and we will enter the active phase of launching the production base of the joint venture.

The agreement on the creation of the JV MIM was signed by the management of the participating companies in May 2019 at the International Technical Conference of the Izolyator plant in India.



One of the key activities that we are engaged in is the development of a joint venture with our Indian partner.

On 30 October 2019, the Ministry of Corporate Affairs of India issued a certificate of registration of JV MIM in accordance with Indian law.

Experience sharing with Indian colleagues

Management representatives and a group of technical specialists of the Indian transformer plant Mehru Electrical & Mechanical Engineers (P) Ltd. visited Izolyator plant. Executive Director of Mehru Sandeep Prakash Sharma led the delegation.

Deputy Chief Designer Pavel Kiryukhin and other leading Izolyator specialists gave a detail step by step introduction to the entire production cycle and modern technologies of manufacturing and testing high-voltage bushings with solid internal RIP and RIN insulation to the Indian colleagues.

Mehru Electrical & Mechanical Engineers (P) Ltd. produces measuring transformers for voltage up to 420 kV. The company is one of the leading suppliers of measuring transformers for numerous customers, not only in India but also worldwide: the products are exported to 30 countries. ■



Representatives of the Indian transformer plant Mehru Electrical & Mechanical Engineers (P) Ltd. at the Izolyator test center, the third on the right is Sandeep Prakash Sharma, Executive Director



Inspection of HV bushings tests by specialists of the state power grid company of the Indian state Telangana Transmission Corporation of Telangana Limited (TSTRANSCO)

Tests successfully passed

The state power grid corporation of the Indian state Telangana Transmission Corporation of Telangana Limited ran an inspection of tests of high-voltage bushings at Izolyator plant.

Acceptance tests of 252 kV transformer RIP bushings to complete the equipment of

Transformers & Rectifiers (India) Ltd, intended for installation at TSTRANSCO power facilities, were held at the test center of Izolyator plant.

The group of TSTRANSCO inspectors included Chief Engineer at Warangal Zone Sampath Kumar Gade and Engineer Bingi

Suresh Kumar. Our colleague Dmitry Orekhov, International BDM did a big job in preparing, organizing and facilitating the visit and inspection. Head of test center of Izolyator plant Dmitry Ivanov managed the tests.

At the all stages of the tests, the group of inspectors received access to absolutely all process operations and the obtained results. The tests went according to the existing international standards in full scope and ended successfully. ■



Participants of TSTRANSCO's inspection of HV bushings tests

Meetings with management of Polish companies

International Business Development Manager of Izolyator plant Alexander Znamenskiy met with management representatives of the engineering company Trafo-Technika Sp. z o.o. and service company ZUT Energo Audit in Poland.

At Trafo-Technika Sp. z o.o. based in Lodz, Chairman of the Board of Directors of Andrej Gadulja received the guest. At ZUT Energo Audit in Radom, the company Owner Miroslaw Zajac and Sales Director Dariusz Wojchek received the visitor.

During the meetings, current trends in the electrical market of Poland were discussed in terms of choosing optimal areas of cooperation and developing mutually beneficial cooperation. The sides discussed opportunities and prospects of joint projects pursuing common interests and goals.

The parties emphasized the need to intensify exchange of technical information, including direct professional communication between the specialists of the enterprises.

One of the main outcomes of the meeting was Trafo-Technika's order of a batch

of Izolyator high-voltage bushings with expected delivery in the first quarter of 2020.

All talks participants expressed a shared intention to strengthen and develop mutually beneficial cooperation. ■



The owner of the Polish ZUT Energo Audit Miroslaw Zajac (L) and Alexander Znamenskiy at the company office in Radom in Poland

Maxim Osipov, Director of Neighboring Countries Sales, Izolyator

Now the moment has come when we need to unite as never before, gather our thoughts and boldly go forward. The world has changed, but at the same time, the values, which have always been important to us, are still here: to keep our word, meet delivery terms, treat our work with responsibility.

The first quarter of 2020 went as planned: we carried out deliveries for our partners in Azerbaijan, Belarus, Kazakhstan, and Kyrgyzstan. We are successfully bidding in various tenders for supply of equipment for leading power grid companies and electrical enterprises of neighboring countries: for example, we won the tender of the KEGOC system operator of the unified electric power system of Kazakhstan. All our contracts will be delivered on time, and somewhere even earlier than the scheduled dates.

In recent years, our company has strengthened ties with power grid companies and power equipment OEMs of neighboring countries, including Armenia, Moldova, Tajikistan, Kazakhstan, Belarus, Ukraine, Uzbekistan and Georgia, the Baltic countries.

We approach the tasks facing us with all responsibility and are grateful to our partners for mutual interest and timely feedback.

Traditionally, we plan to keep on telling about the latest developments and state-of-the-art technologies for manufacturing high-voltage bushings during technical seminars that we can conduct for our customers using video conferencing.

In a situation of unstable epidemiological conditions, one in no case should panic. I am convinced that only a balanced, reasonable approach, perseverance and professionalism will help us continue to develop and succeed in business.



The world has changed, but at the same time, the values, which have always been important to us, are still here: to keep our word, meet delivery terms, treat our work with responsibility.

Partner reference

Khmelnitsky NPP reported the absence of any complaints on Izolyator bushings of 800 kV with RIP insulation, which are operated on shunt reactors of the station.

Khmelnitsky Nuclear Power Plant is engaged in production of electric energy. the station is located in the central part of Western Ukraine. Satellite town — Netishin, Khmelnytsky region.

Khmelnitsky Nuclear Power Plant is a division of the National power generating company Energoatom.

We appreciate our partners for a reference letter and fruitful cooperation. ■



Khmelnitsky NPP

Visit of Director of Ishim Techelectro from Kazakhstan



Director of the Kazakh company Ishim Techelectro Eldar Sarman (2nd on R) at the talks with Izolyator representatives

Director of Kazakh trading company Ishim Techelectro Eldar Sarman paid a visit to Izolyator plant.

The guest was received by Director of Neighboring Countries Sales Maxim Osipov, Lead Technical Support Specialist Victor Kiryukhin, Manager of Neighboring Countries Sales Anna Zubakova.

During his first visit, Ishim Techelectro's Director familiarized himself with the plant and

its century-long history, manufacturing facility and advanced technologies of the making of high-voltage bushings with solid RIP and RIN insulation.

At the talks, the sides discussed modern trends on the electrical equipment market of Kazakhstan and the most promising forms of long-term cooperation. ■



Eldar Sarman is getting familiar with production of HV bushings at Izolyator

Power Industry of Kyrgyzstan is prepared to emergency situations



Photo: National Power Grid of Kyrgyzstan

The power engineers of National Power Grid of Kyrgyzstan during the state of emergency associated with the spread of the new coronavirus shifted onto enhanced duty while undertaking a set of measures to ensure reliable power supply to consumers.

In case of emergencies, a repair stock of electrical equipment was prepared with emergency response measures drilled and emergency crews strengthened in case of unforeseen situations with power supply.

An emergency operations center has been created in the company to coordinate the implementation of measures for the prevention of coronavirus infection. Action plans for preventive measures are being developed.

The company arranged for management representatives of the central office, the heads of all branches, as well as the responsible specialists of the National Power Grid of Kyrgyzstan to work on duty. ■



Alexander Znamenskiy,
 Manager of International
 Business Development
 Department, Izolyator



Thanks to our habit to plan our work well in advance, we are initially aimed at ensuring that all our projects of agreements and orders implementation are completed.

Naturally, in this sense, nothing has changed for us in the first quarter, and we, in strict accordance with the schedules, carried out the planned deliveries to partners from Europe and Turkey.

Among the fresh and already delivered orders, there are projects with partners from Poland and Slovakia, where Izolyator was chosen as one of the priority suppliers for replacing obsolete bushings installed in the eighties of the last century. Such bushings often have long exhausted their resources, so renovation is necessary to maintain reliable energy supply in the country.

Power grid upgrade programs include switching to RIP-technology in which Izolyator is a recognized leader and is ready to offer modern integrated solutions.

We are open to dialogue with our foreign partners and make joint plans for the future.



Anna Zubakova,
 Manager of Neighboring Countries
 Sales, Izolyator



Our company continues to operate normally, despite the difficult epidemiological situation in the world. First of all, because the fulfillment of the obligations that we undertake affects the reliability of the functioning of one of the most important sectors - electric power industry.

We not only ship against previously confirmed contracts, but actively continue planning for the future. One of the key areas of our activity remains participation in competitive procedures: for example, in the first quarter, the company won a tender for the first delivery of RIN bushings to the Republic of Belarus for the needs of RUE Gomelenergo. In addition, I would like to note the victory in the tender for the supply of bushings to the Kyrgyz Republic for National Power Grid of Kyrgyzstan.

In the II quarter, we planned the delivery of bushings with RIN insulation to the DPR for the republican enterprise State main power grid company.

We make every effort to ship deliveries on time and in strict accordance with the terms of the contracts, which is a solid foundation for the successful development of cooperation with all our partners.



Dmitriy Orekhov,
 Manager of International
 Business Development
 Department, Izolyator



It is traditionally believed that the beginning of the first quarter sets the pace for the coming year. And with us it started really actively. In March, Izolyator was visited by representatives of the state-owned electric grid company of the Indian state of Telangana Transmission Corporation of Telangana Limited. The purpose of the visit was inspection of acceptance testing of 252 kV high-voltage RIP bushings. We have successfully confirmed compliance with high international standards. It is especially important for us that our partners can personally verify the quality of the products and the degree of responsibility with which we approach our work.

Over the past few years, Izolyator has made a number of large deliveries of high-voltage bushings to key energy facilities in the Indian state power grid company Power Grid Corporation of India Limited (PGCIL) and we are not going to stop there. So, we are preparing to participate in the tender for the supply of 100 pcs. 420 kV high-voltage bushings, in which we will take part in the next quarter.

Due to the epidemiological situation, the Indian partners quarantined from March 25, but we continue to interact on current orders and their implementation.

EXPORT | quarter 2020

BUSHINGS DELIVERIES



NON-CIS:

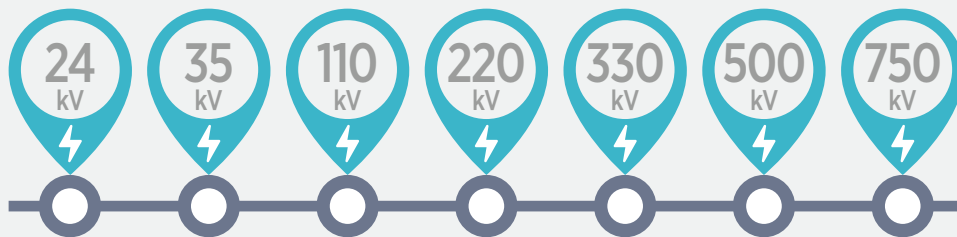
Poland, China, Lithuania, Estonia, Turkey



CIS:

Azerbaijan, Belarus, Kazakhstan, Moldova

VOLTAGE CLASSES OF BUSHINGS:



TYPES OF INTERNAL INSULATION:



RIP and RIN insulation

EXPORT SHARE IN SALES

20-30

DELIVERIES TO MORE THAN 30 COUNTRIES OVERSEAS %



INDIA:






Preparation for production launch of Russian-Indian joint venture to manufacture high-voltage bushings with solid RIP insulation











«Massa Izolyator Mehru Pvt. Ltd.»

PARTNERSHIP GEOGRAPHY



-  Kentau transformer plant
-  Togliatti Transformer
-  Vitebskenergo
-  GK Dnistrenergo
-  Trafo Technika

-  ZREW Transformatory
-  Power machines - Toshiba. High-voltage transformers
-  SVEL Group
-  TBEA Co., Ltd.

-  PowerGrid
-  Siemens AG
-  Fortum
-  Uraleletrotiyazhmas

IN I QUARTER 2020

10 COUNTRIES



Kara Sea

90

105

120

135

Laptev Sea

 Azerbaijan

 Kazakhstan

 Belarus

 Lithuania

 China

 Moldova

 Estonia

 Poland

 India

 Russia

RUSSIA

Sea of Okhotsk

Sea of Japan

Philippine Sea

TBEA

CHANGJI


CHINA

Gurgaon

सागरविद्युत


INDIA

 Electricgeneration INTER RAO


 Hydrorepair-VKK

 Federal Grid Company of Unified Energy System

 Gomelenergo

 ATEF Group

 Electroshield Samara

 Chirchiq transformer plant

 Unipro

 Energy Standard

 Moscow united power grid company

 Production Enterprise Electroavod JSC

 Rosseti

Maxim Zagrebin, Head of OEM Sales, Izolyator

It has always been important for all Izolyator staff members to interact with partners and we always aim at creating dialogue and demonstrating mutual interest. So now, despite of the situation in Russia and the world, we do not give up our principles of work. On the contrary, we comprehend that it is particularly important to fulfill all our obligations in the changing world regardless of obstacles, supporting each other.

The electric power industry is one of the key industries in the country. It is logical that the sector with its enterprises should stop for a minute. We are operating normally and most of the transformer plants with whom we cooperate also continue to function.

We are actively working on conclusion of contracts, everything that was planned is realized strictly on schedule. I would also like to mention that our division is preparing implementation of especially large projects of international importance related to the electricity generation industry.

It so happened that life made adjustments to the plans of millions of people and companies. The best we can do in this situation is to comply with all agreements and day after day prove the status of a reliable manufacturer of high-voltage bushings.



We are actively working on conclusion of contracts, everything that was planned is realized strictly on schedule.

Ongoing work and plans for the future



Participants of the working meeting at the Production Complex of Electrozavod Holding Company

Head of OEM Sales at Izolyator Maxim Zagrebin had a working meeting at the Production Complex of Electrozavod Holding Company in Moscow.

The guest was received by the company's CEO Yuri Vertyakov, Chief Designer Anton Anikeev, Sales Manager Gennady Zhikharev and Lead Sales Specialist Lyudmila Gvozdeva.

The sides discussed the results of joint activities and outlined plans of further interaction in the nuclear power sector.

The partners also discussed technical and commercial aspects of the nearest projects with involvement of both companies. ■

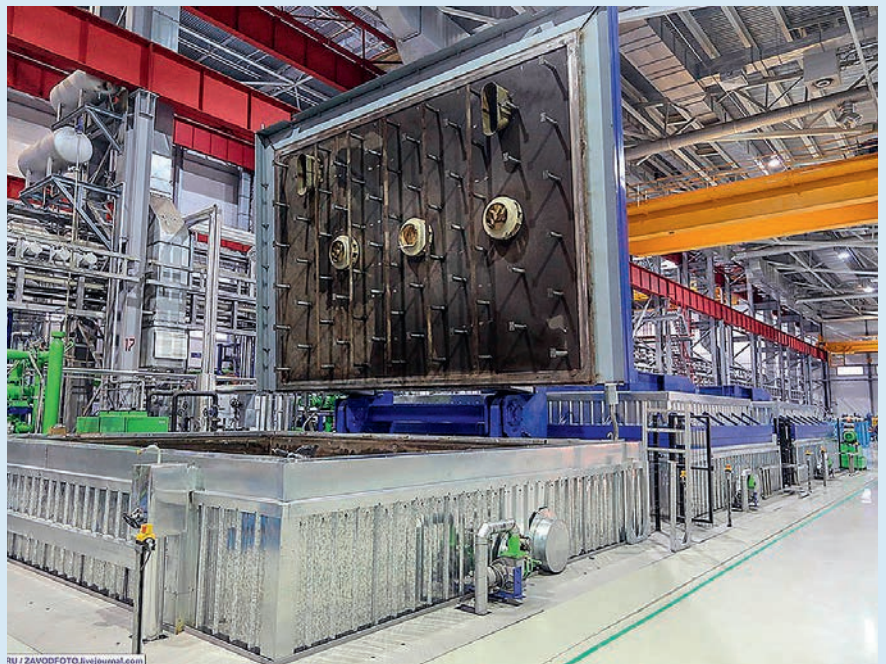
Energy of development

Head of OEM Sales at Izolyator Maxim Zagrebin had a working meeting with the management of transformer plant PMTT. High-voltage solutions in Saint-Petersburg.

Izolyator representative was received by General Director Vladimir Kostenko, Head of Purchasing Sergey Suvorin and Deputy Chief Designer Alexander Yuzhakov. Our colleague made acquaintance with the new

plant manager at PMTT. The sides had a detail discussion of ongoing projects under existing agreements, the nearest plans and potential projects.

The successful cooperation of the two enterprises on a long-term basis makes a real and significant contribution to the modernization and development of the electric power complex. n



PMTT. High-voltage solutions plant in St. Petersburg (photo: Made by us)

Priorities of cooperation

Izolyator's Head of OEM Sales Maxim Zagrebin held talks at the Joint-Stock Company of High-Voltage Equipment Electroapparat in St. Petersburg. Electroapparat was represented by Project Director Alexander Poganov and Head of Sales Ilya Arsenyev at the meeting.

The sides discussed promising areas and forms of cooperation, based on

common goals and production and technical potentials, and also fulfillment of contract obligations.

The results of the negotiations will serve as the basis for the continued development of cooperation between the two enterprises, taking into account current trends in the energy sector and in the market of electrical equipment. ■



Photo: VO Electroapparat JSC

Continuous interaction



A plant tour over SVEL Power Transformers plant in Ekaterinburg, L-R: Maxim Zagrebin, Head of Purchasing at SVEL plant Anastasia Lavrentieva, Alexander Slavinsky and Alexey Kishko, CEO at SVEL Group

The SVEL industrial group is a strategic partner to Izolyator plant. In the first quarter, the companies had a series of activities.

In person

Thus, the Head of OEM Sales of Izolyator Maxim Zagrebin held a working meeting at the SVEL - Power

transformers plant in Yekaterinburg, where he was received by Purchasing Manager Danila Safin. The sides summarized the results of cooperation in 2019, marking the successful projects and smooth coordination between the companies.

During the meeting, promising areas of activity, plans for 2020 and a set of measures for cooperation development were discussed.

Current issues

In January, Izolyator gave a technical workshop on the key company developments at the industrial group SVEL in Ekaterinburg. Izolyator was represented by Maxim Zagrebin and Lead Technical Support Specialist Victor Kiryukhin. The seminar participants showed a keen interest to the topics. On their side, Izolyator representatives provided a thorough coverage of the questions, giving exhaustive answers on the operation of high-voltage bushings with solid internal RIN insulation.

Upon completion of the seminar, the sides had a discussion of cooperation plans in 2020, where the Purchasing manager of the company Danila Safin and his colleagues at SVEL Group took part.

The workshop and negotiations were a success showing a good result and the sides expressed a shared opinion that the mutually beneficial cooperation will be continued in the framework of existing agreements and prospective projects.

Important steps

In March, SVEL Group and Izolyator management representatives had in Ekaterinburg. On Izolyator side, CEO at Zavod Izolyator LLC Alexander Slavinsky and Head of OEM Sales Maxim Zagrebin participated at the talks.

At SVEL Group, the guests were received by:

Alexey Kishko, CEO, Andrey Shmakov, Procurement and Logistics Director, Anastasia Lavrentieva, Head of Purchasing at SVEL – Power transformers, Danila Safin, Purchasing manager at SVEL – Power transformers.

The key topic of the meeting was issues of long-term cooperation and strategic planning of cooperation between the two enterprises in view of existing and forecasted trends on

the global and Russian electrical products markets. The partners considered potential joint projects, available resources and effects of achieved targets.

Besides, the sides made analysis of the work progress under current agreements and key aspects of optimal coordination in their realization.

The hosts arranged for a plant tour over SVEL Power Transformers plant – a new company in the SVEL Group. The parties appreciated the talks as a very important step towards development of the traditionally successful and productive cooperation of SVEL Group and Izolyator plant. ■



Purchasing manager at SVEL plant Danila Safin (L) and Maxim Zagrebin at SVEL – Power Transformers in Ekaterinburg. At the background – a 265 MVA transformer with 550 kV Izolyator bushings, made for RushHydro Group

Dialogue for the future

Alexander Savinov,
Director of Strategic Sales,
Izolyator

The challenges that not only our industry, not only our country, but the whole world suddenly faced today definitely have an impact on us. But it is in our power to use every effort to make it out winners in the situation.

We started the working year as planned and try to stick to our plans. In the first quarter, we continued an active dialogue with our partners and customers of products for the supply of high-voltage bushings to power facilities of the Unified Energy System of Russia.

Our partners require to timely receive high-voltage bushings - and we are ready to deliver even in such difficult conditions.

We always maintain direct contact with customers, we actualize and optimize all our production and storage facilities, and we are ready to deliver all planned production volumes on time and in full accordance with the concluded contracts.



Our partners require to timely receive high-voltage bushings - and we are ready to deliver even in such difficult conditions.

Talks with Main power systems of Volga

Director of Strategic Sales of Izolyator Alexander Savinov held talks with management of Main Power Systems of Volga in Samara. The guest was received by General Director Andrey Koltsov and First Deputy General Director - Chief Engineer Dmitry Bagalin.

The first part of the talks was devoted to summarizing results of the past year and analyzing the results achieved in the implementation of joint projects. It is a shared opinion that the cooperation between MPS Volga and Izolyator is successful and has significant potential for further strengthening and development.

In the second part of the meeting, the parties outlined the main directions and plans for joint work in 2020, based on existing and projected needs of the power grid complex in modernization and renovation by introducing modern and reliable power equipment.

Participants of the talks expressed readiness to develop close cooperation in process of reaching set objectives. ■



Transformer with Izolyator HV bushings at 500 kV Kurdyum substation of MPS Volga

Seminars for specialists of Main Power Systems - branches of FGC UES



Dmitry Mashinistov is conducting the theoretical part of the seminar for technical specialists of the main power systems of FGC UES

Izolyator plant gave 9 seminars for technical specialists of main power systems in the country's regions, branches of the Federal Grid Company of the Unified Energy System.

The «Installation of Izolyator high-voltage bushings in power equipment» workshops were organized and conducted according to respective program and schedule, agreed between FGC UES and Izolyator.

46 specialists from regional main power systems (MPS) totally took part in the training.

Head of SVN-Service department of the design office of Izolyator plant Dmitry Mashinistov carried out overall control over the program and

along with leading commissioning engineers led the theoretical and practical blocks of the seminars.

The theoretical part, accompanied by an extensive use of multimedia tools, included an introduction to the production complex, manufacturing technology and features of high-voltage RIP bushings operation.

The instructors used full-scale replicas of high-voltage bushings and their structural units as visual aids at the practical training.

All stages and specifics of HV bushings installation were considered taking into account the extensive and versatile experience

accumulated by SVN-Service over decades of practice.

Also, in the framework of the seminars, there were plant tours organized to demonstrate all the technological stages of manufacturing and testing of modern high-voltage

bushings with solid internal RIP and RIN insulation.

At the end of the seminars, MPS experts received personal certificates confirming the acquisition of the necessary knowledge and skills for independent work (or supervision) in installation of Izolyator high-voltage bushings on power equipment. ■



Lead Commissioning Engineer of SVN-Service Alexey Grigoriev is demonstrating high-voltage bushing unpacking

Evaluation of technical condition of power transformers and autotransformers with rated voltage 110 kV and higher

In accordance with the amendments to the Strategy of the electric grid complex development approved by order of the Government of the Russian Federation of November 29, 2017 No. 2664-r, beginning 2018 in Russia, a gradual transition from the system of planned preventive repairs at electric grid facilities to the organization of repairs according to the actual technical condition considering the consequences of failure of the main technological equipment (risks) has been carried out.

It is also necessary to emphasize that one of the objectives of this strategy is to prevent the presence of critical equipment at power grid facilities, as well as to reduce the share of equipment, having high and medium levels of technical risk, considering the consequences of its failure.

In this connection, it is obvious that to ensure the reliability of the operation of power transformers and autotransformers of electric networks when implementing a risk-based approach to managing electric grid assets, the question of assessing the technical condition of 110 kV and higher power transformers and autotransformers is relevant, so as the decision-making methodology on the need for timely disengagement of the transformer for repair, the possibility and expediency of further operation, or the need to plan its replacement on the results of its technical condition assessment is becoming an urgent task.

In accordance with applicable OMR requirements, repair of power transformers (autotransformers) is carried out as



M.Yu.Lvov, UEC

necessary depending on their technical condition, determined by measurements, tests and external inspection. The terms of repair are established by the technical manager of the power facility. Assessment of the technical condition of power transformers and autotransformers in operation is done using a set of controlled indicators and their standards. The main document regulating the list of tests for power transformers during commissioning and during operation, maximum permissible values of controlled indicators and monitoring frequency is «The volume and standards of testing of electrical equipment» regulating document.

At the same time, Russia has a system of regulatory and technical documents regarding methodological guidelines and techniques, as applied to assessing the status of power transformers and autotransformers [3], which allows operational enterprises to fully implement the established requirements of the RD «Scope and norms of electrical equipment testing».

By Decree of the Government of the Russian Federation of December 19, 2016 No. 1401 «On the integrated assessment of indicators of the technical and economic condition of electric

power facilities, including indicators of physical depreciation and energy efficiency of power grid facilities, and monitoring of such indicators», to determine technical condition of electric power facilities, the physical depreciation value was introduced. To evaluate physical wear, the technical condition index (ITC) is used.

In accordance with the specified Methodology, an ITC calculation procedure is provisioned for determining the planned type of technical impact on the equipment, depending on the established ITC ranges.

At present, a decision-making methodology has been developed for assessing the technical condition of power transformers and autotransformers which also accounts for the damage risk as a factor of evaluation. Certain criteria have also been developed to allow classification of the type of technical condition of power transformers and autotransformers upon achieving maximum permissible values, regulated by RD «Scope and norms of electrical equipment tests», based on the assessment of their diagnostic value and assessment of the risk factor of transformer damage, which may be accompanied by an internal short circuit.

Indicators of a malfunctioning operational condition (upon reaching the established maximum permissible values in accordance with the RD «Volume and norms of electrical equipment testing»):

- resistance of windings to direct current;
- loss of idling;
- chromatographic analysis of
- dissolved gases in transformer tank oil (boundary values);
- acid number;
- dielectric loss angle tangent of oil at a 90°C temperature;
- flash point;
- content of solids (purity class);
- soluble sludge content;
- the content of antioxidant additives

AGIDOL (ionol);

- gas content in oil;
- content of water-soluble acids and alkalis.

Indicators of the limit state (upon reaching the established maximum permissible values in accordance with the RD "Volume and norms of electrical equipment testing":

- degree of polymerization of paper insulation of windings;
- short circuit resistance of the windings.

It should also be noted that operating experience shows that the cores of power transformers are damaged relatively rarely during operation [7]. Their possible defects are a short between steel sheets, an unacceptable decrease in the pressing force of the magnetic core and local heating. Moreover, indirectly, these defects can be detected by a change in idle losses, by an increased noise and increased content of dissolved gases in oil. The limit state of the transformer magnetic circuit is determined by the results of inspections, measurements and tests when opening the transformer.

An analysis of the operating experience of power transformers with voltage of 110 kV and higher shows that reliability of power transformers depends primarily on the condition of insulation of the windings. Decrease during the operation of electric and mechanical strength of oil barrier insulation in the local volume of

a transformer can lead to partial discharges, causing the formation of so-called rapidly developing defects of electrical nature, accompanied by internal short circuits with a possible explosion and fire.

In order to comply with the requirements of the "Rules of the Organization of Maintenance and Repair of Electric Power Facilities", approved by Order of the Ministry of Energy of Russia dated October 25, 2017 No. 1013, on the need for an electric power industry facility to approve a local regulatory act establishing the frequency, methods, volumes and technical means of monitoring and control over the technical condition and their permissible and limit values that reliably determine the actual technical condition of power transformers and autotransformers when organizing the repair of power transformers and autotransformers according to the technical condition of equipment, a standard, named "Guidelines for assessing the technical condition of power transformers and autotransformers with voltage of



110 kV Izolyator bushings on a transformer

110 - 220 kV», was developed in United Energy company JSC, taking into account the operating composition of the organization's equipment.

The developed standard includes:

- requirements for the frequency, methods and scope of monitoring the technical condition in accordance with the RD "Volume and standards of electrical equipment testing";
- indicators of technical condition and their maximum permissible values in accordance with the RD "Volume and norms electrical equipment tests»;
- markers and criteria that determine the classification of the type of technical condition (operative, inoperative, marginal);
- description of the diagnostic value of indicators of the technical condition;
- description of the risk of damage to equipment when reaching the specified maximum permissible values of monitored indicators with an assessment of the possibility of an internal short circuit;
- decision-making methodology on the possibility and feasibility of further operation of equipment, depending on the type of technical condition;
- indicators and criteria for the emergency mode of a power transformer (autotransformer) during continuous monitoring of the corresponding indicators.

1. The existing regulatory and technical base in Russia and the accumulated operational experience allow power grid companies to build a system for assessing the technical condition of the operating power transformers and autotransformers with voltages 110 kV and higher to implement risk-oriented management of those power grid assets.

2. Application of criteria for assessing the type of technical condition: operative, inoperative, marginal condition allows to increase the efficiency of the decision-making system on the possibility and feasibility of further operation of power transformers and autotransformers with voltage of 110 kV and higher while implementing the principle of risk-based management of electric grid assets. The use of continuous monitoring (control) of indicators of the emergency mode of a power transformer (autotransformer) is an additional tool of early detection of emergency conditions to prevent internal short circuits.

Based on the article by M.Yu.Lvov, PhD, Head of the Department of Technical Policy and Standardization of Production Processes of UEC JSC in the ELECTRIC POWER. Transmission and distribution #1 (58) Magazine

Oleg Bakulin, Director of Partner Relations, Izolyator

It remains important for all Izolyator employees to have a clear action plan. In this sense in the first quarter of 2020, nothing has changed for us: we are timely fulfilling our obligations. In February, we supplied 550 kV bushings for the needs of Balakovo NPP - a branch of Rosenergoatom Concern JSC (part of the largest division of Rosatom State Corporation «Electricity»). We won the tender for the supply of 500 kV bushings for the facility of PJSC RusHydro - Boguchanskaya HPP.

We do not reduce or plan to reduce volumes of deliveries. Izolyator plant is a continuous cycle enterprise, so everything works as usual. But still we made some adjustments to our traditional schedule: field seminars and meetings with our partners are cancelled. But this is rather a general trend in the industry.

At the same time, no matter how unusual and strange it is to change existing approaches to work, one can also find the positive side. We have always taken pride in having the opportunity to meet with our partners in person: personal contacts create a special atmosphere. However, now, being in new conditions, we find new approaches as well, and we are happy to communicate with our customers via video conferencing.



We do not reduce or plan to decrease volumes of deliveries. Izolyator plant is a continuous cycle enterprise, so everything works as usual.

The First Floating Thermal Nuclear Power Plant in Russia Was Launched



Arrival of the Akademik Lomonosov floating power unit at Pevek, Chukotka Autonomous District

On 19 December 2019, the first floating nuclear power plant in Russia, part of Rosenergoatom Concern, was commissioned in the port of Pevek on the Chukotka Peninsula.

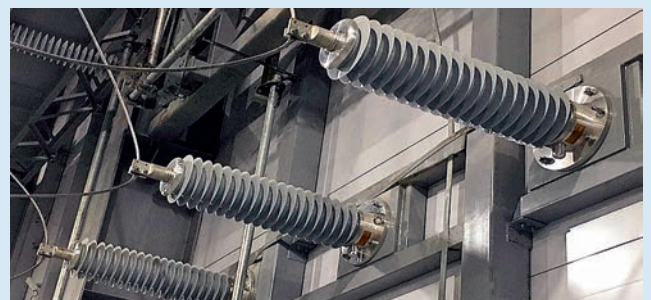
The Floating Thermal Nuclear Power Plant (FTNPP) is the lead project for the 20870 series of low-power mobile transportable power units. The floating nuclear power plant consists of the Akademik Lomonosov floating power unit and coastal infrastructure.

There are 126 kV Izolyator wall bushings successfully operating at the 110/10 kV Beregovaya substation of Chukotenergo, part of the FTNPP coastal infrastructure.

The onshore facilities of the FTNPP are designed to receive and distribute electricity and hot water supplied from the power plant to infrastructure facilities of the Chukotka Autonomous District. ■



126 kV Izolyator wall bushings, installed in a wall of the closed-type switch gear of 110/10 kV S/S Beregovaya of Chukotenergo

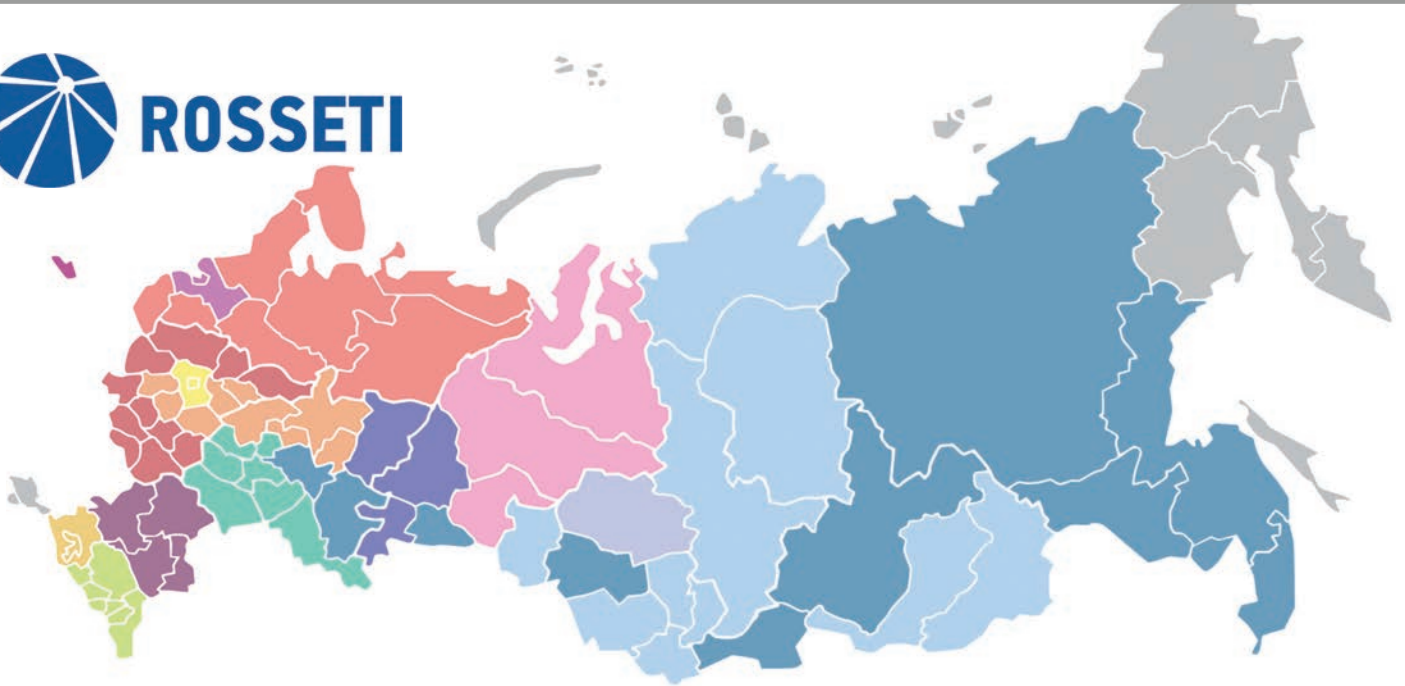


A view of 126 kV Izolyator wall bushings inside the closed switchgear on 110/10 kV Beregovaya substation

POWER INDUSTRY OF RUSSIA | quarter 2020



ROSSETI



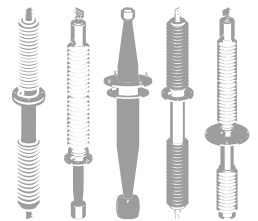
- Yantarenergo JSC
- FGC UES PJSC
- TRK PJSC
- IDGC Volga PJSC
- Rosseti Tyumen JSC
- IDGC Center and Volga PJSC
- Rosseti South PJSC
- IDGC Center PJSC
- IDGC Ural JSC
- IDGC Siberia PJSC
- IDGC North-West PJSC
- IDGC North Caucasus PJSC
- IDGC MOESK PJSC
- Lenenergo PJSC
- Kubanenergo PJSC

Over

600 BUSHINGS

35-500 kV

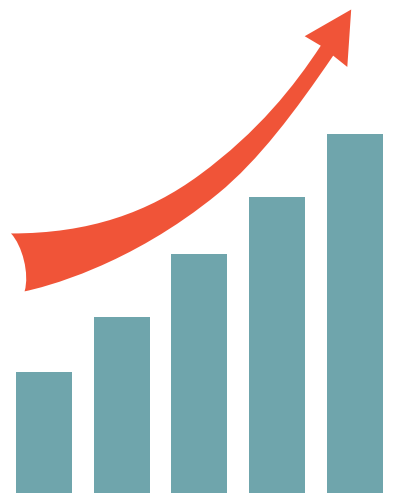
delivered in the 1 quarter 2020
to the Unified Energy System of Russia



IZOLYATOR PLANT

70-80%

MARKET of high-voltage bushings in Russia and CIS countries



Dmitry Karasev, Head of Procurement Department, Izolyator

The first quarter always has a special place in the work schedule, because at this time we not only implement the planned projects, but also shape the prospects for the whole year. We have set new procurement goals in planning, optimization and standardization issues.

In the first quarter, we launched a project in mechanical treatment outsourcing. Within the first quarter, an analysis of the proposals of a number of suppliers was carried out, more than half of the proposals were accepted and in March we received the first product samples for evaluation of the quality of the outsourcing services offered. According to the results evaluation, most of the proposed samples successfully passed the entrance control.

In February, we had a meeting with a strategically important supplier of our company, metallurgical company Alfa-Metal LLC. At the meeting, we actively discussed expansion of the range of rolled aluminum, paying special attention to the cast products by low pressure.

Despite the spread of coronavirus infection, our company continues to work in full force. Deliveries of components, materials to ensure production cycle does not stop.

I am confident that together we will cope with all the challenges of the time.



Achieving strong performance of procurement system requires comprehensive work on all possible leverage of saving

Visit of Industrial Procurement Alfa-Metal management representatives



Entry quality control of purchased components of high-voltage bushings by the quality service of the Izolyator plant

Industrial Procurement Alfa-Metal management representatives paid a visit to Izolyator plant.

IP Alfa-Metal was represented by Deputy General Director Valentin Borunov, Production Director Alexey Bushin, Commercial Director Dmitry Taskin.

Head of Procurement Department Dmitry Karasev met the visitors.

At the meeting, the sides discussed the possibilities of manufacturing and machining cast aluminum parts of high-voltage bushings at the production site of IP Alfa-Metal

with the aim of developing outsourcing in this area of activity. Representatives of IP Alfa-Metal expressed their readiness to develop production accordingly. And a trial batch of manufactured parts will be delivered soon.

They also discussed prospects and plans for joint activities for 2021 inclusive.

Following up the talks, Dmitry Karasev noted: "Today, Alfa-Metal is one of our key suppliers, and we will make every effort to successfully develop cooperation between our enterprises on a long-term and mutually beneficial basis." ■

New level of partnership



Talks with representatives of the Swiss Staubli Electrical Connectors AG at Izolyator plant

Talks with representatives of the Swiss supplier Staubli Electrical Connectors AG took place at Izolyator plant.

Staubli Electrical Connectors AG was represented by Rajeev Kapoor, Business Development Manager and Head of Sales Dpt at Staubli RUS Sergey Migush.

Staubli representatives offered new technical solutions for perfecting construction design of high-voltage bushings' measuring tap.

The sides also discussed volumes of delivery of components in 2020. ■

Dmitry Abbakumov, Deputy Commercial Director, Izolyator

Traditionally, the first quarter is the time when plans for the entire next working year, tasks and goals are set.

We commit ourselves, clearly understanding that we must deliver under any circumstances. It so happened that this year, indeed, for many this time has become a test of endurance and the fact that we continue to work in normal mode is visual confirmation of how a strict planning helps us keep our word. Under any circumstances.

Among the events of the first quarter, I would especially like to mention the participation in the working meeting of representatives of the Ministry of Investment and Innovation of the Moscow Region and industrial enterprises of the region at the end of February. The ministry conducts state policy and implements executive and administrative activities in the Moscow region in the investment and innovation, in the formation and implementation of industrial policy, determining priority areas for the development of science and technology, attracting private investment, implementing investment projects in various industries, creating a favorable investment climate in the Moscow region.

Given the current situation, we joined another important event - participation in an extended meeting of the Expert

Council on energy engineering, electrical and cable industries under the State Duma Committee on Economic Policy, Industry, Innovative Development and Entrepreneurship and the Commission on the Development and Implementation of Technologies in the Field of Energy Efficiency and Energy Saving of the Russian Union of Machine Builders.

Energy security issues key at all times. Significant issues such as the dependence of production on foreign



Dependence of production on foreign suppliers, import substitution and production localization are on the agenda of relevant ministries and institutions

suppliers, import substitution and production localization are on the agenda of relevant ministries and institutions. We continue to actively participate in all government initiatives to address pressing issues in the development of the electrical engineering sector.

Meeting of Representatives of the Ministry of Investment and Innovation of the Moscow Region and Industrial Enterprises of the Region



Participants in a working meeting in the Government House of the Moscow Region, Dmitry Abbakumov - 4th on R

On 28 February 2020, Izolyator took part in a working meeting of representatives of the Ministry of Investment and Innovations of the Moscow Region and industrial enterprises of the region.

The purpose of the event is participation of manufacturers of the Moscow region in corporate competitiveness improvement programs (CCIP).

Corporate competitiveness programs are now implemented to improve the quality and

increase the production and export of Russian products. Organizations onboarding CCIP will have access to concessional lending mechanisms for investment loans for the implementation of export-oriented projects in Russia and abroad.

Izolyator was represented at the meeting in the Government House of the Moscow Region by Dmitry Abbakumov, Deputy Commercial Director of Izolyator.

According to the Ministry of Industry and Trade of the Russian Federation, 327 billion rubles will be allocated from 2019 to 2024 for the development of exports of enterprises of federal and regional significance. According to the CCIP program, at least 250 enterprises in the country should receive support. ■



75 VICTORY!

1945–2020



On the eve of the 75th Anniversary of the victory in the Great Patriotic War, we are starting a special project telling about our plant and its workers' contribution in the Great Victory!

If tomorrow is war

The country's leadership set task of mobilizing all material and labor resources to ensure the accelerated pace of development of the defense industry and to prepare to repel possible aggression to every enterprise and every industry. It was decided to create state reserves of fuel and electricity. It was planned to build backup enterprises in the eastern regions of the country.

In 1939, the Izolyator plant made a commitment to master the production of new designs of high-voltage bushings in replacement of imported ones. The fulfillment of government tasks during the years of the third five-year plan took place under special condi-

tions associated with the growing threat of war. The country was preparing for defense.

At the Izolyator plant, already in early 1939, defense work was started. In March 1939, local air defense teams were created: degassing, law enforcement, repair, fire, communications teams.

The fighting begins

In the very first days of the war, many communists, Komsomol members, non-partisan workers, and technical and engineering workers filed applications asking them to be sent to the front. In June 1941, many employees of the Izolyator plant were drafted into the army.

On 3 and 4 July 1941, in the Leninograd district of Moscow, the formation of the 18th division of the militia took place. The creation of the division was carried out on a voluntary basis, from volunteers not subject to draft in the Army.

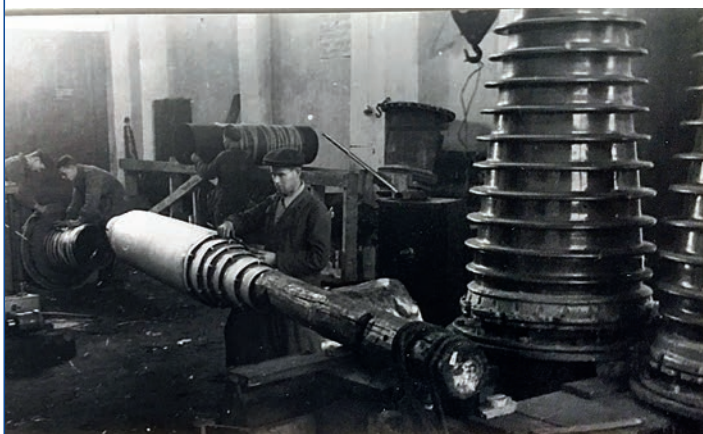
In the early days of the war, 36 people enrolled in the militia at the Izolyator plant. The Executive Committee of the Moscow Council of Workers' Deputies awarded the Izolyator plant staff with an

Honorary Diploma for high patriotism in the formation of the people's militia and the heroism and courage shown in the battles during the defense of the Motherland.

The plant was repeatedly attacked by German airforce, one of the attacks resulting in the threat of a serious fire at the enterprise, in the elimination of the consequences of which many workers distinguished themselves.

The plant's staff received the first baptism of fire during an air raid by German aviation on the night of July 21-22, 1941. Fascist aircraft dropped incendiary bombs on the plant. Fighters, commanders and political workers of the air defense squad quickly neutralized them. The Nazis carried out their second air attack from August 10 to 11, 1941. Several incendiary bombs were dropped on the plant, which were also defused by the air defense teams of the plant.

In 1941, on the basis of a decision of the Council of People's Commissars of the USSR, the Izolyator plant was evacuated and relocated to the city of Kosulino, Sverdlovsk Region. To organize



and start production at a new location, workers, engineering and technical workers were allotted from among the workers of the plant and sent to the city of Kosulino, Sverdlovsk Region. Some families of factory workers were evacuated to the same town.

Not giving up for a minute

One of the most difficult economic tasks of the military economy was to provide electricity to the industry evacuated to the eastern regions of the country. To this end, in the Volga region, in the Urals, in Siberia, in the regions of Central Asia, great work was done to expand and build new power plants.

The demand for the plant's products only increased during the war: it had to provide with its products both power plants in the eastern regions, center and also the country's power systems in the liberated territories, fulfilling orders from the defense industry at the same time.

By the decision of the State Defense Committee, dated 18 November 1942, the task was set to promptly bring the Izolyator plant capacity to the level of 1940, which was received as a combat order at the plant: in 1944 the Izolyator plant was declared the winner in the All-Union Socialist Competition and was awarded the 3rd place.

The crew of stampers of the 24th shop Yenishina, Ilyina, Kareva, Perfilieva

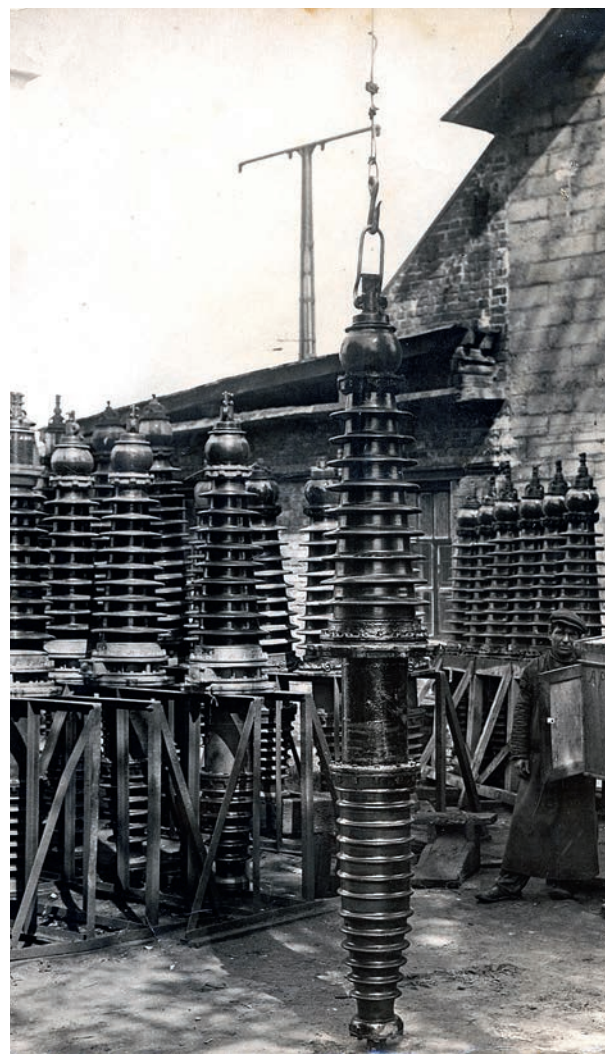
was awarded the title of "Front Brigade", since they met the production norm by more than 2 times. Many of the teams exceeded the norm by 1.5–2 times. Among them, the brigade of the Komsomol member Vera Mukhina was especially distinguished. The best Komsomol-youth brigades included the teams of A. A. Antonova, processing of reinforcement frames, T. S. Mitina - press-workers, T. N. Rakova and others.

By 1945, the plant mastered up to 60 new types of bushings and mastered the production of special-purpose bushings for radio installations and other defense purposes. In the same year, the entire pre-war product ranges of bushings was completely restored, the production of 154 and 220 kV oil-filled bushings was started, which was discontinued in the first years of the war.

Keeping memory. Being proud. Honoring.

At the Izolyator plant, the workers of the factory — front-line soldiers and workers of the rear of the Great Patriotic War — are sacredly honored. Their names are inscribed on a monument at the factory square.

In the year of the 75th Anniversary of the Victory in the Great Patriotic War, we bow our heads before the memory of the fallen and with all our hearts we thank all the veterans of war and labor living among us.



PULSE OF THE COMPANY

Julia Turina, Human Resources Manager at Izolyator

As part of the project to create a corporate university, the Personnel and Social Resources Management Service is actively preparing corporate and individual training programs, developing competency profiles, choosing methods for assessing employees' competencies, as the company is interested in training highly qualified personnel capable of ensure its effective development in the long run.

The corporate university is a training system built on the corporate ideology using a uniform concept and methodology and available to all managers, specialists and workers. The corporate university is a tool of strategic management and part and parcel of the enterprise's business processes.

The objectives for creating of a corporate university:

- harmonization of corporate goals and principles with life goals and values of individuals (to which end such subjects are introduced into the training programs as universal culture and company history);
- introduction of mechanisms of continuous improvement, increasing the return on transformation projects, development and maintenance of corporate identity in the company;
- increasing the efficiency of training for company employees by a differentiated approach to the design of training programs.

The decision to create a corporate university is a very responsible step, so our department thanks the company management and all structural units managers for their support. In respect of formation and implementation of specific objectives, it is provided for:

- creation of a corporate library;
- preservation of the «cultural heritage», strengthening and development of the existing corporate structure;
- staff adaptation;
- certification and assessment of staff, as well as receipt of feedback from structural divisions.



The decision to create a corporate university is a very responsible step, so our department very much thanks the company management and all structural units managers for their support

Within the corporate university, we plan to perform complex system tasks, such as knowledge management (systematization and dissemination of accumulated experience, mutual exchange of information between divisions and individual company employees) and innovation management, corporate culture management (in this meaning, the university acts as a repository of corporate values).



ВИДЫ ОБРАЗОВАТЕЛЬНЫХ ЛИЦЕНЗИЙ ДЛЯ КОМПАНИИ:

Дополнительное образование:

- ✓ Лекции;
- ✓ Семинары;
- ✓ Тренинги;
- ✓ Другие аналогичные виды деятельности.

Дополнительное профессиональное образование:

- ✓ повышение квалификации;
- ✓ переподготовка.

Awarding the Anniversary Medal «90 Years of the Moscow Region»



Alexander Slavinsky is being awarded the 90 Years of the Moscow Region anniversary medal



Chief Executive Officer of Zavod Izolyator LLC Alexander Slavinsky and the General Director of Massa LLC Sergey Moiseev were awarded the 90 Years of the Moscow Region anniversary medal for their great contribution to the development of the region's industrial and innovative potential.

The medal is awarded to the individuals who made a significant contribution to the development of the Moscow region in economy, production, science, engineering, construction, culture, art, education, healthcare, sports, law and order, defense, spiritual development of citizens.

The awarding was held in a festive atmosphere at the final meeting of the year 2019 where the key achievements and directions of the enterprise's development were outlined. ■



Sergey Moiseev is being awarded the 90 Years of the Moscow Region anniversary medal

To know to apply



Corporate training on Ecological safety at the enterprise

As part of the Izolyator company management training program for employees, staff members received "Environmental Safety at the Enterprise" training in March.

Environmental safety specialist Alexander Golikov spoke about the basic principles of environmental management, as well as the basics of environmental management at our enterprise.

Before starting the training, the medical specialist Tatyana Panyukova informed the staff about the measures taken at the enterprise to reduce the risk of spread of COVID-19. ■

42 | Congratulations on The Defender of the Motherland Day!

Izolyator held a performance of the veterans' choir Singing hearts from Dedovsk, Moscow Region, dedicated to the Defender of the Motherland Day. Izolyator's Mikhail Kuzmin, staff member of the electro-mechanical department, is an active contributor, serving as accompanist of the choir. A variety of songs of patriotic and folk themes in excellent performance sounded at the concert. The audience received them with great emotional enthusiasm and gratitude for the artists.



▶ Alexander Slavinsky is congratulating everyone with the Defender of the Motherland Day



◀ Grateful audience – staff members of Izolyator plant

▼ Participants of the Singing Hearts Choir at the museum of Izolyator plant



▼ Performance of the Singing Hearts Choir from Dedovsk, Moscow region at Izolyator plant, Mikhail Kuzmin accompanying



With the warmest wishes

On the eve of 8 March, the male half of the Izolyator plant congratulated women of the enterprise with the brightest spring holiday. Fresh flowers and warm words became a real gift for all female employees of the company.

► All is ready for the festive meeting of the female members of staff of Izolyator



► Today, all colleagues will be greeted with flowers



▲ On this day, men are markedly gallant

▼ Smile always, dear women! Be loved and happy!



44 | A bright debut

Izolyator took part in the III International Volleyball Tournament VolleyENERGO-2020 Cup among enterprises in the fuel and energy complex. The corporate tournament, organized by Sportiko, was held in the sports arena of the GoPark multifunctional club near Moscow, gathering 12 teams of the leading industry enterprises in Russia and neighboring countries for the third year in a row to identify the strongest squads on the volleyball court. The Izolyator select team debuted in the tournament and from the first games demonstrated a decent level of skill and teamwork.



◀ The teams lining-up before the tournament

▼ Offensive combination



▼ Decisive serve



▲ Attack from the second line performed by the Izolyator team



Support of the student sports

The development of extracurricular activities and student sports is an important part of the life of future specialists. Izolyator fully shares this message and actively supports the development of these aspects. Thus, the company became an official partner of the student hockey team Electronic of the MIET, which is a co-founder of the Moscow Student Hockey League (MSHL). Today, this sports team from Zelenograd performs in the strongest division of the MSHL, and also actively participates in the games of the Student Hockey League. The MIET administration expressed sincere gratitude to the Izolyator team for their support in the development of student sports.

▶ Sport is a key part of everyday life of MIET's people



▶ One can be proud of such a team

▶ Electronic team is in the game



▼ Tactical briefing



▼ MIET's cheerleaders - they are passionate supporters too



46 | Friendly Volleyball Matches in the MIET

In the sports complex of the National Research University Moscow Institute of Electronic Technology, a response meeting of the Izolyator plant and the university teams took place as part of a series of friendly volleyball games.

The delegation of Zavod Izolyator LLC was led by Alexander Slavinsky, CEO, graduate of the Physics and Technology Department of MIET in 1985. Before the start of the games, Izolyator plant employees visited the exhibition complex and the renovated university library, later heading for the sports complex.



▲ The Izolyator delegation on a tour of the Moscow Institute of Electronic Technology (MIET)



◀ A traditional line-up before friendly matches begin

▼ Match participants and fans are welcomed by MIET cheerleading team



▼ Everyone is happy with the results of the draw



This time, each of the teams was represented by two sets of players. Following the results of two matches, the strongest teams of MIET and Izolyator met. Despite the spirit of competition and exciting moments, the meeting was held in a friendly atmosphere.

▶ All participants and fans of friendly matches in MIET

▼ From now on, Alexander Slavinsky is an honorary member of the Electronic student hockey team of MIET



▼ Passing the ball into the attack

▼ Cannon strike



▼ Invaluable fan support



OUR PARTNERS

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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.



Haefely Test AG (Switzerland) designs and manufactures systems of surge voltage and current testing, systems of high-voltage alternating current testing, equipment for power cables, motors, generators, distribution and power transformers testing. Haefely Test AG and Hipotronics Inc. (USA) are operating under the common brand Haefely Hipotronics.



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, i.e. 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 Dnestrenergo (SUE GC Dnestrenergo) services 35–330 kV substations and power lines throughout the territory of Transnistria. The main goal of the enterprise is to support the equipment and power lines.



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.



PMTT. High-voltage Solutions (PMTT) manufactures 110–750 kV power transformers and autotransformers of over 25 MVA capacity including units in three-phase arrangement. The production capacity of PMTT is more than 10 000 MVA annually. Headcount — about 350 staff members.



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

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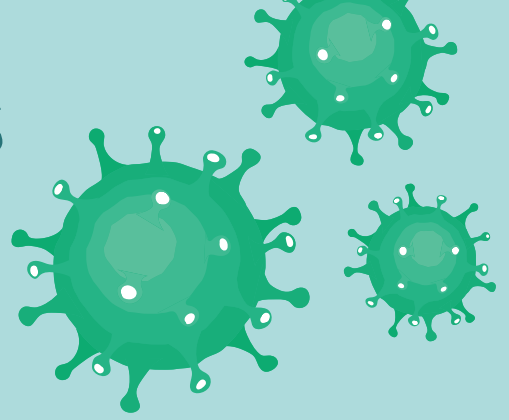


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Recommendations for prevention of coronavirus infection



1



Wash hands with soap and water carefully after return from the street, or contacts with strangers

2



Abstain from visiting public places: shopping centers, sports and spectacular events, etc.

3



Disinfect gadgets, office equipment and surfaces that you touch

4



Wear a single-use medical mask in public places changing it every 2-3 hours

5

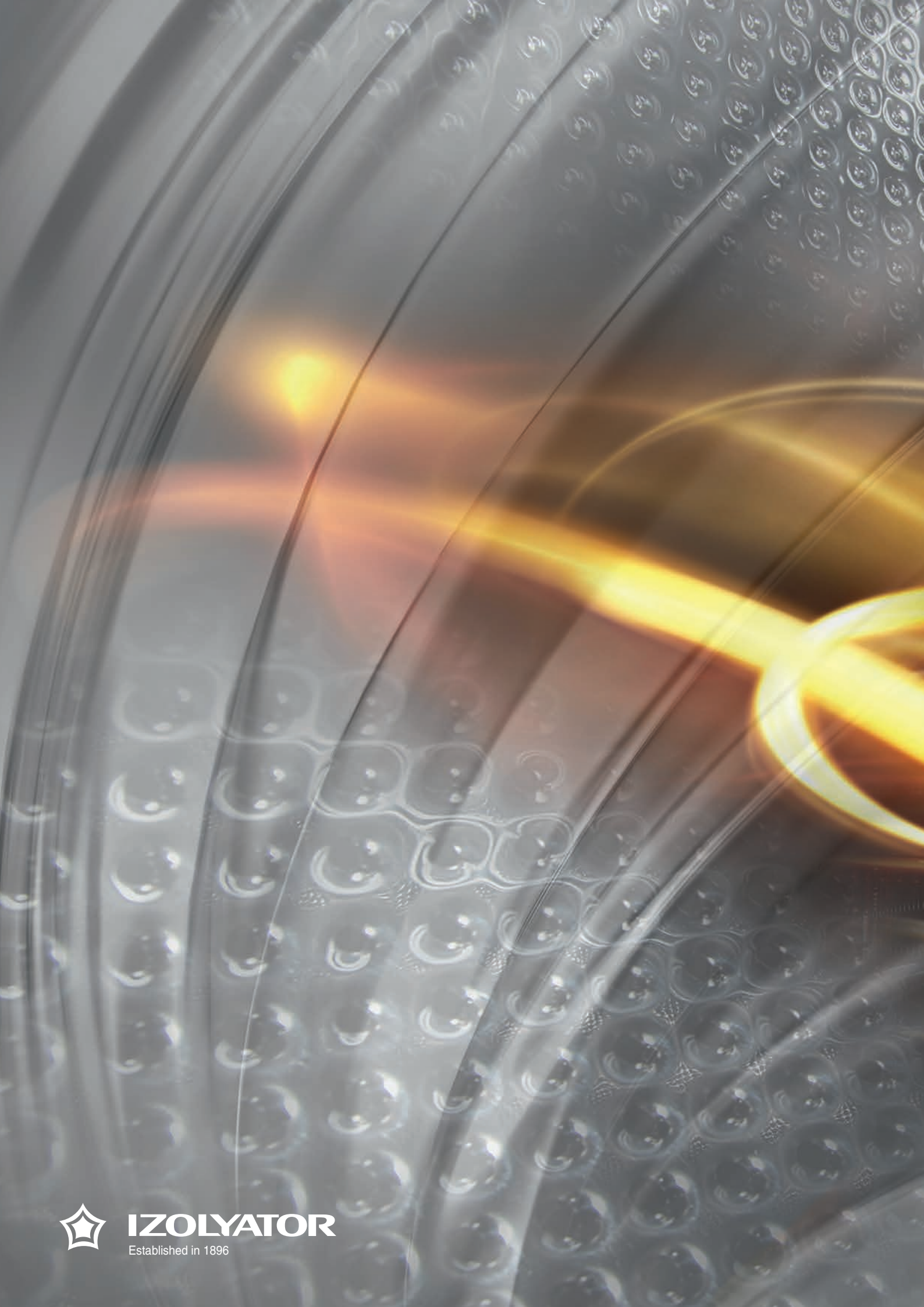


Avoid if possible on greeting close hugs and handshakes

6



Avoid close contacts and staying in the same premises with people, having visible signs of respiratory decease



IZOLYATOR

Established in 1896