RUSSIAN AVIATION & MILITARY GUIDE

Special analytical export project of the United Industrial Edition

№ 05 (36), April 2019

The best innovations for any defense and security tasks

IDEF'19

SPECIAL PARTNERSHIP

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EDITORIAL

The best offers from Russia

It has become already obvious and undeniable that security is becoming increasingly important among the various values of civilization. Today, for any state, the ability to reliably and securely protect the territory, residents and values is a priority.

Political situation in the world (conflicts, sanctions, threats of war and other) makes nations once again reconsider their defense possibilities. Threat of local conflicts to be evolved into global ones, failure of worldwide system of safety and non-ending crisis – all of this leads to an unstable and dangerous situation.

One can predict raise of defense means market in times like this. But together with developing of defense technologies in order to safety, rivalry among sellers of weapons and defense systems increases in order to achieve such goals as increasing profits and market share. International exhibition IDEF 2019 presents in Istanbul the best world (Russian also) military innovations for global market, which are the undisputed world leaders on price and quality in their segments.

These exhibition shows that it is not serious about how many weapons and planes you have, but quality and possibilities of every single one of them is fact what leads to victory on the battlefield and on the global market. Other significant factor is technological independence from seller – modern technologies make it possible to shut down any device from any place of the globe if you have appropriate access. With hi-tech products, solid aftersales service and proven reliability, Russia is honest and friendly partner for all countries, ready for mutual work.

Taking part in IDEF 2019 Russia continues the policy of open partnership with Turkey and other countries of Europe and Asia. Russia has a wide product line that meets all the needs of defence and security and ready propose the best technology and the best price offers.

Valeriy Stolnikov

COMPONENTS FOR THE INDIA SPACE CENTRE

The Ruselectronics holding company, which is part of Russian State Corporation Rostec, has supplied ferrite components to the Space Applications Centre of the Government of India. These materials will be used in super-high-frequency devices for space satellites.

Ferrite Domen Scientific Research Institute (part of the Ruselectronics holding) has delivered microwave ferrites for the space industry to the customer. They can be used under conditions of solar radiation and other interference to precisely control wave oscillations, switch energy flows from one direction to another, and partially or fully absorb the power flow. These characteristics mean that microwave ferrites can be used as components in space microwave equipment.

'India is continuing to actively increase its pace of space exploration and is spending more than $1.2 billion per year in this field. The country is already ranked fifth among the space powers and intends to strengthen this position. The first supply of ferrites for Indian civilian satellites allows us to open a new area of cooperation and gain a foothold in this fast-growing market. Thanks to the expansion of cooperation with India, in 2018, we already expect to quadruple the share of exports of ferrite products compared to last year,' says Rostec's Executive Director, Oleg Yevtushenko. Ferrite Domen Scientific Research Institute manufactures around 40% of all ferrite products in Russia.

The Space Applications Centre of the Government of India produces civilian satellites, which are used for telephone communications, radio broadcasting and satellite Internet. In addition, the organization develops optical and microwave sensors for satellites, and software for signal and image processing.

ZENIT & LEICA

Krasnogorsky Zavod, manufacturer of the Russian brand Zenit, in cooperation with Leica Camera AG, German manufacturer of premium cameras and optics, designed a new digital rangefinder camera Zenit M with a new generation lens. The Shvabe Holding, part of Rostec, has presented this product on its exhibition stand at Photokina 2018, the largest international trade fair for the photographic and imaging industries held in Cologne. One of the participants of this Russian-German project is Krasnogorsky Zavod (KMZ Zenit), one of the Russian leading designers of photographic equipment, is part of the Shvabe Holding. The Zenit M camera is technically based on the Leica M Type 240 platform, but has been modified both in terms of hardware and software.

New Records of Russia in the Global Arms Market

Russia confidently ranks second in the world in production and export of weapons. Despite sanctions, Russia's military-technical cooperation portfolio has reached $ 55 billion, which is the highest in last ten years. More than 700 enterprises incorporated in Rostec holdings have made a significant contribution in achieving these record-breaking indicators for our country.

As it appears from the new report of Stockholm International Peace Research Institute (SIPRI), the United States, Russia and France hold the lead in arms exports in the world. According to SIPRI, over the past five years, Russia has retained the second place among the largest arms dealers.

SIPRI indicators somewhat differ from the Russian data in percentage terms. According to experts' opinion, SIPRI methodology raises questions, main of which is the use of relative rather than absolute numbers. Ranking countries is not entirely correct without an accurate data on the volume of arms supplies.

But what does not cause questions to anyone - Russia confidently ranks second in the world in the arms export market, and so far only the United States is the only serious competitor of our country. According to SIPRI, from 2014 to 2018, the US share in global arms export market amounted to 36 percent, while Russia had 21 percent. France was in third place by a significant margin of its share close to 7 percent.

Let us recall that in December of 2018, Deputy Prime Minister Yuri Borisov, who oversees the Russian defense industry, in an interview with RBC, stated that Russia is in second place in arms exports, with a 22 percent share of the world market. According to Borisov, Russia has

been cooperating with almost 100 countries of the world, and the portfolio of orders for military-technical cooperation (MTC) over the past years has been at a level of no less than 45 billion US dollars, and by the end of 2018 it amounted to 55 billion US dollars.

Russian arms sales are showing sustainable growth. According to Rosoboronexport, weapons and military equipment (WME) worth 12.7 billion US dollars were supplied in 2015, exports amounted to about 13 billion US dollars in 2016, and to 13.4 billion dollars in 2017, shipments reached a record 13.7 billion US dollars in 2018. It also needs to be remembered that the international military-technical cooperation market is extremely conservative and is growing by about 1-2 percent per year.

The biggest in the world

Russian Helicopters (part of Rostec State Corporation) successfully completed preliminary flight tests of the Mi-26T2V helicopter. The machine is being prepared for a handover to the Russian Ministry of Defense to do joint official tests.

The upgraded heavy Mi-26T2V helicopter designed in the interests of the Ministry of Defense made its first flight in August 2018. The machine participated in the International Military and Technical Forum ARMY 2018. Then it was transferred to Mil Moscow Helicopter Plant to do preliminary flight tests.

The customer requested that Mi-26T2V should ensure completion of tasks even in regions with complex physical and geographical and adverse climatic conditions, at any time of the day, at equipped and unequipped routes, or even without routes, and on featureless terrain, in conditions of fire and information counteraction of the enemy.

The new helicopter differs from the basic Mi-26 model due to a modern integrated NPK90-2V avionics suite, which significantly simplifies piloting of the helicopter. The latest avionics system allows following the route in automatic mode, coming to a preset point, performing approach and final approach maneuvers, and returning to the main or alternate aerodrome. The helicopter is also equipped with a

digital flight center, and the crew cockpit has multi-function color LCD indicators that significantly reduce the workload of the flight crew. Moreover, Mi-26T2V got a new airborne defense complex Vitebsk that not only detects a threat to the helicopter, but also repels attacks.

Mi-26T2 lighting equipment is now adapted to the use with night vision goggles, and the cockpit is equipped with new energy-absorbing seats for the crew. There are also improvements to a navigation system and satellite communications of the helicopter.

NAVAL MATERIEL FOR THE EXTERNAL MARKET

Alexander Mikheev, Director General of Rosoboronexport (part of the Rostec State Corporation), and Renat Mistakhov, Director General of the Ak Bars Shipbuilding Corporation, signed a cooperation agreement and a joint action program to promote naval materiel in the external market in 2019–2023.

'The agreement will undoubtedly strengthen Rosoboronexport's positions on proposals for naval forces. We are closely monitoring trends in the world weapons market, we are leading some of its directions, and we ourselves are making the rules of the game that competitors have to follow. The documents signed will make it possible to manufacture products that meet the needs of foreign customers as much as possible, and also provide technology transfer – a highly demanded service today – with our very responsive and reliable protection of the results of intellectual activity of the Russian developers and manufacturers,' said Alexander Mikheev.

The purpose of signing the documents is to organize effective interaction between the companies in developing, manufacturing and promoting Ak Bars Shipbuilding Corporation's military, special, civil and dual-use products and services in external markets.

'I am very pleased to consolidate cooperation with the leading exporter of Russian weapons. We see Rosoboronexport as a reliable partner with many years of experience in external economic activities. I'm sure that our joint efforts will help the Corporation meet its primary strategic goal of increasing the revenues from the current level of 38.5 billion rubles to 100 billion rubles by 2025. In addition, I wish to note the social value of the agreement for Tatarstan: today the Corporation unites 10 enterprises and organizations that employ about 10,000 people. The portfolio of foreign orders for our products supports the modernization of production, permanent employment and growth in incomes,' said Renat Mistakhov.

Under the agreement signed, Rosoboronexport will consider Ak Bars as a possible participant in various military and technical cooperation projects with foreign countries, including in the course of its international naval market research. As is known, Rosoboronexport has been appointed the organizer of the joint Russian displays at international defense exhibitions abroad. In this role, the Company stands ready to provide organizational and information support to the Ak Bars Corporation.

Medical Technology Cooperation with Turkey

Shvabe Holding of Rostec State Corporation demonstrated an intensive care incubator at the international exhibition Expomed Eurasia 2019 in Istanbul. The device sparked the interest of representatives from the Turkish Ministry of Health.

Intensive care incubator IDN-03 is intended for nursing and treatment of infants, including those with critically low weight (from 500 g). The device provides controlled inflow of heat, required air humidity and oxygen concentration inside the infant compartment, and monitors the baby's body weight.

Also as a part of the event, specialists from the E.S. Yalamov Ural Optical and Mechanical Plant (UOMZ) of Shvabe Holding gave a talk about the features and functionalities of their neonatal equipment and organized a training of Turkish specialists for assembly, repair and maintenance of the IDN-03 incubators.

'In the first quarter of 2019 the incubators, as well as respiratory gas humidifiers, neonatal phototherapeutic irradiators and heaters presented in Expomed Eurasia, were sent for testing in Turkish hospitals. This will allow us to strengthen our partnership with the Turkish side,' pointed out Anatoly Sludnykh, CEO of UOMZ.

Today IDN-03 incubators are operated in several Russian medical institutions and they are also supplied to Bangladesh, Tunisia, Indonesia, Uzbekistan, Belarus, Kazakhstan and other countries.

'For a long time Shvabe's medical equipment has been helping to reduce infant mortality in Russia and abroad. In 2018, around 20 countries bought our neonatal equipment. We are planning to expand the geography and selection of our exports to the Middle East and other regions,' said Viktor Kladov, Director for International Cooperation and Regional Policy of Rostec.

Rostec continues to carry out its comprehensive program of developing civilian health projects in accordance with the Strategy-2025 plan, which aims to reach an average 17% growth in revenue (in rubles) until 2025 as well as improve operational efficiency and reach new, quickly developing international markets.

International exhibition of medical, diagnostic, laboratory and hospital equipment Expomed Eurasia 2019 was held in Istanbul. The participant comprised of manufacturers and suppliers from Canada, Belgium, India, China, Germany and other countries.

Chameleon Material

The electrically-controlled chameleon material, developed in the Ruselectronika holding of Rostec State Corporation, for equipping the 'soldier of the future', can be used in the production of interior elements and advertising media. The creators of the new material have significantly expanded its capabilities, thanks to which the design bureaus and construction material manufacturers have already shown interest in the new product.

Electrochrome is a specialized electrically controlled material, created by the CNITI Tekhnomash (a part in Ruselectronics), is capable of changing color depending on the incoming electrical signals. To date, its color line allows you to 'repaint' the material from blue to yellow through green, from red to yellow through orange. Besides that, the scientists managed to get a brown electrochrome, which can be used by the military to create adaptive masking coatings. To obtain complex multi-color drawings, a layer-by-layer combination of electrochromes is used.

The material is also capable of becoming transparent, which allows you to create 'smart' glass on its basis, which changes the transmittance when electricity is applied. Power windows, which can become opaque at the request of the owner, can become a modern alternative to curtains and blinds.

'Electrochromes are a vivid example of the conversion of military developments into civilian industries. It was originally designed to create a disguise of soldiers and military equipment. But we saw market interest in creating innovative civilian products based on this technology. The competitive advantage of electrochrome is low power consumption, so it will be in demand for creating advertising billboards, 'smart' windows and other products. Negotiations are already underway with potential partners interested in creating elements of interior decoration and new advertising media based on electrochromic materials,' said Rostekh's executive director Oleg Evtushenko.

For the first time the electrically controlled material was presented at the International forum 'Army-2018'. Features of electrochrome were demonstrated on the example of a prototype helmet of an advanced military equipment, capable of changing color depending on the masked surface and the environment.

EQUIPMENT TO THE TIANWAN NPP

The Roselectronics Holding of Rostec State Corporation installed the radiation-resistant television equipment to monitor nuclear fuel reloading at the Tianwan Nuclear Power Plant (China). The equipment was supplied as a part of construction of two new power units at the Nuclear Power Plant. It was the first export supply of equipment of such kind. Earlier Rostec has already supplied its solutions to the Tianwan NPP: automated workstations, industrial controllers and radiation control systems.

Special cameras may operate at a distance of 30 cm from the nuclear fuel assemblies at extremely high radiation levels (up to 1x107 rad/hour) and with a significant dose of total radiation accumulated over the entire period of operation (up to 2x108 rad). The plain equipment in similar conditions instantly gets out of order. The supplied systems consist of a television camera with a guiding device and an attachment fitting to be installed in the zone exposed to radiation, and the receiving equipment to be installed in the control room and not exposed to radiation.

The thermal imaging systems supplied to the Tianwan NPP were developed by the HVDC Power Research & Development Institute RASTR belonging to Roselectronics Holding and are a product of cooperation between several Roselectronics enterprises. Each system component is a unique technological solution contributing to the overall high quality and reliability of the equipment.

'China is our key partner in a wide variety of industries, including the nuclear energy sector', noted Viktor Kladov, the International Cooperation and Regional Policy Director at Rostec. 'Installation of the Russian systems at the strategic facility of the People's Republic of China is an indication of the highest level of relations between our countries and high confidence in the Russian equipment'.

China is one of the major trading partners of the enterprises of Roselectronics Holding. Side-by-side with the China Electronics Technology Corporation (CETC), the holding develops research and development cooperation in the field of radio electronics, including the joint development and production of multi-system high-precision navigation receivers (modules). In total, seven agreements have been signed between Rostec and Chinese state corporations covering various areas of cooperation in the field of civilian and dual-purpose technologies.

A-50U surveillance plane

Vega Concern, a member of Rostec's Ruselectronics holding company, and Beriev Air Company supplied the Russian Aerospace Forces with a sixth modernized A-50U surveillance plane. The airborne early warning and control plane A-50U has been modernized in an extensive governmental program of upgrading the AEW&C fleet through a federal defense contract.

A-50U is a new modification of the A-50. Compared with its predecessor it can track a greater number of targets and simultaneously control a larger number of fighter planes. In addition it has an increased of airborne detection range of various aircraft, including completely modern ones.

'Early warning aircraft are practically flying radars which can function as a command and control center. Combat experience has proven that their detection speed and ability to respond against a potential enemy air threat depends on their technical equipment, the performance of their radio-electric systems as well as their flight characteristic. Currently our companies are modernizing a seventh A-50 to the level of A-50U. It will be handed over to the customer in 2021', commented Vyacheslav Mikheev, the CEO of the Vega Concern.

The new variant has a completely new onboard computing system. New electronics with a greater performance and computing speed have made it possible to improve the versatility of the functional software. The monitoring systems of each operator have been updated with new high dimension and resolution LCD-screens. Improved ergonomics have enhanced the work performance of the tactical crew.

The satellite communications equipment is significantly more reliable and effective, which has led to better signal exchange speeds, volume and quality. The new aircraft is capable of longer flight range and faster combat mission completion thanks to its improved piloting and navigational systems. Also crew living conditions have been upgraded.

The use of modernized radar system Shmel', advanced installation and assembly techniques as well as other modern technologies has significantly improved the weight and size related characteristics of the aircraft and its reliability.

Ruselectronics (Russian. Roselektronika) is a key holding company in the electronics market. Founded in 1997, it joined the Rostec State Corporation in 2009. In 2017 Russian United Instrument Manufacturing Corporation was integrated to the holding. Today over 50% of Russia's production of electronic components and around 8% of radioelectric products are carried out by Ruselectronics and it is responsible of providing around 10 % of the industry's jobs. The holding unites more than 120 different companies and scientific organizations specializing in design and manufacture of radio-electric components and technologies, communication devices and systems, automated control systems, robotics, microwave radio electronics, computing technology and telecomm equipment. The holding employs over 70 000 people. Annual total revenue exceeds 150 billion rubles and the holding's products are shipped to more than 30 different countries, including Europe, Southeast Asia, the Middle East, Africa and Latin America.

VRT500 at Milan Design Week

The design bureau VR-Technologies, subsidiary of Rostec's Russian Helicopters holding company, presented a mockup of the light multi-purpose helicopter VRT500 at the Fuorisalone exhibition (part of the Milan Design Week, held April 8–14). The helicopter model is presented at the exhibition of ItalDesign, which was one of the developer companies of VRT500.

Currently specialists of Russian Helicopters are developing the construction documentation of the helicopter. This stage is scheduled to be finished at the end of 2021 with the production of the first series of VRT500 in the Ulan-Ude aviation plant.

'VRT500 will become a competitive product in the market of light single-engine helicopters and allows Holding Company to join this new segment for the first time. 'Russian Helicopters' consider Europe as a potential market, so we plan to apply the helicopter for certification to the European Aviation Safety Agency (EASA) this year. We'll start testing the first prototype in 2020', pointed out Alexander Okhonko, CEO of VR-Technologies.

VRT500 is a light single-engine helicopter with coaxial rotors and maximum take-off weight of 1600 kg. It will be equipped with the latest interactive avionics and have the most spacious passenger cabin in its class with the total capability of 5 persons. The helicopter can reach a max speed of 250 km/h, has a flight range of 860 km and can carry a payload of up to 730 kg.

RUSSIAN MEDICAL EQUIPMENT IN DUBAI

Shvabe Holding demonstrates Russian equipment for anesthesiology and neonatology at one of the largest international exhibitions in the field of medicine and health care, Arab Health 2019 in Dubai. The leading doctors from more than 150 countries become familiar with the holding's medical equipment.

On its stand, Shvabe presents an intensive care incubator IDN-03 for nursing the premature newborns weighing from 500 grams and a compatible neonatal infrared heater 'Radiant Heat-BONO'. The other products on display for the foreign doctors include the phototheraputic and anesthesia-respiratory equipment for children, along with a multifunctional inhalation anesthesia device MAIA-01. Today it is the only device made in Russia that combines artificial lungs ventilation, anesthesia and complex monitoring of the breathing mixture.

The device is manufactured on commercial scale by one of the leading enterprises of Shvabe Holding – the Ural Optical and Mechanical Plant named after E.S. Yalamov (UOMZ).

'Our exposition features a line of medical products that are successfully used by hundreds of Russian medical facilities, and are in high demand abroad. This event will help to lay a foundation for the new lasting partnerships and expand a footprint of the holding in the Middle-East marketplace', said Ivan Ozhgihin, Deputy Director General at Shvabe.

The international exhibition Arab Health has a 40-year old history. Annually it brings together the largest manufacturers of medical equipment, developers of new technologies and experts in the pharmaceutical field. It is expected that this year about 4200 companies will present their products.

Mi-171 & VK-2500-03 in China

The Civil Aviation Administration of China issued a national type certificate for the Mi-171 helicopter with VK-2500-03 engines. The decision of the Chinese authorities gives Russian Helicopters holding company (part of Rostec State Corporation) an opportunity to supply machines of this type to China.

'China has about 20 civilian Mi-8/17 helicopters, and we had previously noted several times that national operators are interested in the latest versions of this type. Cooperation of Rostec's holding companies made Mi-171 more attractive for business, having reduced the cost of its operation due to using new technologies,' said Russian Helicopters CEO Andrey Boginsky.

In late 2018 Russian Helicopters made demonstration flights of Mi-171 with the VK-2500-03 engine in China. The heads of the Chinese Ministry of Emergency Management and the Civil Aviation Administration of China saw transport capabilities of the machine during cargo transportation on an external sling, fighting fire in high mountains and flights with a helicopter bucket.

'Helicopter construction is one of the key areas of cooperation between Rostec and our Chinese counterparts,' said Viktor Kladov, Director for International Cooperation and Regional Policy Department of the State Corporation. 'We are constantly working on expansion of cooperation areas in this industry – this includes machines supply, retrofitting, authorization and certification of existing and creation of new technical service centers, and, of course, our project with China to create AHL.'

Fighting fire and transporting cargo at an altitude of up to 3,300 meters, the Mi-171 helicopters with VK-2500-03 engines demonstrated its key advantages, such as the thrust-to-weight ratio and safety of operation in the mountains, in the best possible way. During the demonstration flight, the helicopter carried three tons of cargo and nine passengers from the altitude of 2,600 meters to the altitude of 3,300 meters. The machine also showed how it takes 3,5 tons of water in the helicopter bucket at the altitude of 3,000 meters and then pours it in the center of the fire. Besides, on the ground, as part of a static show people saw unique capabilities of Mi-171 in terms of passengers and firemen quickly getting on and off the machine.

The certified Mi-171 helicopter with the VK-2500-03 engines was first presented at China International Aviation & Aerospace Exhibition held in Zhuhai. The VK-2500-03 engine designed and supplied by JSC 'UEC-Klimov' is very powerful (compared to the TV3-117VM engine, series 02) in any flight mode and at any altitude due to heat-resistant materials and improved design. The introduction of the BARK-78 digital automatic control system makes it possible to run the engine more properly, ensures closer control over operations in all modes and makes the operation simpler. The use of VK-2500-03 engines in Mi-171 helicopters ensures higher load capacity and increases the absolute and static ceiling. Besides, greater available engine power in an emergency mode ensures greater safety during the flight with one running engine.

Engine Components for MC-21

United Engine Corporation (UEC) and the All-Russian Institute of Light Alloys (VILS), both forming part of Rostec, will prolong the life of the PD-14 engine by using a new heat-resistant granulated alloy.

The new alloy has been used for making high pressure compressor discs and a turbine for the PD-14 engine created for the first Russian short and medium-haul MC-21 aircraft. According to current estimates, its implementation, along with other innovative technical solutions, will increase the life of these components of domestic engines for civil aviation from 5 to 30 thousand flight cycles.

'PD-14 is the result of the broad cooperation work of our enterprises. The innovative solutions applied in it, including new alloys, allowed to create a truly modern, powerful and highly resourced aviation engine. The first flight of the prototype MC-21 with PD-14 is scheduled for the second quarter of 2019. Deliveries of PD-14 for MC-21 will begin in 2021', said Anatoliy Serdyukov, Industrial Director of Rostec's Aviation Cluster.

In 2019 the All-Russian Institute of Light Alloys (VILS) will conduct additional research in the interests of UEC, which will allow more extensive use of this technology for engines of civil aircraft. The research includes development of new alloys and products for a new generation of PD-35 engines based on these alloys.

COOPERATION WITH SOUTHERN AFRICA

Rosoboronexport took part in the Southern African Development Community (SADC) Day celebrations. 'Rosoboronexport regards the Southern African Development Community as a promising partner. It is one of the largest and most influential subregional organizations whose activities are aimed at comprehensively promoting the development of its member countries. The Community's goals and objectives largely comply with our strategy on the African continent. We are working closely with member countries of the Community in strengthening infrastructural and state security, combating terrorism and organized crime, preparing and equipping peacekeeping missions under the auspices of the Community. We are pleased to have such a strong and reliable partner in Africa,' said Rosoboronexport's Director General Alexander Mikheev.

Today, Rosoboronexport notes an upward trend in the arms market in the sub-Saharan African countries, which is due to a number of objective factors. Among them are the fight against the spread of international terrorism and Islamic radicalism, the continuing threat of maritime piracy. In addition, different units from countries in the region are actively involved in peacekeeping operations.

The Company uses a comprehensive approach to cooperation with the countries of the region, offering its partners the delivery of final products, as well as the necessary logistics support throughout their life cycle, training and the establishment of facilities for the repair and maintenance of products.

RUSSIAN LADA IN GLOBAL MARKET

LADA continues to strengthen its positions on foreign markets. It was sold 27398 cars and SKDs in 9 months of 2018 that is by 65% more vs the same period of last year. Along with that it was opened 2 new directions and 9 dealerships. Since the early year LADA cars started to be sold in two new countries – Tunisia (Tunisia) and Chile (Santiago, Punta Arenas). LADA occupies the second position in Belarus by sales results for 9 months of 2018. The brand's dealership has been actively developed here: since the early year 6 new dealerships were opened in Minsk, Gomel, Mogilev, Pinsk, Vitebsk, and Grodno, fully meeting the new standards of design and service. For 9 months of 2018, 3 new LADA dealerships were opened in Uzbekistan – in Tashkent, Dzhizak and Bukhara. By results of 9 months LADA has again occupied the first position by sales in the Republic of Kazakhstan with a market share of 22,9%. And its growth took 5.2% points vs the same period of last year.

Face Recognition Algorithm

NtechLab is one of the world leaders in the field of biometric technologies, reported on the results of testing face recognition algorithms by the National Institute of Standards and Technology of the US Department of Commerce (NIST). The results of the Face Recognition Vendor Test (FRVT) contest demonstrated high results of NtechLab algorithm on the most complex photo databases.

FRVT testing 1:1 corresponds to the scenario of confirming a person's identity by verifying with a photo. This function is used in a wide range of civil, law enforcement and national security programs, including photos examination on visa documents and for issuing passports, identifying individuals using images from the media. Within FRVT framework, more than 100 algorithms from various suppliers were evaluated. The accuracy and speed of the search, as well as the adaptability of the algorithm to subsequent changes were taken into summarizing account. The study also aims to help the US Department of Commerce to identify the world's best suppliers of such software solutions.

FRVT testing was conducted on several photo bases - Wild and Child Exp, which contain photos from social networks, as well as base of people suspected of child abuse. The leading algorithms in such tests continue to work effectively in so-called wild conditions and are used to ensure public safety. The NtechLab algorithm, on which Find Face Security's solution is based, ranked second when working with the Child Exp base and ranked third with the Wild base, having improved by doubling accuracy rates as compared with the previous test.

'A number of new companies took part in this NIST contest, many of which are from China. It can be said that the contest was highly competitive as never before. Based on its results, we can gladly assert that regular improvements of our algorithm allow it to remain among the world leaders in the accuracy of identifying individuals in a variety of conditions,' said Artem Kukharenko, founder of NtechLab, Head of the neural networks laboratory.

NtechLab algorithms have repeatedly proven their unmatched superiority in international competitions. The development of NtechLab ranked first in 2017 according to the results of the American Agency of Advanced Studies in Intelligence competition in categories of the most accurate and the fastest algorithms. NtechLab entered the top three winners of the Wider Pedestrian Challenge in 2018 on detecting pedestrians based on their silhouettes. The algorithm is successfully piloted in ten major cities of Russia and CIS countries, including Moscow, Ryazan, Almetyevsk, as well as in municipal video surveillance systems of cities in India, South America and Southeast Asia.

Lens Manufacturing for Astrophotography

Shvabe holding company (part of Rostec) has resumed the manufacturing of MC Rubinar 10/1000 Macro, a telephoto camera lens for close-up, landscape, architectural and sports photography. It is particularly popular with amateur astronomers as it can capture clear images of the lunar surface, stars and planets of the Solar System.

The manufacturing of MC Rubinar 10/1000 Macro was launched at Shvabe's Lytkarino Optical Glass Factory (LZOS). Fifty items have already been produced and another fifty will become available on the market in the second half of 2019. These lenses are compatible with the majority of reflex and non-reflex cameras and are offered by offline and online photo equipment stores.

'We have relaunched Rubinar, a lens that has been legendary since the Soviet times, at a new level. Modern-day photo equipment is made on digital facilities with advanced technologies for the processing of optical and mechanical parts. Given Rubinar's excellent quality we anticipate high demand both in Russia and beyond. Putting in place manufacturing facilities like these is part of Rostec's strategy that aims at large-scale diversification and at growing the share of civil-purpose products to 50% by 2025,' said Oleg Yevtushenko, Rostec's Executive Director.

Compared to other Rubinar products, the 10/1000 is distinguished by its compactness, light weight and high image quality. With its technical specifications, this classic lens caters to the needs of both amateur and professional photographers.

VLADIMIR PUTIN and RECEP TAYYIP ERDOGAN

Russian-Turkish relations are developed very promising

Russia and Turkey are currently showing probably the best friendship and cooperation relations in history. Confirmation of this are recent talks between Vladimir Putin and Recep Tayyip Erdogan, who was on a working visit to Russia on April, 2019. The presidents of Russia and Turkey had an in-depth exchange on the full range of Russian-Turkish relations, including the progress of joint strategic projects in energy, defence and the humanitarian field, and on current regional and international issues.

Signed documents in various fields were exchanged in the presence of the heads of state. An agreement was signed between the Russian Direct Investment Fund and the Turkey Wealth Fund establishing a Russian-Turkish investment fund with 900 million euros in joint reserved capital.

Another two documents relate to mutual understanding on a programme for accelerated patent processing between the respective departments of the two countries, as well as cooperation in the field of standardisation. Vladimir Putin and Recep Tayyip Erdogan made press statements and took questions from reporters.

At the beginning of Russian-Turkish talks President of Russia Vladimir Putin said to Recep Tayyip Erdogan: 'We are pleased to welcome you to Moscow and today we will open the 8th meeting of the High-Level Russian-Turkish Cooperation Council. We will listen to our colleagues who are responsible for various cooperation tracks. We will discuss bilateral relations and humanitarian contacts and we will meet and talk with representatives of the business community. In the evening, the Russian-Turkish Cross Year of Culture will be launched.

We are witnessing and confirming a good level of development in our relations, with trade growing by 15 percent, its overall volume at $25 billion.

Major projects are being implemented: the Akkuyu power station, which we are to launch by 2023 in accordance with Turkey's wishes, and the Turkish Stream pipeline with its onshore and offshore legs recently connected.

We are cooperating in many spheres of international relations, including good contacts through the Foreign Ministry, the Defence Ministry, and military technical cooperation.'

President of Turkey Recep Tayyip Erdogan said: 'First of all, I would like to note that we are here for the 8th meeting of the High-Level Cooperation Council. We will have meetings on political, economic, trade, military andЙ industrial issues. I hope that we will also discuss both regional and international issues. Today our countries will sign three agreements. We will take another step forward for the future of our countries. As you noted, Mr President, our mutual trade has grown by 15 percent. You and I have now set a new benchmark for our trade relations: to achieve the $100 billion mark.

First of all, I would also like to mention the Turkish Stream. Indeed, the construction of its offshore section has been completed. The onshore part is being laid as planned. We are to finish the construction of this part on time.

Another important part of our cooperation is jointly continuing the fight against terrorist groups that pose a threat to our region. This is especially true of the steps that we have already taken and will be taking on the Syrian track. I believe that today's meeting of the High-Level Cooperation Council is of great importance in this context.

Undoubtedly, during these meetings contacts between our ministers will also continue throughout the day. We will give an assessment to these contacts and thus complete our meeting today.'

During that visit in Moscow Kremlin there was Meeting of High-

'We are witnessing and confirming a good level of development in our relations, with trade growing by 15 percent, its overall volume at $25 billion. Major projects are being implemented: the Akkuyu power station, which we are to launch by 2023 in accordance with Turkey's wishes, and the Turkish Stream pipeline with its onshore and offshore legs recently connected. We are cooperating in many spheres of international relations, including good contacts through the Foreign Ministry, the Defence Ministry, and military technical cooperation.'

Vladimir Putin

'Expanding our dialogue with Russia has been very beneficial for us. Ever since the 1990s, economic and trade relations have become the driver behind Russia-Turkey relations. Today, we have discussed trade, economic and cultural relations, as well as our contacts in all other areas at the delegation level. In addition, Mr. Putin and I have been considering the idea of working together with the business community for a long time now. There is such an opportunity today. This is our way of showing support for the business community.'

Recep Tayyip Erdogan

Level Cooperation Council between Russia and Turkey. Vladimir Putin and Recep Tayyip Erdogan chaired the eighth meeting of the High-Level Russian-Turkish Cooperation Council. The discussion covered various aspects of Russian-Turkish cooperation, including energy, as well as regional and international issues. Earlier that day, the two leaders held a restricted meeting to consider priority issues of developing bilateral relations.

Beginning of the High-Level Cooperation Council meeting between the Russian Federation and the Republic of Turkey Vladimir Putin said: 'I am very happy to welcome all of you at the eighth meeting of the Russian-Turkish High-Level Cooperation Council. Mr President and I have just discussed, at the limited attendance meeting and then one-on-one, the priority issues of developing Russian-Turkish relations. We agreed to continue developing our cooperation as an advanced multilateral partnership.

Now I suggest discussing in the same businesslike and constructive spirit with the participation of the government members and business representatives specific areas of cooperation and the implementation of major joint projects, and mapping out guidelines for the further expansion of mutually beneficial contacts.

The current Cooperation Council meeting was preceded by serious interdepartmental and corporate preparations. A host of meetings at all levels were held. Heads of key ministries and departments of the two countries coordinated their positions in the framework of the special mechanisms of political, economic and cultural cooperation that were established at the Cooperation Council.

In particular, the joint strategic planning group members discussed the situation in Syria at a meeting in Antalya. As guarantors of the Astana process, Russia and Turkey continue making energetic, coordinated efforts for the long-term normalization of the situation in that country. We are coordinating our efforts in the context of stepping up the intra-Syrian political process, particularly with an eye towards forming a constitutional committee as soon as possible.

A regular meeting of the mixed intergovernmental commission took place. It does much to deepen economic ties and boost mutual trade and investment.

Last year, bilateral trade grew by almost 16 percent to over $25 billion. The volume of mutual investment is nearing $20 billion.

I believe that cancelling existing trade restrictions and diversifying the range of products could help expand trade. Launching new joint projects in manufacturing, metallurgy, agriculture and the high-tech sector will promote investment cooperation.

Notably, Russian-Turkish energy cooperation has become truly strategic. Russia is the largest natural gas supplier to Turkey. Last year, 24 billion cubic metres were exported. This covers almost half of the country's needs.

A new gas pipeline, TurkStream, will significantly boost the supply of Russian gas to Turkish consumers when it becomes operational. The deep-water section and Turkey's coastal section of the pipeline were line up the other day, marking the culmination of a major phase of the construction process.

Next, the construction of the receiving terminal on Turkey's Black Sea coast has to be completed, so that TurkStream becomes operational before the end of the year, as agreed.

The construction of the Akkuyu nuclear power plant in Turkey is another key energy project. The first unit is to launch in 2023, to coincide with the 100th anniversary of the Republic of Turkey. At this stage, there is need for bringing in additional funding and executing appropriate agreements with potential Turkish investors, who are available.

Our countries have major goals in strengthening defence cooperation. First of all, this concerns completing the implementation of the contract for the supply of S400 Triumph anti-aircraft missile systems to Turkey. Also on the agenda are other promising projects related to supplying modern Russian military products to the Republic of Turkey.'

President of Turkey Recep Tayyip Erdogan said: 'I am very happy to be in Moscow to attend the eighth meeting of the High-Level Russian-Turkish Cooperation Council. Thank you for your kind invitation and genuine hospitality. My friend Mr. Putin and I have met repeatedly over the year that has passed since the previous meeting of the Council. Our ministers and other authorized persons also maintained close contact.

Together we have broken ground on the Akkuyu nuclear power plant, and completed construction of the offshore section of the TurkStream gas pipeline. Together we set a new record, having received six million Russian tourists in our country last year.

Our business leaders continue contributing to Russia, and now a large number of our businessmen are in Russia. Our Turkish firm Esta has built a plant for the German automobile company [Mercedes-Benz], which was opened by my dear friend Vladimir five days ago.

This year, we mark the Year of Culture and Tourism; the official opening will take place at the Bolshoi Theatre.

We have had the opportunity to discuss bilateral issues, both regional and international, in a one-on-one meeting, while our ministers talked with their colleagues. Now we must give a general assessment of this day together.

Our major target is to reach the $100 billion mark [in trade]. At the moment, we are only at 26. Therefore, we will make every effort to attain this goal strategically, economically and trade-wise – that is, on all tracks.'

Also we must say about the meeting in the Kremlin of Vladimir Putin and Recep Tayyip Erdogan with Russian and Turkish business representatives. Vladimir Putin opens meeting: 'Just now, at a meeting of the High-Level Cooperation Council, we reviewed in detail current issues relating to relations between Russia and Turkey, including, of course, the dynamic economic cooperation between our countries. I would like to note that Russia and Turkey are key partners in trade and investment. Last year, bilateral trade increased by 16 percent, reaching $25.5 billion.

We have achieved good results in agriculture. In 2018, trade in this sector was up 7 percent, reaching $3 billion. Mutual investment stands at about $20 billion.

Today, the Russian Direct Investment Fund will sign an agree-

ment with the Turkish sovereign wealth fund on creating a joint investment platform of $1 billion to be invested in promising sectors of the two countries' economies.

Russia appreciates that Turkish investors are taking an interest in our market. In recent years, Turkish companies have discovered business opportunities in many regions of Russia, including Vladimir, Penza and Kaluga regions and Krasnodar and Stavropol territories.

There is also potential to develop cooperation with the Republic of Crimea. Vacant niches are being quickly filled there, including by foreign investors.

Probably, Turkish companies have invested the bulk of the capital – about $2 billion – in the economy of Tatarstan, primarily at the Alabuga Special Economic Zone, along with the participation of the holding companies Hayat and Coskunoz and the Sisecam Group. Glass, plastics and household chemical manufacturing plants have been established, which are large even by European standards.

Russia and Turkey maintain close cooperation in energy. Flagship projects include the TurkStream pipeline and the Akkuyu Nuclear Power Plant. These projects are being carried out in full conformity with the endorsed plans, and I am confident that both will be put into operation on schedule.

Russian companies like Lukoil and Rosneft have earned a good reputation in the Turkish market. Power Machines is taking part in modernising Turkish hydroelectric power stations. United Engine Corporation is spending quite a bit of money and effort to ensure the reliable operation of the Turkish gas transit infrastructure.

In turn, Turkish builders are active in the Russian market. They have fulfilled about 2,000 contracts with a total value of some $70 billion.

Turkish companies helped build the facilities for the 2014 Olympics in Sochi and the 2018 FIFA World Cup.

The business circles of the two countries have a lot of potential in high-tech, pharmaceuticals, agricultural and transport equipment manufacturing, ship and aircraft construction, as well as the development and launching of space vehicles.

I would like to emphasise that we in Russia are and will be doing everything necessary for foreign companies, including Turkish firms to feel as comfortable and stable in the Russian market as possible, without being subjected to excessive administrative burdens.

Russia is already 31st in the ease of doing business rankings by the World Bank. We moved up several dozen positions in just five years.

All macroeconomic indicators retain positive dynamics in Russia. Last year our GDP increased by 2.3 percent while industrial production growth went up by almost 3 percent. All this allows foreign companies to work steadily and to make long-term plans in Russia.

Hundreds of billions of dollars will be invested in critical economic and social sectors as part of our national programmes. Once implemented, they will open major prospects for foreign, particularly Turkish, businesses.

It is in our interest to create the necessary conditions for your work, and it is in your interest to implement these projects and make a profit from doing so. We will do our best to support you.

The companies you represent have considerable hands-on experience in implementing major joint projects, and, I believe, are interested in building up trade and investment ties.

Therefore, I propose having a detailed and candid discussion of the issues that are of concern to the Turkish and Russian business communities. Of course, it is important for us to hear what you have to say about additional steps that the government should take in order to boost business contacts even further.

I would also like to take this opportunity to invite business people from Turkey, who are always widely represented at the St Petersburg Economic Forum, to take an active part in it this year as well. The forum will be held in St Petersburg on June 6-8.'

President of Turkey Recep Tayyip Erdogan said: 'As you are aware, Mr. Putin and I co-chaired the 8th meeting of the High-Level Cooperation Council today, and I am very pleased to have the opportunity to be here with you now.

I would like our meeting to be effective and useful. I want to thank you for your hospitality on my own behalf and on behalf of all our country's representatives. Expanding our dialogue with Russia has been very beneficial for us. Ever since the 1990s, economic and trade relations have become the driver behind Russia-Turkey relations. Today, we have discussed trade, economic and cultural relations, as well as our contacts in all other areas at the delegation level.

In addition, Mr. Putin and I have been considering the idea of working together with the business community for a long time now. There is such an opportunity today. This is our way of showing support for the business community.

About 1,300 representatives of our business community are here, strengthening our ties. We will be working together with all our agencies to resolve any problems (first identify them, and then deal with them).

Russia is our third largest trade partner. We have reached $26 billion in mutual trade, but of course, this figure is too small. We are trading in finished products, pharmaceuticals, cosmetics, mechanical engineering products – all of those are well represented. But even in these industries, the level of Russian imports into our country is very low.

My dear friend and I have already set a target benchmark of $100 billion, and so we need to find new approaches. Today we talked about this. All of our ministries have already been given the appropriate instructions to increase trade with Russia.

'Notably, Russian-Turkish energy cooperation has become truly strategic. Russia is the largest natural gas supplier to Turkey. Last year, 24 billion cubic metres were exported. This covers almost half of the country's needs. A new gas pipeline, TurkStream, will significantly boost the supply of Russian gas to Turkish consumers when it becomes operational. The deep-water section and Turkey's coastal section of the pipeline were line up the other day, marking the culmination of a major phase of the construction process. Next, the construction of the receiving terminal on Turkey's Black Sea coast has to be completed, so that TurkStream becomes operational before the end of the year, as agreed.'

Vladimir Putin

First, we have transport and visa issues. Work is certainly underway on these tracks. We expect that Turkish firms will soon enjoy the terms now provided to third-country firms.

Turkish builders have been establishing a firm presence here since the 1990s. They have implemented as many as 1,961 projects worth $73 billion. Our construction industry plays a major role in the Russian economy. Then there is investment in the Russian economy. Here we expect the Russian media to provide wider support.

In the same way, Russia has invested $10 billion in our country –in petrochemical and other advanced technologies. All this seriously influences the Turkish economy.

We are ready to provide preferential treatment options for Russian businesses. We are not treating your firms as foreign or Russian investors, but regard them as our own, our local firms.

Energy cooperation is among the most important of economic processes. The Akkuyu Nuclear Power Plant, and the TurkStream and Blue Stream pipelines are strategic items in our long-term plans. Our target by the end of the year is to finish the onshore section of the TurkStream.

It would also be good to convert financial settlements between us to

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Recep Tayyip Erdogan

national currencies as soon as possible so we can be protected against foreign exchange market fraud.

We are ready to address issues of providing the necessary benefits, so all we want now is to hear about your problems and to exchange information.'

After Russia-Turkey talks Vladimir Putin and Recep Tayyip Erdogan gave a news conference in the Kremlin, where said about the results of the Turkish President's visit to Russia. Vladimir Putin: 'It has been our pleasure to welcome the President of the Republic of Turkey in Moscow. We maintain close regular contacts, and today we held another High-Level Cooperation Council meeting. During the meeting, we had limited attendance talks with the participation of the heads of the main ministries, departments and major companies of the two countries. Mr. Erdogan and I also met with representatives of the Russian and Turkish business communities.

During the talks, Mr. Erdogan and I discussed in detail the full range of bilateral cooperation issues. Naturally, we paid special attention to trade and investment ties that have recently become much more dynamic and extensive.

In 2018, trade increased by 16 percent to reach almost $26 billion. Mutual investment was substantial, reaching $20 billion.

The Mixed Intergovernmental Commission is playing a big role in organising our economic cooperation. The Russian-Turkish Business Council is working actively. It helps develop direct contacts between entrepreneurs of the two countries, including those representing small and medium-size businesses.

The Russian Direct Investment Fund and the Turkey Wealth Fund facilitate the implementation of new joint projects. They have just signed an agreement on creating a $1 billion investment platform. I believe with such investment capital they will be able to raise at least $5 billion for various projects.

Our energy cooperation is strategic in nature. Rosatom is building Turkey's first nuclear plant, Akkuyu – four energy units with a total capacity of 4,800 megawatts. The first unit is to be put into service in 2023 – the centenary of the Republic of Turkey.

The construction of TurkStream is proceeding as scheduled. The offshore section was docked with the onshore section on the coast of Turkey, and Russian gas deliveries to Turkish consumers along this route will begin before the year is out.

In the future, after TurkStream's capacity is expanded and the second branch is built, gas will be transity to Europe as well.

Importantly, both these projects – the Akkuyu nuclear plant and TurkStream – meet the highest environmental and technical standards and will be essential to ensuring regional and European energy security.

There are good opportunities for deepening cooperation in the metallurgical industry, the automotive industry, agriculture, as well as innovation-driven and high-tech sectors. We discussed this in detail today with business representatives, as I have already mentioned, and learned about their initiatives.

We discussed Russian-Turkish cooperation in the defence sector, in particular, the contract for supplying S-400 Triumph anti-aircraft missile systems to Turkey. We discussed other current and promising defence cooperation projects as well.

Of course, we touched upon our cultural and civil society ties. The Russian-Turkish Public Forum does a good job in this area. Rectors of Russian and Turkish universities met in Ankara in February. Turkish journalists came to Moscow as part of an exchange programme between news agencies. Russian reporters, in turn, will go to Turkey this summer.

A high level of tourist exchanges is typical of Russian-Turkish relations. Turkey is becoming increasingly popular with Russian tourists, who visit not only Turkish resorts, but numerous historical and cultural landmarks as well. Last year, Russia, with six million tourists, again ranked first in the number foreign tourists visiting the Republic of Turkey.

In turn, we appreciate the Turkish authorities' focus on the safety and convenience of Russian tourists, and we will consistently work on easing mutual visa regulations.

In part, the issue of exempting professional drivers from entry visas will be resolved in the near future.

Ties in science, education, the arts and tourism have always helped strengthen the atmosphere of trust and understanding between our countries. I would like to note in this context that President Erdogan and I attach great importance to the Cross Year of Culture and Tourism of Russia and Turkey, which will open today with a performance of the Turkish opera 'Troya' at the Bolshoi Theatre in Moscow.

Discussing major international issues, we certainly devoted much attention to developments in Syria. Let me emphasise that Russia and Turkey will continue their effective cooperation in the framework of the trilateral Astana format with Iran's participation.

Now that the main terrorist forces have been routed, it is important to concentrate on the final stabilisation of the situation and on promoting the political settlement process in line with UN Security Council Resolution 2254. In this context, Mr Erdogan and I agreed to do everything we can, in coordination with the Syrian Government, the opposition and the UN, to facilitate the launch of the Constitutional Committee.

We also discussed the situation in the Idlib de-escalation zone and prospects for the comprehensive implementation of the Sochi memorandum. I hope our joint efforts will help achieve normalisation in and around the de-escalation zone and eventually neutralise this terrorist hotbed. Importantly, we are guided by the necessity of preserving the sovereignty, independence and territorial integrity of Syria. The division of the country into zones of influence is unacceptable.

Humanitarian assistance for Syria's post-conflict recovery is a primary goal. I am referring to the construction and repair of essential infrastructure, housing, hospitals, schools as well as water and electricity supply facilities. It is important that the entire international community should take part in these efforts. Only together can we create the necessary conditions for the return of Syrian refugees and temporarily displaced persons to their homes.

In conclusion, I would like to say that the current meeting of the Cooperation Council and our bilateral talks were highly successful. I am convinced that today's agreements will help further develop Russian-Turkish cooperation in all areas. /RA&MG/

FSMTC of Russia

Dmitry Shugaev: 'Our military equipment is highly efficient, quite easy to maintain and is much better than its competitors in terms of its unsurpassed ability to operate in severe geographical and weather conditions'

In accordance with the law of the Russian Federation, activities in the field of military-technical cooperation (MTC) with foreign countries shall be controlled and supervised by the Federal Service for Military-Technical Cooperation (FSMTC of Russia) that, among other things, shall ensure implementation of basic principles of the Russian government policy in the field of MTC. Dmitry Evgenyevich Shugaev, the Director of FSMTC, discusses main directions and tendencies in development of military-technical cooperation between the Russian Federation and foreign countries, the peculiarities of Russian military purpose product exporters' activities at the present stage in his interview to our magazine.

– Mister Shugaev, many countries need defense exports to capitalize on the economy of scale effect and make their systems more affordable. At the same time there is a considerable political component to arms trade. As for Russia is it more of a political or a commercial issue today?

– Well, the military-technical cooperation (MTC) is in essence a special area where economic and political interests of a country intertwine. It is the same for the majority of the countries no matter whether they export or import military purpose products (MPP). The economic aspect of MTC is certainly extremely important. Along with the scale effect, which you have aptly mentioned, for any country, not excluding Russia, successful military-technical cooperation contributes to the federal budget and helps us modernize the national industry. It is no secret that export contracts ensure work-load for domestic industrial enterprises all over our country increasing production and creating jobs. Importantly, global competition of defense producers forces them to analyze success stories of rivals as well as the requirements of their partners so that they can better understand global industrial and technological trends.

At the same time even from the economic point of view the military purpose products' market is substantially different from other global markets such as raw materials, end-goods and services. First, fluctuations are quite rare in global arms trade while military purpose products are traditionally in high demand. However, the demand for arms is usually subject to the influence of such factors as national armies' modernization programs, importer states' overall economic stability and, in particular, funds allocated to purchase arms. So, evidently, even in economic terms arms market is influenced by both economic and political factors.

And, of course, MTC is an extremely «sensitive» area. Both for the Russian Federation and for any other leading exporter of military purpose products it remains an important foreign policy tool.

Therefore, it will be correct to say that in pursuing our military-technical cooperation with foreign states Russia proceeds from its strategic interests that have both an economic and a political component.

– What are the principles, the system of cooperation in the field of MTC is based on today?

– Today the system of military-technical cooperation of Russia is built as a vertical relationship where Rosoboronexport is the only exporter of final military purpose products. Concurrently, there is also a number of entities in the field of military-technical cooperation of Russia that are authorized to provide service of the equipment previously purchased by customers, to upgrade it and to supply spare parts for this equipment. These, in particular, include such integrated structures of the defense industry as the United Aircraft Corporation, the United Shipbuilding Corporation, Almaz – Antey Air and Space Defense Corporation and others. They obtained this right to service their equipment supplied to foreign customers as they represent defense industry itself, they embrace the factories that manufacture spare parts, components, etc.

Federal Service for Military-Technical Cooperation is an agency that controls and supervises all the activities related to military-technical cooperation and issues licenses. From strategic point of view the FSMTC of Russia plays the role of government policy 'conductor' in the field of military-technical cooperation and acts as a controlling and licensing agency at the same time.

However, all decisions regarding final supplies anyway are made at the highest level in Russia. That is, either an appropriate ordinance or instruction of the President or the Russian government should be issued. That's why I call it a 'vertical type of relationship.'

The Federal Service for Military-Technical Cooperation (MTS) is a key element of the power vertical managing the MNS system. As federal executive authority. Federal Service for Military-Technical Cooperation (FSMTC of Russia) performs MTS control and supervision functions. FSMTC of Russia reports to the Russian Federation President. FSMTC of Russia is subject to jurisdiction of the Russian Federation Defense Ministry.

'Russo-Turkish military-technical cooperation is fairly dynamic: the Turkish Armed Forces currently operate Russian-made APCs, helicopters, anti-tank missile systems and small arms of different designs. We also have joint projects in various phases of implementation and discussion.'

– How can you describe the development and dynamics of Russian activities in the field of MTC?

– First of all, I'd like to note that Russia is second in the list of world top exporters of military purpose products. It is not a secret that part of our export is made up by aviation equipment; export of the equipment related to aviation varies in the range of 40-50% of the total volume. Of course, we positively appreciate this fact, and we wish exporters of other weapon types to achieve these figures as well.

At the same time we understand, that the market of military purpose products (MPP) is a very specific market having cyclic nature. A number of factors should be taken into account, including rearmament programs of armies, financial solvency of countries depending on their general economic health. Therefore, we do not expect any abrupt jumps, we are building long-term relationships that allow us to speak with confidence about stable growth of export supplies.

It is important to participate in long-term programs, providing technical support to our clients and creating maintenance stations with an understanding that many of our clients aspire to improve their own industry, for example.

– What trends currently drive the development of Russian arms exports?

– Russia is a world-leading arms exporter. If we are to analyse Russian military exports over the past several years, the country has reached a steady level of weaponry and hardware exports at some 15 billion dollars per year.

Despite the sanctions which the USA and its allies keep piling up on Russia's defence companies and banking sector, and the threat of similar sanctions being introduced against our foreign partners, Russia continues successful military-technical cooperation with foreign countries in keeping with national norms, in strict adherence to the rule of international law, and in full conformity with its contractual obligations.

– Which classes of weapons and military hardware are particularly popular with foreign customers?

– Historically, or air force, air-defence and army equipment enjoys the greatest international demand. These three segments used to account for some 90% of Russia's entire arms export portfolio. We predict further growth in the military aviation segment, including as regards rotorcraft. We also expect an increase in orders for air defence systems. There is also good reason to expect the naval market to grow as the leading world powers are demonstrating an increasing interest in upgrading and bolstering their navies.

– You have mentioned the projected growth in demand for air defence systems. Which objective advantages make Russian systems particularly appealing in this segment?

– The experience of contemporary local conflicts demonstrates that the side which commands the more powerful air defences usually has an edge over the adversary. It is, therefore, only natural for Russia, which is a world-leading manufacturer of advanced air defence systems, to be looking to capitalise on this advantage in the global arms market.

This market segment is highly competitive. There are a number of countries that used to import air defence systems but are now entering the international market with indigenous products. These include India, South Korea, Turkey and South Africa, which could become our rivals in the future.

Despite the broad choice of air defence systems available in the global arms market, Russian products enjoy a steady demand. They surpass foreign equivalents in a number of important technical parameters, and their price is also more appealing. The optimal combination of these characteristics is what ensures the steady global popularity of our products, as conceded by US and West European military experts.

Foreign customers note that Russian air defence systems meet the highest contemporary requirements. They appreciate the reliability, low maintenance and excellent repairability of Russian products. In addition, Russia offers a broad range of air defence equipment, from complex solutions to more affordable but nevertheless equally effective options for those governments which require protection of their airspace while not commanding significant financial resources.

The greatest international demand is currently observed for the Kub, Buk, Tor-M2E and S-300PMU SAM systems; for the Pantsir-S1 gun-and-missile system; and also for the S-400 and S-300VM Antey-2500 SAM systems. The S-300PMU Favorit and the S-400 Triumf are worthy of special mention. They have performed excellently in actual combat environments in Syria.

– How difficult is it for Russia to export weaponry and military hardware to countries that are members of military blocs (such as NATO)? Is politico-military affiliation a serious obstacle for those countries interested in procuring Russian weapons?

– We do not differentiate between countries that are members of military blocs and the rest of our customers. Russia sets no additional politico-military conditions in its bilateral relations when it comes to military-technical cooperation. Our country is open to mutually beneficial cooperation with all countries, irrespective of their affiliation with any military alliances.

That said, the global arms market generally remains highly politicised. Quite illustrative in this respect was the introduction of sanctions against Russian defence enterprises by the NATO member states and their allies. The sanctions have caused direct economic damage to many hi-tech manufacturers in NATO countries. This is why the political component and bloc mentality should not be disregarded.

Nevertheless, Russia is prepared to continue dialogue on military-technical cooperation with all interested partners. We continue such cooperation with Bulgaria, Greece, Slovakia and Turkey, all of which are NATO member states, and we discuss further prospects of this cooperation with the respective governments.

– What is Russia's particular interest in IDEF? How is this exhibition different from others? What will be the highlights of Russia's exposition this year?

– IDEF is a major regional defence exhibition. It is also one of the most interesting exhibition platforms, historically bringing together the largest European and Asian defence companies. It is no secret that Russia's presence at many other European arms exhibitions has recently been limited owing to external factors. Thanks to the constructive approach of our Turkish partners, Russia as a leading global arms exporter will have a full-format exposition at IDEF.

Russo-Turkish military-technical cooperation is fairly dynamic: the Turkish Armed Forces currently operate Russian-made APCs, helicopters, anti-tank missile systems and small arms of different designs. We also have joint projects in various phases of implementation and discussion.

For this reason, we are looking to make full use of IDEF in order to continue cooperation with our Turkish colleagues and also with other defence partners that will be taking part in the exhibition. /RA&MG/

'We do not differentiate between countries that are members of military blocs and the rest of our customers. Russia sets no additional politico-military conditions in its bilateral relations when it comes to military-technical cooperation. Our country is open to mutually beneficial cooperation with all countries, irrespective of their affiliation with any military alliances.'

Major areas of FSMTC of Russia activities shall be:

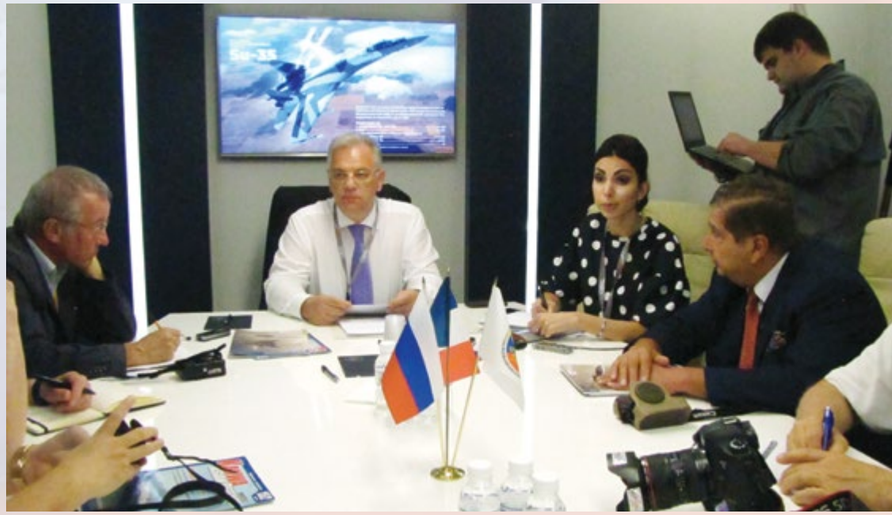
To perform control and supervision functions in the area of military-technical cooperation in compliance with laws of the Russian Federation; efficient functioning of the MTS system; implementation of MTC related international treaties;level of foreign trade prices for military purpose products.

Decision making on MPP import and export; issue of licenses for MPP import and export; authorizing MPP developers and manufactures to conduct foreign trade operations to supply spare parts and support materiel to MPP, their repair, certification, etc.;

Consideration of applications from foreign customers, their registration, record and control over their implementation;

Record and registration of foreign trade contracts;

Maintenance of the register of MTC entities and issue of appropriate certificates to them



Russia at IDEF 2019

Rosoboronexport to discuss promising MTC projects in Turkey

Rosoboronexport (part of the Rostec State Corporation) will be showcasing the best selling and promising new products from the Russian defense industry at the IDEF 2019 International Defense Industry Fair. Rosoboronexport's Stand 232 (Pavilion 2) will provide information on more than 300 pieces of military equipment that have the best prospects in Turkey and the Middle East region, including new products from the Company's export catalog: the newest Kalashnikov AK-200 series assault rifles, 30-mm 32V01 remote weapon station, Viking SAM system and the 76.2-mm AK-176MA automatic naval gun.

'Military-technical cooperation (MTC) between Russia and Turkey shows a positive trend. We successfully deal with competitors' attempts to interfere with our relations,' said Rosoboronexport's Director General Alexander Mikheev. 'We have a number of joint projects for the development of advanced aircraft and helicopter systems, armored vehicle components, after-sales support of supplied weaponry. In addition, Turkey is interested in Russia's latest remote weapon stations, air defense assets of varying ranges, as well as ATGM systems.'

The exhibit profile of the exhibition: Army, Navy, and Air Force military equipment, defense technology, space technology, onboard systems, helicopters, ships, electronics, security systems, transportation and logistics equipment and systems.

'Turkey is among the key partners of Rostec and Russia. The level of bilateral relations, including in industry, is growing rapidly. At the moment, we are discussing with Turkish partners the implementation of a number of critical projects in both military-technical cooperation and civil industry fields,' said Sergey Chemezov, Director General of the Rostec State Corporation. 'Of course, we are ready for various formats of technology cooperation, including in such high-tech areas as the aerospace, helicopter and power industries.'

Rosoboronexport is the organizer of a joint Russian display at IDEF 2019, which includes over 450 pieces of weaponry and military equipment from more than ten domestic defense manufacturers. Almaz-Antey Air and Space Defense Corporation, Shvabe Holding Company and Tehmash Holding Company will be among the exhibitors.

'Military-technical cooperation between Russia and Turkey shows a positive trend. We successfully deal with competitors' attempts to interfere with our relations. We have a number of joint projects for the development of advanced aircraft and helicopter systems, armored vehicle components, after-sales support of supplied weaponry. In addition, Turkey is interested in Russia's latest remote weapon stations, air defense assets of varying ranges, as well as ATGM systems.'

Alexander Mikheev

Rosoboronexport's Stand 232 (Pavilion 2) will provide information on more than 300 pieces of military equipment that have the best prospects in Turkey and the Middle East region, including new products from the Company's export catalog: the newest Kalashnikov AK-200 series assault rifles, 30-mm 32V01 remote weapon station, Viking SAM system and the 76.2-mm AK-176MA automatic naval gun.

The mock-ups of the BT-3F armored personnel carrier, KAMAZ-53949Typhoon-K vehicle, Su-35 multirole super-maneuverable fighter and the Project 12061E Murena-E-class air-cushion landing craft will be on display at the Company's stand.

Numerous meetings and talks are expected to take place at the event with representatives of the Turkish armed forces and other security agencies of the country, as well as with partners from other countries in the region. Rosoboronexport plans to discuss the implementation of current contractual obligations and promising MTC projects.

'IDEF is among the world's top ten largest defense industry exhibitions and, along with Russia's ARMY, MAKS and International Maritime Defense Show (IMDS), is one of the most significant arms exhibitions in Europe. The event provides an excellent opportunity to study the trends in the world arms market, while foreign customers can see the best Russian weapons, known for their impeccable fighting qualities,' added Alexander Mikheev.

It is important to remember that only Rosoboronexport has the right to supply the world market with a full range of arms and military equipment manufactured by Russia's defense industrial complex and approved to be exported. Rosoboronexport accounts for more than 85% of Russia's arms exports. Rosoboronexport is among the major operators in the world market for arms and military equipment. Last year Rosoboronexport marked its 18th anniversary.

Rosoboronexport was set up by RF President's Decree as a federal state unitary enterprise tasked to implement the national policy in the area of military-technical cooperation between Russia and foreign countries. Since 1 July 2011 Rosoboronexport has been operating as an open joint stock company. Rosoboronexport operates under

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Sergey Chemezov

the strict supervision of the Russian President, the Russian Government and in full conformity with the UN arms control treaties and the relevant international agreements.

The official status of the exclusive state intermediary agency gives Rosoboronexport unique opportunities to expand long-term mutually beneficial cooperation with foreign partners, provide guaranteed state support of all export-import operations, and strengthen Russia's leadership in the world arms market.

The main result of biography of Rosoboronexport, despite the difficult economic conditions and fierce, often unfair, competition in the global arms market, that company have managed not only to carry its sales, but also significantly enlarge its footprint in the traditional and new arms markets. Through integrated marketing strategies, company have ensured that order book today exceeds US$ 46 billion.

The special exporter makes painstaking efforts on a daily basis to increase Russian arms exports resulting in more than a thousand contract documents signed with foreign customers every year. Over the period of its operation in the international market, Rosoboronexport has delivered hundreds of thousands of units of military equipment and weapons worth more than US$ 120 billion to 115 countries.

Rosoboronexport pays great attention to both major billion dollars contracts and small deals. The company seeks to operate flexibly and efficiently by using modern and advanced marketing and customer settlement methods. The special exporter cooperates with more than 700 Russian defense-industrial enterprises and organizations, which enables it to offer partner countries the comprehensive and cost-effective solutions for strengthening their defense capability and national security.

Rosoboronexport is the only state-owned arms trade company in the Russian Federation authorized to export the full range of military and dual-purpose products, technologies and services. It is a subsidiary of the Rostec Corporation. Founded on 4 November, 2000, now Rosoboronexport is one of the leading world arms exporters to the international market. Its share in Russia's military exports exceeds 85 percent. Rosoboronexport cooperates with more than 700 enterprises and organizations in the Russian defence industrial complex. Russia maintains military technical cooperation with more than 100 countries around the world.

Core areas of activities of Rosoboronexport

• Export / import of all types of conventional weapons, military and dual-use equipment and services.

• Organization of licensed production of armaments and military equipment abroad, joint R&D efforts with foreign partners.

• Maintenance and repair of earlier supplied weaponry and military equipment.

• Modernization of Russian-made weapons and military equipment.

• Training foreign specialists in Russia and customer countries in the operation and maintenance of supplied military equipment.

• Technical assistance in the construction of military infrastructure facilities: defense plants, airfields, depots, ranges, training centers.

By concluding export contracts, Rosoboronexport supports the Russian defense industry, which is especially important under difficult conditions in the global market. High-tech products are in increased demand in the world arms market today and thus the company is interested in developing smart manufacturing in Russia. In addition, Rosoboronexport is actively involved in a number of charitable and sponsorship projects. The company provides assistance to military hospitals, military historical museums, and children's educational institutions. Rosoboronexport supports major sporting events and various sports federations, acts as sponsor and partner of the largest industrial exhibitions and cultural events held in Russia and abroad.

Rosoboronexport pursues a marketing strategy targeted to expand the geography, range and volume of export deliveries. A number of special programs and projects for exporting products to specific countries have been developed based on a comprehensive analysis of the arms markets and foreign partners' needs. Rosoboronexport seeks to operate flexibly and efficiently in the market, using modern and advanced marketing and customers' settlement methods.

Foreign customers are offered package solutions for national systems intended to defend land, air and seaside borders, which feature the optimal trade-off between cost and performance. These solutions may include both the supply of military products and services and organization of licensed production in customer countries, the setting-up of joint ventures to manufacture and maintain equipment, as well as joint R&D efforts. Rosoboronexport widely uses the optimal offset programs. With regard to foreign customers' interests and the opportunities of the Russian defense industrial complex to increase its exports, Rosoboronexport pays much attention both to major billion-dollar contracts and small deals worth the hundreds of thousands to several millions of dollars. /RA&MG/

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Alexander Mikheev

TOR-M2KM

The best protection for long and medium range SAM systems

The Tor-M2KM SAM system (hereafter referred to as 'the system') is an autonomous short-range surface-to-air missile system. The system provides effective engagement of hostile manoeuvring long and medium range cruise missiles, antiradar missiles, anti-ship missiles flying at altitudes of up to 5 m above the sea level, glide and guided bombs, unmanned areal vehicles, aircraft and helicopters, flying at altitudes from 10 m up to 1,000 m above the sea level at range from 1,000 m up to 15,000 m and parameter up to 8,000 m.

The system has a high jamming resistance against active and passive jamming, provides combat operation under any weather conditions day-and-night.

The system is fully autonomous and can be integrated with any platform of appropriate carrying capacity (automobile chassis, semitrailers, trailers, flat wagons, roofs of the buildings and constructions, decks of the ships and civilian vessels or can be placed stationary in hard-to-reach places on prepared sites). No engineering changes are needed when mounting the system on the platform. The system can be easily installed and removed by any lifting gear with capacity of not less than 25 t within 10 minutes.

The system can be integrated in any AD system through unified battery command post (UBCP) Ranzhir-MK (hereafter referred to as 'Ranzhir').

The system comprises combat and technical facilities.

Combat facilities:

- autonomous combat module (ACM) 9A331MK-1;
- two surface-to-air missile modules (SAMM) 9M334Д with four SAMs 9M331Д in each (totally 8 ready-to-launch SAMs).

Technical facilities include maintenance and repair facilities, group SPTA set. There is an electronic simulator available to train the ACM combat crew.

In the long and medium range SAM system network the information on air situation and general commands is transmitted through standard communication means from combat control post (CCP) or command post (CP) of the above mentioned systems to Ranzhir. Ranzhir provides fire control of four autonomous combat modules 9A331MK-1 (hereafter referred to as ACM) (battery) or from 12 (battalion) up to 16 (regiment) ACMs via battery command posts Ranzhir.

The CCP-Ranzhir network provides communication range up to 30 km.

The Ranzhir-ACM network provides radio communication range up to 15 km, telecode communication – up to 5 km.

The Ranzhir-Ranzhir communication network can cover up to 30 km with ability to extend the communication range to 60 km if combined radio set P-142HMP is used.

The following variant of SAM system Tor-M2KM is recommended for close-in coverage of the S-400 SAM system:

Two ACMs (Squad mode) and Ranzhir are used to cover control facility 30K6E.

Two ACMs (Squad mode) and Ranzhir are used to cover SAM system 98Ж6E.

The close-in coverage facilities are controlled from CCP 55K6E СУ in the network CCP-Ranzhir on the higher level and in the network Ranzhir-Ranzhir while close-in covering of the SAM system 98Ж6E through higher-level Ranzhir.

The ACM 9A331MK-1 is an autonomous combat module all alone

The system is fully autonomous and can be integrated with any platform of appropriate carrying capacity (automobile chassis, semitrailers, trailers, flat wagons, roofs of the buildings and constructions, decks of the ships and civilian vessels or can be placed stationary in hard-to-reach places on prepared sites). No engineering changes are needed when mounting the system on the platform. The system can be easily installed and removed by any lifting gear with capacity of not less than 25 t within 10 minutes.

capable of detecting air targets, identifying their nationality and destroying them. The ACM is fitted with own radars and optical facilities (day-and-night), eight ready-to-launch SAMs, a control computer system, combat crew workplaces, systems of survey control and orientation, a primary power supply source of 3x220V 400Hz 65kW (gas-turbine engine or diesel generator) and a backup power supply source (a solid-state inverter of 3x200V 50Hz in 3x200V 400Hz up to 90kW), a fuel capacity and life-support systems. Herewith, all the equipment and people are located in a single special space-saving body. The ACM combat operation is fully automated. In automatic mode the ACM searches, acquires and tracks up to 144 targets; 10 targets out of them are selected by the computer system as the most dangerous ones and displayed on the commander's indicator having numbers from 1 to 10. Commander presses a control panel button with a number of the target to be destroyed, designated by the CCP through Ranzhir. The system in automatic mode takes 3 more targets for auto tracking, located in a sector of 30 degrees. The targets are automatically transferred into the missile tracking and guidance channel. The control computer system estimates the moment for the SAM to be launched to destroy the target at the maximum range of the killing zone and then a command is generated at the commander panel enabling launch of missile. Commander presses the LAUNCH button.

The system is universal and can be used for air defence of crucial state and military objects, close protection of long and medium range SAM systems, Land forces units, ships, auxiliary vessels, civilian vessels, protection of airdromes, naval bases, ammunition and fuel depots, etc. The system employs 'one target-one missile' algorithm, since the target kill probability is more than 0.9. By estimate of military experts with regard to 'efficiency-cost' ratio the Tor-M2KM SAM system occupies a leading position among the short-range SAM systems both in Russia and abroad.

During the combat operation there is an automatic functional test performed for all the ACM's equipment. Troubleshooting system is also available.

The ACM has a radio-command guidance of its missiles that ensures high jamming immunity of the missile guidance channel and ability to guide SAMs with different parameters customized according to the target type. The guidance parameters are selected automatically by the control computer system depending on the target type. One guidance parameters allows effective destroying low flying cruise missiles at altitude of up to 10 m above ground level (5 m above sea level). Another parameter allows destroying diving targets like a Harm anti-radar missile. The third one – guided air bombs. The fourth, fifth and sixth – aircraft, helicopter and remotely piloted vehicle (RPV) correspondingly. The system ability to engage targets with 8 km parameter provides covering of objects within area of 480 km^2.

The system is operational within the temperature range from -50 degrees C up to +50 degrees C. The system combat facilities are protected from environmental activities: solar radiation, precipitation, salty fog, salt water splashes, etc.

The 9A331MK-1 ACM's total weight is not more than 15 tons that makes it easy to transport it by any type of transport including heavy helicopter of MI-26T type on external sling.

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RCWS from Russia

Remote controlled weapon stations

Analysis of recent experience of countering international terrorism gained by the Russian armed forces has showed that the turret accommodating armaments is one of the most vulnerable elements of fighting vehicles. The latest developments made by Russian defense enterprises will reduce the crew size in combat vehicles, cut the cost of their installation on various weapon platforms, as well as limit personnel casualties in clashes with the enemy on the battlefield. In particular, Rosoboronexport offers its customers 30mm and 57mm remote controlled weapon stations (RCWS) to equip wheeled and tracked armored combat vehicles.

A major advantage of introducing these weapon stations is the versatility of their installation on weapon platforms of previous generations: old tanks, IFVs and APCs manufactured in the world in the mid-twentieth century. What is considered to be obsolete armament can be turned into a new, highly effective type of weapons with new combat properties required to perform missions in modern warfare and, most importantly, in local counter-terrorism operations, its primary form.

An equally important factor is the commercial attractiveness for the customer, enabling it to dramatically raise the operational capabilities of its troops at the lowest cost, without the need to buy the latest, expensive weapons.

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Lightweight and middle-weight champion

The 32V01 30mm RCWS is intended to be installed on wheeled and tracked chassis both in the production of new armored vehicles and in the retrofitting of currently deployed Soviet-, Russian- and foreign-made ones.

The uniqueness of this weapon station lies in its layout solutions, high fire capabilities against lightly armored targets on the battlefield, enemy manpower, and low-flying air targets.

The armament has a remote, electromechanical, re-cocking system. It features an elevation angle between -10 and +60 deg and a traverse angle of 360 deg.

The 32V01 RCWS is fitted with a sight having TV, thermal imaging and range-finding channels. The crew compartment of the vehicle accommodates an operator's workstation equipped with a plasma or LCD control panel, a built-in ballistic computer and a control console.

High fire capabilities of the RCWS are provided by a 30mm autocannon stabilized in vertical and horizontal planes, a 7.62mm machine gun, and an automated fire control system incorporating state-of-the-art technical solutions. The fire control system is capable of detecting, recognizing and engaging targets in all conditions: at halt and on the move, in any weather, day or night.

Absolute champion

The 30mm caliber of autocannons cannot always provide a solution to a combat mission, e.g. if the enemy has heavily armored vehicles, including modern infantry fighting vehicles and armored personnel carriers.

For these purposes, the AU-220M RCWS with a 57mm autocannon, which can be installed on future and upgraded light tanks, infantry fighting vehicles, armored personnel carriers, fixed facilities, as well as boats and ships, including foreign-made ones.

High fire capabilities of this weapon station are provided by ammunition power, a unique 57mm autocannon, and an automated fire control system incorporating state-of-the-art technical solutions. The AU-220M's fire control system provides target detection and identification day and night, in poor visibility conditions, firing of the 57mm autocannon and 7.62mm machine gun on the move, at halt and afloat in any operational environment.

High fire capabilities of the RCWS are provided by a 30mm autocannon stabilized in vertical and horizontal planes, a 7.62mm machine gun, and an automated fire control system incorporating state-of-the-art technical solutions. The fire control system is capable of detecting, recognizing and engaging targets in all conditions: at halt and on the move, in any weather, day or night.

The fire control system includes combined commander's and gunner's sights with TV and thermal channels and laser rangefinders, an automatic target tracker, a ballistic computer with a package of firing condition sensors, and a two-plane armament stabilization system. The module's advantage is the capability to control from two workstations, with the control duplication function.

The 57mm rounds are more powerful than 30mm ones. The maximum firing range of the 57mm HE projectile is 14.5 km. Equipping combat vehicles with this RCWS will significantly enhance the fire capabilities of mechanized infantry units against enemy targets, including heavily armored ones.

These two unique 32V01 and AU-220M platforms have been developed taking into account the vast experience of recent counter-terrorism operations and have been recognized by experts as an excellent option of equipping army and special forces units. By the way, you can learn more about them at the IDEF 2019 exhibition. /RA&MG/

IDEX-2019

Russian military innovations for UAE, Gulf states and other Asian countries

The International Defence Exhibition and Conference in Abu Dabi (IDEX) is one of the most strategically important and biggest tri-service defence exhibition in the world. In this year IDEX-2019 and NAVDEX-2019 were demonstrated the latest technology across land, sea and air sectors of defence. These two exhibitions become a unique platform to establish and strengthen relationships with government departments, businesses and armed forces throughout the Gulf region and MENA's states. The IDEX exhibition has been held since 1993 and is now rightly regarded as one of the most representative international platforms for showcasing weapons and security technologies. Russia has always been and continues to be its active participant.

IDEX-2019 was held under the patronage of His Highness Sheikh Khalifa Bin Zayed Al Nahyan, President of the UAE and Supreme Commander of the UAE Armed Forces and is organised by the IDEX LLC in association and with the full support of the UAE Armed Forces. IDEX and NAVDEX took place at the Abu Dhabi National Exhibition Centre (ADNEC), and occupied all of the 100% of the state-of-the-art exhibition centre, utilising 133,000 sqm of event space. More than 1500 companies took part in the exhibition.

Big success was in NAVDEX-2019, the main topic of it was Maritime Security Area. This was very interesting for local and international exhibitors who specialize in naval, maritime and coastal security technology, equipment and crafts. Located on the dock edge, NAVDEX-2019 also showed, on-water exhibits, daily demonstrations and visiting navy vessels.

The other part of IDEX-2019 was Defence Conferences, the official conference of IDEX, was analytic platform to meet away from the bustle of the exhibition halls with key decision makers from the government, military and defence industry, giving you the opportunity to discuss the biggest challenges the industry is facing and indentify the potential solutions.

Organised by ADNEC in collaboration with the Ministry of Defence and UAE Armed Forces, the two exhibitions showcased the latest defence developments featuring technology trends from the Fourth Industrial Revolution and artificial intelligence and the vital role of these technologies in advancing the defence sector and its relevant industries. Themed 'Defence for Security and Safety', the event also highlighted the leading initiatives in achieving digital transformation in line with the country's Artificial Intelligence Strategy aimed at enhancing government's performance. Humaid Matar Al Dhaheri, Group CEO of ADNEC has confirmed that the edition of IDEX and NAVDEX 2019 proved once again its leading position as a global platform to showcase the latest leading developments in security and defence, in line with the global technological trends such as the Fourth Industrial Revolution.

Russia is traditionally one of the largest participants in the defense exhibition in Abu Dhabi. At the IDEX-2019 International Defense Exhibition Rosoboronexport, a subsidiary of the

Vladislav Kazak,
CEO, NPO Angstrem:

'This was not our first IDEX exhibition. We present our key products, including our pride which is a sixth-generation portable radio station made for export. This year our exposition included a novelty: a portable sixth-generation programmable radio station, whose characteristics make it unique both in Russia and internationally. The station has a frequency hopping sequence of up to 20,000 hops per second, making it virtually impossible to intercept the signal or feed false information. The station provides absolute reliability of communications guaranteed against any jamming or malicious interference. Our products are well known in the world as some of the best examples in their class. We ran an analysis of the exhibits on display at IDEX 2019 and arrived at the conclusion that NPO Angstrem has a number of technology advantages over the competition. Our technology solutions are already drawing the interest of international industry leaders and experts, which is a cause of pride for us.'

Alexander Smirnov,
managing director, NPO Splav:

'The IDEX-2019 show, hosted in Abu Dhabi on 17-21 February 2019, was one of the largest and most prominent international arms exhibitions. NPO Splav, a Techmash Concern company, showcased an impressive array of defence products in the framework of Rostec Corporation's cluster of conventional weapons, munitions and special chemistry. The company's exposition featured a capability presentation of the new-generation Tornado-G multiple-launch rocket system.

The presentation was supported by the NettleBox 3D holographic visualization rig, which allowed for a highly detailed demonstration of the Tornado-G's competitive vehicle and munitions. NettleBox represents a significant new milestone in promoting Russian weapon systems at international exhibitions. It will help NPO Splav to increase commercial return on participation in trade events and maintain its status as a business that utilizes hi-tech solutions in all aspects of its operations.'

Rostec State Corporation, is organizing a demonstration of modern and most demanded Russian weapons

Russia is traditionally one of the largest participants in the defense exhibition in Abu Dhabi. At the IDEX-2019 International Defense Exhibition Rosoboronexport, a subsidiary of the Rostec State Corporation, was organizing a demonstration of modern and most demanded Russian weapons.

'The Middle East and North Africa (MENA) countries are extremely important markets for us where we implement a lot of projects both in civilian areas and in the field of military-technical cooperation, said Sergey Chemezov, Director General of the Rostec State Corporation. More than 50 Russian defense enterprises will demonstrate their innovations at IDEX 2019. In total, about a thousand items will be exhibited, and we'll show a number of pieces of military hardware for the first time.'

'Each time, Rosoboronexport shows the latest additions to its export catalog here, and this year will be no exception. In the framework of a single Russian display, organized by the company, we will present our foreign partners with more than 200 advanced pieces of weaponry for all services of armed forces. I am sure that IDEX 2019 will traditionally open new horizons in the Arab East, the key region for our company, which accounted for almost half of our deliveries in 2018,' said Rosoboronexport Director General Alexander Mikheev.

For the first time, Rosoboronexport and NPO High Precision Systems were organized in Abu Dabi demonstration of the Pantsir-ME naval air defense missile/gun system at an exhibition held abroad. The system has been designed and manufactured by the KBP Instrument Design Bureau named after Academician A. Shipunov.

The newest Kalashnikov AK-200 series assault rifles (AK200, AK203, AK204 and AK205) was displayed for the first time at Kalashnikov Concern's stand. Rosoboronexport held presentations of these rifles in the course of negotiations with foreign customers on the supply of small arms.

Also the company held two presentations of advanced products, 'Russian-made Air Defense Systems' and 'Small Arms, Special Weapons and Close Combat Weapons,', during which its specialists told about new and the most popular products. In addition Rosoboronexport held a presentation of the commercial and industrial potential of the Republic Tatarstan, which produces a lot of weapons and military equipment for export.

Other advanced novelties from Rosoboronexport's catalog were also showcased at IDEX-2019: BMD-4M airborne combat vehicle, BTR-MDM airborne multipurpose armored personnel carrier (APC), BT-3F amphibious tracked APC, Viking SAM system and Pantrir-S1M air defense missile/gun system, Karakurt-E and Sarsar small ships, components of the Ratnik combat gear's protection system and the 6B52 combat gear system. The latest ammunition for artillery, including rocket artillery, were also on display at the company's stand.

Foreign customers showed keen interest in products that have been tested in real combat conditions during the anti-terrorist operation in Syria. Such models have already become the undisputed leaders in their segments of the world arms

Andrey Alexeyev,
Deputy Director Technical Training Equipment Department, RPA RusBITech:

'At IDEX-2019, our company exhibited innovative developments related to military training and commander's decision support at various levels of planning and warfare command.

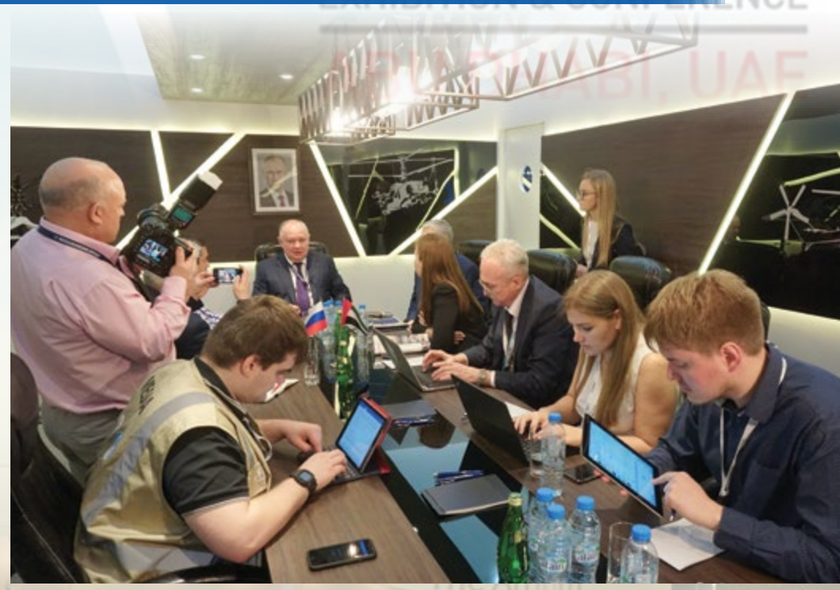
Our IT technologies include the Spektr-7E software/hardware intended for headquarters and officer training, joint combat training through warfare modelling, and integration of training assets into a single virtual battlefield. We also offer the TESE-E electronic small arms training simulator and the KPO-E shooting-range targeting system.

One of our most prominent developments is the Spektr-7E software/hardware system, which we keep upgrading. The product cuts headquarters and officer training times to prepare personnel for combat in any region, and allows for the training of joint army, navy and air force groups.

The system offers a broad range of training and warfare simulation scenarios, allowing personnel to model and train through different options and select the one that would help achieve the combat objective with the minimum losses and costs. Our product has a number of objective advantages over international equivalents. It provides more realistic simulation, has a longer service life, offers higher operating speeds, features a simpler and convenient interface, and is more attractive commercially. One of the system's important features is that it utilises actual terrain maps and can present the combat situation in both three-dimensional and two-dimensional formats.

The Spektr-7E can be used as a technology platform for combat training centres based on the latest Life, Virtual, Construction (LVC) concept, which ensures maximum simulation of actual warfare scenarios.

IDEX is a colossal exhibition platform representative of all the leading international industry players. It is obvious that RPA RusBITech is acting correctly and in keeping with the global trends; we are on a par with the latest technologies and developments, and often are ahead of the competition.'



Nikolay Semenenko,
Managing Director, Mechanical Engineering Research Institute named after V.V. Bahirev:

'At the IDEX 2019 exhibition in Abu Dhabi, our institute presented a wide spectrum of ammunition for armour, field artillery and naval artillery applications ranging between 76 mm and 152 mm. Middle Eastern countries are historically interested in such munitions. The exhibition was stolen by the efficient 100-mm Basnya high-explosive fragmentation projectile, which can be used in conjunction with the BMP-3 infantry fighting vehicle. Basnya is of interest in the region because a number of Arab countries operate Russian-made IFVs. The institute is prepared to both provide MRO services for products already sold and localize production in countries that order them. At the UAE exhibition, the institute presented a cluster munition that deploys around 40 submunitions at a certain point and covers an impressive area, including any equipment.

We are observing a growing interest in our products, seeing as the global situation is growing ever more complicated and armoured vehicles remain the backbone or ground troops. Virtually all the munitions designed by Mechanical Engineering Research Institute named after V.V. Bahirev are reliable, highly efficient and adapted to the existing and future combat technologies, making them universal.

We are equally respectful to all markets, including Middle Asia and North Africa. We are prepared to work on all the existing markets and in virtually all the existing regions, and we are invariably treated with respect. Professionals are well aware that Russia makes the best munitions in the world.'

market: Su-35 and MiG-29M fighters, Mi-28NE and Ka-52 attack helicopters, T-90S MBT, BMPT fire support fighting vehicle, Kornet-EM ATGM system, S-400 Triumf anti-aircraft missile system, the Repellent anti-UAV electronic warfare system, as well as ships and submarines equipped with the Kalibr integrated missile systems. Rosoboronexport met and hold negotiations with government officials, senior military officers and business representatives from the Middle East and North Africa countries.

The UralVagonZavod Research and Production Corporation presented a number of its products at IDEX-2019, particularly the T-90MS main battle tank. The Russian name of the vehicle is Proryv (Breakthrough), implying that this is not just another upgrade of the T-90 tank but also a truly new tank. It has greater accuracy of fire, a new highly automated digital fire control system, new digital communications, navigation and interaction equipment, and a more powerful engine. The vehicle has enhanced protection in all projections. Its modular design allows for building up capability in further upgrade efforts.

The company also presented the AU-220M unified automated unmanned 57-mm artillery module, whose all-new cannon has an enhanced firing accuracy and can be controlled remotely. The public also demonstrated a heightened interest in the upgraded TOS-1A Solntsepyok heavy flamethrower, which features an advanced engine and explosive reactive armour. The flamethrower has a new launcher, and the loading vehicle has a new crane. The TOS-1A combines great cross-country ability, mobility and effectiveness against enemy troops personnel in open terrain and in shelters.

As part of the IDEX 2019 international exhibition, the Tecmash Concern of State Corporation Rostec has presented unique video footage of the Tornado-G multiple rocket launch system in action.

The combat vehicle is equipped with an automated guidance and fire control system, as well as preparation and launch equipment. Without leaving the cockpit, it is possible to enter flight mission data remotely into the detonators and launch the

Alexand Krasovitskiy
Director General, Military Industrial Company

'Military Industrial Company brought to IDEX 2019 a VIP-configured example of the Tigr armoured vehicle co-created with Bogema Auto. The version outwardly differs from the baseline in the quality of body painting and polishing, and also in the presence of door footboards. The interior offers a high level of comfort, convenience and safety. It incorporates elements made of fine wood, genuine leather and suede. The vehicle is outfitted with an advanced multimedia system. The armoured body and window glass offer NATO STANAG 4569 level 2 ballistic protection.

Our equipment intended for Russian government agencies and for export undergo official tests involving specialised organisations of the Russian Defence Ministry and other national security services. UralVagonZavod supports uninterrupted operation and combat readiness of its products through out their service life. We are constantly improving our after-sales support system and expanding the range of repair operations available. Our export products are covered by maintenance warranty for the entire duration of the period stated in the contract. We train local specialist to maintain and repair our vehicles. If required, we deploy teams of highly qualified maintenance personnel to the customer's country.'

Dmitry Bruskov,
Director General, KSF Peredovaya Tekstilschitsa:

'At the Abu Dhabi exhibition we presented our traditional products, which are widely used in different types of rescue and personal protection equipment from parachutes to bulletproof vests and helmets. The Persian Gulf market is extremely competitive, but our produce is generally more advantageous, first of all thanks to the stronger threads we use. Our products offer better ballistic protection, lower weight and smaller size, as corroborated by the history of their operation in the region. Our IDEX-2019 exposition was visited by numerous international delegations. Our potential customers are naturally interested not only in purchasing our products but also in the possibility of organising local production. We are prepared for such talks, but one should realise that their outcome will largely depend on political and economic considerations. In addition, protection equipment is normally marketed as part of bigger systems. Also, we export all our products with our good business partner Rosoboronexport.'

Georgy Antsev,
General Director – Chief Designer, Morinsis-Agat Concern:

'At IDEX-2019, our exposition primarily focused on the demonstration of competencies in the creation of integrated information management systems and distributed surveillance systems (including for underwater operations), computational warfare modelling, particularly in the littoral zone, etc. We presented our solutions related to integrated systems intended for the automated management of ships and onboard weaponry, and also solutions related to radio detection and ranging, hydroacoustics, coastal protection and other applications that may interest foreign customers. We were also promoting the Bal coastal missile system, which has proved its high effectiveness in service with the Russian Navy and with foreign clients. Overall, we offer a whole new level of integrated solutions aimed at bringing together the existing systems for maximum protection of coastal lines.

This is a highly competitive market, but our concern is certainly a leading player. Our developments are consistently among the best products available.

Not only do we offer optimal IT solutions integrating all the network resources, we are also prepared to deliver terminal devices for the purpose of providing comprehensive reliable protection systems for sea-surface ships, submarines, boats, aircraft, etc. In other words, we are ready to provide turnkey solutions for our customers and act as the chief system integrator, seeing as we have successful prior experience solving complex problems, as corroborated by the concern's unique competences.'

projectiles. The launch package on the Tornado-G combat vehicle consists of forty tubes. The system was developed in a 122-mm caliber, which allows the use of rocket projectiles from both the Tornado-G and the Grad systems.

Also for the first time, Tecmash has presented abroad one of the munitions developed for the Tornado-G – a 122-mm unguided missile with a detachable high-explosive warhead with fragmentation increased-efficiency (index 9M539). It was developed at the NPO SPLAV base and is intended to destroy open and sheltered manpower, unarmored vehicles, command posts and other targets. A missile can effectively hit targets behind folds of the terrain (backward slopes, ravines, etc.) and in mountains.

'The firing range of this projectile is from 5 to 20 kilometers. The temperature range of combat use is from –50 °C to + 50 °C. The damage efficiency is, on average, six times higher than that of the uncontrolled 9M22U high-explosive fragmentation projectile (standard projectile) of the Grad system,' said CEO of Tecmash Vladimir Lepin.

'Tornado-G is a follow-up to the renowned Grad system that has been used by armed forces of many countries for more than 50 years and has proven its reliability and faultless operation. As compared to its predecessor, Tornado-G is five times faster and has a higher damaging capacity,' noted Sergey Abramov, Industrial Director of the Armament Cluster of the Rostec State Corporation.

At the defense exhibition, Tecmash has also showed the world community the AZ-TSR-47 increased-efficiency turbo-jet projectile, designed to protect surface

Yuri Nabokov,
Director General, Scientific production association Pribor (NPO Pribor):

'At IDEX-2019, NPO Pribor was primarily exhibiting its traditional product line, including new-generation 30-mm munitions for aerial cannon, ship-based anti-aircraft missile/gun systems, armoured vehicles and infantry units. We also presented our close-combat products and the Balkan grenade launcher, which turned heads as a jewel of the Russian exposition. Our munitions historically enjoy high and sustained demand in the region; our products have long been known in the local market and have proved themselves excellently.

We are also seeing a great deal of interest in our work to increase the effectiveness of munitions through improving their reliability, seeing as we have virtually hit the combat power ceiling with the existing materials and technologies. Incidentally, NPO Pribor significantly surpasses its international competition when it comes to the reliability of its products, and Russian-made munitions offer a much more advantageous price-to-quality ratio.'

ships from weapons equipped with radar guidance systems, for the first time. The main objective of this munition is to create radar interference in a given area. When moving, the projectile releases a false radar target in the form of a cloud of dipole reflectors, thereby misinforming enemy detection systems or diverting an attacking rocket to the false target. The projectile has increased efficiency in comparison with known analogs due to the rapid formation and large area of dispersion of false radar targets. The munition is launched from the shipboard ZIF-121 launcher of the PK-2 shipboard complex.

In addition, the RPG-30 anti-tank grenade with disposable grenade launcher, which has no analogs in the world, has been presented at the Tecmash stand. The RPG-30, developed at the NPO Bazalt, can strike modern and advanced tanks, including those equipped with attached dynamic protection and an active defense system, as well as other armored and unarmored targets.

In total, at the IDEX-2019 exhibition, Tecmash presented over a hundred samples of military products from seven of its leading enterprises: NPO Splav, NPO Bazalt, NPO Pribor, NIMI V.V. Bakhirev, the Plastmass plant, NZIV and NPO Poisk. The area of the exhibit was more than 120 square meters. **/RA&MG/**

Dmitry Zhidkov,
Deputy Director General for Armed Services Procurement, Military Technical Cooperation and Interaction with the State Authorities, Shvabe Holding:

'This was the second IDEX exhibition for Shvabe Holding. We presented a broad array of defence products and components for armament and military equipment. These included a tank commander's panoramic surveillance device, a short-wave infra-red (SWIR) camera, and other products. IDEX 2019 was the first international debut of our new ULTRA ultraviolet camera, one of the most effective devices for locating insulation faults in power generation, as well as for a laser-based instrument landing system, the SOLT-25 targeting system and the Irbis-K tank thermal sight. IDEX is the largest and most authoritative such exhibition in the region; our optical devices and optoelectronic systems are in high demand across in many countries of the region, so we are very much hopeful about this market.'

Sergey Kulik

SECURE RESCUE AT ANY HEIGHT

Unique autonomous rescue parachuting back-pack system for emergency escape

The innovative Russian private Space Rescue Systems Ltd. (SRS Ltd.) company (www.cosmic-rs.com) proposes a unique and unrivalled emergency rescue vehicle SPARS® – an Autonomous Rescue Pneumo Transformable Chute Back-pack System – a validated forefront rescue solution for guaranteed secure individual emergency escape from nearly any high elevation structure (skyscrapers, offshore platforms etc.). The SPARS® project is resulted in a creation of a brand new pneumo-framed aerodynamic devices technology. There is no doubt in the near future this solution is going to be a must-have in skyscrapers construction all over the world.

The SRS Ltd. proposes a SPARS® high rise escape technology that has a global nature. It is uncovered market niche with an obvious but unrealized human requirement to be and to feel safe while living or working in high elevation buildings. In case of emergency than traditional evacuation is impossible or ineffective those people all over the world have practically no means of urgent secure rescue from the height and need an alternative solution.

Actually the technical reviews shows that at present there are practically no means for secure alternative escape starting from 60÷80 m height and higher available on the market. But according to the said firefighter's statistics about 3÷5% of people being caught in alarm situation on the high-rise building used to try escaping from the windows and usually perished. On the other side homeland security analytics says that in average an every skyscraper in the world is expected to be subjected to a fire case (terroristic attack or other emergency) once in every 47 years.

So the SRS Ltd. has decided to resolve the problem in finding an alternative to traditional evacuation methods technical solution. It takes about eight years of R&D to resolve the task. Finally it is resulted in creation a brand new escape technology – an Autonomous Rescue Pneumo Transformable Chute Back-pack Solution for secure personal rescue from high-elevation structure in case of emergency than traditional evacuation methods are impossible.

The SRS. Ltd company in outsourcing cooperation with 18 leading Russian and foreign aerospace companies has fulfilled full-scale research and development activities to develop the project from conceptual proposal stage to releasing operating prototypes unparalleled anywhere in the world.

The SPARS® escape technology is based on a synergy of sophisticated aerospace technologies such as Air-Aspirator Rapid Inflation; Elastic Pneumo-Frame Catapult Ejection; Air-Drag Deceleration; Air-Bag Shock Absorbing and others. Such technologies were invented for space probes deceleration during descent in atmospheres of Solar system planets and its landings on surfaces.

The SPARS® device provides a secure individual escape of untrained person or valuables cargos with weights 45÷120 kg. from about any of existing high-rise (50÷1000m) facilities (skyscrapers; towers; offshore platforms etc.) with guaranteed safe landing on any underlying surface in urban terrain or water in case of emergencies than traditional evacuation methods are impossible.

The SPARS® solution meets the Russian Ministry of Emergency Situations (EMERCOM) requirements for high-rise emergency escape apparatus (GOST R 22.9.08–2005; GOST R 12.4.206–99) and provides for the following unique capabilities, never implemented before:

1. Alternative of emergency escape (so-called 'last resort rescue')
2. Emergency evacuation of an untrained person having weight of 45÷120 kg, from heights of 50÷1,000 m;
3. Ready-for-use in 45÷60 sec;
4. Self-sustained operation and independently selected escape route;
5. User-friendly operation for untrained persons and fully automated rescue procedure right from start;
6. Personal protection against external hazards during evacuation;
7. Appropriate weight of a back-pack-type carried device;
8. Secure injury-free landing on any underlying surface.

The SPARS® unit for individual use had required a special certificate basis. In this regard the National Standard (GOST) 4240-001-2012 specifying medical and technical requirements for injury-free operation by untrained persons rescued by means of new type SPARS® shock-absorbing systems entered into force in 2013.

To have certification tests performed a special Hybrid-III (USA) crush test dummy-based anthropomorphous (bionic-like) instrumentation station has been developed and created by the SRS Ltd., which has no equals in Russia.

A full cycle of comprehensive calculations and testing to validate design properties and performance has been performed. Up to now the SPARS® device technical operational reliability is 98.7% but further testing is under way.

New SPARS® escape solution provides the following advantages:

1. Alternative (a 'last resort') escape mean for ordinary person in case of emergency in the high-rise structure;
2. Secure rescue of untrained personnel (18÷70 years old) from high elevations from 5 till 1000m (no practical means available starting from 50 m height);
3. Off-line capability of the system provides mobility that helps to find optimal self-escape way of out from emergency situation;
4. Smooth automated ejection from the emergency object after manual initialization of the system;
5. Guaranteed deploy of the canopy with 3÷5 m loss of height irrespective of air flow speed pressure;
6. Protection from dangerous external factors (fire, hits, smoke) during descent;
7. Safe landing on any underlying surface in urban terrain;
8. Reusable and does not sink.

In packed and assembly complete mode the SPARS® system weights 25 kg with back-pack dimensions

The SPARS® General Specifications

1. Total Assembly Weight – 25 kg
2. Rescue Payload Weight – 45÷120 kg
3. Descent Elevations – 5÷1000 m
4. Landing Velocity – 5÷7 m/s
5. Landing Angle – < 30°
6. Footboard Barrier Elevation – 1.5 m
7. Descent Time – 3÷150 s
8. Ready-to-use Time – 45÷60 s
9. Launch Initialization Time – 15÷20 s
10. Inflating Gas – Air;
11. General Dimensions:
    a. Aassembled – 900x450x300 mm
    b. In Descent mode – 6,500x2,700mm *(without conopy)*

Actual Landing Impact Loads:

Acceleration directions:

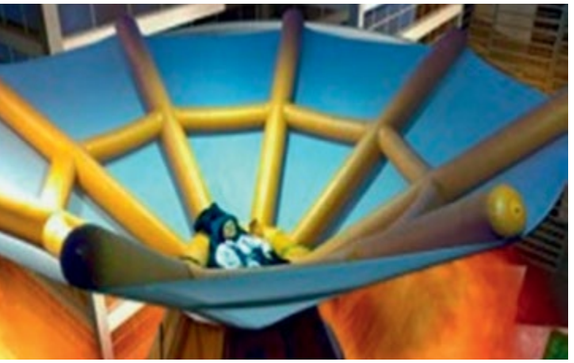
'chest-to-back' – up to 8÷10 g

'side-to-side', 'head-to-pelvis' – up to ± 6 g

Acceleration Exposition Time – less than 0.5 s

Acceleration Growth Velocity – less than 500 1/s

User's age – 18÷70 years



850x450x350mm and has easy – to-use suspension system.

The SPARS® has its Technical Data Sheet (TU 801130–5047075064–01–10) and working design documents issued. Under the SRS Ltd requirements Russian gas-filling systems (GFS) manufacturing company has mastered Autonomous Two-Stage GFS for SPARS® (TU 8042–017–45307693–2013).

The SRS Ltd. Intellectual Property Rights on SPARS® and its 'know-hows' have been completely protected within Russia (9 Patens, 3 Trade Marks) and abroad under PCT (Patent Cooperation Treaty) procedures 2 'umbrella' requests for SPARS® have entered national level in 15 countries and covered 78% skyscrapers and 95% potential SPARS® manufacturers. 13 Patents of the US, China, Japan, Canada, South Korea, Singapore, the Ukraine, Indonesia, Malasia and Australia have been already received.

Three Russian EMERCOM Certificates of Conformity were received for the SPARS®. 'Aerospace medicine and military ergonomics' R&D Institute of the Russian Air Force has granted an official approval for the SPARS® physical adaptability.

The SRS Ltd. company now is looking for cooperation with a strategic Partner and/or investor in order to industrialize the brand new SPARS® product; to make it commercial; to prepare and set up its production and to enter with it into a global commercial market having all necessary intellectually property rights protected.

An accurate assessment of the terms, timeframes and investments required for the SPARS® industrialization it is foreseen that a Partner from the region where product itself (or its production) could be demanded (Middle East, China, US, Europe, Asia-Pacific etc.) could formulate and provide the SRS Ltd. Company with the regional authority technical requirements to upgrade the product specifications and also could determine the necessary level of licensing.

At the same time in order to reduce production costs it is desirable to find and select a local manufacturer taking into account its technical capabilities and possibility to use appropriate production process technologies.

Upon receiving necessary information from a Partner the SRS Ltd. Company could finalize the design documentation, to fabricate a prototype with specifications meeting local needs and to determine expected investments and timeframes necessary to prepare and to run mass production of the product in the region.

Shares and Conditions in the business organization is a matter of further negotiations. The SRS Ltd. Company would be ready to demonstrate its good willing approach and to meet a Partner in negotiations halfway with necessary flexibility in some critical questions aiming to achieve mutually beneficial cooperation.

Such forms of cooperation as Joint Venture, Technical, Manufacturing or License Agreements are feasible.

For a strategic industrial Partner sought who would be interested to run mass production of the SPARS® in the region and enter an empty market with protected rights it would be necessary to have production technology experience in the fields of:

- thin coated/laminated fabric manufacturing;
- assembly from these fabrics a complex air-beam-frame air-proof inflatable structures;
- parachute canopy manufacturing;
- air-aspirator gas filling manufacturing;
- plastics (carbon) manufacturing and forming
- human field (air-borne) tests plastic forming and others.

A Partner sought may be expected to undertake part of those activities or provide financing for already SRS Ltd. Company existing outsourcing manufacturing solution in Russia on a mutually beneficial basis.

As for the SPARS® solution operation such a potential entity sought (hotels, profitable houses; skyscraper's management company; offshore platform management; airborne attractions & entertainment companies etc.) should only require a free window exit sized 1000x500 mm at the appropriate height to use Autonomous Pneumo Transformable Escape Chute and propose to its clients an additional exceptional secure service with limited warranty.

General market estimations shows there are over 7,303 finished and 2,500 under construction skyscrapers worldwide with the heights of 100÷828m, over 100,000 buildings having height of 50÷100m and more than 800 offshore platforms. Taking that analysis into account the SPARS® may have potential market capacity of up to $700-850 million annually.

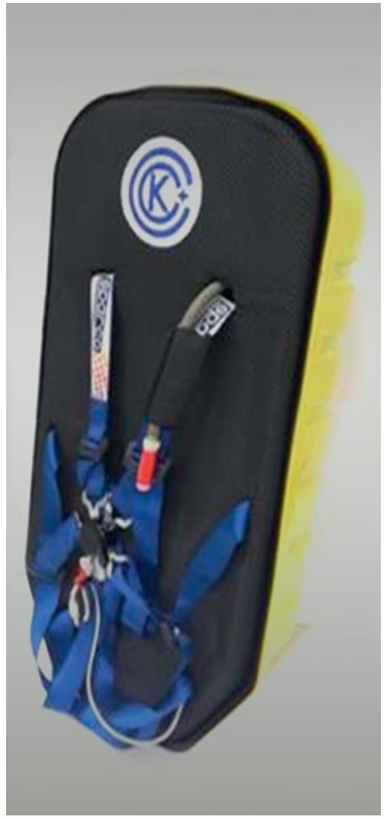
Furthermore, the SPARS® estimated potential market capacity is worth over $3.5 billion in commercial sector alone. The Governments market is bigger but for accepting that new technology implementation it may require some updates of the appropriate local norms and regulations.

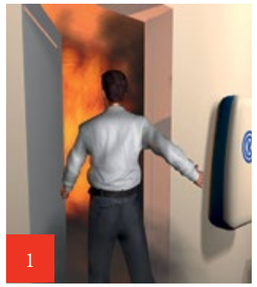
/RA&MG/

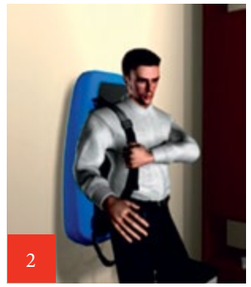
There are following innovations in the proposed SPARS® technology:

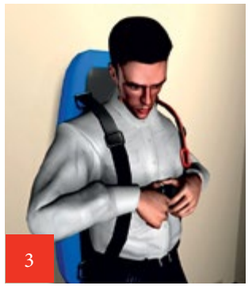
1. A brand new free parachuting technology (means and escape method) was created for emergency escape from heights higher than 50 m where practical methods for safe evacuation of a person are not available on the market.
2. Sinergy solution based on specially designed and produced from film-laminated fabric a rapid inflatable air-beam single volume frame structure for:
   - Elastic catapult ejection of a human from a window of an emergency object;
   - Forced deploy of the canopy with only 3÷5 m loss of height and irrespective of air flow speed pressure for deployment (usual parachute requires of 25÷100 m free fall and/or 250÷350 km/h speed of airplane to be deployed);
   - Guaranteed safe landing with 5÷6 m/s vertical velocity on any underlying surface in urban terrain using integrated air-frame shock absorbing pneumo dumper.
3. Fully automatic mode of usage (after manual initialisation of the apparatus) and all the descend envelope accelerations bearable for an ordinary person make the escape solution available for use by untrained people from 18 till 70 years old;
4. New type of light weight air-proof film coated fabric for air-beam inflatable frame structure was created.

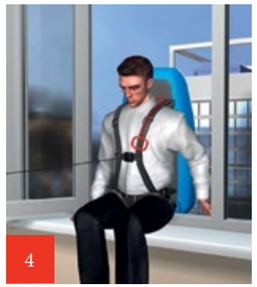
The Special National Standard (GOST) for shock acceleration limits for untrained human using new type of lodgment Rescue Parachuting Systems was issued.
The Crash test dummy Hybrid-III 50% percentile was instrumented, calibrated with the help of centrifuge, certified and used as anthropomorphic instrument for human acceleration checking during field tests and validation of the Autonomous Pneumo Transformable Escape Chute.

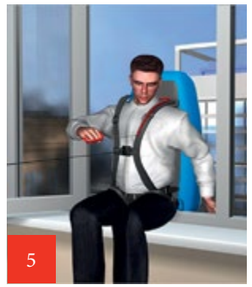












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РОССИЙСКО-ТУРЕЦКИЙ ДЕЛОВОЙ ЖУРНАЛ
TÜRK-RUS IŞLETME DERGISI

№ 01 (01) Октябрь / Ekim 2019

РОССИЙСКО-ТУРЕЦКИЙ ДЕЛОВОЙ ЖУРНАЛ
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ЖУРНАЛ ДЕЛОВОГО СОТРУДНИЧЕСТВА ДВУХ ДЕРЖАВ

Объединенная промышленная редакция реализует проект по выпуску 'Российско-Турецкого делового журнала', который выступает в роли информационно-аналитическое сопровождения по развитию взаимовыгодных деловых связей между российскими и турецкими предпринимателями.

Материалы в журнале публикуются параллельно на русском и турецком языках. Журнал поступает по адресной целевой рассылке в структуры государственной власти России и Турции, связанные с реализацией промышленной и экспортной политики, в союзы международного сотрудничества, торгово-промышленные палаты, международные и национальные инвестиционные фонды, крупнейшим игрокам взаимного делового сотрудничества между Россией и Турцией.

Ключевые темы 'Российско-Турецкого делового журнала':
- динамика и тенденции торгово-экономических отношений;
- меры государственной поддержки и содействия международному бизнесу обеих стран;
- инвестиционные проекты, программы, предложения;
- совместные предприятия;
- опыт реализованных проектов российско-турецкого делового сотрудничества;
- межрегиональные программы и проекты;
- изменения в законодательстве двух стран;
- вопросы финансирования международных индустриальных проектов;
- сотрудничество в области высоких технологий;
- развитие культурных, туристических, молодежных программ;
- предложения по проектам сотрудничества, отраслевой консолидации, совместным разработкам;
- презентация новой продукции высокого экспортного потенциала.

Выход первого номера 'Российско-Турецкого делового журнала' – 15 октября 2019 года. Среди главных тем: 'Инвестиции', 'Безопасность', 'Энергетика', 'Строительство', 'Туризм'.

Выход первого номера приурочен к проведению в Стамбуле 23-й международной выставки средств и технологий индустрии безопасности и защиты ISAF 2019 (17-20 октября 2019, Istanbul Expo Center).

İKI YETKILI İŞ İŞBIRLIĞI DERGISI

'Türk-Rus Işletme Dergisi', Rus ve Türk girişimcileri arasında karşılıklı yarar sağlayan iş ilişkilerinin geliştirilmesine yönelik bilgi ve analitik bir destektir.

Dergide materyaller Rusça ve Türkçe olarak paralel olarak yayınlanmaktadır. Dernek, Rusya ve Türkiye arasında, sanayi ve ihracat politikasının, uluslararası işbirliği birliklerinin, ticaret ve sanayi odalarının, uluslararası ve ulusal yatırım fonlarının, Rusya ve Türkiye arasındaki karşılıklı ticari işbirliğinin en büyük oyuncularına uygulanmasına ilişkin devlet yetkililerine gönderilmektedir.

Anahtar konular:
- ticaret ve ekonomik ilişkilerin dinamikleri ve eğilimleri;
- her iki ülkenin uluslararası ticaretine devlet destek ve yardım önlemleri;
- yatırım projeleri, programlar, teklifler;
- ortak girişimler;
- Rus-Türk iş işbirliğinin uygulanmış projelerinin deneyimi;
- bölgelerarası programlar ve projeler;
- İki ülkenin mevzuatındaki değişiklikler;
- uluslararası endüstriyel projelerin finansmanı;
- Yüksek teknolojiler alanında işbirliği;
- Kültürel, turistik ve gençlik programlarının geliştirilmesi;
- işbirliği projeleri, sektörel konsolidasyon, ortak kalkınma önerileri;
- Yüksek ihracat potansiyeli olan yeni ürünlerin sunumu.

'Türk-Rus Işletme Dergisi' nin ilk sayısı 15 Ekim 2019'te. Başlıca konular şunlardır: Yatırımlar, Güvenlik, Enerji, İnşaat, Turizm.

İlk sayının yayınlanması, güvenlik ve savunma sanayii ISAF 2019 (17-20 Ekim 2019, İstanbul Fuar Merkezi) 23 uluslararası araç ve teknolojinin İstanbul'daki holdingine zamanlandı.

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INTERNATIONAL AEROSPACE, MILITARY, NAVY AND TECHNOLOGY GUIDES IN 2019

In 2019

ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
'RA&MG' №01 (32)	February 12th	**IDEX 2019 / NAVDEX 2019** (17-21.02.2019, UAE, Abu Dhabi)
'RA&MG' №02 (33)	February 15th	**AERO INDIA 2019** (20-24.02.2019, India, Bangalore)
'RA&MG' №03 (34)	March 24th	**LIMA 2019** (26-30.03.2019, Malaysia, Langkawi)
'RA&MG' №04 (35)	April 01th	**LAAD 2019** (02-05.04.2019, Brazil, Rio de Janeiro)
'RA&MG' №05 (36)	April 01th	**IDEF 2019** (30.04-03.05.2019, Turkey, Istanbul)
'RA&MG' №06 (37)	May 12th	**IMDEX ASIA 2019** (14-16.05.2019, Singapore)
'RA&MG' №07 (38)	May 14th	**SITDEF 2019** (16-19.05.2019, Peru, Lima)
'RA&MG' №08 (39)	June 16th	**Paris Air Show 2019 Le Bourget** (17-23.06.2019, France, Paris)
'RA&MG' №09 (40)	June 24th	**ARMY 2019** (25-30.06.2019, Russia, Moscow)
'RA&MG' №10 (41)	July 01th	**IMDS-2019** (10-14.07.2019, Russia, Saint Petersburg)
'RA&MG' №11 (42)	August 27th	**MAKS-2019** (27.08-01.09.2019, Russia, Moscow)
'RA&MG' №12 (43)	September 16th	**AVIATION EXPO CHINA 2019** (18-20.09.2019, China, Beijing)
'RA&MG' №13 (44)	October 01th	**INMEX SMM India 2019** (03-05.10.2019, India, Mumbai)
'RA&MG' №14 (45)	October 13th	**SEOUL ADEX 2019** (15-20.10.2019, Korea, Seoul)
'RA&MG' №15 (46)	October 28th	**BIDEC 2019** (28-30.10.2019, Bahrain, Manama)
'RA&MG' №16 (47)	November 02th	**Defense & Security 2019** (04-07.11.2019, Thailand, Bangkok)
'RA&MG' №17 (48)	November 16th	**Dubai Airshow 2019** (17-21.11.2019, UAE, Dubai)
'RA&MG' №18 (49)	December 08th	**Gulf Defense & Aerospace 2019** (10-12.12.2019, Kuwait, Al Kuwait)

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