

RUSSIAN AVIATION & MILITARY GUIDE

Special analytical export project of Industrial Weekly

№ 09 (16) October, 2017

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*In the Persian Gulf and
Middle East region*



FSMTS of Russia
*The new trends
of the defense exports*



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EDITORIAL



Innovations for Defense

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 nonending 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 secure people's safety, rivalry among sellers of weapons and defense systems increases in order to achieve such goals as increasing profits and market share. The first Bahrain international defence exhibition and conference (BIDEK-2017) will present the best weapons that price and quality are the undisputed world leaders in their segments.

This defence exhibition will show that it is not serious about how many weapons you have, but quality and possibilities of every single one of them is fact what leads to victory on the battlefield. 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 BIDEK-2017 Russia continues the policy of open partnership with the countries of the Persian Gulf and the entire Middle East region. Russia has a wide product line that meets all the needs of defense in all elements — on land, in air, on water and under water.

Valeriy Stolnikov

SOKOL SECURITY SOLUTION

Rosoboronexport demonstrated Russia's state-of-the-art system providing security of vital installations, including military airfields, namely the SOKOL security solution, at the International Aviation and Space Show MAKS-2017. The unique system already caught attention of our partners from India and we count on it to pique interest on the part of customers from other countries in view of the growing terrorist threat. Promotion of such products paves the way for us to the market of hi-tech special-purpose equipment,' says Deputy Director General Sergey Goreslavsky of Rosoboronexport. The system utilizes alarm devices complete with fiber-optic cables to provide security of long perimeters and facilities. It boasts unique technical characteristics and capabilities. Should the boundaries of a protected installation be trespassed, the system automatically detects the place and directs to it video and IR imaging cameras to transmit information to the Duty Post. The trespasser may even not know that he has been detected, for the elements of the system can be buried into the ground forming up warning lines. Meanwhile, it has no impact whatsoever on the detection accuracy, which is within 5m, while the protected boundary can be as long as 100 km.

MOMENTS OF ARMY GAMES 2017

The Russian Defence Ministry issued the final video that concentrated brightest, breathtaking, challenging and spectacular moments of the International Army Games 2017. The video clip was published on the official website and accounts in the social networks Odnoklassniki, Vkontakte, Facebook, Twitter and YouTube. The clip comprises the footage of all contests of the Army Games 2017. They reflected the opening, culminating and final stages. Among them there are the highlights of the obstacle course passing at the Military Medical Relay Race contest participated by the women team, breath-taking fighters' flights at the Aviadarts, the individual race among the Chemical scouts within the Safe Environment, and classical views of the Alabino range that hosted the Tank Biathlon. The video clip ended with shots of the awards and closing ceremony, and the speech of the Russian Defense Minister General of the Army Sergei Shoigu.

For commercial deliveries

Russian Helicopters Holding Company (part of Rostec State Corporation) obtained a type certificate for medium utility Mi-171A2 helicopter in a convertible configuration from the Federal Air Transport Agency of the Russian Federation (Rosaviatsia). This document opens the door for helicopter deliveries to commercial customers.

The type certificate certifies that the Mi-171A2 developed at Moscow Mil Helicopter Plant may safely transport passengers and cargoes day and night in standard and adverse weather conditions, including over water areas both as per VFR and IFR. Moreover, the document proves that the helicopter may be operated along international air routes. The certification opens the way to serial production and deliveries of Mi-171A2 helicopters to Russian and foreign customers.

The Mi-171A2 has been certified as per category A, which stipulates meeting the most stringent safety requirements imposed on civil helicopters. In particular, one of the requirements is the possibility to continue OEI flight with the maximum take-off weight.

'Obtaining a type certificate is one of the most important events of the project and means the opportunity to deliver this helicopter to commercial operators. The Mi-171A2 offers ample opportunities to renew helicopter fleet of Russian and foreign operators, who have experience in operating Mi-8/Mi-17 helicopters,' said Andrey Boginsky, Director General of Russian

Helicopters Holding Company, emphasized.

Flight tests of Mi-171A2 helicopter, where four prototypes were engaged, began in 2014. Another two prototypes participated in static tests. Since the beginning of 2017 Mi-171A2 helicopter performed more than 200 flights.

Performed activities resulted in completion of tests in six programs with drawing up certificates of additional certification tests. In addition, during MAKS-2017 the helicopter performed eight demonstration flights simultaneously with the test program.

The Mi-171A2 is the result of a radical modernization of worldwide known Mi-8/Mi-17 helicopters. When developing the Mi-171A2, the goal was to reduce helicopter operation costs, improve its performance and bring them in line with tight modern airworthiness standards applied to civil aircraft. More than 80 changes were introduced to the Mi-171A2 design as compared to the baseline model. The helicopter is powered by VK-2500PS-03 engines (civil version of the engines installed on Mi-28 combat helicopters) with FADEC system. The transmission was reinforced due to



the engine power increase. Digital navigation system with data display indication allowed reducing the crew to two people. Introduction of HUMS into avionics improved helicopter safety and made it possible to reduce its maintenance time.

A new rotor system is the one of the most important distinctive features of the Mi-171A2 as compared to Mi-8/Mi-17 helicopters. The helicopter is equipped with a more efficient X-shape tail rotor and a new main rotor with all-composite blades of improved aerodynamic design. Therefore, aerodynamics alone contributed to the increase of the Mi-171A2 main rotor thrust more than by 700 kg, which improved the whole range of flight and technical performance. Mi-171A2 helicopter entered serial production at Ulan-Ude Aviation Plant.

Support to Businesses

Russian Ministry of Economic Development has initiated forging of business advisory sites within the 3d SBI Forum of the SCO and BRICS Regions. During the Forum, all participants will be able to receive advice from representatives of the Ministry's SMB support infrastructure including experts from industrial parks, guarantee and micro finance institutions, as well as export, cluster development, engineering, prototyping, standardization, certification and testing support centers.

Today, SMB support infrastructure mastered by the Russian Ministry of Economic Development covers around 800 facilities across different regions in the country. including 82 guarantee and 83 micro finance institutions, 42 business support centers, 54 coordination centers for export oriented SMB support, 141 business incubators, 25 industrial and technology parks, and 104 organizations supporting innovation and manufacturing SMBs. All

infrastructure facilities were created within the framework of the Small and Medium Business Support Program that has been implemented by the Ministry of Economic Development of Russia since 2005.

'One of the key obstacles of a small business is their ignorance of municipal, regional, federal support measures they are entitled to. In addition, they do not always know where to turn and with what issues. That is why

we have initiated forging of business advisory sites within the 3d SBI Forum of the SCO and BRICS Regions. Russian Ministry of Economic Development will delegate the most competent representatives of the SMB support infrastructure from different regions. They will give advice on specific issues to all interested businessmen, in dedicated exhibition stands,' said Oleg Fomichev, State Secretary and Russian Deputy Minister.

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AIR DEFENCE RECEIVED PANTSYR-S1

Air defence units located in Saratov region received Pantsyr-S1 air defence systems. Crews of the Central MD air defence formation have returned to permanent locations in the Saratov region. They have received Pantsyr-S1 air defence systems in course of the State Defence Order in the Astrakhan region. The units received the hardware in mid-September at the Ashuluk range. The troops had conducted independent, group, and massive firing at day—and nighttime. The servicemen engaged targets, which imitated maneuvering air targets. The Pantsyr-S1 systems are to put on combat alert this year.

RUSSIA-BELARUS AIRBORNE EXERCISE

Snipers of the Russian Airborne troops and Belarus Forces of Special Operation will engage an indicated enemy at the Strugi Krasnye firing ground striking the targets at a range of more than 2,000 meters. During the training, the Russian and Belarusian paratroopers covered by machine-gun detachments are to destroy and incapacitate more than 200 targets in a short period of time including those imitating high-precision surveillance systems of the indicated enemy. The sniper live-fire exercise will be held in day and night conditions with the usage of modern high-precision electro-optical guidance and spotting equipment. Long-range fire will be conducted using 12.7 mm guns with different types of ammunition. During the drills the engaged units will use standard communication, reconnaissance, weapon systems and special hardware. In total, the Russia-Belarus tactical drills will involve more than 1,000 troops and more than 200 pieces of military and special hardware from the both countries.

MI-26 HELICOPTERS FOR DEFENCE MINISTRY

Russian Defence Ministry is to update Mi-26 helicopters in course of the state rearmament programme. This was stated by the Deputy Defence Minister Yuri Borisov after his visit to Rosvertol company in Rostov-on-Don. According to the Deputy Defence Minister Yuri Borisov, implementation of this plan has been included into the state rearmament programme. Mi-26 helicopters have the highest lifting capacities in the world. They are used for transportation of Airborne units and large hardware. The helicopters can be used in course of transportation, evacuation, and fire-fighting operations.

Certification trials of K-62

Russian Helicopters Holding (part of Rostec State Corporation) intends to commence certification trials of the bleeding-edge helicopter Ka-62 early in 2018. The trials are to be completed within two years, following which the machine will be available for commercial use.

Progress Aresenyev Aviation Company has by now produced two flight models. The first one has already undergone in-plant tests in May 2017. According to the testing programme, Ka-62 has already performed the first circuit-circling at 110 km/h for 15 minutes. The test pilots of JSC Kamov, the principle principal of Ka-62, have tested its overall operating performance, main energy supply systems, airborne equipment and power unit. The second flight model has been unveiled to the Russian and foreign audiences at the third Eastern Economic Forum.

'We continue preparing Ka-62 helicopter for mass production. We will conduct a series of ground and flight certification trials, following which we will offer the model to the market. This will be a state-of-the-art hi-tech

helicopter, which I believe is bound to enjoy a good demand on the market,' said Andrei Boginsky, the CEO of Russian Helicopters.

Moreover, a third flight model of helicopter Ka-62 is scheduled for the development in 2018.

Helicopter Ka-62 is designed for the passenger carriage, offshore works, emergency medical aid, search and rescue, conveyance of cargo inside the cabin and as suspended load, patrolling and environmental monitoring. The high operating ceiling and high power loading of its engines enable Ka-62 to perform search-and-rescue and evacuation works in mountainous areas.

Ka-62 was made of the most advanced polymeric composite materials (PCM). The amount of PCM in the helicopter was brought to



60% in weight, which allowed reducing the weight of the empty machine, consequently increasing its speed, manoeuvrability and lifting capacity, as well as reduce fuel consumption. The helicopter stands out with perfect aerodynamic lines of the airframe, high capacity of the cargo and passenger cabin, and the tricycle landing gear with tail support.

UEC and AECC CAE

The United Engine Corporation (UEC, part of Rostec State Corporation), as part of Aviation Expo China 2017, has signed a memorandum with the Chinese company AECC Commercial Aircraft Engine Co., Ltd. (AECC CAE). The Memorandum determines the objectives and main principles of interaction in the joint development of a gas turbine engine for a prospective long range wide-body aircraft (LRWBA/C929).

Under the Memorandum, the primary objectives of the program for creating an engine for the LRWBA will include engaging in joint research and competitive analysis, defining the potential customers' requirements to the engine, forming the appearance of the engine, and determining its basic technical parameters.

'The signing of the Memorandum on the development of the engine for the LRWBA is a milestone for the civil aviation of Russia and China. It's not just a matter of being competitive, it is a matter of technological independence for our countries,' said Sergey Chemezov, CEO of Rostec State Corporation. 'Our ultimate goal is the creation of our own powerful world-

class engine certified in accordance with the highest international standards.'

The UEC has previously started to develop a high-thrust civil engine PD-35 for prospective wide-body long-haul aircraft. There is currently research and development groundwork under way under the PD-35 program in order to bring the degree of its development up to level 6 that will allow implementing research and development work as a whole with minimal technical risk. During the implementation of the PD-35 project, the scientific and technical groundwork carried out during the development of the new Russian PD-14 engine for aircraft MS-21-300 will be widely used.

'The Memorandum of interaction in the joint development of a gas turbine engine for a prospective long range wide-body aircraft defines the basic principles and tasks of Russian and Chinese parties within the framework of the project,' said Denis Manturov, Minister of Trade and Industry of Russian Federation. 'In general the project is carried out according to the agreed schedule — the start of engine test is scheduled for 2022, its certification for 2027.'

AECC CAE is part of the Aero Engine Corporation of China, created in 2016, and is engaged in the development, manufacture and maintenance of civil gas turbine engines. The UEC is working closely with AECC and its divisions.

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SECURITY IN MIDDLE EAST

The Russian Defence Minister General of the Army Sergei Shoigu and the King of Saudi Arabia Salman bin Abdulaziz Al Saud discussed issues of regional security in the Middle East in course of their meeting in Moscow. According to Sergei Shoigu, Russian military department paid much attention to development of bilateral co-operation between two countries in military and military-technical fields. 'I suppose that issues of regional security in the Middle East could be discussed in course of the meeting. Today, cohesion of the international community in fighting against international terrorism is required,' stressed the Russian Defence Minister. 'I hope that our meeting will promote strengthening of friendship between armed forces of two countries,' stated Sergei Shoigu.



TARIFFS AND TARGET INFLATION

At the meeting of the Government Russian Minister of Economic Development presented Social and Economic Outlook for 2018-2020 years. Russia's Social and Economic Outlook 2018-2020 is in general approved by the Government, said the head of the Ministry of Economic Development Maxim Oreshkin during the briefing on the outcomes of the Cabinet meeting. Maxim Oreshkin: Among the recent changes that were made at the meeting of the Government related to clarifying the latest economic trends, it is, first and foremost, a reduction in the inflation rate to 3.2% for this year. This was certainly included into the Outlook. In addition, there were changes caused by a slightly higher oil price over this year and a slightly stronger Ruble reflecting the actual trends of the last month. The forecast takes into account, among other things, an increase in the rate of economic growth for the three-year period, which we have already mentioned and which is stimulated by industrious activities of the Government in implementing changes in different fields including investment support and launch of a variety of priority projects.

Major Forest Fire in China

The Mi-26Ts helicopter produced by Russian Helicopters (part of the Rostec State Corporation) supplied to China in the summer of 2016 extinguished a major forest fire near Dalian, in Zhejiang province, Republic of China. The Ka-32 helicopter of the local fire station was also involved in the operation. The fire was extinguished within several hours.

The fire occurred 60 km from a settlement in a mountainous area, therefore, access for ground transport was hampered. The Mi-26Ts and Ka-32 helicopters promptly flew to the fire site and threw more than 250 tons of water on the fire. Within several hours, the fire was fully extinguished. The neighbouring settlements did not suffer.

'We are happy that our equipment performed commendably in the emergency situation. China has traditionally demonstrated interest in Russian fire fighting helicopters, and the experience has shown that this choice is justified in actual operational conditions,' said Alexander Shcherbinin, Deputy CEO for marketing and business development, Russian Helicopters.

Mi-26Ts (certified according to the flight standards of China) is the world's heaviest serially produced helicopter. It can carry the total maximum payload of up to 20 tons in the transport cabin or on the external sling. The helicopter has



proven its efficiency during suppression of major fire spots in the PRC on numerous occasions. The main objective of Mi-26Ts in emergency response is to deliver special-purpose machinery and fire brigades to the fire point and throw water on the burning forested area.

Ka-32A11BC is a medium multi-role coaxial helicopter designed for complicated fire suppression assignments, search and rescue operations, evacuation of patients and injured

persons and patrolling and support of operations of intelligence services. The fire fighting Ka-32A11BC has more than 40 fire fighting equipment options, including Bambi-Bucket and Simplex systems, water cannons for horizontal fire suppression.

At present, the State Forestry Administration of China operates four Mi-26Ts and 15 Ka-32A11BC helicopters. They serve successfully and take part in forest fire fighting every year.

Russian-Chinese Long Range Aircraft

Technodinamika holding (part of Rostec State Corporation) has been shortlisted as a candidate to supply systems and components for Russian-Chinese long range wide-body CR929 aircraft. The final selection of suppliers of systems will begin before the end of 2017.

Under the competition, Technodinamika plans to focus on the development of landing gears, air conditioning, fire protection and oxygen equipment systems. Moreover, the holding offers electrical systems, cabin air pressure, secondary cooling, fuel and de-icing systems to include in the project for building the aircraft.

Technodinamika is expected to have an opportunity to develop the equipment in cooperation with a number of Russian and foreign companies under the project. All the critical systems and components will be created at the holding's own facilities.

'CR 929 is one of the key projects in the field of civil aircraft construction both for Russia and for China.

Rostec takes an active part in it,' said the CEO of Rostec State Corporation Sergey Chemezov. — 'The entry of Technodinamika into the number of potential suppliers for CR 929 once again confirms the strong position of our holding in the production of components for the aviation industry.'

In 2016, Technodinamika holding was announced as the winner of an open contest of the Ministry of Industry and Trade and was awarded a contract for research and development on eight systems for the project of the long range wide-body aircraft. The value of the contract amounted to 250 million rubles.

On September 29, during an official ceremony in Shanghai, the aircraft

was named CR929, where the letters C and R stand for China and Russia. The project of the aircraft is developed by the United Aircraft Corporation in co-operation with the Chinese Commercial Aircraft Corporation of China. The China-Russia Commercial Aircraft International Corporation (CRAIC) enterprise will function as the operator of the program.

In September 2017, United Engine Corporation (UEC, part of Rostec State Corporation) signed a memorandum with the Chinese company AECC Commercial Aircraft Engine Co., Ltd. (AECC CAE). The Memorandum defines the tasks and the main principles of interaction during the joint development of a gas turbine engine for a future long range wide-body aircraft (LRWBA).

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THE ECONOMY IS ALREADY STABLE

Maxim Oreshkin, Russian Minister of Economic Development, held a meeting of the Executive Committee of the Foreign Investment Advisory Council (FIAC) to sum up the year results of the Council WG's and discuss topical issues that would be reviewed at FIAC plenary session attended by Russian PM Dmitry Medvedev. 'The key indicators now demonstrate that the economy is already stable, while inflation rate is easing at 3.3%, the latest data say. In the next three years, economic growth rate is expected to be no less than 2%, with inflation rate being at the target level estimated by the Bank of Russia,' he said. Maxim Oreshkin compared the current situation in the Russian economy to that moment of the U.S. economy in the first half of the 1980s, when the country had had low and steady inflation rate, which opened the doors for a positive credit cycle that lasted 27 years. 'The overall debt burden in the Russian economy is very low and the credit cycle can be expected to be long. The Government and the Central Bank of Russia are tasked to ensure that the credit cycle is supportive of economic growth. This suggests sharper focus on corporate and investment lending and developing financial instruments such as mortgage loans,' he said.

COOPERATION AGREEMENT AT EXPORT-IMPORT

On September a memorandum of understanding was signed between EXIAR (part of the Russian Export Center Group) and the Export-Import Bank of Korea (KEXIM). The document was signed at the Eastern Economic Forum by Alexey Tyupanov, Executive Director of the REC Group and CEO of EXIAR, and Hong Young-Pyo, Acting Chairman and President of KEXIM. The document sets out plans for the organizations to work together on long-term projects, and set up information and staff exchange programs. This agreement with the Export-Import Bank of Korea marks a significant step forward in our efforts to establish cooperation channels with the world's biggest ECAs. South Korea is one of the Asia Pacific's leading economies. On top of that, it is an export-oriented economy, with a focus on growing production of high-tech products. I firmly believe that by working together on projects, we will be building an environment conducive to the expansion of non-commodity exports, which will in turn have a wider positive effect on subsequent economic cooperation between our countries.

Mi-35M for Mali

Russian Helicopters holding company produced two Mi-35M transport/attack helicopter for Mali under Rosoboronexport-related contract. Aircraft and all property necessary for their operation is delivered to the customer.

'Performance of the contract on Mi-35M delivery to our Mali partners once again confirms that the holding company holds a leading position in the world market of attack helicopters. I am sure that successful implementation of this order will result in growing demand for Russian helicopters in the region,' said Russian Helicopters CEO Andrey Boginsky.

'I am confident that the helicopters we delivered will help Mali to protect its sovereignty and fight against the universal threat of terrorism. I also would like to mention that the supply of Russian Mi-35M helicopters is another significant contribution to the development of military and technical cooperation between our two countries, which in recent years has demonstrated a good upward trend,' said Rosoboronexport CEO Alexander Mikheyev.

Mi-35M is the world's only universal attack helicopter, which in addition to effective performance of fire missions is able to transport up to 8 soldiers with weapons, up to 1,500 kg of ammunition or other cargo inside the cabin, and up to 2400 kg of cargo on external sling; evacuate those who are

wounded; deliver technical staff to the autonomous deploying sites.

The firepower of the Mi-35M is by 140% higher than that of its main competitors in the market due to a significant mass of equipment payload. Helicopter's unguided missile and missile-gun armament is 30% more powerful than that of competitors, which allows it to carry out air support for troops on the battlefield more effectively.

Due to the fact that the helicopter can be used in combat 24/7 in any weather conditions, it can perform combat tasks on aviation support of ground forces accordingly.

The helicopter demonstrates impressive high-altitude performance and is able to take off and land on concrete and ground sites located at altitudes up to 4000 m above sea level. In addition, effective design solutions used in Mi-35 allow to use this Russian helicopter in many physiographic regions and climates, including in the mountains, at temperatures from -50°C to +50°C, and humidity up to 98%.

JSC Russian Helicopters (part of Rostec State Corporation) is one of the world leaders in helicopter in-



dustry, the only developer and manufacturer of helicopters in Russia. The holding company was established in 2007. The head office is located in Moscow. The holding company is comprised of five helicopter plants, two design bureaus, enterprises for production and maintenance of components, aircraft repair plants and a service company providing after-sales support in Russia and abroad. Among the buyers of the holding company's products are the Defense Ministry of Russia, the Ministry of Internal Affairs of Russia, EMERCOM of Russia, and other state customers, Gazprom Avia and UTair airlines, as well as major Russian and foreign companies. In 2016, the revenue of Russian Helicopters under IFRS amounted to RUB 214.3 billion, its shipments totaled to 189 helicopters.

'Production Line 2020'

Concern Kalashnikov, a member of the Rostec State Corporation, presented the 'Production Line 2020' by introducing Industry 4.0 business processes in this production area. The purpose of the project was to reflect the changes that occur in the industry as influenced by information technologies.

One of the monitoring and management tools are VR technologies that combined the data of various systems into a single cabinet — now the head of the production line can obtain full information on the processes even remotely.

'Concern Kalashnikov is a clear embodiment of the Russian industry's success. We can positively expect that the proceeds of the Kalashnikov Group will be about 40 billion rubles this year. Today the concern has gone far beyond the limits of manufacturing the

world-beating machine guns: apart from AK-12 and AK-15, sniper rifles, sports and hunting rifles Kalashnikov builds motor boats, motorcycles and unmanned aerial vehicles. Today was saw a pilot project on the road to introducing Industry 4.0 at our plants and factories. And the first step was made here, in Izhevsk. I am sure that this experience will be positive, and in the future we will be able to apply it at other large production facilities,' said General Director of the Rostec State Corporation Sergey Chemezov.



In the nearest future additional artificial intelligence-based technologies will be introduced to allow not only to manage current contingencies, but also to materially anticipate them.

Международный военно-технический форум ARMY 2018

№01, 21 августа 2018 года

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«С 22 по 27 августа Министерство обороны Российской Федерации проводит Международный военно-технический форум «АрMY-2018». Это третье по счету масштабное мероприятие, в котором примут участие крупные отечественные и зарубежные предприятия оборонно-промышленного комплекса, ведущие конструкторские бюро и научно-исследовательские институты.

Основные мероприятия форума пройдут в Конгрессно-выставочном центре «Патриот». Общая площадь экспозиции в выставочных и на открытой площадке превысит 300 тыс. кв. м. Дипломатические полки из разных стран и отряды войск Вооруженных сил России, военной полиции и специальной техники составят на территории Кубинки, поселке Алабино, в Удесе и в окрестностях Москвы, в том числе на Северном флоте.

Научно-деловая программа пройдет в формате пленарных заседаний, конференций, круглых столов и брифингов, что позволит обсудить актуальные вопросы обороны и безопасности, дальнейшие направления совершенствования способов промышленного производства военной продукции.

Также посетители смогут ознакомиться с последними достижениями в области высоких технологий и перспективными разработками, которые реализуются в военный сфере.

Состояние форума...

International military-technical forum 'ARMY-2018'

August 21-26, 2018

The Patriot Congress and Exhibition Centre with the Military and Patriotic Park of Recreation and Leisure of the Armed Forces of the Russian Federation

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Reports on the work of the Forum, the most important current business and presentations, the representation of participants, their exposition and programs.

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LARGEST EXPORTERS OF RUSSIA

Holding company Shvabe ended up on 161 line in the TOP-200 largest exporters of Russia. The holding took 28th place in the category of non-resource exporters. As of the end of 2016, the holding company's export volumes were about 5 billion rubles, with the exception of supplies to the Eurasian Economic Union. This indicator, the main factor of ranking in the annual rating prepared by the Expert Analytical Centre, guaranteed 161 line for Shvabe. The TOP-200 list includes 38 non-resource exporters with more than 50% share of non-resource export in the overall volume of export supplies. According to the Analytical Centre, the holding company exports 99.4% of non-resource products and holds 28th place in this rating category. Shvabe's presence on the international market has expanded in the last five years. Its geography of sales included 20 new countries. As of today, the Shvabe's products are supplied to 95 countries. In particular, the holding company entered new distribution markets in the Southeast Asia and Europe, Latin America, as well as Central, North, South and West Africa. The revenue also demonstrates stable growth dynamics. A significant portion of our products is technologically advanced export.

LARGEST IMPORTER TOP-100

KAMAZ became a TOP-100 largest importer of Russia according to the rankings of the Russian Export Centre (REC). At the end of the previous year the export volume of the company has grown by 25% and was US 178 mln. The company holds 86th position in the overall ranking. At the same time KAMAZ became a TOP-10 leader among Russian companies of the machine building industry and holds 13th position in the overall ranking of non-resource exporters. As was noted before, in the nearest five years KAMAZ expects to triple the volumes of trucks sold internationally. Half of the new supplies will be new model vehicles. It should be recalled that KAMAZ has been exporting vehicles and components to more than 30 countries, including countries of CIS, Southeast Asia, Middle East, Africa, Eastern Europe, Latin America. There are three KAMAZ assembly plants operating abroad — in Kazakhstan, Lithuania and Azerbaijan. Besides, two more sites prepare for renewal of operation — in Vietnam and Iran.

Russian security products

Rosoboronexport (part of the Rostec State Corporation) is expanding the sphere of its foreign trade activities. As the state intermediary agency for the export and import of the whole range of end products, technologies and services of military and dual use character, Rosoboronexport is planning to enlarge its competences since 2017 with the export of the Russian security products operating at different levels, including the national security one.

'In 2017-2018 we will have a repositioning of the Rosoboronexport's image. This is connected with the explosive growth of interest in the world market to the solutions to provide state and infrastructure security, which was caused by the unprecedented expansion of terrorism and extremism threats. This is why we consider the promotion of security services in the external market as one of the company's drivers. Meanwhile, Rosoboronexport has all the necessary competences for the successful work in this area with the ministries of interior, border guard services, national guards and coast guards of the partner nations,' said Yuri Kaptelkin, head of the Office of the Rosoboronexport's Director General.

For the development of the special exporter's new area of activities, a

special thematic cluster of the Rostec State Corporation companies producing anti-terrorist equipment was created. The development projects are implemented in cooperation with the experts on countering terrorism and crime prevention from all the Russian law-enforcement agencies, i.e. the Ministry of Defence, Federal Security Service, Ministry of Interior, Russian Guard and EMERCOM.

The products, offered by Rosoboronexport, include a variety of special assets and systems. They comprise the 'Secure City' complex automated system, law-enforcement units' transportation systems, including the aviation ones, designed for the conduct of special operations, as well as special vehicles for the provision of public order,

non-lethal weapons, special small arms for the police, individual armour protection assets.

A considerable part of the new area of activities is devoted to the anti-terrorist assets. Foreign customers may receive special small arms and close combat assets, special armoured vehicles, search and inspection equipment, explosives and drugs detection assets, explosive objects handling equipment, robotic systems.

'In addition to that, we now offer to our partners equipment for the protection of installations of special importance and of critical infrastructure as well as of long land and water boundary lines. Special attention is given to the issues of countering unmanned aerial vehicles and provision of cyber security,' added Yuri Kaptelkin.

For upgrading BMP-2 and BMD-2

Sergey Chemezov, General Director of the Rostec State Corporation, launched production at a new workshop for soft-skin vehicles upgrade at Sheglovsky Val, a Tula factory (a member of Rostec). It will be used for upgrading BMP-2 and BMD-2 combat vehicles — a respective agreement has been signed between Rostec and the Ministry of Defence of Russia.

A workshop with a total floor area of 5,000 square metres with modern equipment is designed for mechanical treatment, welding, thermal treatment, assembly and painting works.

'The new workshop for soft-skin vehicles upgrade will not only become another step towards introduction of modern technologies to armament production. This workshop also means 240 new jobs. The workshop commissioning will ensure repairs and upgrade of soft-skin vehicles: BMD-2 and BMP-2. This step has been taken with the support from the Ministry of Defence: today we have signed an agreement on upgrade of 540 combat vehicles of BMP-2 and BMD-2 types,' stated Sergey Chemezov.



The agreement envisages upgrade of combat vehicles through a state defence order for the Ministry of Defence as part of the Armaments State Programme — 2025. This agreement is one of the first major arrangements for implementation of the state defence order as part of the Armaments State Programme — 2025.

On behalf of Rostec the agreement was signed by Deputy General Director of the High Precision Systems Holding Company, Managing Director of KBP Instrument Design Bureau Dmitry Konoplev. On behalf of the Ministry of Defence of the Russian Federation the agreement was signed by Deputy Minister of Defence of the Russian Federation Yuri Borisov.

ELECTRIC CHARGING STATION

Ryazan State Instrument-Making Enterprise (RSIME) started first Russian commercial production of electric charging stations (ECS). Before the end of this year the Concern also intends to produce the first commercial batch of the new model devices — direct current stations 'FORA-EZS-DC' for fast charging of electric cars. The first three pre-prototypes of the stations with the trade name 'FOR A' were manufactured in March 2014 at the Ryazan enterprise of KRET. In pursue of the import substitution task, Rosseti have commenced the tests of domestically produced electric charging stations. FORA has proven that in terms of its technical features it is equal to foreign equivalents and corresponds to all modern requirements. As compared to foreign equivalents, the national electric charging station even has advantages: menu in the Russian language, capable of operating under Russian climatic conditions, but the main advantage is that its cost is almost twice as low.

NEXT-GENERATION HYDROFOIL SEA SHIPS

The Obninsk ORPE Tekhnologiya will supply glazing for the next-generation hydrofoil sea passenger ships 'Kometa 120M'. In total, pursuant to the contract Tekhnologiya will supply to the customer sets of domestically manufactured technologically advanced polycarbonate for 12 motor ships. Monolithic polycarbonate glazing manufactured by Tekhnologiya is highly resistant to impact. This material is approximately 100 times stronger than the ordinary silicate glass and approximately 10 times stronger than acrylic glass. The newest glazing is also twice as light than the previously used silicate glass equivalents which ensures higher sea stability. 'The newest glazing made of domestically manufactured monolithic polycarbonate will be installed on Russian ships for the first time ever, and this is a good trend. Participation in the programme for commercial building of new passenger motor ships is the result of our work on civil products market development. At the end of 2016, the company's share of proceeds from the sale of civil products in the revenue structure was 24.5%,' noted General Director of ORPE Tekhnologiya Andrey Silkin. The 'Kometa 120M' hydrofoil ship is designed for passenger carriage in the coastal sea zone. Passenger capacity of the ship is 120 persons, speed — about 65 km/h. It is expected that the main differences of 'Kometa 120M' from the previously built equivalents will be high level of passenger comfort: the ship is equipped with a motion and overload reduction system.

Main aviation topics

Yuri Slyusar, President of United Aircraft Corporation (UAC) and Irkut Corporation, held working meeting at Irkutsk Aviation Plant, dedicated to implementation of plant's major programs.



While evaluating the second stage of MC-21 factory finishing tests, Yuri Slyusar said: 'The aircraft undergoes tests successfully, in accordance with the schedule. We gradually expand operational envelope in altitude, speed, and weight. Recently, the aircraft has reached the altitude of 10 000 meters and speed of 900 km/h. For today, the aircraft confirms to all declared characteristics.'

Currently, four MC-21-300 test aircraft are under construction. Till the end of this year, the second aircraft is planned to be transferred to the Flight Test Facility of the plant.

During working meeting, the progress of military programs of Irkut Corporation was also discussed. Yuri Slyusar expressed confidence that all this-year contract obligations on aircraft deliveries to the Russia's MOD

and foreign Customers would be timely implemented. The plans on future state and export orders for Su-30SM, Yak-130, Yak-152 aircraft were also discussed at the meeting.

In conclusion, President of United Aircraft Corporation (UAC) and Irkut Corporation noted that currently Irkutsk Aviation Plant is facing the complicated task of organizing serial production of MC-21 aircraft, to-

gether with rotating production tempo of military products. That is why, Yuri Slyusar stressed, it is important to implement programs directed to retention of professional cadre at the plant. In particular, United Aircraft Corporation develops housing program, which envisions that successful plant's employees may obtain 50% subsidies for purchasing ready-made housing.

Briefing to Russian companies

A delegation from Bahrain Defence Force gave a briefing to Russian companies on Bahrain International Defence Exhibition and Conference (BIDEC) 2017. The briefing at the headquarters of Rosoboronexport was held in cooperation with the Embassy of the Kingdom of Bahrain in the Russian Federation and was attended by the Ambassador of Bahrain to Russia, Ahmed Abdulrahman Al-Sa'ati, Colonel Adnan Mohammed Al-Sada, Lieutenant Colonel Ahmed Ali Al-Rowaie, and the representative of 'Clarion Events', the organizer of the exhibition.

Rosoboronexport Deputy Director General, Igor Sevastyanov and 15 representatives of Russian companies specializing in military industry, including 'Kalashnikov Concern,' 'Rostec Corporation,' 'Federal Service for Military-Technical Cooperation' and 'Ruselectronics,' attended the meeting from the Russian side.

Rosoboronexport Deputy Director General welcomed Dr. Al-Sa'ati and the Bahraini delegation, highlighting the development of cooperation between Bahrain and Russia reflected in the numerous contracts that have been signed between the two countries in the fields of military and defence.

He affirmed Rosoboronexport's keenness, along with its partners and representatives, to actively participate in BIDEC 2017 and to enhance

joint cooperation between Bahrain and Russia.

Al-Sa'ati expressed thanks and appreciation to Rosoboronexport's officials for providing the opportunity to brief Russian companies on BIDEC 2017 and to promote Russian products in the Middle East.

He highlighted the development of the Bahraini-Russian relations, which was evident in the visit of His Majesty King Hamad bin Isa Al Khalifa to Moscow on September 5-7 last year, during which HM the King was the honorary guest of the Russian Army-2016 Expo. The visit also resulted in signing agreements and memorandums of understanding, most important of which was the establishment of the Joint Governmental Committee for commercial, econom-

ic, scientific and technological cooperation, as well as military cooperation.

The Sales director and the representative of 'Clarion Events' gave a presentation of the exhibition, logistical and technical topics related to the participation of Russian companies, the spaces allocated to them and the number of participants from foreign countries.

The representatives of the Russian military companies raised questions and queries to the representatives of the Bahrain Defence Force, regarding logistic and technical topics.

The representatives of Rosoboronexport and other Russian military companies affirmed their keenness to participate actively in such exhibitions, highlighting the importance of the GCC to the Russian military products.

FRIENDSHIP AND PARTNERSHIP

Bahrain is important partner in the Persian Gulf and the entire Middle East region

Relations between Russia and Bahrain have always been friendly and mutually beneficial. They demonstrated and demonstrate the high principles of mutual respect, successful investment partnership, development of business and cultural prospects. One of the evidence of this is the frequent meetings of the leaders of the two countries — Vladimir Putin, the president of Russia, and Hamad bin Isa Al Khalifa, the King of Bahrain.

The diplomatic relations between Russia and Bahrain were established on the level of Embassies on 29 September 1990. The Ambassador of the USSR presented his credentials in Manama on 30 July 1991, the Ambassador of Bahrain presented his credentials in Moscow in February 1992. And since that time friendly and business relations have actively developed between countries, including in the field of strengthening the defense capability.

One example of mutual partnership is the ratification of an important international instrument — Agreement between Russia and Bahrain on encouragement and mutual protection of capital investment. Vladimir Putin signed this Federal Law On the Ratification of the Agreement Between the Government

of the Russian Federation and the Government of the Kingdom of Bahrain on the Encouragement and Mutual Protection of Capital Investment on November, 2015.

The agreement drafted with due regard to modern contractual practice, Russian law and international standards in the area of concern was signed in Moscow on May 27, 2016, with the aim of developing international legal framework of the Russia-Bahrain cooperation in extradition matters.

Under the agreement, the parties undertake, on a reciprocal basis, to extradite, upon request of either party, individuals who committed crimes and are located on the other party's territory, for criminal prosecution or execution of a sentence in the requesting country. The agreement sets forth the extradition terms and requirements for the format and con-

tent of an extradition request as well as the request processing order.

The leaders of the two countries constantly discuss the principles laid down in the basis of this document at meetings. For example, on September, 2016 Vladimir Putin met with King Hamad bin Isa Al Khalifa of Bahrain in the Kremlin, Moscow.

Within the framework of that meeting in the presence of the heads of state, intergovernmental agreements were signed on the establishment of the Intergovernmental Russian-Bahraini Commission on Trade, Economic, Scientific and Technological Cooperation, and on military cooperation. Memorandums of understanding were also signed to expand cooperation in the sphere of liquefied natural gas and strengthen partnership in geophysical research in oil and natural gas exploration and production.

The King of Bahrain is in Russia on a working visit during which he visited the Army-2016 international military technology forum and acquainted himself with Russian defence industry products.

President of Russia Vladimir Putin said that times: 'Your Majesty, welcome to Russia. I am pleased to see you. I hope that your visit this time will be as productive as our previous meeting. We discussed a whole host



of opportunities for expanding our collaboration. I know that this time you wanted to see our defence industry capabilities. I hope that you have been able to see what we can offer our friends and partners. Your Majesty, I would also like to know your opinion about what you saw today.

And naturally, it is very important today to talk about your view of what is going on in the region. I had an opportunity in China to discuss these issues with some of our colleagues from the region. In this connection, Your Majesty's visit is very timely and I am happy to see you. Welcome to Russia!

King Hamad bin Isa Al Khalifa of Bahrain said: 'Mr. President, thank you for the invitation and for your warm welcome. I would like to convey to you the best wishes of the people of Bahrain. Today, we were pleased to visit an exhibition featuring the latest models of advanced weapon systems. The Deputy Prime Minister Dmitry Rogozin and the Defence Minister Sergei Shoigu gave us a very warm welcome.

Indeed, we would like to get a closer look at your modern prod-

ucts, your arms manufacturing complex. And naturally, taking this into account, we build our relations in accordance with our needs. And, glory to God, everything that we agreed on earlier is being put into practice. However, of course, we, Russia and Bahrain, would like to set even more objectives for ourselves. Mr President, you and your leadership, your Government are held in high regard in the region and throughout the world. And we thank you.'

At another meeting of the two leaders (in Sochi, Russia) Vladimir Putin said to Hamad Bin Isa Al Khalifa: 'Your Majesty, friends, let me wish you a warm welcome to Russia. I want to thank you for accepting our invitation. I recall that we met together here 18 months ago and mapped out some plans for developing our bilateral relations. The economic situation is difficult right now, but we nevertheless continue developing the mechanisms needed to expand our cooperation.

Bahrain is one of our important partners in the Persian Gulf and the entire Middle East region. We are very happy to see our friends here and have this chance to discuss our bilateral relations and examine the situation in the world, particularly in the region, of course. Welcome!'

King of Bahrain Hamad Bin Isa Al Khalifa said: 'Mr President, thank you for this invitation. This is an important and welcome opportunity to discuss and exchange views on strengthening our bilateral relations and matters concerning our common interests, and to discuss matters concerning the Middle East and the entire world. Regarding the challenges and the economic situation, we perhaps do not have the full picture yet, but cooperation between countries can help us all to overcome the current difficulties.

We therefore welcome the chance to work together with Russia under your leadership, Mr President, and this is the common desire of all countries in our region. Thank you very much.'

It is interesting to recall that the Russian president and the King of Bahrain had met in Sochi before — for example, in October 2014. during that meeting, Vladimir Putin noted: 'Next year will mark 25 years since



our countries established diplomatic relations. I am very happy to see that the ties between Russia and Bahrain have developed over this time and that we now have regular and ongoing contacts. Your Majesty, I am very pleased to have this chance to discuss our bilateral relations with you and talk about the situation in the region. I hope that you will like the way we have organised the Formula One competition, which Russia is hosting for the first time ever.'

King of Bahrain Hamad Bin Isa Al Khalifa answered: 'I am very pleased to have taken up this invitation to visit Russia and I note your hospitality and the excellent organisation of my visit and the reception I have been given. This is nothing surprising given your level, Mr President, and the heritage that we have in our bilateral relations. We cooperate in many different fields, including in culture and the economy, and you could say that our relations have a strategic nature. Indeed, Russia and Bahrain are really very close and it took us only three hours to get here. I must say too what a beautiful place Sochi is. It is really very good, an excellent resort. I will tell my brothers and my colleagues in Bahrain and recommend that they also come here and see it for themselves.'

/RA&MG/





DEFENSE EXPORT FROM RUSSIA

Dmitry Shugaev: 'The current trend is to create new high-technology products in co-operation'

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, 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.'

— **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 last year our defense exports exceeded \$15 bln. The major part of this export is 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

— Yes, we are open to new partnerships and we understand that this is the trend. Of course, the approach 'buy it as it is or search for it elsewhere' is becoming obsolete. Naturally, sales of the final product is our main priority, but our partners increasingly aim at building their national manu-

facturing facilities to develop their industries.

The relationship with partners in the 'export final products only' coordinate system are gradually replaced by cooperation in the field of creation of new high-technology products as a result of mutual efforts. And

The countries of the Middle East and North Africa are our time-tested partners in various fields including the military-technical one. Therefore, they have been using almost all types of Russian military purpose products. Armored machinery, aviation equipment, air-defense systems and naval equipment of Russian (Soviet) origin are in high demand in this region. And in all the above mentioned directions we cooperate closely.

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.

— **Is Russia open today for new cooperation ties?**





we are ready for this kind of cooperation as a country that has built its own defense industry. We are ready for cooperation and we will help our partners to create systems they need today.

— **Can you give any particular examples?**

— A case in point is the joint venture to manufacture Ka-226T helicopter, which is registered in India in accordance with appropriate inter-governmental agreement. It will start its active work soon. Another example of technological cooperation is BrahMos joint venture established in India.

In addition, the establishment of a chain of maintenance stations in Latin America, in particular, in Peru and in Brazil can be invoked here too. We have a lot of cooperation projects with Chinese companies etc.

Therefore, our foreign partners can be sure that we are ready for technological cooperation based on many years of experience and strong reputation of Russian weapons in the world.

— **Is it really strong?**

— Yes, it is. Russian weapons and military equipment have made a good showing in the world. Today experts state that our weapons are:

first, highly technological; and, second, proving their 'mission survivability'. In addition, it is relatively easy to maintain our weapons. Combination of the above mentioned factors explains why our products are so popular in the world.

At the same time today we offer the best value for money in the global market. This is recognized by everybody, including our competitors. I state this proudly and not for the purpose of advertising, because it is not only our opinion, but assessments of experts of the global market of military purpose products.

Thus, for example, despite the Afghan army has Mi-171 helicopters in use for a quite long time, pilots do not wish to refuse these machines and migrate to other, newer helicopters. By the way, the American pilots who use our special-purpose helicopters give similar assessments.

— **And did Soviet equipment prove its high efficiency?**

— Yes, it did. And it is still doing. For example, Vietnam has been our partner in the field of military-technical cooperation for a long time for one reason only: Vietnamese army uses soviet military equipment for



decades and is satisfied with it and with Russian products supplied in replacement of older soviet equipment.

— **Does it ring true amid the evidently growing competition in the weapon market...**

— We live in the real world and we clearly understand that competition is strong. It is absolutely normal. Russian manufacturers take into account the trends in the global market of military equipment.

— **What is impact (if any) of sanctions of some Western countries on the MTC of Russia with foreign countries?**

— Sanctions is a bad notion in principle, they contradict the logic of free market per se. Suffice it to say that WTO, of which Russia is a member, upholds freedom from any restrictions. Unfortunately, many international institutions intended to strengthen mutually beneficial cooperation are failing today. And in this particular case we are witnessing politically motivated



Russian weapons and military equipment have made a good showing in the world. Today experts state that our weapons are: first, highly technological; second, proving their 'mission survivability'. In addition, it is relatively easy to maintain our weapons. Combination of the above mentioned factors explains why our products are so popular in the world. At the same time today we offer the best value for money in the global market. This is recognized by many, including our competitors. Therefore, I state it proudly and not for the sake of advertising, but because it is common knowledge.

Today Russia is a manufacturer of a large number of advanced and very expensive weapons, including the most innovative. But this is not to say that we shall offer exclusive solutions only. Russia is aimed at active expansion of its niches in the global market participating in many international tenders for both state-of-the-art weapons and traditional products. This stimulates national industry to manufacture the best products at most competitive prices.

and absolutely unjustified discrimination. However, being realists, we have to work and find solutions.

First when the sanctions were imposed (since it was done quite abruptly) our industry, of course, was faced with certain difficulties related to embargo of component supplies, interruptions of cooperation relations we used to have, among others, with Ukraine.

But in spite of everything, the system of military-technical cooperation

with foreign countries has adjusted to these changes. We have successfully implemented a program of import substitution, which has timely oriented the industry to create certain systems previously supplied by our partners from abroad. Thus, a serious impulse was given to developing the national industry, especially in the fields of engine manufacturing, radio electronics, manufacturing of special materials, including those used in military equipment. We found solu-





tions for the contracts made with our partners before sanctions, which were exposed to serious risks.

However, the companies that are enforced to follow the sanctions imposed on Russian companies, have considerable losses as well. It will be very difficult to return to our market after cancellation of these sanctions (this will happen sooner or later). Perhaps it will be impossible at all: the niches are already occupied.

We hear about 'fatigue' about the sanctions with increasing frequency from our partners on a very high level, and not only from business community. Everybody understands that this should be stopped, because nobody gains from it. We shall see how things turn out. The Russian Federation has never burned out bridges, we take the situation in a pragmatic and unimpassioned way.

— **So we are still to see who suffered from the sanctions more, aren't we?**

— Those who lost the Russian market have suffered most. So, it is our former suppliers. Especially this is related to Ukrainian suppliers. It's a pity, of course, but it is not our choice. You know, they have stopped cooperation with the Russian Federation unilaterally. But I would like to reiterate our industry has eventually gained from it. It is an important factor to our customers: when a product is manufactured completely in the country of supplier, including all components and equipment, it eliminates any issues of supplies in future.

I mean, first of all, the aftersales service. Today Russian manufacturers due to the imports substitution program and the search for new cooperation have minimum risk of

contractors refusing to supply parts or equipment because of some politically motivated reasons. In this case suppliers are usually forced either to shift supply dates or to negotiate new conditions with customers. Nobody finds it comfortable. If a MPP is manufactured completely within the country, it is a guarantee for its national army that everything will be done in a timely manner. And it is a big competitive strength in the eyes of foreign customers.

— **What types of Russian arms and military equipment are well-known in the Middle East region? In what directions cooperation is most active today?**

— The countries of the Middle East and North Africa are our time-tested partners in various fields including the military-technical one. Therefore, they have been using almost all types of Russian military purpose products. Armored machinery, aviation equipment, air-defense systems and naval equipment of Russian (Soviet) origin are in high demand in this region. And in all the above mentioned directions we cooperate closely.

— **What main competitive advantages does Russian equipment have in terms of its operational capabilities in this region?**

— No doubt, the main competitive advantage of the Russian equipment, from the point of view of any foreign customer, is its quality-price ratio. As for its operation in the countries of the Middle East and North Africa I will

We have been developing military-technical cooperation with the countries of the region from the middle of the 20th century, that is for more than 50 years. Symbolically enough, the inception of interaction in the military-technical field with the countries of the Middle East and North Africa coincided with the period when our system of military-technical cooperation was established. For our regional partners it was the time they obtained independence. Thereafter our cooperation in the military-technical sphere has developed steadily and in a constructive manner.

add another important factor highly assessed by our partners after many years of usage. This is high efficiency and excellent capabilities of our weapons and equipment in extreme climatic conditions. I believe these two major advantages altogether make our military purpose products so popular with regional customers.

— **How long have Russia and the countries of the Middle East and North Africa been cooperating in the military-technical field?**

— We have been developing military-technical cooperation with

intended for the countries of the Middle East and North Africa? What can the Russian Federation offer today to the countries of the Middle East and North Africa in this regard?

— At present, some operators of our military equipment in the region are facing the necessity to repair and modernize the equipment produced in the USSR and supplied earlier. I can say with full confidence that all those products, as well as the Russian origin military equipment, have considerable potential for renovation. As an example, there are several large-scale projects on repair of domestic armored materiel and air defense systems under implementation that are quite successful.

Our country is ready to offer a comprehensive service program of maintenance, repair and upgrade of our military products according to the highest quality standards.

— **What current offers of the Russian aircraft equipment and other defense solutions, according to experts of FSMTC of Russia, are more promising for the countries of this region?**

— Long-term experience of successful cooperation with the countries of the Middle East and North Africa and the relationship of trust at bilateral level give us a strong cause for optimism about the future of military-technical cooperation with these countries.

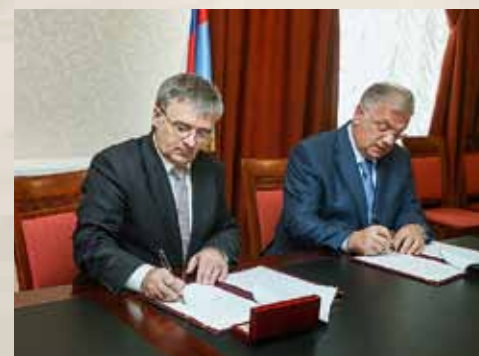
Armor materiel, air defense systems and aviation equipment are traditionally in demand here because they enable our partners to optimize the protection of special infrastructural objects, which is of paramount importance.

However the need for a more integrated approach to the issues of national security amid security challenges and looming threats compels the countries of the Middle East and North Africa to actively diversify and modernize their national Armed Forces. Therefore, we consider the regional market a promising one for a wide range of military purpose products.

— **Is Russia ready to consider JVs in the countries of the Middle East? Is there any existing positive experience of such cooperation?**

— A number of our partners from the countries of the Middle East and North Africa show interest in establishing joint ventures (JVs). The Russian Federation is ready to consider different models of cooperation, including various forms of JV. Some projects are already under implementation. We hope that they will be successfully fulfilled to further promote cooperation between the Russian Federation with the countries of the region.

/RA&MG/



the countries of the region from the middle of the 20th century, that is for more than 50 years. Symbolically enough, the inception of interaction in the military-technical field with the countries of the Middle East and North Africa coincided with the period when our system of military-technical cooperation was established. Thereafter our cooperation in the military-technical sphere has developed steadily and in a constructive manner.

— **How high is the potential of modernization and renovation in the Russian military equipment**



RUSSIA AT THE BIDEDEC-2017

Rosoboronexport develops military and technical cooperation with the Kingdom of Bahrain

Rosoboronexport (part of the Rostec State Corporation) notes the increasing interest of the Middle East and North Africa countries in the progressive development of the military and technical cooperation with the Russian Federation. In this context, being invited by the Kingdom of Bahrain, an official Rosoboronexport delegation will head to Manama in October to take part in the BIDEDEC-2017 International Defence Exhibition & Conference, which is to be held under the auspices of His Majesty King Hamad bin Isa Al Khalifa, King of Bahrain.

In 2015 our countries signed an agreement on military and technical cooperation. In line with the document, Rosoboronexport already in 2016 made several supplies of the Russian defence products for the Bahraini armed forces, including the 'Kornet-E' anti-tank missile launcher and close

combat weapons. Several contracts were signed this year. Besides, currently we are actively negotiating a possibility to provide a wide range of military equipment and materiel for our partners,' said Alexander Mikheev, Rosoboronexport's Director General.

Sergey Goreslavskiy, company's Deputy Director General, is appointed head of the Rosoboronexport's

delegation to the 1st International Defence Exhibition & Conference BIDEDEC-2017.

'Rosoboronexport highly appreciates Bahrain's interest in the Russian weapons. Active development of bilateral cooperation and good relations between our countries, undoubtedly, influenced positively the decision to take part in the BIDEDEC-



2017. At the exhibition we are going to set up a unified Russian exposition where Rosoboronexport will demonstrate all the state-of-the-art Russian weapon systems to the representatives of the armed forces of Bahrain and other Middle East countries. It is expedient to mention that those weapon systems have already shown their worth in the region: aggregate proportion of the Middle East and North Africa countries in the volume of the company's exports in 2016 made up around 50 percent. This is the highest rate in this market of weapons throughout the whole period of Rosoboronexport's operation,' added Alexander Mikheev.

Rosoboronexport is performing a wide range of marketing activities in the countries of the region, also by accelerating its advertising and exhibition activities. Earlier, at the International Aviation and Space Salon MAKS-2017 Rosoboronexport confirmed to the Kingdom's Minister of Transportation and Telecommunications Kamal bin Ahmed Mohammed its intention to take part in the Bahrain International Airshow-2018'.

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.

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 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.

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 70 countries around the world.





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

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.



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 deliv-

ered 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 dollar 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.

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 export-



ing 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.

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KORNET-EM

MULTI-PURPOSE LONG-RANGE MISSILE SYSTEM



Multi-purpose long-range missile system 'Kornet-EM' is designed to engage existing and future combat tanks protected by explosive reactive armor, light armored vehicles, fortifications, surface low-speed air targets (helicopters, UAVs, assault aircrafts) by day and at night in adverse weather conditions as well as in optical and radio jamming environment.

Advantages and Operating Features

- Targets engagement in automatic mode reduces psychophysical stress of operators, requirements to their skills as well as reduces their training period.
- Simultaneous salvo firing at two targets greatly increases rate of fire and firing effectiveness of the system.
- Firing by two missiles in one beam to engage extra dangerous targets including those protected by ERA.
- Two times (up to 10 km) as compared to 'Kornet E' ATGW increase of firing range and guidance accuracy increases up to 5 times.
- Wider possibilities for ATGW thanks to engagement of small-size air targets (helicopters, UAVs, assault aircrafts).
- 'Kornet EM' system can be installed on wide range of carriers with small loading capacity (1 pc AL 0.8-1.0 t; 2 pcs AL 1.2-1.5 t). System provides firing by all missiles of 'Kornet E' family.

GUARANTEED WINS

One of the best of world high-precision weapons brands from Russia

Products of the High-Precision Weapons Holding (part of Rostec Corporation) are well known all over the world, including in the Gulf countries. Suffice it to recall that in 2014, the Kingdom of Bahrain became the first customer of the complex 'Kornet-EM'. This made the army much fighting capacity, military power of the Kingdom has increased markedly. However, the Holding has a worldwide reputation not only due to the complex 'Kornet-EM'. Russian brands like 'Pantsir-S1', 'Kapustnik-B', 'Konkurs', 'Metis-M1' and others made by High-Precision Weapons Holding are determining technological and combat future of high-precision systems all over the world. This Russian holding is the primary designer and manufacturer of Russian high precision weapons is engaged in producing the world's best types of high precision weapons.

The High-Precision Weapons Holding was founded in 2009 and includes 19 enterprises being mostly world leaders in their production and technology segments is the world largest science and technology complex engaged in developing and creating high-precision weapon systems for combat tactical zones. The company being a member of Rostec, the world largest engineering corporation, is among the leading designers of modern weapons in the world. The holding consists of a number of largest leading defense enterprises

that are well known on the world arms market. It is sufficient only to mention such brands as Shipunov KBP Instrument Design Bureau, Tula Arms Plant, Tulatochmash, Nudelman Precision Engineering Design Bureau, Kovrov Electromechanical Plant, V.A. Degtyaryov Plant, All-Russian Scientific Research Institute Signal, and others. Most of them are national and international leaders in their segments.

High-Precision Weapons Holding plays an increasingly important role on the world arms market. The holding is the Russian largest developer

and manufacturer of the most modern and innovative high-precision weapons. The importance and potential of the Russian holding increase worldwide as well: On a scale of the top 100 weapons manufacturers in the world, the Stockholm International Peace Research Institute (SIPRI) rates the High-Precision Weapons Holding from Russia at 39.

Such a success can be explained by increasing deliveries both to the Armed Forces of the Russian Federation and to the foreign market. According to an SIPRI expert, 'the Russian companies ride the ground-



swell of boosts in military spending and arms export. Eleven companies from the top 100 list are Russian ones. Their income has increased by a total of 48.4%. It also can be noted that the High-Precision Weapons Holding belongs to the top 10 world's defensive rankings by an overall production and supply increase rate.

The weight of the holding company and its products in terms of strengthening defensive power of Russian army and delivery of the newest weapons to word markets can hardly be overestimated. There is a fast growing number of high precision systems and importance of tasks performed with them in the biggest armies of the world. Thus, over the recent five years Russian Armed Forces have had increasing

purchase volumes. Export volumes of the latest weapons are also increasing. According to Alexander Denisov, Director General of High-Precision Weapons Holding, 'in view of defense and industrial sector mission we are considering well-timed and full fulfillment of purchase obligations as a priority task.'

According to military experts among the calling cards of the company is first of all the above-mentioned 'Pantsir-S1' air defense gun and missile system made by Tula instrument design bureau (KBP), ship-based 'Palma' air defense artillery system armed with 'Sosna-R' missiles, 'Kapustnik-B' fire control system, 'Kornet-EM', 'Konkurs', 'Metis-M1' antitank missile systems, 'Krasnopol', 'Arkan' guided missile systems and

others. The majority of weapons being exported by High-Precision Weapons Holding are second to none in the world in terms of performance and efficiency.

An average annual increase of the company's export deliveries is 25-40% that is certainly a world record in the sector of high precision weapons. Middle East, North Africa, Persian Gulf countries and India are among the most stable importers of the company-made products. Recently there has been also increasing export activity in the markets of Southeast Asia, Latin America, Central and South Africa. Besides, according to military experts





there is every reason to believe that by 2020 export delivery volume of High-Precision Weapons Holding may have been increased twice. It is clearly seen at nearly every international armament exhibition where the holding company takes part, its products (both at displays and open sites) are leading objects of regard for experts and ordinary visitors. This is also because everybody wants to take a closer look at famous 'Pantsir-S1' or 'Kornet-EM' and meet the people who create the most efficient and advanced weapons in the world.

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Among absolute masterpieces acknowledged by experts is 'Kornet-EM' long-range antitank missile system, which in term of versatility, efficiency and reliability is considered to be a unique product of today. This multipurpose 24-hour high precision system is designed to engage ground and air targets. It is capable of killing both modern and advanced tanks including those equipped with reactive armor. As a matter of fact 'Kornet-EM' is a versatile defensive which can be also used during local conflicts with fast moving battles. In addition to engaging any tanks 'Kornet-EM' can easily fight any light-armored equipment, ensure crossing fortifications, provide protection against air weapons (UAV, helicopters and so on) at a distance of up to 10km.

'Kornet-EM' features the modern 'fire and forget' principle, where targets are killed almost automatically to reduce psychophysical load, skill requirements and preparation time. 'Kornet-EM' is also popular for its mobility and easy-to-use capability. It is manufactured in two versions, they are tripod-mounted hand-held version (to augment antitank defense of attacking and defending ground troops and field artillery) and version mounted on small vehicles (car, APC, IFV and others).

It goes without saying that when you talk about Tula KBP you should anyway mention its famous 'Pantsir-S1' air defense gun and missile system designed to defend military, administrative and industrial assets and districts against airplanes, helicopters, cruise missiles and high precision weapons, smart air bombs and remotely-controlled vehicles as well as to augment air defense forces when repelling air strikes and kill light-armored vehicles. Today 'Pantsir-S1' is possibly the most famous and popular weapon not only in its class but among all other defensive means generally.

It is no coincidence that currently 'Pantsir-S1' is among the top 10 rated ground weapons in the world. Escalation of tensions, military operations in unstable regions, all this only adds the Russian air defense system a fair-minded attractiveness to strengthen defensive power of many countries. Besides, its geographical application is extending. Military exercises and tests show that 'Pantsir-S1' can be properly used both in sand storm and severe conditions of polar night. In addition to that, being equipped with many heavy weapons 'Pantsir-S1' remains highly maneuverable, all-terrain, easy-to-use. Besides, it is capable of steady killing the wide range of targets including low-flying air ones.



The newest defensive sensation from High-Precision Weapons Holding was the presentation of anti-aircraft artillery weapon system 'Pantsir-ME' in St.Petersburg (the end of June this year). The creation of new innovative defense complex confirms the fact that Russian High Precision Weapons Holding is one of the world leaders in creating modern weapons.

There was an absolute sensation in the world of military innovation. The system provides the ultimate protection against modern air threats, including small-size unmanned aerial vehicles. The naval missile and anti-aircraft artillery weapon system 'Pantsir-ME' developed by the Tula KBP (part of the High Precision Weapons Holding) provides the ultimate protection against modern air threats, including low-flying and small-size unmanned aerial vehicles.

The naval weapon systems 'Pantsir-ME' and its forerunners 'Kashtan' and 'Kashtan-M' developed by the Tula KBP are the only systems in the world that combine a powerful artillery armament, an effective multimode missile armament and an integrated radar-optical armament control system in a single turret mount. Equipped with two types of armament (which is already a considerable advantage), these systems have better characteristics of each

individual armament type as compared to their analogues.

The creation of the new weapon system 'Pantsir-ME' provides reliable protection for ships against air threats with absolute probability virtually equal to 1, including protection against low-altitude anti-ship missiles and unmanned aerial vehicles. The key feature of the systems created by KBP is that they can first open fire on a target with missiles and then, in the dead zone of anti-aircraft missiles, use artillery armaments, if the target is not destroyed.

'One of the key imperatives in the strategy of Rostec weapons cluster is the development and creation of new weapons, including anti-aircraft missile systems. The development of the 'Pantsir-ME' system is a consistent element in the implementation of this strategy. The creation of almost each primary system required brand-new high-tech solutions. As a result, the destructive potential of 'Pantsir-ME' is 3-4 times higher than that of 'Kashtan-M', says CEO of Rostec Sergey Chemezov. Thus, the missile intercept zone has been increased from 10 to 20 kilometers in length and from 3 to 15 kilometers in height. All the stages of combat performance — from target search to firing — are performed in motion. The combined use of radar and optical control systems

provides an all-weather 24/7 operation. All the system processes are automated, the crew ensures only supervision and control.'

High engagement effectiveness is determined by the new features implemented in the 'Pantsir-ME' system. The modular design remains intact: 1 command module and up to 4 combat modules depending on ship type, which allows a flexible defence. The combined missile and artillery armaments ensure an effective engagement of all types of targets within the whole range of field conditions and counter-weapons with a potential for further development until 2020-2025.

The combat module of 'Pantsir-ME' includes a multifunction radar station with a phased antenna and an intercept missile with an engagement range of 20 km, which ensures simultaneous engagement of 4 targets, as well as an engagement of new types, updated anti-ship missiles and small-size air threats and surface targets. The combat module can work autonomously and as part of a cell of 4 modules. The system can be installed on ships with a displacement of 300 tonnes and more.

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RUSSIA AND BAHRAIN

Cooperation breaking new grounds

This year a Russian delegation headed by minister of trade and industry Denis Manturov and chairman of Russian-Bahrain business council, vice president of the Russian chamber of commerce and industry Vladimir Dmitriev has paid a working visit to the capital of Bahrain Manama. The visit has become an important stage of further extension of business relations between the Russian Federation and the Kingdom of Bahrain.



The delegation held a number of meetings with the King of Bahrain Hamad al Khalifa, Prime Minister Khalifa al Khalifa, and Crown Prince Salman al Khalifa among others.

Following the negotiations important decisions were made as to development of relations in industry and trade between two countries.

'We have discussed the issues on the agenda of our countries. They included trade, economy, investments, science and technology cooperation and cultural advancement of our relations,' Denis Manturov said following the meeting.

Thus, in particular, Russia and Bahrain discussed establishment of international multilateral designated organization dedicated to commercial production of aluminium. Such move is going to facilitate prevention of inefficient use of resources, stabilization of market and proper operation of global aluminium industry.

So far as trade is concerned during the panel meeting it has been revealed that in 2016 commodity turnover between two countries increased almost five times as compared with 2015. Besides, Russian export has grown more than 11 times. The potential of development is increase of grain crops export. Moreover during intergovernmental

panel meeting agreements were made as to supplies of finished meat products for customers of the Kingdom of Bahrain. The products include raw beef, mutton and poultry.

Investment cooperation is among the key areas of the bilateral relations. Today Russia is considering Bahrain as a reliable investment partner. As far back as 2014 investment foundations of two countries undersigned an agreement to invest Bahraini \$250 mln into joint projects. Now 9 of them have received investments. Over \$50 mln have been invested in retail, commercial property, mineral production and logistic services. Several dozens of projects are being under consideration now. Other 6 Bahrain-involved transactions including investments in regional airports of Russia, real estate and agriculture are expected to close in the next months.

Oil and gas beneficial cooperation has been also discussed during

the meetings. Bahrain has plans to build the first liquefied natural gas import terminal which is expected to start operation in 2019. Currently the parties are making in-depth studies of gas delivery opportunities to Bahraini market. Making certain agreements as well as beginning of practical cooperation in this regard will help hold more meaningful dialogue with Bahrain including the issue of creating a regional gas hub.

Denis Manturov explained: 'We consider this issue as very promising. Taking into account the terminal to start operation in 2019 we expect to have increased the liquefied gas output in Russia by this time that will allow to export the part of it to other countries including Bahrain.'

Another subject discussed at the meetings is probable supply of airplanes and helicopters made in Russia. Now PJSC United Aircraft Corporation is ready to discuss the possibility of supplying civil planes SSJ-100 and MS-21 to be used for regional and international flights as well as establishing maintenance and operation facility dedicated to planes delivered.

At the same time the states are considering prospects for tourism cooperation. Thus, taking into account developing relations between Russia and Bahrain the latter has also launched visa liberalization initiative.

The King of Bahrain Hamad al Khalifa has also mentioned powerful capabilities of developing trade and industry relations between two countries: 'Today the potential of Russia is obvious. Its national leaders look forward without backward glance.'

A plenary meeting of Russian-Bahraini intergovernmental panel for trade and economy, science and technology cooperation was held during the visit. Initiated by business councils of our countries and in accordance with action plan for their joint work signed in November last year the intergovernmental panel protocol included main areas of Russian-Bahraini trade and economy cooperation.

In his opening speech at the panel meeting its co-chairman Minister



of industry, trade and tourism of Bahrain Z. al Zayani has emphasized the important role played by business councils in progressive development of cooperation between two countries. Denis Manturov mentioned the significance of bilateral agreements signed in November 2016 under Russian business mission headed by Vladimir Dmitriev. The Russian minister has also announced plans for Russian national exhibition to be held in the near future in the Kingdom of Bahrain. The exhibition is to be focused on the Gulf States and the first Russian film festival.

Speaking at intergovernmental panel meeting Vladimir Dmitriev has appreciated the efforts made by Bahraini business council partners with regard to implementation of available potential of beneficial cooperation. He said that during the fruitful negotiations and meetings held in two days the parties had

jointly managed to specify certain areas of cooperation and actual requirements of both parties as well as shape a plan for further actions.

Besides, Vladimir Dmitriev has also negotiated with the chairman of Bahraini-Russian business council, chairman of Bahraini Chamber of commerce and industry Khalid al Moaied, chairman of tourism and exhibition council of Ministry of industry and trade sheikh Khaled al Khalifa. During the negotiations they discussed issues of common interest for businessmen of both countries. In particular, they talked about establishing joint funds to be involved in providing money for projects both in Russia and Bahrain, arranging Russian national exhibition in the Kingdom of Bahrain and other proposals dedicated to further enhancement of Russian-Bahraini trade and economy cooperation.

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GOOD PROSPECTS FOR EXTENDING AGRICULTURAL COOPERATION

The prospects for development of Russian and Bahrain agricultural cooperation were discussed in the Chamber of commerce and industry of the Russian Federation attended by the delegation of the Kingdom of Bahrain. The meeting has been sponsored by Russian-Bahraini and Bahraini-Russian business councils. The Bahraini delegation was headed by executive board member of Bahraini Chamber of Commerce and Industry, Chairman of Food Committee Khaled al Rashid al Amin.

The Chief Operating Officer of Russian-Bahraini business council Kamo Babloyan has mentioned there has been

favorable political background established recently. Russian-Bahraini and Bahraini-Russian business councils make every effort to facilitate cooperation between business communities of the both countries and find areas of common interests.

Russian-Bahraini intergovernmental panel founded this year and headed by the ministers of trade and industry of the both states is going to be a very practical mechanism for developing bilateral trade and economic relations. Kamo Babloyan said intergovernmental panels were far from always headed by ministers. This certain event has shown Russia's serious approach to development and enhancement of cooperation with Bahrain.

Bahrain is also targeted at developing trade and economic relations

with Russia. According to the latest assessments a commodity turnover between two countries is approximately \$10 mln. 'Our goal is to increase this sum up to \$100 mln at least,' emphasized Khaled al Rashid al Amin.

The Bahraini representatives offered to create a headquarters within Bahraini borders which would be dedicated to providing any assistance including money to those Russian businessmen who would decide to start activities in the Kingdom. Khaled Al Rashid Al Amin was sorry to say that recently there had been no regular export from Russia while the other Gulf States needed Russian products too.

The Chairman of council of ministers of Crimea, Crimean permanent representative under the President



of the Russian Federation Georgy Muradov has in details described great opportunities of establishing supplies of agricultural products from Southern Russia to Bahrain. 'There are gates in our hands which lead into the Persian Gulf through Bahrain and into the Southern Russia through Crimea, where Black Sea international cooperation association has been recently established,' he also said. Crimea is the only Russian free economic area. Georgy Muradov has also said that building up any type of production including agricultural processing for Bahraini needs requires one and half less money than it does in any other place in Russia or other countries.

Even today Russia can conclude contracts with Bahrain to deliver approximately 300 thousand tons of wheat, class 3 and 4, 140 thou-

sand tons of barley, 180 thousand tons of top-grade flour. There are also great opportunities of working in other areas. Thus, Crimea can offer high yield of top-grade vegetables and fruit, halal meat produced according to long traditions. However Crimea has insufficient number of agricultural processing enterprises.

Georgy Muradov has offered Bahraini businessmen to have their factories involved in producing flour, preserved food, compotes and any other goods needed by Bahrain. He mentioned Crimea was open for any agreements with Bahrain and exchange of delegations. The participants of the meeting have also spoke about opportunities of investing in agricultural infrastructure; discussed innovative technologies of producing clean potable water, acoustic freezing, use of drones in agriculture,



Bahrain-dedicated ecosystem block-chain.

In the end of the event the parties exchanged opinions as to issues of mutual interest. The meeting was followed by a working lunch at Expocentr Exhibition Complex. The Bahraini delegation has been received by Executive Director of Expocentr S.Bednov.

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THE MAIN NAVAL PARADE

Vladimir Putin: 'Navy Day is among the most popular holidays with the Russian people, who have hold in high regard people in naval uniforms, their nobility and heroism, and their professional traditions.'

On Navy Day of Russian fleet In St. Petersburg there was the Main Naval Parade of Russia. Parade was held in the Neva and inner harbour of Kronstadt. In accordance with the Presidential Executive Order of July 27, 2017, the Main Naval Parade was held for the first time in Russia's modern history. The parade featured the passing of ships and a marine air force unit overflight. Sailors from the Baltic, Black Sea, Northern and Pacific fleets and the Caspian Flotilla participated in the parade.

President of Russia Vladimir Putin was on the parade and congratulated all Russian veterans, sailors, midshipmen, petty officers, officers and admirals. In his speech Vladimir Putin said: 'This holiday is celebrated in each Russian region and with special solemnity, at

the bases and in the garrisons of the Northern, Pacific, Baltic, Black Sea fleets and the Caspian Flotilla.

Russia's history is inseparable from the victories of its courageous and fearless Navy. Our country's status as a strong marine power has been achieved through the brave acts of sailors and officers, the inven-

tive talent of our shipbuilders and the daring exploits of sea explorers.

Throughout the centuries, the fortitude and tenacity of Russian sailors was tempered in battles. Both on land and at sea, they mastered their military skills, strengthened the traditions of their unique naval brotherhood.

During the Great Patriotic War the Navy fought to the bitter end on the coasts and sea borders of our native lands. The Battles of Odessa and Sevastopol, heroic deeds of the Northern Sea Fleet sailors, legendary raids by Soviet submarines, the defence of Leningrad and the impregnable Kronstadt have been forever enshrined in the chronicles of history.

The Navy and commitment to Fatherland are inseparable. As Admiral Nakhimov used to say, a sailor has neither an easy nor difficult path, but rather a glorious one.

And everyone currently serving, in our ground forces and submarines, in the marine air force, in the coastal defence, and those who work in the shipbuilding industry, all are faithful to these vows. Their high moral and



'Russia's history is inseparable from the victories of its courageous and fearless Navy. Our country's status as a strong marine power has been achieved through the brave acts of sailors and officers, the inventive talent of our shipbuilders and the daring exploits of sea explorers.'

Vladimir Putin



professional qualities have been and will remain the foundation of successful service in the Navy, and the state will offer its full support.

Much is being done today for the development and renovation of the Navy. New ships are being commissioned, the fleet's combat training and readiness are being perfected. Seamanship is chosen by the vigorous and strong-willed, by those who dare to defy the elements, who





cannot imagine themselves without the sea, without difficult and noble service to their Fatherland.

Today the Navy is not only solving its traditional tasks but is also nobly responding to new challenges, making a significant contribution to the fight against terrorism and piracy. The children and grandchildren of today's sailors will take pride in their forefathers. Of this I am certain. Because your exemplary training, promptness and discipline are borne out during both training exercises and combat operations.



I want to express gratitude to those who wait for you in your homes and keep you warm with their love.

Thank you for your readiness and your ability to solve the most complicated tasks, for your worthy service and your unwavering allegiance to our Motherland and to our people.

On that day Vladimir Putin has visited Admiralty building, which houses the Russian Navy Headquarters. The Supreme Commander-in-Chief of the Russian Armed Forces, accompanied by Defence Minister Sergei Shoigu and Commander-in-Chief of the Russian Navy Admiral Vladimir Korolev, toured the library premises and viewed its unique Russian naval history documents, including those from the Peter the Great era.

The President was also shown the office of the Russian Empire's last Naval Minister, Ivan Grigorovich. Once restored, the room can again be used as the main office of the Russian Navy Commander-in-Chief. Vladimir Putin left a note in the dis-



tinguished visitors' book saying, 'My congratulations on completing the restoration. I wish you success in your work in the name of the Russian Fleet.'

In the Admiralty building, the President also viewed an exhibition of the Central Naval Museum.

The restoration of the Admiralty building began in 2013, with repairs being made on the facades and the roof, and reinforcements done to the tower and the building's foundation. At the end of 2013, the Church of Saint Spyridon, Bishop of Trimythous, was opened in the



tower with the steeple at the intersection of Admiralty Embankment and Dvortsovy Proezd.

Following the visit to the Admiralty, the President attended a reception to mark Russian Navy Day. Vladimir Putin said: 'Navy Day is among the most popular holidays with the Russian people, who have hold in high regard people in naval uniforms, their nobility and heroism, and their professional traditions.'



Today, we honour courageous, strong-spirited people. You have chosen to serve in the navy, protect the interests of our Motherland and provide security of its citizens, while making a great contribution to the strengthening of Russia's defence capacity and global stature.

My most heartfelt congratulations to the veterans of the Great Patriotic War. You fought to bring victory on board military ships, on land, and as



part of combined naval units, marine infantry units. You have always been an example of perseverance and bravery.

My special words of gratitude go to workers, engineers and designers. Shipbuilders' Day, a holiday that was established this year, is the result of the well-deserved appreciation people have for the work of the many generations of people who have given life to ships and continue to do so.



We will strictly follow our other plans for the Navy's development to boost our arsenal of modern weapons and raise the quality of combat training. And, of course, we will provide all necessary social support and assistance to servicemen and their families.

We are rightfully proud of our legendary naval commanders, brave and bold officers and mariners, fearless pioneers of Arctic travels and



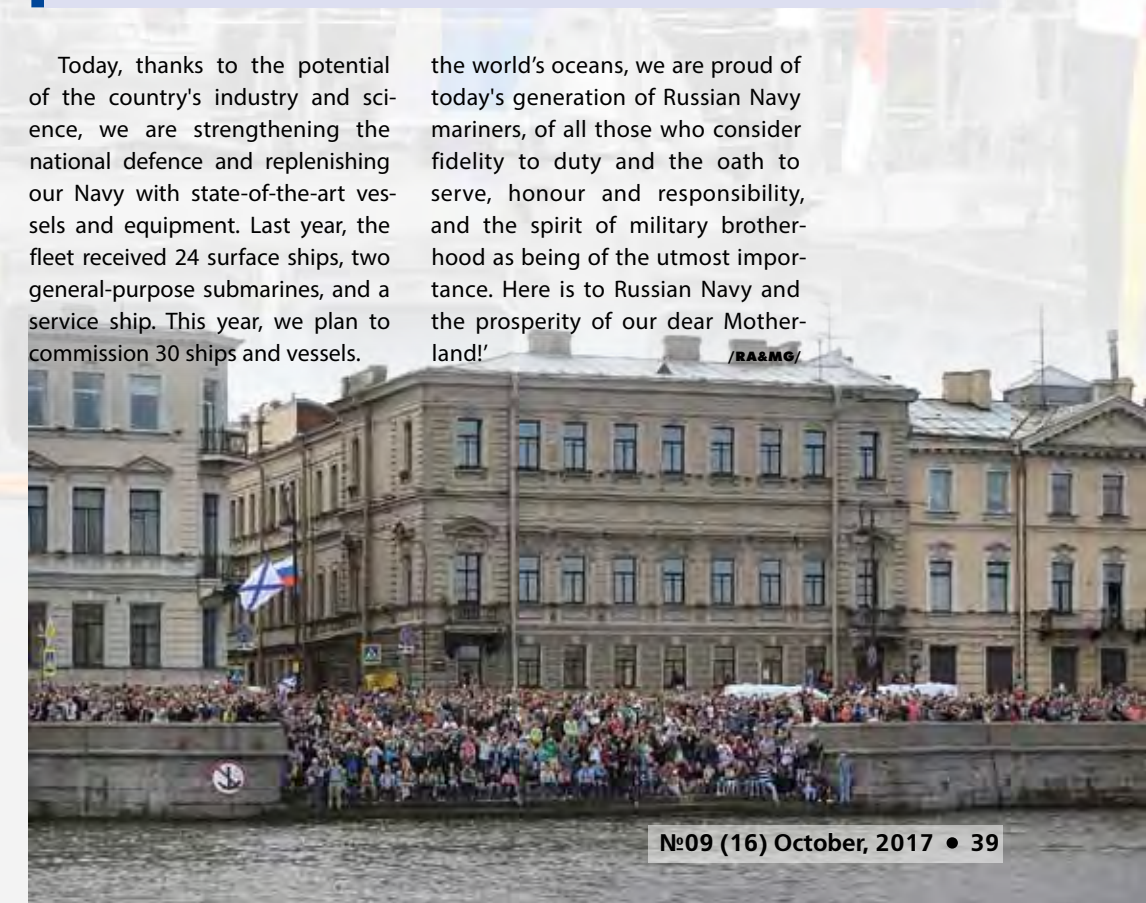
'Today, thanks to the potential of the country's industry and science, we are strengthening the national defence and replenishing our Navy with state-of-the-art vessels and equipment. Last year, the fleet received 24 surface ships, two general-purpose submarines, and a service ship. This year, we plan to commission 30 ships and vessels.'

Vladimir Putin

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the world's oceans, we are proud of today's generation of Russian Navy mariners, of all those who consider fidelity to duty and the oath to serve, honour and responsibility, and the spirit of military brotherhood as being of the utmost importance. Here is to Russian Navy and the prosperity of our dear Motherland!

/RA&MG/



FOR LAND FORCES

Around 1000 items of land forces equipment to the foreign customers

Rosoboronexport (part of the Rostec State Corporation) notes an unfailing interest in the Russian military products for land forces and the increase in orders for the civilian and dual use equipment.

Land forces materiel and military equipment produced in Russia are very popular and have a well-deserved authority among foreign armies. Our military equipment turns out to be much more attractive than foreign equivalents due to its characteristics, 'effectiveness-cost' criterion and a capability to operate in difficult environmental and climatic conditions. The total volume of its export since

2001 until now has reached nearly 25 bln US dollars, and today we note the increase in demand in the countries of South-East and Central Asia, Central and Western Africa and Latin America,' said Rosoboronexport's Deputy Director Igor Sevastianov.

Russian military products for land forces take stable leading positions practically in all segments of the market. They correspond to the present-day requirements, keep up and, in many aspects, outperform competitors' products. Very much in demand are the small arms, close combat weapons, armoured and automotive vehicles, artillery, anti-tank missile systems and ammunition.

'Today Rosoboronexport offers a variety of land forces equipment and materiel to the foreign customers. The list of offered products includes around 1000 items. They are mostly designed for the armed forces, but there is a substantial part of civil and dual-use products in our port-

folio of orders. For instance, over 18 thousand KAMAZ, URAL, GAZ and UAZ based vehicles designed for the transportation of cargoes and personnel have been supplied to the Asian, African and Latin American countries since 2001,' added Igor Sevastianov.

Besides, after the adoption of changes to the Federal Law 'On Weapons' in 2017 Rosoboronexport received the right to export non-military and service weapons. 'Given the fact that Rosoboronexport has all the necessary competences and a solid experience, these changes will allow us to increase the portfolio of orders and come to the new markets. We are also launching cooperation on this issue with the countries, which did not have an opportunity to buy Russian non-military and service weapons before due to different reasons. And we are already engaged in negotiations with a number of customers,' Igor Sevastianov noted.

/RA&MG/



HIGH-PRECISION WEAPONS IN RUSSIA AND IN THE WORLD

ВЫСОКОТОЧНОЕ ОРУЖИЕ в России и в мире

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"United Industrial Edition" preparing to publish a new quarterly international research project dedicated to the development, creation, production, delivery, maintenance and use in the armed forces of various types of precision weapons. The publication of the bilingual (Russian and English), addressed to professionals, creators and operators of high-precision weapons. Distribution is by subscription.

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SYMBOLIC HOMECOMING

Volga-Dnepr Airlines' An-124-100 and IL-76TD90-VD freighters have proudly completed an emotional homecoming to Germany of a Boeing 737-200 which was hijacked by terrorists in 1977. The former Lufthansa aircraft is to be fully restored and placed on permanent display in the Dornier Museum in the town on Friedrichshafen.

The aircraft, named after the Bavarian town of 'Landshut', was hijacked on October 13, 1977, en route from Palma, Majorca, to Frankfurt. This was the start of a four-day ordeal for the passengers and crew as the aircraft was forced to travel to Rome,

Cyprus, Bahrain, Dubai and Aden before reaching its final destination in Mogadishu, Somalia. The hijacking was ultimately ended by a daring early morning raid by German special forces which successfully freed all 86 hostages. Tragically, the aircraft's pilot, Jurgen Schumann, had already lost his life at the hands of the four terrorists before he could be rescued.

The Boeing 737-200 eventually went back into service and was later sold, ultimately flying for the Brazilian airline TAF Linhas, before being decommissioned in 2008. Since then, it had been abandoned at Fortaleza Airport in northeastern Brazil until the German foreign ministry purchased the 737 in order to bring it 'home', describing the 'Landshut' as a living symbol of a free society, which cannot be defeated by fear and terror.

A large crowd of officials, former crew members from the 1977 flight, international media and aviation enthusiasts were on hand to see Volga-Dnepr Airlines' An-124-100 and IL-76TD-90VD freighters touch down at the local airport in Friedrichshafen. The fuselage and wings of the Boeing 737 was transported in a special frame for its An-124-100 flight from Brazil, while Volga-Dnepr's IL-76TD-90VD carried the 737's engines and other components.

Mikhail Smirnykh, General Director of Volga-Dnepr Airlines, said: 'We are extremely proud to have been chosen to bring the Boeing 737 'Landshut' home to Germany. It is a symbol of the nation's commitment to never bow down to terrorism. Bringing this Boeing home is very meaningful to us as we share and support everything it stands for.'

/RA&MG/

ОПК РФ

СПЕЦИАЛЬНЫЙ ИНФОРМАЦИОННО-АНАЛИТИЧЕСКИЙ ПРОЕКТ

ОБОРОННО-ПРОМЫШЛЕННЫЙ КОМПЛЕКС РФ



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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 devel-

op 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 anthropomorphic (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;

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. Assembled — 900x450x300 mm
 - b. In Descent mode — 6,500x2,700mm (without canopy)

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

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





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 Patents, 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, Malaysia 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 nec-

essary intellectual 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; air-borne 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.

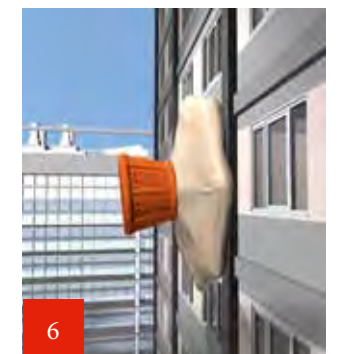
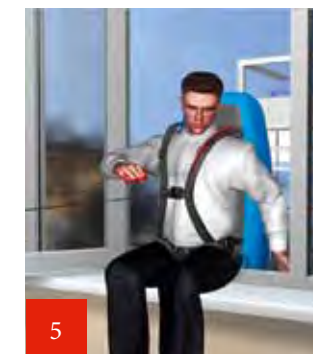
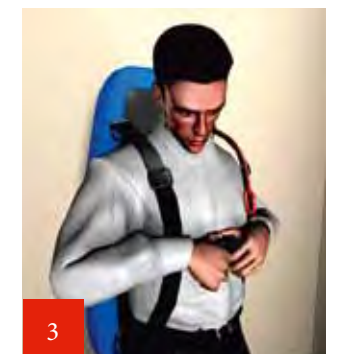


There are following innovations in the proposed SPARS® technology:

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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'Russian Aviation & Military Guide' 2017

	Release dates	Additional distribution
'RA&MG'№08 (15)	August 22th	ARMY-2017 (22-27.08.2017, Russia, Moscow)
'RA&MG'№09 (16)	October 14th	BIDEC-2017 (16-18.10.2017, Bahrain, Manama)
'RA&MG'№10 (17)	November 04th	Defense& Security 2017 (06-09.11.2017, Thailand, Bangkok)
'RA&MG'№11 (18)	November 10th	Dubai Airshow 2017 (12-16.11.2017, UAE, Dubai)
'RA&MG'№12 (19)	December 10th	Gulf Defense & Aerospace 2017 (12-14.12.2017, Kuwait, Al Kuwait)

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	Release dates	Additional distribution
'RA&MG'№01 (20)	February 05th	Singapore Airshow 2018 (06-11.02.2018, Singapore)
'RA&MG'№02 (21)	March 09th	DIMDEX 2018 (12-14.03.2018, Qatar, Doha)
'RA&MG'№03 (22)	March 27th	ArmHiTec 2018 (29-31.03.2018, Armenia, Yerevan)
'RA&MG'№04 (23)	March	DEFEXPO INDIA 2018 (Goa, India)
'RA&MG'№05 (24)	April 02th	FIDAE 2018 (03-08.04.2018, Chile, Santiago)
'RA&MG'№06 (25)	April 13th	DSA 2018 (16-19.04.2018, Malaysia, Kuala Lumpur)
'RA&MG'№07 (26)	April 23th	Eurasia Airshow 2018 (25-28.04.2018, Turkey, Antalya)
'RA&MG'№08 (27)	April 25th	ILA Berlin Air Show 2018 (25-29.04.2018, Germany, Berlin)
'RA&MG'№09 (28)	May 04th	SOFEK 2018 (08-10.05.2018, Jordan, Amman)
'RA&MG'№10 (29)	May 21th	KADEX-2018 (23-26.05.2018, Kazakhstan, Astana)
'RA&MG'№11 (30)	June 11th	EUROSATORY-2018 (11-15.06.2018, France, Paris)
'RA&MG'№12 (31)	July 16th	Farnborough Airshow 2018 (16-22.07.2018, UK, London)
'RA&MG'№13 (32)	September	ARMY-2018 (September, Russia, Moscow)
'RA&MG'№14 (33)	September 17th	Africa Aerospace and Defence 2018 (19-23.09.2018, South Africa)
'RA&MG'№15 (34)	September 24th	ADEX 2018 (26-29.09.2018, Azerbaijan, Baku)
'RA&MG'№16 (35)	September 26th	Istanbul Airshow 2018 (27-30.09.2018, Turkey, Istanbul)
'RA&MG'№17 (36)	October 15th	Future Forces 2018 (15-19.10.2018, Czech, Prague)
'RA&MG'№18 (37)	October 22th	EURONAVAL 2018 (23-26.10.2018, France, Paris)
'RA&MG'№19 (38)	November 05th	Airshow China 2018 (06-11.11.2018, Zhuhai, China)
'RA&MG'№20 (39)	November 07th	INDO DEFENCE 2018 (07-10.11.2018, Indonesia, Jakarta)
'RA&MG'№21 (40)	November 10th	BIAS 2018 (14-16.11.2018, Bahrain, Manama)
'RA&MG'№22 (41)	November 26th	IDEAS 2018 (27-30.11.2018, Pakistan, Karachi)
'RA&MG'№23 (42)	November 27th	JIAE 2018 (28-30.11.2018, Japan, Tokyo)
'RA&MG'№24 (43)	December 03th	Expo Naval 2018 (04-07.12.2018, Valparaiso, Chile)

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HIGH-PRECISION WEAPONS



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