

RUSSIAN AVIATION & MILITARY GUIDE

Special analytical export project of Industrial Weekly

№02 (09) Special Edition 2017

FSMTC of Russia
Dmitry Shugaev says
about good prospects



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EDITORIAL



High defence cooperation

Russian defense technology is developing very actively. Experience in the supply of Russian technology to countries in the Middle East and the Persian Gulf confirms the high quality and reliability of these weapons and military equipment. Today efficiency and reliability are the main criteria. This is especially important given the difficult situation on the world stage. Threat of local conflicts to be evolved into global ones, failure of worldwide system of safety and non-ending crisis — all of this leads to an unstable and dangerous situation. One can predict raise of defense means market in times like this. But together with developing of defense technologies in order to 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.

World experience shows that it is not about how many weapons you have, but quality and possibilities of every single one of them is 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 technology, solid after-sales service and proven reliability of products, Russia is honest and friendly partner for many countries, ready for mutual work. At the exhibition IDEX-2017 Russia again represents their best products, prepared for use in this region.

Valeriy STOLNIKOV

CONTRACT WITH LAKESHORE INTERNATIONAL AVIATION

Russian Helicopters signed a marketing agreement with Hong Kong based Lakeshore International Aviation Co., Ltd at the China International Aviation Exhibition Center in Zhuhai, China. According to the agreement, Lakeshore International Aviation Co., Ltd. becomes an authorized agent of Russian Helicopters for marketing and promotion of Russian made civilian helicopters in China. Companies already have a history of cooperation in the Asian helicopter market with joint research projects aimed at identifying most attractive regions for sales and consulting with regional operators of civilian helicopters in China and Southeast Asia. Ka-32 helicopters have been operated in China as fire-fighting helicopters for several years. They are based on a coaxial scheme and considered one of the best for urban firefighting, which is crucial for China with its highlands and modern metropolitan areas. Mi-171 helicopters also have been used throughout China for a long time for transportation and evacuations, as well as for transporting medical supplies, humanitarian aid and construction materials.

AIRCRAFT AND HELICOPTERS OF THE NORTHERN FLEET

The first group of pilots of the Northern Fleet deck aviation has flown from the Admiral Kuznetsov carrier to the base in the Murmansk Region. Among them — the crews of 3 MiG-29K and one Su-33 aircraft as well as 3 helicopters Ka-52, Ka-29 and Ka-27. Since November 8, 2016, the carrier group of the Northern Fleet consisting of the carrier Admiral Kuznetsov, nuclear missile ship Peter the Great and Vice-Admiral Kulakov as well as the ships of the Black Sea Fleet, auxiliary vessels and over 40 aircraft carried out antiterrorist tasks in Syria. Within two months, the pilots performed 420 combat sorties among them 117 night ones, as well as 750 sorties for search-and-rescue tasks. Nearly all flights were carried out in difficult weather conditions. Over 1000 terrorist objects were hit.

AVIATION STRIKE OF LONG-RANGE BOMBERS

Tu-22M3 long-range bombers of the Russian Aerospace Forces took off from an airfield located in the territory of the Russian Federation, flew over territories of Iraq and Iran, and carried out an aviation strike ISIS terrorists' targets near Al-Mayadin town in the Deir ez-Zor province. The aircraft were targeted large ammunition and armament of insurgents. According to the objective monitoring data, all assigned targets have been hit. Su-30SM and Su-35S fighters covered the bombers. All Russian aircraft came back to the airbases after performing assigned combat tasks.

Kalashnikov Increase its Staff

Despite Sanctions from several West countries, the Group's Export Order Portfolio Is Growing. To fulfill the growing number of orders, Kalashnikov Group is planning to increase the headcount by at least one third. This means the creation of about 1,700 new jobs.

'Following the growth of production volume, which was driven by the rise in the number of export orders, it was decided to increase the number of the Group's employees. The challenge we face is managing the growing number of orders. To fulfil them, as of April 2017, production will run in three shifts,' said Alexey Krivoruchko, CEO of the Kalashnikov Group.

In 2017, the Group is going to increase the production of arms by 70 to 80%. Over the last two years, the



company's export order portfolio has grown more than fourfold, and in 2016 it amounted to USD 230 million. At the end of 2016, the Group's average payroll count was about 6,500 people. The

recruited staff will work at the Group's plant in Izhevsk, where 95% of weaponry, power tools is produced.

Staff will be recruited for core and support positions to work in production units as service technicians, grinders, toolmakers, milling machine operators, press operators, machine operators, etc. This new staff will be assisted to adapt to full-scale work. All of them will complete the adaptation programme at the Group's School of Production Training.

Counter-terrorism technology

At the 20th anniversary InterpoliteX state security exhibition 2016, JSC Rosoboronexport will exhibit its comprehensive solutions for law enforcement, counter-terrorism and protection of critical infrastructures. The exhibition was at the VDNKh All-Russian Exhibition Center in Moscow last autumn.

Increased terrorist activities, the globalization of criminal groups as well as the use of the methods of hybrid warfare by some countries have recently heightened interest among most of countries in modern equipment and weaponry intended to ensure national security. Rosoboronexport is ready to offer foreign customers the whole range of facilities to counter such developments on a nationwide scale,' said Vyacheslav Ovchinnikov who heads of the Company's delegation at the exhibition.

Demand for both small arms and light armored vehicles as well as intelligent crime prevention and control systems has been strong among counter-terror and special services in recent years. At Rosoboronexport's stand potential customers was an opportunity to get acquainted with the specifications of BTR-82A and BTR-80A armored personnel carriers, BMP-3 and BMP-3M infantry fighting vehicles as well as the GAZ-233036 Tigr special police motor vehicle. The Ka-226T and ANSAT light multipurpose helicopters, Ka-52 and Mi-171Sh helicopters and Be-200 unique amphibious aircraft were also presented to visitors to the exhibition.



The Yarygin pistol, Kedr sub-machine gun and, of course, the Kalashnikov assault rifle in a variety of derivatives — a hallmark of Russian arms makers — seemed most promising among small arms for demonstration to foreign delegations. Moreover, the SKAT small arms trainer together with weapon mock-ups was placed at Rosoboronexport's stand to demonstrate the capabilities of the Kalashnikov MMG AK-101 assault rifle and MR-654K pistol.

In addition, much attention is now being given to building an integrated security system for critical infrastructures. The Russian side offers different options of such a system, depending on the customer's material and financial possibilities, including its integra-

tion with the equipment system from other manufacturers.

The exhibition included an extensive demonstration program, which allowed potential customers to get familiar with the specifications and capabilities of armament, special equipment and facilities developed for law enforcement authorities under conditions of their use in practice.

'In total, we expect that representatives from over 60 countries, which show interest in Russian-made weapons and military equipment, visited Rosoboronexport's exhibit display. Among them are both our traditional partners and a number of potential customers from virtually all regions of the world,' said Vyacheslav Ovchinnikov.

As part of the International military-technical forum "ARMY-2017"



www.intelltechexpo.ru



IntelTechEXPO
Intellectual technology exhibition

August 22-27, 2017
Russia, Moscow

EXHIBITION PROFILE:

- Integrated technologies based on high-performance machines, tools, and equipment for modernization of factories
- Automation of production. Robotic production facilities
- Test, measuring and diagnostic equipment
- Materials
- Electronic components and modules
- Additive technologies
- Energy
- Building technologies
- Industrial design
- Personnel training
- Specialized Innovation Club exhibition

Location:



Official partners:



Organizer:



INTERJET RESUMES SJS100 OPERATIONS

Sukhoi Civil Aircraft (SCA) has completed repair work on six Sukhoi Superjet 100 (SSJ100) for Interjet airline. Technical teams from SCA were sent to Mexico as part of SCA's after-sales support service for Interjet's Sukhoi Superjet 100. Thanks to the work done by SCA and Interjet specialists, all six aircraft resumed operations in the first week of January. Twenty-two SCA technical specialists were sent to Mexico for the warranty maintenance work. The team was made up of specialists with extensive experience in aircraft production and maintenance. The troubleshooting procedure was agreed to with the Russian aviation authorities (Federal Air Transport Agency) and carried out under the control of the Mexican aviation authorities (DGAC). Interjet is one of the world's largest operators of SSJ100 aircrafts and has been flying the model since 2013. Interjet's SSJ100 technical dispatch reliability is one of the highest among the operators. The company's fleet of the SSJ100s has accumulated more than 90,000 flight hours, and Interjet has operated more than 75,000 flights. SCA strives to provide maintenance support as quickly as possible and is working on improving SSJ100's reliability. The SSJ100 was created and tested to international and Russian airworthiness standards, which are confirmed by the IACAR (Interstate Aviation Committee Aviation Register) and EASA (European Aviation Safety Agency).

KA-32A11BCS FOR JIANGSU BAOLI AVIATION

Russian Helicopters has completed deliveries of the first batch of multirole Ka-32A11BC helicopters, which are built at Kumertau Aviation Production Enterprise. The delivery is part of the contract to supply four multirole Ka-32A11BCs, which was signed between Russian Helicopters and Jiangsu Baoli Aviation Equipment Investment Co., Ltd in November 2015. After the delivery of the first batch, two more helicopters will be handed over to the Chinese operators in 2017. These machines will be used for firefighting and rescue operations. The multirole Ka-32A11BC helicopter is designed for search and rescue missions and for work at high altitudes, for cargo transporting, medevac, firefighting and patrolling. In China, these machines are mainly used for firefighting and rescue operations, as well as for work in the highlands. Russian Helicopters have previously delivered 11 Ka-32 type helicopters to various Chinese customers. With the continued increase in fleet of Russian-made helicopters in China, Russian Helicopters are also looking to create service centers in China. In addition to China, Ka-32s of various modifications are operated in Spain, Portugal, Colombia, Switzerland, Canada, South Korea, Taiwan, Japan and other countries.

Sergei Shoigu visited to the 'SPLAV'

Russian Defence Minister General of the Army Sergei Shoigu visited the research and manufacturing association 'SPLAV' in Tula. There he has inspected the implementation of the State Defence Order and held a meeting with representatives of the Rostec, the direction of the research and manufacturing association 'SPLAV' and the military authorities.

The Head of the military department stated that the modernization of the association had to have no influence on the quality, volume and implementation dates for the State Defence Order. The Minister also mentioned that the staff of the enterprises of the Military industrial complex was to be reconstituted and renewed.

In his turn, the Governor of the Tula Region Alexey Dumin stated that

the industrial production index of the Region had achieved the level of 112,6% owing to the enterpris-



es of the military industrial complex. He thanked the Minister of Defence for support provided for the regional military industry and stated that the Tula Region was interested in enlargement of State Defence Orders.

Alexey Dumin also mentioned that scientific and production companies would be formed at the enterprises of the Military industrial complex in the near future.

Shielding Materials for the Navy

Ruselectronic has supplied a batch of absorbing shielding materials for the modernization of the Russian Navy's surface ships — the spray-on absorbing coat on ship hulls reduces its radar signature. Regular tests of the materials are scheduled for mid-2017.

The materials were developed by the specialists at the Ferrit-Domen Scientific Research Institute and are applicable on small, medium and heavy ships.

'The major requirements for radar-absorbing coatings include the attenuation of the reflected signal, operation within a wide range of radio frequencies, and the simplicity of manufacture. These requirements are all well met by the shielding material developed at the Ferrit-Domen Scientific Research Institute,' said Alexei Leonkov, Military Expert from the magazine 'Arsenal Otechestva'.

He explained that this domestic technology is based on the spraying of a special mixture resistant to aggressive mediums on the external surface of the ship, which distinguishes it from American laminated thin-film shielding structures. According to the expert's data, the test results prove that the new coating reduces the radar signature of the ship's structures, thus making it a difficult target for detection by any foreign alarm or destruction bodies. The material also does not affect the operation of shipborne radar facilities.

'The provision of electromagnetic compatibility for radio antennas and phased array antennas installed

aboard the ship, which will undoubtedly simplify the configuration of radar equipment in the future, is one additional property of the coating,' Alexei Leonkov added.

The Ferrit-Domen Scientific Research Institute is a participant in the state armament program through 2020 for providing ship hulls with protective materials. In accordance with this program, the Severnye Verfi plant shall hand over to the RF Ministry of Defense a series of six corvette designs 20380 and 20385 by 2018, and a series of six frigate designs 22350 by 2020.

Ruselectronics is the largest Russian manufacturer of radar components and technologies and a part

of Rostec Corporation. The company incorporates 108 electronic industry enterprises specialized in developing and manufacturing electronic equipment items, electronic materials and equipment for their production, microwave equipment and semi-conductor devices, communication subsystems, complexes and technical facilities, as well as automated and information systems.

The holding company consolidates about 60% of the domestic industry for electronic components (for microwave components — up to 80%). In compliance with Rostec's development strategy, the share of civilian products in the consolidated revenues of Ruselectronics are set to double from 15 to 40% by 2025.



INTERNATIONAL EXHIBITION OF ARMS
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FSE "Nizhny Tagil Institute of Metal Testing"

COOPERATION ON AFTER-SALES SERVICE

Russian Helicopters signed an agreement on control of certified repairs with Iran Helicopter Support and Renewal Company (IHSRC) at the 8th International Airshow on Kish Island, Iran. The document is another step for the Russian and Iranian sides on expansion of after-sales service of helicopters produced in Russia, which operate in Iran. Previously, Russian Helicopters approved the roadmap for retrofitting the Mi-17 maintenance and overhaul center in Iran. The authorized repair center in Iran is being created to provide customers with quality and timely maintenance. The opening of the center at IHSRC will help improve performance of the Russian rotorcraft operated in Iran and will increase helicopter flight safety. At present, Mi-17s are the most popular Russian helicopters in Iran. Almost the entire model range of this type of helicopters is in use there, including Mi-17s, Mi-171s, Mi-171Es, Mi-8 MTVs and Mi-17V-5s.

FIRST BATCH OF MI-8MTV-5S TO BELARUS

The official ceremony of transferring six helicopters produced by a Russian Helicopters' subsidiary — Kazan Helicopters — took place at the Machulischi airport near Minsk. The ceremony was attended by the Belarusian Minister of Defense, the Air Force and Air Defense commander and top management of Russian Helicopters. The military transport Mi-8MTV-5 helicopters were delivered to the Ministry of Defense of Belarus in October. Today, during the ceremony, the rotorcraft was transferred to the personnel of the 50th combined airbase of the Belarusian Air Force. During the event military pilots demonstrated the capabilities of the Russian machines. This was also the indication that Russian Helicopters has finished the first part of the contract for delivery of 12 Russian-made Mi-8MTV-5s, which had been signed during the Army-2015 International Military Technical Forum. Mi-8MTV-5 multirole helicopter is part of the Mi-8/17 family. These helicopters are used in medical and search-and-rescue operations; they carry out cargo and passenger transportation. As of today, more than 12 thousand helicopters of the Mi-8/17 series have been produced and delivered to 100 countries. Over many years of operation, the Mi-8/17 type helicopters produced by Kazan Helicopters and by Ulan-Ude Aviation Plant have proven that they can successfully perform tasks in any climatic conditions and are justifiably the most numerous and one of the world's best in their class.

First civilian rotorcraft to Pakistan

Russian Helicopters, part of State Corporation Rostec, has won an international tender and signed a contract with Balochistan provincial government to supply a Mi-171 helicopter. The helicopter is expected to be delivered in the first part of this year. The government of Balochistan will use its first Russian civilian Mi-171 for transporting passengers and cargo, sanitation tasks, patrolling and emergency response.

'Our victory in the tender is a natural indication that Russian helicopters are most suitable for use in this region. We expect that the Pakistani authorities will continue to increase the volume of deliveries of Russian rotorcraft in the future. There are preconditions for that already,' said Russian Helicopters Deputy CEO for Marketing and Business Development Alexander Shcherbinin.

The Mi-17-type helicopter was chosen for Balochistan due to its proven reliability and efficiency in a wide variety of climates, ability to store without a hangar, ease of maintenance and operation in areas with limited development of ground infrastructure.

The Mi-17-type helicopters are produced at Russian Helicopters'

Ulan-Ude Aviation Plant and Kazan Helicopter Plant. As of 2014, more than 12 thousand units have been made, which is a world record for twin-engine helicopters. They were delivered to more than 100 countries and their total flight time totals about 100 million hours.

'Asian and Middle Eastern markets are demonstrating stability and a need for reliable and multifunctional helicopters of various classes including helicopters for top officials. We are ready to offer not only modern rotorcraft and perspective new models but also all necessary support services including after-sales service,' said Alexander Shcherbinin.

The prospective multirole Mi-171A2 is designed with the use of best modern technologies and meets



all aviation industry's safety requirements and environmental standards. Modern avionics allows the helicopter to operate day and night, in adverse weather conditions, and to fly over water. This helicopter's high performance characteristics, reliability, ability to operate in a wide range of conditions and temperatures, versatility, ease of operation and maintenance make it one of the best deals for the Asian market and for the Middle East.

Russian military robots

Military robotic systems and automated fire control means enjoy ever increasing demand on the world arms market. JSC Rosoboronexport (part of the Rostec State Corporation) is promoting land forces equipment developed by Russian defense industry enterprises in full accordance with the recent trends in the global arms market.

Two meetings of the Land Forces Equipment and Armament section of Rosoboronexport's Science and Technology Council were held in 2016. During these events, the representatives of Rosoboronexport, developers and manufacturers discussed the prospects for Russian export of automated fire control systems, the various types of remotely controlled weapon stations and military robotic systems, as well as the possibilities for accommodating the recent global trends in the development of the best weapon systems.

Among other things, the participants of the meetings decided to arrange for obtaining the necessary permits for the export of new types of au-

tomated and robotic systems being developed in Russia, as well as intensify marketing activities for promoting such systems on foreign markets.

'Automatic and remote control systems that have become available on the world arms market suggest a new stage of the evolution of the means of warfare. They offer great opportunities for development of advanced weapon systems and military equipment. We are actively working to meet demand in this area. As of today, Rosoboronexport 's portfolio of orders for land forces weapons and military equipment, which includes also such systems, exceeds \$7 billion,' said Rosoboronexport Deputy CEO Igor Sevastyanov.



According to Rosoboronexport, Russian manufacturers can successfully compete with their foreign counterparts on the markets of small and medium UAVs and smart robotic security systems. In particular, development work in this area is underway at Rostec's Kalashnikov Concern and United Instrument Corporation.

8th INTERNATIONAL EXHIBITION OF ARMS AND MILITARY MACHINERY



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2017

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MINISTRY OF DEFENSE OF THE REPUBLIC OF BELARUS
NATIONAL EXHIBITION CENTER "BELEXPO"
UNDER THE PRESIDENTIAL PROPERTY MANAGEMENT
DIRECTORATE OF THE REPUBLIC OF BELARUS



GENERAL MEDIA PARTNER: Национальная оборона

BRANCH MEDIA PARTNER: Defence Blog

MEDIA PARTNERS: ВООРУЖЕННЫЕ СИЛЫ БЕЛАРУСИ, АРМИЯ БЕЛАРУСИ, НАУКА ТЕХНИКА, ПРОМЫШЛЕННЫЙ КОМПЛЕКС БЕЛАРУСИ, ОПК РО, АВИАЦИОННО-МИЛИАРНЫЙ КОМПЛЕКС БЕЛАРУСИ

ARMSCOM, БЕЛРЕТДИНОВ И КО, КРЫЛЬЯ, ВІКОВР, АВІАЦІЯ І СПОРТ, ПІТЕНЦІАЛ, КАДЕКС-2018, АВИАЦИОННО-МИЛИАРНЫЙ КОМПЛЕКС БЕЛАРУСИ



RUSSIAN FEDERATION & UNITED ARAB EMIRATES

The Russian Federation and the United Arab Emirates build their relations on a solid basis of respect for mutual interests, respect each other, to establish promising business partnership. From year to year there are strong linkages both at the highest political level and at the level of direct business ties between companies. Highly effective mutual investment process, export and import operations all of this suggests a robust international mutually beneficial partnership. Regular meetings between the leaders of our countries are one of the clearest confirmations of friendship and cooperation.

The meeting Vladimir Putin with Crown Prince of Abu Dhabi and Deputy Supreme Commander of the United Arab Emirates Armed Forces Mohammed Al Nahyan at the Kremlin, Moscow which was last year, was a historical stage in development of friendship and cooperation.

During that meeting President of Russia Vladimir Putin said: 'It is my great pleasure to welcome you to Moscow. We consider it very important that we have developed such good relations, which we continuously maintain at the top level and promote. Regrettably, our trade has decreased for certain reasons, but our Intergovernmental Commission



focuses on four major areas, and I hope that our colleagues will make a positive contribution to our cooperation. Naturally, investment cooperation is extremely important. I know that specific plans already exist, and we will, of course, welcome and support them. It goes without saying that we think your visit is very well timed, considering the need to discuss regional developments.'

Crown Prince of Abu Dhabi Mohammed Al Nahyan said: 'I am very happy to be in Moscow today. Indeed, as you said, trade has fallen, but that is why we came to Moscow. We are in Moscow because Moscow plays a serious role in the Middle East. We attach great importance to



'We consider it very important that we have developed such good relations, which we continuously maintain at the top level and promote. Our Intergovernmental Commission focuses on four major areas, and I hope that our colleagues will make a positive contribution to our cooperation. Naturally, investment cooperation is extremely important. I know that specific plans already exist, and we will, of course, welcome and support them.'

Vladimir Putin



continuous dialogue both on the further development of our bilateral relations and on the ways of enhancing stability in the Middle East. We strongly believe in the development of our relations and are striving to make them a firm foundation for our future cooperation.'

Such meetings at the highest level are held regularly and with great success. For example, at one of the meetings even the two leaders stressed the importance of consolidating the international community's efforts to fight interna-



tional terrorism effectively. Mr. Putin informed the Crown Prince in detail on various aspects of Russia's action to unblock the Syrian crisis, including the concrete results achieved by the Russian Aerospace Forces in their operations against Islamic State and other radical groups. The two leaders agreed to continue close contacts through the relevant agencies and coordinate their steps to implement the results of the International Syria Support Group's meeting in Vienna. The two leaders also exchanged views on intensifying cooperation between Russia and the United Arab Emirates in various areas. /R&MG/



'Moscow plays a serious role in the Middle East. We attach great importance to continuous dialogue both on the further development of our bilateral relations and on the ways of enhancing stability in the Middle East. We strongly believe in the development of our relations and are striving to make them a firm foundation for our future cooperation.'

Mohammed Al Nahyan





FSMTC OF RUSSIA SEES GOOD PROSPECTS

Dmitry Shugaev: 'We have been developing military-technical cooperation (MTC) with the countries of the region from the middle of the 20th century, that is for more than 50 years. Our cooperation in the military-technical sphere has developed steadily and in a constructive manner'

The Federal Service for Military-Technical Cooperation (FSMTC of Russia) as the main regulator of the Russian defense exports pays a lot of attention to the Asian regions. With many countries of the Middle East we have a long history of constructive relations, including in the field of military-technical cooperation. Shortly before IDEX-2017 Mr. Dmitry Shugaev, Director of FSMTC of Russia, said in an exclusive interview to magazine 'Russian Aviation Military Guide' about the features of arms exports from Russia to this region.



January 31, 2017 the President of the Russian Federation V.V. Putin appointed Dmitry E. Shugaev for the post of the Director of the FSMTC of Russia.

Dmitry Shugaev has extensive experience in international technology transfer and export. Candidate of economic sciences. In 1987 he graduated the Moscow state Institute of international relations. He then worked in various public and commercial structures. Passed retraining and advanced training in Military Academy of the General staff of the Armed Forces of the Russian Federation on the speciality: 'Defence and security of the Russian Federation'. Last 16 years he worked in Rosoboronexport and in Rostec Corporation. Dmitry Shugaev has a number of high state awards.

— **Mr. Shugaev, what types of Russian arms and military equipment are well-known in this region? In what directions cooperation is the 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. However, 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 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 alto-

gether 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 (MTC) 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-tech-

We have been developing military-technical cooperation (MTC) 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.

nical 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.

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



The IDEX-2017 exhibition has attracted a record high number of Russian companies, and the total area of the Russian exposition has expanded almost twice. It reflects the growing interest of Russian top producers towards the region. Deciding on the scale and the contents of a Russian exposition at any international military show takes a lot of preparatory marketing work.

tries 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

Major areas of FSMTC of Russia activities shall be:

- To perform control and supervision functions in the area of military-technical cooperation in compliance with laws of the Russian Federation;
- To participate jointly with other federal government authorities in elaboration of state policy in the area of military-technical cooperation and submit in the established manner relevant proposals to the President of the Russian Federation, the Government of the Russian Federation, and Defense Ministry of the Russian Federation;
- To ensure jointly with other federal government authorities implementation of key state policy guidelines in the area of military-technical cooperation as set by the President of the Russian Federation; and Within its competence and jointly with other federal government authorities, to implement state regulations in the area of military-technical cooperation.





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.



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.

— What equipment presented by Russia at this salon is likely to cause high interest?

— The IDEX-2017 exhibition has attracted a record high number of Russian companies, and the total area of the Russian exposition has expanded almost twice. It reflects the growing interest of Russian top producers towards the region. Deciding on the scale and the contents of a Russian exposition at any international military show takes a lot of preparatory marketing work. One has to take into account what could be of interest to foreign customers. This year at 'IDEX' Russian companies will present a wide range of aviation equipment and armor materiel, air defense means, artillery and anti-missile systems, optical and optolaser systems, small arms of different caliber.

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.



Russia will also present some state-of-the-art military products. I hope these items will not only draw visitors' attention, but, perhaps, they will also find potential customers.

— 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/



In conformity with laws of the Russian Federation, FSMTC of Russia shall perform control and supervision functions relating to:

- Compliance, of activities in the field of military-technical cooperation of federal government authorities, government authorities of the Russian Federation constituencies, and Russian organizations empowered in the established manner to carry out foreign trade activities regarding military purpose products, corporate developers and manufacturers of military purpose products, other legal entities, officials and individuals, with legal acts and regulations of the Russian Federation and key state policy guidelines in the field of military-technical cooperation, requirements of the Russian Federation laws on export control over procurement of military purpose products;
- Implementation of underlying state policy principles in the field of military-technical cooperation including state monopoly;
- Efficient functioning of state regulatory system in the field of military-technical cooperation;
- Fulfillment of international treaties of the Russian Federation in the field of military-technical cooperation;
- Activities in the field of military-technical cooperation of representative offices of military-technical cooperation-affiliated entities in the Russian Federation and foreign states, as well as those of other organizations;
- Marketing, advertising, and exhibition activities in the field of military-technical cooperation;
- Efficient application of funds allocated from the federal budget to finance activities in the field of military-technical cooperation, as well as efficient use of federal property by military-technical cooperation-affiliated entities;
- Level of foreign trade prices for export and import military purpose products with due regard to protection of economic interests of the Russian Federation;
- Level of local prices for military purpose products to be funded out of the federal budget, and supplied to foreign customers under international treaties of the Russian Federation.

HIGH TECHNOLOGY OF INTERNATIONAL PARTNERSHIP

Rosoboronexport: more than 85% of Russia's arms exports

On November 4, this year JSC Rosoboronexport (part of the Rostec State Corporation) will mark its 17th anniversary. The sole Russian state intermediary agency, which is responsible for import/export of the full range of defense and dual-use end products, technologies and services was set up by the RF President's Decree in 2000. This is a 100% state-owned company.

The Joint Stock Company Rosoboronexport, part of the Russian Technologies State Corporation, is the sole Russian state intermediary agency responsible for import/export of the full range of defense and dual-use end products, technologies and services. Rosoboronexport was set up by RF President's Decree 1834 of 4 November 2000 as a federal state unitary enterprise tasked to implement the national policy in the area of mil-

itary-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.

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.

The official status of the exclusive state intermediary agency gives Rosoboronexport unique opportunities to expand long-term mutually beneficial cooperation with foreign partners, provide guar-



anteed state support of all export-import operations, and strengthen Russia's leadership in the world arms market.

The main result of biography of Rosoboronexport, despite the difficult economic conditions and fierce, often unfair, competition in the global arms market, that company have managed not only to carry its sales, but also significantly enlarge its footprint in the traditional and new arms markets. Through integrated marketing strategies, company have ensured that order book today exceeds US\$ 45 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



The first Soviet state intermediary agency for military-technical cooperation with foreign countries was created on 8th May 1953 after the USSR Council of Ministers had decided on forming the General Engineering Department within the then Ministry of Domestic and Foreign Trade. Other special foreign trade bodies were created later on to provide for further expansion of military-technical cooperation activities. In the late 1990s there were two federal state unitary enterprises in Russia acting as state arms exporters Rosvoorouzhenie State Corporation and Promexport. In November 2000 the two enterprises were merged into a single one — Rosoboronexport Federal State Unitary Enterprise, the sole state intermediary for export/import of defence products, by the Presidential Decree No. 1834 dated 4th November 2000 aimed at restructuring the system of military and technical cooperation of the Russian Federation with foreign states, and improving its performance. Since 1 July 2011 Rosoboronexport has been operating as an open joint stock company.

market, Rosoboronexport has delivered hundreds of thousands of units of military equipment and weapons worth more than US\$ 120 billion to 115 countries.

Rosoboronexport pays great attention to both major billion 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 strength-

ening 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 histori-



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.

cal museums, and children's educational institutions. Rosoboronexport supports major sporting events and various sports federations, acts as sponsor and partner of the largest industrial exhibitions and cultural events held in Russia and abroad.

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

Foreign customers are offered package solutions for national systems intended to defend land, air and seaside borders, which feature the optimal trade-off between cost and performance. These solutions may include both the supply of military products and services and organiza-



tion of licensed production in customer countries, the setting-up of joint ventures to manufacture and maintain equipment, as well as joint R&D efforts. Rosoboronexport widely uses the optimal offset programs. With regard to foreign customers' interests and the

opportunities of the Russian defense industrial complex to increase its exports, Rosoboronexport pays much attention both to major billion-dollar contracts and small deals worth the hundreds of thousands to several millions of dollars.

/RA&MG/

NEW CEO OF ROSOBORONEXPORT

Alexander Mikheev from January this year headed the company Rosoboronexport, which 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.

Alexander A. Mikheev was born on November 18, 1961 in Moscow.

Education: graduated in aeronautical engineering from the Moscow

Institute of Civil Aviation Engineering in 1985; obtained a master's degree from the Military Academy of the General Staff of the Russian Armed Forces in 2005; graduated from the Russian Government Financial Academy in 2006, with a degree in finance and credit. Holds a candidate degree in economics.

Career:

From 2001 to 2013, he served in various positions at JSC Rosoboronexport. Prior to his appointment to the position of Deputy CEO of Rosoboronexport (then a federal state unitary enterprise) in 2007, he was

head of the company's export department for special property and services for the Air Force;

In September 2013, he was appointed CEO of JSC Russian Helicopters;

In January 2017, he became CEO of JSC Rosoboronexport.

State decorations:

Awarded the Order of Honor, the Medal for Services to the Fatherland (2nd class), the Order of Alexander Nevsky, the Duslyk (Friendship) Order of the Republic of Tatarstan.

Honored with a letter of commendation of the President of the Russian Federation.



MASTERPIECES BY BRAND 'DUX'

R-73 missile: the best from the best in the world



Yuri Klishin, Director General of 'Dux', JSC

One of the world's oldest and the most experienced aircraft manufacturers, Russian factory 'Dux' which celebrates its 124-d anniversary this year, is now undergoing full-scale upgrading phase. Known worldwide for its air missiles the enterprise is going to significantly increase the range of equipment manufactured and among other things enter a world market with its new civilian products. We have had a conversation with Yuri Klishin, General Director of 'Dux', JSC about new milestone of 'Dux' and his export activity.

— **Mister Klishin, 'Dux' has a life history full of bright pages...**

— The enterprise which traces its history back to 1893 had been an all-purpose machine builder for over 120 years. Among its great values was a capability of mastering new products in record time and putting wide range of goods into production. Suffice it to recall that during its history 'Dux' had been producing hardware for circus, bicycles, motor bikes, propeller-driven sledges, airship, planes, air weapons, missiles

and so on. The enterprise received the habitual title 'the first' as it comes from its name (Latin Dux for the first). In 20th century 'Dux' actually became the father of a number of aircraft companies and brands such as 'Sukhoi', 'MiG', 'Yak', 'Vympel', 'Progress'. Today its main serial products are close air combat air-to-air missiles R-73 and R-73E as well as launcher P-72. I would like to add that thanks to performance R-73 leaves behind all known foreign counterparts in terms of reliability and safety. I may

state it is based on my personal experience. According to experts this kind of missile is the most used one by air force.

— **How do you describe the current stage of the enterprise in the context of its great history?**

— During its more than 120-year-long history 'Dux' has always been known for its diversified production and multifunctional products. Today we are also on the way of full-scale increasing product range. We wish to manufacture versatile goods both military and civil ones. Now we are fully engaged in doing so. Furthermore our enterprise is extending fields of application of military products. In particular, there are plans to upgrade the missiles as a whole and their components.

Quick mastering of new products has been the main distinctive feature

in charge of every stage of weapons life cycle: from design to disposal.

We make use of the best traditions of the best Russian engineering centers, cooperate with them, work side by side with national aircraft builders, provide 'Dux' designers with the newest technologies, master modern production decisions...

— **Mr. Klishin, to what extent do you think has the value of 'DUX'-made products grown in a current international climate as a deterrent for local wars threat?**

— R-73 is a dangerous weapon which has been many times tested during real operations. Available armaments have always been and will be a deterrent against ill-advised actions by a potential enemy. In this regard our R-73 will provide a necessary protection and countermea-

R-73 is a dangerous weapon which has been many times tested during real operations. Available armaments have always been and will be a deterrent against ill-advised actions by a potential enemy. In this regard our R-73 will provide a necessary protection and countermeasures in a menace of local war. So far the missile has been popular both in Russia and other countries.

of our company throughout its history. From bicycles and motor bicycles to propeller-driven sledges, aircraft, engines, weapon systems and small arms. Thus, range of products is defined by state requirements. 'Dux' has been very quick in responding tasks and manufactured appropriate goods.

Nothing has changed so far. We are ready for a prompt mastering the widest range of products in favor of the state or customers based on the vast experience and perfect technical facilities which are being now intensively renewed.

— **What current 'Dux' programs do you think are the most promising and important?**

— Our main task is increasing efficiency of our weapons. If yesterday our priority task was a serial production, today we are extending our range of products intensely. We are planning to become developers. In its new capacity 'Dux' is going to be

in a menace of local war. So far the missile has been popular both in Russia and other countries.

— **R-73 is certainly among the best defense masterpieces. Thus, which operational and other values made it a world blockbuster?**

bat capabilities, range, speed and power. We are aware of a number of upgrade patterns to make the best use of the product.

— **What is the trend for 'DUX' upgrading of world-known products?**



— It has a tested and reliable aerodynamic configuration, long life. When performing scheduled repairs of old missiles we can see they are in a perfect operating conditions, though something has to be replaced. This missile can be developed further. Thus, fitted with new hardware it can have increased com-





— Our main goal is increasing weapons effectiveness. However, as recently as yesterday our priority task was to set up a mass production, but today we are making the range of products absolutely extended. We have plans to be engaged in development. Thus, in new capacity 'DUX' will be responsible for all armament life cycle stages, from development to disposal.

We use the best traditions of the best Russian engineering centers and cooperate with them, work closely with national aircraft manufacturers, provide 'DUX' designers with the latest technologies, adopt the latest production solutions. Besides, we introduce computer-aided engineering systems.

— **Which 'DUX' innovations do you consider to be the most important and promising?**

— Today 'DUX' is making many efforts to upgrade R-73 missile and its launcher. The missile is getting better power system, control, dependability, G force, altitude and range capabilities. The new missile is going to be 1.5 times more efficient than the previous one. The launcher being used by all front-line aircraft is also being improved.

We are engaged in developing new trends although today demand is exceeding production. Furthermore, it does not involve only missiles, but warning panels, all kinds of electric valves, high-pressure bottles, electric operating mechanisms and other items, the majority of which are components for other finished products. We are absolutely sure that manufacturing wide range of products is a kind of protection during hard times.

— **To what extent is Asia-Pacific region important for the enterprise?**

— Asia-Pacific region is the largest customer for 'DUX'-made air weapons, both export version of R-73 (R-73E (R-73EL) and its heavy-upgraded version RVV-MD. Asia-Pacific region has already received many products. We have been cooperating until the present day.

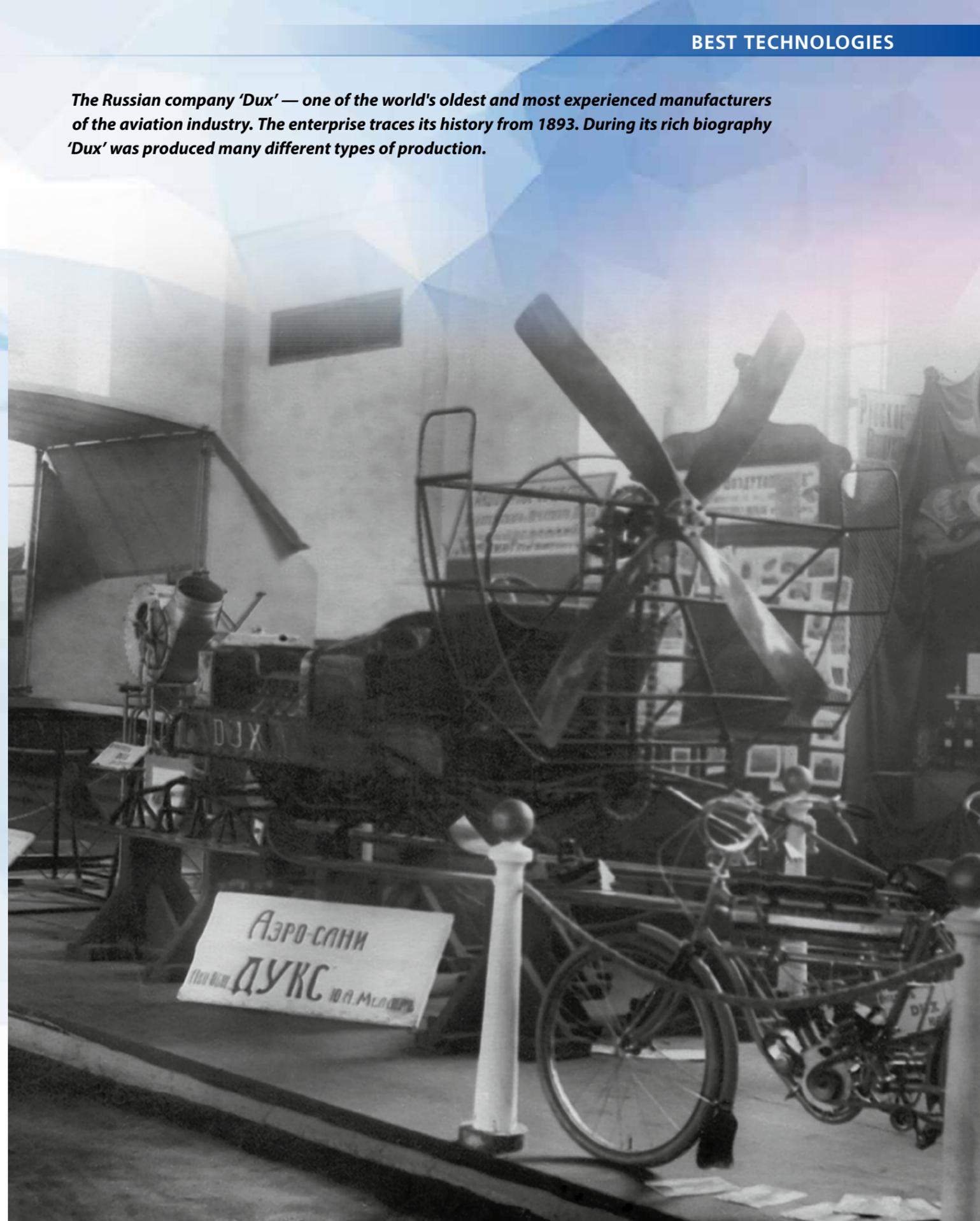
— **What principles does 'Dux', JSC follow in its maintenance policy? What new is added to after-sale support and maintenance pattern?**

— R-73 type missiles being within rated service and storage life with manufacturer's certificate available are involved in corrective maintenance system, which includes activities to keep products reliable, trouble-free and efficient according to standard technical and operational documents. Such activities can be done both on the manufacturer's premises and in the field with technical support available. Faults happened during a warranty period should be repaired by a manufacturer, free of charge. Faults happened beyond this period (non-warranty) should be repaired at customer's cost. By deeper testing of separate missile compartments we can surely define failure origins and perform a dedicated preventive maintenance.

— **How does the enterprise ensure optimized customer unit costs, i.e. good condition and overall operat-**



The Russian company 'Dux' — one of the world's oldest and most experienced manufacturers of the aviation industry. The enterprise traces its history from 1893. During its rich biography 'Dux' was produced many different types of production.





ing costs? What signature formulas are used by 'Dux'?

— To optimize good condition costs (per 1 working unit) and overall operating costs as to products with expiring lifecycle we apply a corrective maintenance done on the manufacturer's premises (manufacturer's certificate executed similar to a new product), which involves general repairs for complete recovery of a

product operating life with components replaced including basic ones, and both new and recovered units used (only once).

Besides, lifecycle and warranty liabilities are similar to those of the products equipped with currently-made components.

— **Today 'Dux' is implementing a large-scale program to upgrade production capacities. What effect will it have on export products in the future?**

— Currently we are engaged in extensive equipment upgrading. We are purchasing new manufacturing machines, carrying out renewal and improvement of available machines, installing new attachments, let's say high-frequency spindles, hold-

ers, cutters, computerized numerical control on durable cast frames of Soviet-Russian machines.

Meanwhile, we care about each production area and buy only certain equipment with required performance. When choosing machines and machining centers we rely on



One of the principles which we follow when shaping 'Dux' development strategy is a production self-containment in order not to become a hostage of circumstances. Currently it is self-containment that often makes enterprise stable and determines its readiness for hard times, especially when supply is restrained. So we have made a decision to improve our self-containment, viability and profitability using our own developments. In this regard, as I said before, we upgrade production, renovate personnel, establish cooperation with other research institutions and enterprises, both military and civil. That means that we try to make ourselves independent on the others, and on the contrary to determine new approaches and view of development of any given product both military and civil-oriented. We wish to enter new markets not because of dumping prices but thanks to better quality products and using 'Dux' proud brand.



opinion of technologists, those who directly specifies things required for production. Generally speaking, we base upon a flexible system which helps us accomplish upgrade on a real-time basis.

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Missile R-73



Short range air-to-air infra-red seeking combined aero and gasdynamic control missile is designed for conducting fast-moving close air combats, killing air targets (fighters, ground support planes, bombers, transport aircraft, helicopters and cruise missiles) from rear hemisphere and on collision course. It is capable of operating day and night, under active countermeasures taken by enemy, in any climatic conditions. The missile can also destroy ground-based heat-source targets and automatic drifting balloons.

The missile can be launched by both ground and ship-based fighters or ground support aircraft.

Combat performance:

- Launch weight, kg	105
- Length, mm	2,900
- Body diameter, mm	170
- Wingspan, mm	510
- Finspan, mm	385
- Warhead weight, kg	8
- Launch range:	
Max front hemisphere, km	30
Min rear hemisphere, km	0.3
- Max angle of attack, grad	40
- Max lateral G load, g	60
- Designating angle, grad	±45
- Homing eye deflection angle, grad	±75
- Target altitude, km	0,02...20
- Max speed of target, km/h	2,500
- Target G load, g	up to 12
- Warhead type	rod
- Powerplant	Single-mode solid fuel engine
- Proximity fuse	Active radar fuse / Active laser fuse

bility and profitability using our own developments. In this regard, as I said before, we upgrade production, renovate personnel, establish cooperation with other research institutions and enterprises, both military and civil. That means that we try to make ourselves independent on the others, and on the contrary to determine new approaches and view of development of any given product both military and civil-oriented. We wish to enter new markets not because of dumping prices but thanks to better quality products and using 'Dux' proud brand. It is worth a lot.

— **Aircraft systems of dozens of countries are equipped with your missiles. What helps your enterprise maintain competitive capability at world market for decades?**

— Our competitive capability depends on great quality and reliability of every product. In this regard a key role is played by age-old traditions of manufacturing advanced aircraft and armament. Thanks to highly qualified personnel tasks can be accomplished to a high standard. /RA&MG/



HIGH PRECISION WEAPONS FROM RUSSIA

The best of the best examples of the innovative military systems

This year at IDEX-2017 Russian holding company High-Precision Weapons as always shows the best of the best in its class examples of the innovative systems. This holding is a leader not only the Russian military-industrial complex, it is one of the leading developers of the most advanced combat systems in the world. Not a coincidence that at all exhibitions where the company participates, its exposition has become one of the most popular.

The High-Precision Weapons Holding (a part of the Rostec State Corporation) was founded in 2009. 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 the JSC 'Shipunov KBP Instrument Design Bureau', the 'Tula Arms Plant', 'Tulatochmash', the 'Tactical Missiles Corporation', the 'Nudelman Precision Engineering Design Bureau', the

'Kovrov Electromechanical Plant', the 'V.A. Degtyaryov Plant', the 'All-Russian Scientific Research Institute 'Signal', and others. As of today, there are 19 companies joined in the holding. 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 (the holding did not belong to the world's top 100 weapons manufacturers before) 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



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results of 2017 will surpass last year's figures, when the High-Precision Weapons recorded the high efficiency of their foreign economic activities.

The products of the holding's companies are well known on all continents and much sought after on international arms markets. Interest in the products of the 'High-Precision Weapons Holding' grows due to the objective situation. The exports of the holding are based on warfare systems well known on the international market such as 'Pantsir-S1', 'Palma', 'Kornet-E', 'Konkurs', 'Metis-M1', 'Igla-S', 'Arkan', 'Verba', 'Shmel', 'Kapustnik' and others as well as on training systems, armored vehicles upgrade, and so on.

The holding's products are well known and much sought after on the markets in the Middle East, the Gulf, Northern Africa, Latin America, India, Central and Southern Africa. The holding is constantly expanding the geography of its exports. This is due to product line extension, development of new models and upgrade of products in demand as well as well thought-out service policy.

The holding invests much into the development of promising designs of weapons and military equipment, enhances and augments its development and production potential, and invests in the development of models of tomorrow.

Ministry of Defense the corresponding quantity of planned weapons. There are 'Iskander-M', 'Pantsir-S', 'Verba', 'Shturm-SM' and other systems among the most critical supplies. Due to the holding, the Russian Army is armed with the best weapons in the world.

Holding is existing export contracts and the conclusion new is being conducted almost constantly. There is every reason to believe that



In 2016, the High-Precision Weapons holding topped the planned revenue value by more than one milliard US dollars. The holding is gradually taking a more important position in the global arms market. A considerable amount of holding's production enterprises supplies is carried out serving the interests of many regions. Moreover, the arms produced by the holding constitute the basis of high precision weapon park of many countries. The High-Precision Weapons holding is the biggest developer and producer of the top-notch high precision weapons in Russia.

It is evident that the demand for high-precision weapons only increases around the world. They do not miss. They are mobile, fast, maintenance-friendly, reliable, and the most modern. The newest technological solutions are used. 20 years ago, the proportion of high-precision weapons used in local conflicts amounted to up to 7%. In recent years, this share

has increased by up to 90-95%. The most designs of the High-Precision Weapons Holding are the best in the world and determine the technological vectors of development in their segments.

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biggest developer and producer of the top-notch high precision weapons in Russia.

High Precision Weapons the leading Russian designer and manufacturer of wide variety state-of-the-art military and special equipment, including but not limited to land systems, small arms, air close and short range defense systems, is now opening new business opportunities for partners. Moscow-based and ranked among top 50 global producers of military equipment by SIPRI chart, JSC 'High Precision Weapons' is legally authorized since November 2016 to provide full spectrum of maintenance and overhaul, modernization and upgrade works and services worldwide.

Experts in the global arms market confident that interest in high-precision weapons in the world will only grow. Therefore, the demand for the products of the leading Russian holding will also grow from year to year.

/RA&MG/



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Tulsky Oruzheiny Zavod (Tula Arms Plant)

Tula Arms Plant (Public Joint Stock Company 'TULSKY ORUZHEINY ZAVOD'), founded in 1712 under the decree of Peter the Great, is one of the recognized centers of military and dual use technologies.

Following three-century traditions of arms mastery the plant offers their clients and partners its military goods: high-precision anti-tank guided missile 9M113M of 'Konkurs-M' System, intended to engage modern armoured vehicles equipped with explosive reactive armour, fortified fire emplacements, low flying helicopters; 9 mm small-size assault rifle AM intended to engage the enemy manpower wearing antifragementation armour vests as well as the non — armored vehicles at a distance of 200 m; 7,62 mm Special Self-loading Pistol which is a personal weapon for noiseless and flameless shooting under the conditions of cover attacks and defence; 9 mm assault rifle AS is intended for noiseless and flameless shooting to hit the enemy manpower wearing any type of bulletproof vests; 9 mm Special Sniper Rifle VSS is intended for noiseless and flameless shooting; 5,45 mm Kalashnikov short assault rifle with a folding stock is an individual weapon. The small dimensions and high hitting capability make it possible to use the assault rifle in any extreme situation.



The enterprise also manufactures the civilian goods such as light simple and reliable hunting carbines cal. 5,6 mm or 7,62 mm with magazines of different capacity, double barrel hunting shotguns with barrels of different gauges and muzzle chokes; single barrel self loading hunting shotguns for different type of hunting with a set of muzzle adapters.

Today Tulsky Oruzheiny Zavod not only personifies the city but symbolizes it. The enterprise provides hundreds of jobsites, solving many social problems in the city. The plant revives the pride of the Russian nation. TOZ is the future of our national history.

Anti-Tank Guided Missile 9M113M of the 'Konkurs-M' System

The missile is intended to engage modern vehicles equipped with the reactive armor, fortified fire emplacements, both moving or stationary surface and afloat targets and low flying helicopters at any time and weather conditions.

The operating temperature range is from -50°C to +50°C. The missile is launched from a combat vehicle, remote launcher or other units. The control of the missile is semi-automatic, the commands are transmitted over the wire communication line.

Caliber, mm	135
Average flight speed, mps	206
Firing range, m	75-4000
Sighting range, m	500
War head type	Tandem, cumulative
Average homogeneous armour equipped and unequipped with an reactive armour penetration with frequency not less 0,5, mm	750
Container length with a missile, mm	1263
9M113M.00.00.090 Packing for a missile: Dimensions (length, width, height), mm	1380x312x353
Weight with a missile, kg	49,4



9 mm Special Assault Rifle AS



The 9 mm assault rifle AS is intended for noiseless and flameless shooting. The automatic reloading is based on the work of powder gases. The assault rifle is intended to engage the enemy manpower protected with bulletproof jackets and the non-armoured vehicles.

The design features of the assault rifle are:
— high characteristics in the accuracy of fire and closely-grouped fire are achieved due to original design of the assault rifle barrel;
— the high hitting is guaranteed due to the subsonic velocity of a bullet;
— making single and automatic shots;
— the folding metal buttstock and the quick detachable silencer make it possible to reduce assault rifle dimensions;
— mounting seats for optical and night sights;
— absolute harmless handling is guaranteed with safeties;

Caliber, mm	9
Bullet muzzle velocity, mps	up to 295
Magazine capacity, cartridges	20
Sighting range, m:	
with open and optical sight	up to 400
with night sighting device	up to 300
Length of assault rifle, mm:	
with unfolded stock	878
with folded stock	615
Weight with an empty magazine and without sights, kg	not more 2,5

The advantage of the assault rifle is a detachable double-column sector-type magazine with the cartridges located in a chess-board order and interchangeable with VSS and AM magazines. It fires the 9-mm armor — piercing cartridge SP6 and 9-mm sniper cartridge SP5.

9 mm Special Sniper Rifle VSS

Caliber, mm	9
Bullet muzzle velocity, mps	282 – 292
Magazine capacity, cartridges	10
Sighting range, m:	
with open and optical sight	up to 400
with night sighting device	up to 300
Weight with an empty magazine and without sights, kg	not more 2,6
Length of assault rifle, mm	894

The special sniper rifle is intended for noiseless and flameless shooting. The rifle is equipped with an optical sight also it is possible to install a night sighting device. The automatic reloading is effected by the energy of powder gases. The firing and trigger mechanism of a striker type allows to deliver both single-shot and automatic fire.

The design features of the sniper rifle are:
— the original design of the barrel allows to achieve high characteristics in the accuracy of fire and closely-grouped fire;
— the subsonic speed of a bullet and its high hitting effect;
— a silencer ensures noiseless and flameless shooting;
— a quick assembling into three parts makes it comfortable to carry the rifle secretly (in a special bag or case);
— the presence of safeties makes the rifle harmless in handling and prevents making any shots even if the trigger is accidentally pulled or the rifle is dropped or hit when the barrel bore is not locked.

The advantage of the sniper rifle is the presence of a detachable double-column sector-



type magazine with the cartridges located in a chess-board order and interchangeable with AS and AM magazines. The 9-mm armor-piercing cartridge SP6 and 9-mm sniper cartridge SP5 are used for the shooting.

9 mm Small-Size Assault Rifle AM



The 9-mm small-size assault rifle is intended to engage the enemy manpower wearing bulletproof jackets as well as the non-armored vehicles at a distance of 200 m. The automatic reloading is based on the work of powder gases.

The design features of the assault rifle are:
— the magazine quick 'ejection' mechanism;
— the metal folding buttstock reduces the overall dimensions and allows to deliver aimed fire with folded or non-folded stock;
— the assault rifle dimensions are the same as a submachine gun has but the firing range and hitting effect of the assault rifle are considerably better.

Caliber, mm	9
Bullet muzzle velocity, mps	295
Magazine capacity, cartridges	10; 20
Length of assault rifle, mm:	
with unfolded stock	640
with folded stock	396
Weight of assault rifle with an empty 10-round magazine, kg	2,1
Rate of fire, rpm	840

The advantage of the assault rifle AM is a detachable double-column sector magazine with the cartridges located in a chess-board order and interchangeable with magazines of the AS and VSS firearms. The 9-mm armour-piercing cartridge SP6 and 9-mm sniper cartridge SP5 are used for shooting.



Tatiana Valeeva

AGAINST ANY TANKS

The best in the world Komet-EM multipurpose missile system

As of today the 3rd generation Komet-E portable/transportable laser beam-rider system developed by KBP and adopted in 1998 is the weapon definitively complying with the concept of advanced ATGW, being state-of-the-art specimen of multipurpose tactical short range weapon system allowing engagement of virtually any small-size target within the system's line of sight. Aiming for further enhancement of Komet-E ATGW combat capabilities, KBP Instrument Design Bureau developed a new multipurpose missile system — Komet-EM.

Antitank guided missile systems (ATGM) have been developed and produced globally for already half a century. Since then they became the most popular and wanted type of high precision weapons (HPW) thanks to their usability and relatively low cost. A future ATGM system must be a versatile defensive-offensive guided weapon, whose portable and combat vehicle transportable modifications ensure a wide range of applications in close range tactical zone in various combat environments.

The weapon is designed as an automatic combat system, incorporating, besides the firing unit itself, both reconnaissance and control assets, and ensuring full automation of all combat operation constituents

— target detection and distribution, issuing and processing of target designation, missiles' guidance. The operator's task within such system is limited to supervision of its proper functioning and launch of missiles.

The open architecture of the system in terms of data exchange with higher-rank and peer units along with its combat capabilities makes it a vital element of Army network-centric system.

Komet-EM multipurpose missile system provides for engagement of modern and future tanks, various fortifications (pillboxes, bunkers) and low-velocity aerial targets (helicopters, assault aircrafts and UAVs) in day&night and adverse weather conditions under enemy ECM and optical jamming at ranges up to 8-10 km.

The Komet-EM system comprises:

- combat vehicle with two automatic launchers and operator's panel with a display;
- battery commander's reconnaissance and control vehicle, equipped with combined surveillance system including TV, IR and radar reconnaissance aids, navigation, communication and data exchange systems, automated control suite and weapon system (Komet-EM ATGM and PKTM machine-gun),
- guided missile with HE warhead with impact and proximity fuses and firing range of up to 10 km;
- an antitank guided missile with a maximum firing range of 8000 m and shaped charge warhead armour penetration of 1100-1300 mm which enables the Komet-EM system to

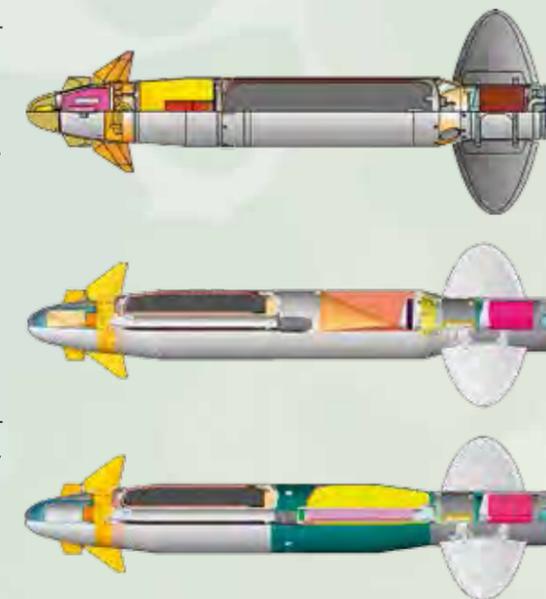


engage modern and future tanks bearing in mind the tendency to growth of their armour protection.

Due to implementation of state-of-the-art but, however, low cost technical solutions, Komet-EM acquired a number of new features, allowing significant broadening of its combat capabilities to counter both conventional ground targets, as well as non inherent to this class of systems ability to engage low-velocity aerial targets:

- the use of computer vision along with automatic target tracker makes it possible to exclude an operator from missile guidance process and in fact implements the 'fire-and-forget' principle, thus giving a 5-times increase in accuracy of target tracking during real combat.
- engagement of targets in automatic mode reduces psychophysical stress to operators, requirements to their skills and duration of their training.
- automation of guidance process along with automated target detection and distribution, target designation commands generation and processing result in virtually fully automatic combat system, limiting the operator's task to supervision of its proper functioning and launch of missiles.
- combat vehicle with twin-launcher ensures simultaneous salvo firing at two targets, thus significantly increasing the system's firing rate and number of targets handled and at the same time allowing two-fold reduction of combat assets required to complete a mission. Such perfor-

mance specifications endow Komet-EM with the highest target handling capability among similar existing and future systems — min. 3-4 targets per minute at ranges up to 5 km. Thus, in case the weapon systems are positioned at a stand-off range from enemy tanks (more than 4 km) a single Komet-EM battery of 9 combat vehicles is able to repulse an attack (i.e. destroy min. 50% of targets) of enemy tank (M1A2 class) battalion (58 tanks). Actually, such mission may be accomplished by two battery salvos, destroying 32-34 tanks, i.e. 55-60% of the battalion. The time required to accomplish the mission will not exceed 1 minute, allowing to avoid casualties, since the enemy



Main Performance Specifications

Flight range	150 — 8000
Armour penetration, mm	1100 — 1300
Maximum flight speed, m/s	300
Weight with launch-tube, kg	31
Length of launch-tube, mm	1210

tanks will not be able to reach their effective firing distance.

- new capability for ATGW — effective engagement of small-size aerial targets — reconnaissance and reconnaissance-attack unmanned aerial vehicles being the enemy's crucial and mass combat support tool,





as well as helicopters and assault aircrafts.

UAV on a reconnaissance mission lets enemy well in advance disclose defence, give accurate target designation for firing over-the-horizon munitions, record and transmit information on army relocations both during operations near the line of contact with enemy and in the rear. This results in significant increase in casualties and possible failures of combat mission performance. From the point of view of engagement, UAVs are difficult targets due to low altitude of flight. Moreover, in case of mass application they are a teaser for

the air defence assets, causing high consumption of expensive surface-to-air missiles.

Attack helicopters and tactical aircrafts are by now the highest threat for land forces, as they can inflict maximum damage in minimum time. For example, a helicopter is able to destroy a company of armoured vehicles (10-14 armoured vehicles) with one ATGM load.

To efficiently counter the UAVs, attack helicopters and tactical air-

Another distinctive feature of modern combat operations is deployment of sophisticated surveillance and networking technologies in the tactical units. Wide application of integrated surveillance aids (various combinations of optical, radar, TV and IR systems), sophisticated automatic assets of tactical units operation control, communication and navigation allows continuous monitoring of the battlefield, real-time reception of reconnaissance



crafts the air defence assets should be available right in the combat formations, because at-tack or reconnaissance flights are performed at low altitudes, impeding due-time detection with medium and short range air defence systems which are usually stationed deep in the home front. Komet-EM is the system able to efficiently accomplish low-velocity aerial threats repulsion tasks.

data (both from peer and higher level units) overlaid on the digital maps and automatic or semiautomatic generation and transmission of target&firing data to the fire units, thus, determining the efficiency of high-precision tactical weapons and ATGW employment.

Availability of surveillance systems providing detection of wide range of targets and automatic bat-

Komet-EM multipurpose missile system provides for engagement of modern and future tanks, various fortifications (pillboxes, bunkers) and low-velocity aerial targets (helicopters, assault aircrafts and UAVs) in day&night and adverse weather conditions under enemy ECM and optical jamming at ranges up to 8-10 km.

tery operation control aids is a vital need for Komet-EM with its versatility of combat applications and ability to effectively counter aerial targets. Timely submission of aerial targets data to the fire units (Line Komet-EM combat vehicles) directly influences both the efficiency of ATGW counteraction to aerial threats, as well as casualties in the units under air raid.

To provide operational surveillance/data exchange and control of Komet-EM battery combat operation, a battery commander's surveillance&control vehicle is designed based on standard line Komet-EM CV.

The Surveillance&Control vehicle is special-purpose unit combining both reconnaissance/control and fire unit functions.

The control vehicle comprises:

- Integrated surveillance system featuring TV, IR and radar aids;
- navigation aids;
- communication and data exchange system;
- automated control suite;
- weapon system.

Employment of radar in the control vehicle allows target detection at ranges significantly exceeding the firing range of line combat vehicles weapon systems. This provides efficient control of Komet-EM battery combat operation along with wide sector surveillance by Komet-EM control vehicle.

Provided with such surveillance capabilities the task of the control vehicle limits to target detection, friend-or-foe identification and target distribution among the line vehicles in order to avoid multiple firing at a single target.

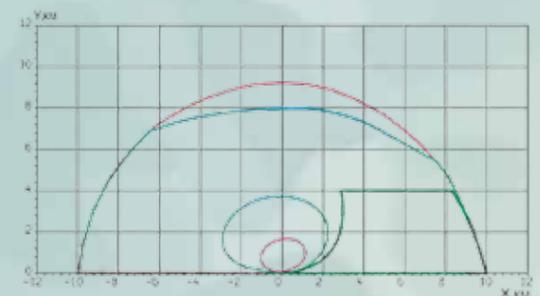
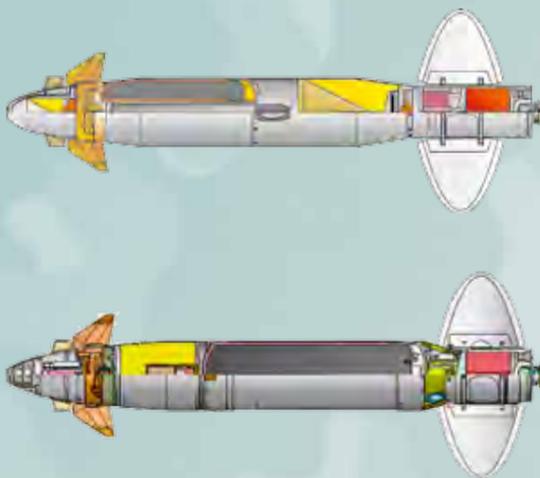
The battery commander's control vehicle capabilities by day/night time and under any weather conditions are the following:

- detection, identification and tracking of moving or stationary air and ground targets, automatic measurement, generation and processing of the detected targets' coordinates;
 - friend-or-foe identification;
 - generation and transmission of target designation data from the anti-tank battery commander to line combat vehicles;
 - maintaining radio communication within the battery, as well as with higher-rank and peer unit commander's;
 - real-time control of battery fire, relocation and firing pattern planning in case of changing deployment area with data overlaying on the digital map.
- These capabilities allow:
- reduction of ground targets detection time for line combat vehicles — by 2-3 times at daytime and by 6-10 times at night (if compared to target search using IR sight), aerial targets — more than 10 times;

- automatic determination and firing primarily at the most threatening target;
- maintaining balanced target load on the combat vehicles to avoid multiple firing at a single targets by several vehicles;
- timely readjustment of battery firing pattern in case of casualties.

As a result, the Surveillance&Control Vehicle is able to double the combat effectiveness of Komet-EM battery while countering enemy tanks attack in properly arranged defence formations, or increase it by 2.5 times in case of entering the combat (from march) without prior area survey and missing information about enemy forces.

In case of countering aerial threats (UAV, helicopters) the combat efficiency of ATGW battery will increase by 2.5-5.0 times due to reduction of target detection time and increase of detection probability. /RA&MG/



Main Performance Specifications of the System

Firing range, m:	
• minimum	150
• maximum	10 000
Guidance system	automatic, beam riding guidance
Jamming immunity	high
Number of targets engaged simultaneously by a salvo	2
Armour penetration by shaped charge warhead, mm	1100-1300
TNT equivalent of high explosive warhead	7
Ammunition load, pcs including ready-to-fire missiles	16
Change-over from traveling to combat configuration, seconds	8
	7





BE-200ES AIRCRAFT FOR THE EMERCOM OF RUSSIA

PJSC 'Beriev' delivered the first production amphibian

On January a UAC subsidiary PJSC 'Beriev' delivered the first production amphibian Be-200ES to the EMERCOM of Russia. The aircraft named after the renowned naval pilot, the Hero of the Soviet Union, Alexander Razgonin, successfully passed the program of pre-delivery and acceptance tests, including takeoffs and landings on the Black sea, as well as water scooping and dropping.

At the end of 2016, the Ministry of Industry and Trade of the Russian Federation granted a budgetary subsidy to PJSC 'Beriev' in the amount of 3.5 blnroubles to reduce its debt load and ensure financial stability.

'We are seeing that the company is achieving a stable production rate. The state support given to the company on behalf of the Ministry of Industry and Trade of the Russian Federation allowed the company to successfully carry out the production program and meet liabilities to the customers', stated Denis Manturov, the Minister of Industry and Trade of the Russian Federation.

Yury Grudinin, PJSC 'Beriev' Director General, said that currently



there are four Be-200ES amphibians in final assembly in various stages of completion being produced under the Contract with the EMERCOM of Russia. The second aircraft will soon start the program of required flight tests and ground checks. It is planned to hand over four more aircraft to the customer by the end of 2017.

Based on operation experience and in compliance with additional customer requirements the Be-200ES during the transfer of serial production to Taganrog has been seriously modernized: the aircraft is now fitted with upgraded avionics equipment; changes have been made to the airframe structure, a number systems have been sourced from Russian suppliers.

The Be-200ES amphibian proved itself during rescue operations in European countries, as well as in Indonesia and Israel. The aircraft has good export potential and attracts interest of foreign customers. Memorandums on aircraft delivery to Thailand, China, Kazakhstan, and Vietnam were signed in 2016. Negotiations are in progress with several countries of Asia-Pacific Region and European Union, interest in the Russian amphibian has been demonstrated by the USA as well.

The first Taganrog-produced Be-200ES will be operated in the Southern regional center of the EMERCOM of Russia. After the handover ceremony the Be-200ES amphibian flew over to its permanent deployment base in Rostov-on-Don.

The official rollout ceremony for the first Beriev-made series Be-200ES amphibian aircraft was in May 2016. Before that, the aircraft used to be assembled at the Irkutsk Aircraft Plant, but the production subsequently moved to Taganrog. For the purpose of mass production of the Be-200ES, Beriev Aircraft PJSC established hi-tech production facilities, procured equipment, upgraded process lines, workshops and composite structure production facilities, and recruited and trained personnel.

'I am sure that Beriev Aircraft PJSC will develop not only as an enterprise engaged in repairs and development activities, but primarily as the center of Russian and, to a great extent,

global seaplane building, because our country is the leader in this industry', emphasized during the rollout ceremony President of the United Aircraft Corporation (UAC) Yuri Slyusar.

Yuri Slyusar specifically noted that 'We are witnessing a second birth of the much-needed and demanded aircraft as supported by the successful operating experience and by examples of its use in emergencies in Russia and abroad — in Greece, Portugal or France. Keen interest in the aircraft is also shown in Indonesia'.

This year the company's production is expected to achieve more than a double volume, and this pace will be maintained in the future. We find it important that the enterprise will function steadily, which means that the labor market, too, will be stable. I am confident that development of the enterprise will enable to resolve social issues of the city residents and the enterprise itself', said

The first Taganrog-produced Be-200ES will be operated in the Southern regional center of the EMERCOM of Russia. After the handover ceremony the Be-200ES amphibian flew over to its permanent deployment base in Rostov-on-Don.

the Governor of the Rostov Region Vasily Golubev while emphasizing the importance of the event for the entire Don region.

The Head of the Southern Regional Center of the Ministry of Emergencies Igor Oder noted that the Russian Ministry of Emergencies has been operating the Be-200ES aircraft for more than a decade. 'The enterprise is now facing a great future, with the big production base already in place and the certification and airworthiness centers expected

to be established. These prospects give every reason to hope that the enterprise will see revival and will enjoy the past glory and pride. The main thing is to keep the approaches and people who are able to create such important aircraft'.

According to the Director General and General Designer of Beriev Aircraft PJSC Yuri Grudinin, based on

the past operating experience and upon request of the customers — the Russian Ministry of Emergencies and the Russian Ministry of Defense — the aircraft has incorporated significant upgrades: the aircraft has been upgraded by more than 50% in terms of equipment and by up to 70% in terms of airframe. Beriev Aircraft PJSC is currently performing contracts for the production of the Be-200 amphibian aircraft for the Russian Ministry of Emergencies and the Russian Ministry of Defense.

/RA&MG/



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

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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run mass production of the SPARS® in the region and enter an empty market with protected rights it would be necessary to have production technology experience in the fields of:

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

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

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

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

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

/RA&MG/



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'RA&MG' № 03 (10)	March 20th	LIMA 2017 (21-25.03.2017, Malaysia, Langkawi)
'RA&MG' № 04 (11)	April 02th	LAAD 2017 (04-07.04.2017, Brazil, Rio de Janeiro)
'RA&MG' № 05 (12)	May 14th	IMDEX ASIA 2017 (16-18.05.2017, Singapore)
'RA&MG' № 06 (13)	May 17th	SITDEF 2017 (18-21.05.2017, Peru, Lima)
'RA&MG' № 07 (14)	June 18th	Paris Air Show 2017 (19-25.06.2017, France, Paris)
'RA&MG' № 08 (15)	June 27th	IMDS-2017 (28.06-02.07.2017, Russia, S-Petersburg)
'RA&MG' № 09 (16)	July	MAKS-2017 (July 2017, Russia, Moscow)
'RA&MG' № 10 (17)	August 22th	ARMY-2017 (22-27.08.2017, Russia, Moscow)
'RA&MG' № 11 (18)	September 17th	AVIATION EXPO CHINA 2017 (19-22.09.2017, China, Beijing)
'RA&MG' № 12 (19)	October 02th	INMEX SMM India 2017 (03-05.10.2017, India, Mumbai)
'RA&MG' № 13 (20)	October 15th	SEOUL ADEX 2017 (17-22.10.2017, Korea, Seoul)
'RA&MG' № 14 (21)	November 04th	Defense & Security 2017 (06-09.11.2017, Thailand, Bangkok)
'RA&MG' № 15 (22)	November 10th	Dubai Airshow 2017 (12-16.11.2017, UAE, Dubai)
'RA&MG' № 16 (23)	November 20th	MILIPOL 2017 (21-24.11.2017, France, Paris)
'RA&MG' № 17 (24)	December 10th	Gulf Defense & Aerospace 2017 (12-14.12.2017, Kuwait, Al Kuwait)

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