RUSSIAN AVIATION & MILITARY GUIDE

Special analytical export project of the United Industrial Edition

№14 (45), October 2019

Best Defense Innovations for Vietnam and Southeast Asia

DSE VIETNAM
SPECIAL PARTNERSHIP

ANNUAL PHOTO ALMANAC
FOR MILITARY-TECHNICAL COOPERATION

The new project of the United Industrial Edition is an annual photo almanac dedicated to the most important and most striking in military-technical cooperation between Russia and foreign countries. The Almanac is an annual supplement to the magazine 'Russian Aviation & Military Guide'.

The almanac includes key partners and supplies, new military products, major contracts and programs, participation in biggest international salons and exhibitions, supplies of dual-use products and much more. The almanac will be released in February 2020.

UIE UNITED INDUSTRIAL EDITION

'Russian Aviation & Military Guide'
№14 (45), October 2019

Special analytical export project
of the United Industrial Edition

Registered in the Federal Service for Supervision of Communications, Information Technology and Mass Media (Roscomnadzor)
09.12.2015 PI № FS77-63977

The magazine 'Russian Aviation & Military Guide', published by the United industrial edition, is a winner of National prize 'Golden Idea 2016' FSMTC of Russia

General director
Editor-in-chief
Valeriy STOLNIKOV

Chief editor's deputy
Elena SOKOLOVA

Commercial director
Oleg DEINEKO

Managers
Tatiana VALEEVA
Natalia MOZHAEVA
Andrey PARAMONOV
Alexander STOLNIKOV

Designed by
Svetlana SELIVERSTOVA

There are materials from the information agencies and from the press services of the federal authorities of the Russian Federation used in the project.

Edition is 3 thousand copies

Editorial office:
Malaya Gruzinskaya St., 39
Moscow, 123557
Tel.: +7-495-505-76-92, 778-14-47, 729-39-77

Media postal address:
Moscow, Russia, 123104, mailbox 29

doc@promweekly.ru
promweekly@promweekly.ru
www.promweekly.ru

The materials marked with R published on a commercial basis

CONTENTS

EDITORIAL

The best innovations for Vietnam and Southeast Asia area

United Industrial Edition sincerely welcome the holding of the first Defense & Security Expo Vietnam 2019 (DSE Vietnam 2019). We consider it a great honor for ourselves to act as an informational partner of this most important defense forum in Hanoi.

It has become already obvious and undeniable that security is becoming increasingly important among the various values of civilization. Today, for any state, the ability to reliably and securely protect the territory, residents and values is a priority. Political situation in the world (conflicts, sanctions, threats of war and other) makes nations once again reconsider their defense possibilities. Threat of local conflicts to be evolved into global ones, failure of worldwide system of safety and nonending crisis – all of this leads to an unstable and dangerous situation.

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

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

Taking part in DSE Vietnam 2019 Russia continues the policy of open partnership with Vietnam and other countries of Southeast Asia area. Russia has a wide product line that meets all the needs of this region and ready propose the best technology and the best price offers.

Valeriy Stolnikov

MC-21 AND CR929 AT MAKS-2019

United Aircraft Corporation (UAC) represented its advanced commercial, military and transport aviation products during the International Aviation and Space salon MAKS, which has taken place in Zhukovsky, Moscow Region, from August 27 to September 1, 2019.

'During this important home-run event, we demonstrated to public our leading products. With the consistent UAC strategy implementation based on the government support, the major investments and the engineering aspires we were ready to demonstrate our achievements at MAKS-2019. Our brand new MC-21 airliner was unrevealed to the guest of the airshow: they saw one prototype in the flight program and the other two on static display. Pilots of the Su-57 fighter demonstrated aerobatic figures and first-class pilotage. This fifth generation aircraft will be available for observing on static display', – noted Yury Slyusar, General Director of UAC.

The world premiere of the MC-21 aircraft was promising to be the key event of the upcoming Salon. The three test aircraft were shown to the public altogether for the first time. One of them boasted with the demo cabin installed, so that the future passengers could estimate the high level of comfort of the aircraft.

Another crowd-puller feature of the Salon was the full-scale CR929 cabin and flight deck mock-up, as well as Superjet 100 with its stylish SABERLETS on static display and in flight program.

As for the military premieres, the Su-57 fifth-generation fighter was open for public viewing on a static display. A state contract for the supply of Su-57 fighters to the Russian Ministry of Defense was signed this June. The Mig-35 4++ generation fighter was presented on special podium and also took part in the flights.

The novelty of MAKS-2019 was public debut of the new Il-78M-90A tanker. It's the first air tanker manufactured in Russia in the post-Soviet period. It's also planned to demonstrate the Be-200 amphibious aircraft.

UAC presented a commercial market outlook with global fleets data analysis, that comprise the demand forecast for commercial aircraft and the corresponding market potential for each world region, particularly for Russia, China and India.

MAKS-2019 became a basement for business meetings and conferences, including the agreements upon digital transformation in circuit of UAC general strategy.

Serbian Minister visited Russian Helicopters

Serbian Defence Minister Alexander Vulin has visited 'Rostvertol' plant of 'Helicopters of Russia' holding of Roctec State Corporation during his working visit to Russia.

The Head of Defence Ministry had inspected the Mi-35M transport and combat helicopters manufactured by the Rostov plant for the Serbian Air Force under the contract signed with Rosoboronexport.

As part of his visit to the company, Alexander Vulin met with Rostvertol management and specialists of flight and engineering personnel being trained at the company.

In addition, the Defense Minister of got acquainted with the production sites for the assembly of Mi-35 helicopters.

Mi-35M is the world's only universal combat helicopter, which, among effective fire missions, is able to transport up to eight soldiers with weapons, up to 1,500 kg of ammunition or other cargo inside the cabin and up to 2,400 kg of cargo on external sling, evacuation of the wounded, delivery of technical staff to the autonomous bases.

Round-the-clock and all-weather combat use of the helicopter provides the ability to perform combat missions of air support units of the ground forces at any time of the day and in all weather conditions.

The helicopter has significant high-altitude characteristics with the ability to perform takeoffs and landings on concreted and unpaved landing sites located at altitudes up to 4,000 m above sea level.

In addition, the successful design solutions used in the Mi-35M, provide the possibility of using the Russian helicopter in a wide range of physical, geographical and climatic conditions.

Drone Festival

From 24 to 25 August 2019, M. Gorky Central Park of culture and recreation hosted the second international festival of drone racing Rostec Drone Festival. The event was organized by the all-Russian sports society 'Labor reserves' together with Drone Sports Global with the support of Rostec State Corporation, 'Technodynamica' holding and the 'Rosoboronexport' company.

32 professional pilots, 16 of whom represent Spain, Germany, Latvia, Belarus, Poland, Austria, Israel, Sweden, South Korea, France, came to Moscow to compete for the title of the best and to fight for the prize Fund of 2.5 million Rubles.

On Saturday, the first day of competition, sportsmen were qualifying, and on Sunday, August 25, the final was held.

This year, sportsmen had a two-level track with suspended structures and a tunnel for spectators, through which everyone was able to pass and see the race from its epicenter.

Spectators and guests of the festival had the opportunity to try themselves as a professional pilot on a computer simulator and learn how to control a racing drone on a special track.

For children there were master classes from the network of workshops of robotics 'Robolatory'. It was possible to learn about modern trends and novelties in the world of unmanned aerial vehicles in the exposition zone.

The festival also hosted a photo exhibition and video show of contestants for the best photo and video taken with the use of an unmanned aerial vehicle.

The organizer of the video contest 'Take off and shoot!' was TV channel 'T24', and the organizer of the photo competition and a strategic partner of the festival was the sports society 'Labor reserves'.

The best works were awarded with prizes.

'Drone racing is becoming for many young people a point of entry into the profession associated with the creation of drones, their control. Rostec conducts a lot of developments in this area, so we are interested in attracting young professionals, in cooperation with promising teams of specialists. Thus, the festival not only demonstrates the capabilities of modern unmanned technologies, but also opens up new opportunities for their development,' said Nikolay Volobuyev, Deputy General Director of Rostec State Corporation.

RUSSIAN HELICOPTERS AT PARIS AIR SHOW 2019

Russian Helicopters Holding Company (part of Rostec State Corporation) presented the light multi-purpose Ansat helicopter equipped with the new Mku30 satellite communication system at the 53th International Paris Air Show 2019.

'The Holding Company actively develops the introduction of modern satellite communication systems for helicopters. We entered into an agreement with the MOST-satellite systems company on joint promotion of these products. The Ku-band satellite communication system was created for Ansat and integrated into its avionics. It ensures data transmission and reception at the speed up to 2 Mbps regardless helicopter's location. We plan to offer this system as an option for all civil helicopters of the Holding Company,' said Andrey Boginsky, Director General of Russian Helicopters.

The Mku30 satellite communication system allows single-point and multi-point video conferencing on board, smooth real-time transmission of selected amounts of data and high-quality video content.

At Paris Air Show 2019 held in the French capital on June 17-23, Russian Helicopters showed two Ansat helicopters – medical and VIP versions.

The light multi-purpose Ansat helicopter, which has the largest cabin within its class, is actively used by the Russian air medical services. This twin-engine helicopter has compact size and does not require a large landing area. It can also be used for normal passenger and VIP transport, cargo delivery and environmental monitoring. High-altitude tests of Ansat have been successfully completed, which confirmed the possibility of its use in mountainous terrain at altitudes up to 3,500 meters. The helicopter can be operated in a temperature range between -45 and +50 degrees of Celsius. Its significant advantage is the possibility of storage out of the hangar and low cost of operation.

The international air show in Le Bourget is one of the largest and oldest air shows in the world. It takes place every two years at the Le Bourget airport, 12 kilometers from Paris. Russia is a regular participant of the show. The first Russian aircraft presented in France was ANT-35 in 1936. In 1965, the Soviet Union showed Mi-6, Mi-8 and Mi-10 helicopters for the first time at Paris Air Show.

Rostec at MAKS

State Corporation Rostec was showing new civil, military and special aviation equipment at the MAKS-2019 air show, which was held from August 27 to September 1 in Zhukovsky. Among those items were six new aircraft and helicopters, as well as communications equipment, electronic warfare equipment, aircraft systems, engines, and airfield equipment. The state corporation was one of the main organizers of the MAKS air show.

The Rostec holding companies and enterprises exhibit, with an area of about 2,500 square meters, was located in pavilions C2, F2 and F3. In addition, a large number of full-scale models of aircraft were placed in a static exhibition in the open. During the air show, Rostec representatives were going to take part in the forum's business program and signed a number of agreements with both Russian and foreign partners.

'MAKS is, without exaggeration, a key event in the business calendar for the entire aviation industry and, above all, for Rostec. The corporation today includes key Russian manufacturers of aircraft and aircraft components. After integration with UAC, Rostec will be one of the largest aircraft manufacturing companies in the world, the annual production volume of the corporation's aviation cluster will exceed 1 trillion rubles. This year, we were showing over 250 models of equipment on the sidelines of the forum, including 40 new products – these were airplanes, helicopters, communications, avionics and much more. We were also planning significant negotiations and signings in the field of creating new models of equipment and deliveries of our products,' Rostec head Sergey Chemezov said.

All the key holding companies and enterprises that make up State Corporation Rostec were taking part in the largest air show in Russia. Among them were United Aircraft Corporation, United Engine Corporation, Russian Helicopters, Techmash, Shvabe, Roselectronika, the Avtomatika Concern, Radioelectronic Technologies Concern, Technodynamics, and others. State special exporter Rosoboronexport, which is part of the Rostech, was also attending the forum.

The biggest unveiling at MAKS-2019 was the first-ever MS-21-300 mid-range aircraft, created by the United Aircraft Corporation, and displayed to the general public for the first time. Forum guests were able to inspect the aircraft from the outside, and to see the passenger cabin of the aircraft. In addition, the fuselage of the Russian-Chinese CR929 aircraft was presented at the air show. Another new item at MAKS-2019 was the new Russian tanker Il-78M-90A in its first public display. It is the first air tanker produced in Russia in the post-Soviet period.

Among other aircraft models, an Ansat helicopter with a cabin in the style of the Aurus brand was presented for the first time at MAKS. In addition, the first serially produced Mi-38 helicopter in VIP configuration was shown for the first time at MAKS. Also, the newest Russian Ka-62 helicopter took part in the forum's flight program for the first time.

For the first time at the MAKS air show, the PD-14 aircraft engine for the MS-21 aircraft, created by the United Engine Corporation, was presented. The power plant unit has already received a type certificate from the Federal Air Transport Agency (Rosaviatsia). UEC plans to produce up to 50 PD-14 aircraft engines per year.

Among the military models was the fifth-generation Su-57 fighter, which was shown to the public for the first time at the static site at the air show, and also took part in the flight program. This is a fifth-generation multifunctional complex designed to solve a wide range of combat missions during operations against air, ground and sea targets. Another new military plane is the Il-112VE light military transport aircraft, an export modification of the Il-112V aircraft. All the necessary export documentation has been received for both aircraft, so Rosoboronexport was able to offer them to foreign customers.

Also, the enterprises of the Rostec aviation cluster presented the latest systems and components for existing and prospective aircraft – a wide range of avionics samples. The exhibit of the radio-electronic cluster showed new computer systems and data storage systems, airfield equipment, optical systems, communications, radar stations and other products.

The MAKS-2019 International Aviation and Space Salon was held from August 27 to September 1 in Zhukovsky, Moscow Region. The event was organized by the Ministry of Industry and Trade of the Russian Federation and State Corporation Rostec. The organizer of MAKS-2019 was JSC Aviasalon. The first days of MAKS, from August 27 to 29, were devoted to business events and business meetings. The air show was attended by 635 companies from around the world. In 2017, more than 450,000 visitors attended the MAKS air show, the volume of contracts and agreements of intent reached 394 billion rubles, and the business potential of MAKS-2017 exceeded 600 billion rubles.

ANSAT TO GET AUSTRIAN MEDICAL MODULES

The Russian Helicopters Holding Company (part of Rostec State Corporation) and an Austrian company Air Ambulance Technology signed a cooperation agreement. The parties agreed on joint development and Russian certification of the medical module which may be installed on Ansat helicopters.

The document was signed by Director General of Russian Helicopters Holding Company Andrey Boginsky and managing director of Air Ambulance Technology Nicole Kuntner-Hudson during the international aerospace exhibition Paris Air Show 2019.

'We are pleased to announce the start of cooperation with Air Ambulance Technology and we hope that this will be long-term and fruitful work. Creation of the new medical module which meets international standards for medical aviation will allow the holding company to expand the pool of potential customers, including European companies. We expect that installation of such equipment will help Ansat get a certificate of the European Union Aviation Safety Agency', said Director General of Russian Helicopters Andrey Boginsky after the ceremony to mark signing of the agreement.

The light multi-purpose helicopter Ansat, which has the largest cabin within its class, is actively used by the Russian air medical services. This twin-engine helicopter is compact, and it does not require a large landing area. It can also be used for passenger and VIP transport, cargo delivery and environmental monitoring. High-altitude tests of Ansat have been successfully completed, which confirmed the possibility of its operation in mountainous terrain at altitudes up to 3,500 meters. The helicopter can be operated in a temperature range between -45 and +50 degrees Celsius. The possibility of keeping the helicopter out of the hangar and low cost of operation are its significant advantages.

Export Contracts Against Sanctions

Within the framework of MAKS-2019, the International Aviation and Space Salon running in Moscow satellite town of Zhukovsky, from August 27 till September 01, 2019, the professional community of Rosoboronexport, belonging within Rostec State Corporation, has held over 200 pre-bid negotiations, conferences and technical presentations for foreign delegations, following which the refill of the company booking by a handful of billions of dollars is anticipated.

'There's no doubt that new international procurement awards for Russian fixed and rotor-wing aircraft and air defense weapons will become the principal result of MAKS-2019. The successful implementation of merely those schemes that we have discussed with our partners during these August days, would bring in a handful of billions of dollars for the Russian manufacturers which would go towards the fees and to the evolvement of state-of-the-art technologies. Today's booking of Rosoboronexport lies historically within $ 50B. This year we have exported products of the Russian defense industry complex to a value of over $ 8,5B, whereas one half of all the procurement fell to the Air Force and the Air Defense share, where Russia is a top-ranked global leader', – Alexander A. Mikheev, Director General of Rosoboronexport, Deputy Chairman of Russian Engineering Union, was quoted as saying.

At the air show pavilion F2 and at the static testing pad of MAKS-2019, Rosoboronexport hosted the demonstration of the top-of-the-line fifth-generation jet fighter Su-57E, purpose fighters Su-35, a combat capable trainer Yak-130, a troop transport Il-76MD-90AE, a tanker aircraft Il-78MK-90A, a troop-carrying gunship helicopter Mi-35M, follow-on helicopters Mi-28NE and Mi-171Sh in special and counterterrorism operation design, a multi-purpose helicopter Mi-38T, unmanned aerial vehicles 'Orlan-10E' and 'Tachyon', smart air weapons, air defense weapons: anti-aircraft missile and gun system 'Pantsyr-C1', anti-aircraft weapon system 'Buk-M2E' and 'Tor-M2KM', COMJAM, automated air defense systems and then some. Altogether over 160 Russian defense industry complex production units.

On the air show days, also Air Force pilots from foreign guest countries invited by Rosoboronexport to Zhukovsky, could make familiarization flights on Russian airplanes and helicopters.

'A vibrant business and flight program of MAKS-2019 has promoted successful co-operation with the foreign delegations, at times led by topside designated persons. For instance, the demonstration of the top-of-the-line fifth-generation jet fighter Su-57E has definitely added up to its publicity on a global basis: the Rosoboronexport professionals have established an aggressive interest for the jet fighter on the part of the foreign guests and media worldwide. Taken as a whole, MAKS has reasserted the vast export opportunities for Russian fixed and rotor-wing aircraft and air defense weapons. We await, in the soonest possible time, incoming fresh letters of request from our partners, in the first place relating to the gear with a track record of operational service in combat conditions, including Syria', – so Alexander Mikheev.

Beyond the discussion of issues of bilateral armaments cooperation, the company has signed, on the sidelines of MAKS-2019, a memorandum of partnership with the government of the Yaroslavl Region, where the Engineering Union regional business unit is supervised by Alexander A. Mikheev.

In addition, the Rosoboronexport display, including the massive motional installation at the company booth, has been highly appreciated by the air show organizer, and was awarded in one of the nominated categories of the contest 'GOLDEN WINGS MAKS-2019'.

Upgrading helicopters

During the International Aviation and Space Salon MAKS-2019, Mil Moscow Helicopter Plant of Russian Helicopters Holding Company (part of Rostec State Corporation) and UTair-Engineering signed a cooperation agreement to develop modified versions of Mi-8/17 helicopters and maintain airworthiness.

The agreement gives UTair-Engineering an opportunity to independently carry out all the work related to upgrading helicopters such as Mi-8T/P/PS, Mi-8MTV-1, Mi-8AMT, Mi-171, Mi-171A2 and Mi-172. UTair-Engineering is the first Russian company that does not form part of Russian Helicopters Holding Company, with which such an agreement is signed.

'It is important for us to polish the system for giving permissions for modifying machines by cooperating with one of Russia's largest enterprises specializing in repair and maintenance of helicopters. Thus, in the future this will allow us to apply this procedure to other companies, due to which our engineers will be able to focus on substantially upgrading machines in serial production and designing new types of helicopters,' said Director General of Russian Helicopters Holding Company Andrey Boginsky.

'Signing this agreement is an important step for UTair-Engineering in its long-standing cooperation with Russian Helicopters. New functions will allow us to quickly modify helicopters to meet customers' needs and increase competitiveness of Russian helicopters globally,' said UTair Engineering CEO Rashid Faradzhaev.

IRKUT CORPORATION AT PARIS AIR SHOW 2019

Irkut Corporation (a UAC member) took part in Paris Air Show 2019.

At the stand of the United Aircraft Corporation, the mock-up model of MC-21 aircraft and the upgraded version of procedural simulator for training (retraining) flight crews of MC-21-300 passenger aircraft were presented.

The procedural simulator of MC-21-300 had been upgraded including taking into account the results of flight tests.

The central part of the simulator was the unified MC-21 aircraft cabin module. The module enables to form different variants of training devices.

The simulator has the latest versions of consoles and controls design, display and alarm systems of cockpit, upgraded software and hardware system for the visualization of cockpit environment. The simulator touch panels simulating a complete ceiling console is replaced with a full-featured simulator. The special software and mathematical software that simulates operation of aircraft systems has also been updated.

MC-21-300 CERTIFICATION FLIGHTS

Flight test experts of the European Aviation Safety Agency (EASA) completed the second session of the MC-21-300 validation program.

During the certification tests EASA experts evaluated the behavior of MC-21-300 aircraft in various modes at altitudes till 12,000 m. The flights were performed with a large and low take-off weight, in the conditions of front and rear centering. The operation of the integrated aircraft control system in the normal mode has been verified. Testers rated the aircraft's behavior at minimum handling speeds* of take-off and landing, including with an imitation of engine failure.

Yuri Slyusar, President of UAC said: 'The MC-21-300 is undergoing flight tests in order to obtain Russian and European type certificates. The completion of the second session of certification flights by EASA testers is another step in this direction. In parallel, at the Irkutsk Aviation Plant we are expanding the production of MC-21-300 aircraft intended for initial customer's delivery'.

The first session of the certification flights of EASA experts took place in January 2019. In September 2018, EASA test crew completed a special course in theoretical and practical training, as a result of which they obtained permission to fly on MC-21-300 aircraft.

*Minimum handling speed – the minimum speed at which the necessary level of controllability of the aircraft is ensured.

Rostec presented Mi-171A2 and Ka-226T

As part of its joint exposition with the Buryat Republic, Russian Helicopters Holding Company (part of Rostec State Corporation) presented its latest civilian helicopter Mi-171A2 and Ka-226T light-weight multi-purpose helicopter, which are planned to be supplied to India, at the Eastern Economic Forum in Vladivostok.

Earlier, Russian Helicopters and Global Vectra company (India) had signed a contract for the delivery of a Mi-171A2 helicopter, including an option for one more rotorcraft. The helicopter manufactured under this contract and already painted in the livery of the Indian customer was presented at the Eastern Economic Forum. Its delivery to India is scheduled for late 2019 – early 2020.

The Ka-226T helicopter presented at the Forum was a demonstration of the prospects of Russian-Indian industrial cooperation – in accordance with the 2015 intergovernmental agreement, India will be supplied 200 such helicopters, of which 140 will be assembled locally.

'At the Eastern Economic Forum, we showed our Indian colleagues Ka-226T and Mi-171A2 multi-purpose helicopters designed for them. It is worth noting that our partners were well aware of all the advantages of the products of Russian Helicopters Holding Company. In India, Soviet and Russian-made helicopters make up more than 30% of the total fleet of civilian and military rotorcraft registered in the country. Our current projects create a good basis for further development of our cooperation,' said Viktor Kladov, Rostec Director for International Cooperation and Regional Policy.

The EEF also saw the Ka-226T parts and units, which are subject to localized manufacturing in India as part of this project. Last February, Russian Helicopters Holding Company signed agreements on a number of presented units with leading Indian aircraft manufacturers who desired to participate in the project to localize the Ka-226T helicopter production.

'The contract for Mi-171A2 supply to India is a clear demonstration of the fact that our latest civilian rotorcraft is in demand abroad, it is waited for and counted on. The helicopter showcased at the Forum is ready for delivery: we will be able to transfer it to the customer as soon as the certificate for Mi-171A2 is validated in India', noted Andrey Boginsky, Director General of Russian Helicopters Holding Company. 'We also demonstrated the progress of the Russian-Indian Ka-226T project: the Ulan-Ude Aviation Plant has already mastered the manufacture of certain parts and components of the helicopter and is preparing to start its serial production. We are also gradually developing our cooperation with Indian manufacturers in terms of localization, our dialogue with some of them will be continued as part of the Forum. At the Forum, we presented the Ka-226T with folding blades: this model is suitable for operation in marine conditions and for installation on board ships. This option is a good basis for more orders for this rotorcraft.'

Among other products presented at the Forum by the Holding Company was Ka-62 medium transport and passenger helicopter manufactured by Progress AAC named after Nikolai Sazykin. The model was showcased in the Primorsky Krai (Territory) Pavilion as part of 'Streets of the Far East' exhibition. On the verge of the Forum, the Ka-62 prototype took part in the flight program of the MAKS-2019 International Aviation and Space Salon in Zhukovsky.

The Mi-171A2 helicopter is the latest representative of the Mi-8/17 helicopter family. It encapsulates the best features of world famous Mi-8 type rotorcraft. The helicopter is equipped with KBO-17 integrated onboard digital flight and navigation system ('the glass cockpit'), which makes it possible to operate the machine without an engineer on board, thereby reducing its crew to two people. The new engines and supporting system improved the helicopter's flight performance, including its cruising and maximum speed. Depending on the operator needs, Mi-171A2 helicopter can perform search and rescue missions, medical and cargo operations, fight fires or carry passengers day and night, at temperatures from -50°C to + 50°C.

Ka-226T is a twin-engine light class helicopter, designed in coaxial configuration. A unique feature of Ka-226 helicopter is its modular design; it can be assembled with standardized easily removable modules of various configurations carrying special equipment.

The Fifth Eastern Economic Forum was held from September 4 to 6, 2019. During the previous Forum edition, 220 agreements, contracts, memoranda and protocols were signed for the total amount exceeding RUB 3 trillion. The Forum was attended by 6002 delegates and 1357 media representatives from 60 countries.

KA-32 HELICOPTERS FOR FIREFIGHTING

Russian Helicopters Holding Company (part of Rostec State Corporation) has delivered three Ka-32A11BC multipurpose helicopters to Turkey. The machines will be used in firefighting.

In July 2018 contracts were signed with KAAN Air (Turkey) for delivery of three Ka-32A11BC multipurpose helicopters. Currently all three were handed over to the customer. The rotorcraft were purchased primarily for firefighting purposes.

'Ka-32A11BC is the helicopter with the best technical equipment for firefighting missions', noted Andrey Boginskiy, CEO of Russian Helicopters Holding Company. 'This rotorcraft is an admitted leader in its class, and it is capable of solving a wide range of tasks. We are looking forward to further fruitful cooperation with our Turkish partners as far as delivery and after-sales support of helicopters are concerned.'

'Russia has top-tier competence in civil helicopter industry. Depending on the types of tasks and missions, we are ready to deliver a variety of helicopters to our Turkish partners', said Viktor Kladov, Director for International Cooperation and Regional Policy at Rostec. 'Right now Turkey is interested in expanding its fleet of firefighting aircraft, and Rostec intends to continue developing its cooperation with Ankara in this field. We estimate the current Turkish market for this type of helicopters as several dozens of machines.'

The Ka-32A11BC multipurpose helicopter is designed to perform complex firefighting operations, special search-and-rescue and high altitude construction operations, to transport cargo inside the fuselage and on the external sling, to log forest, transport patients and evacuate injured persons.

The co-axial scheme and absence of the tail rotor ensure compactness, high power-to-weight ratio and maneuverability, as well as exceptional controllability of the helicopter. Ka-32A11BC has a high load lifting capacity up to 5 tons of cargo on the external sling. The assigned service life of Ka-32A11BC is extended to 32,000 hours which guarantees lower operating costs.

The firefighting version of Ka-32A11BC can be equipped with various fire extinguishing systems, including Bambi Bucket and Simplex type, as well as a horizontal firefighting system. The helicopter is capable of extinguishing flames on the highest floors of high rise buildings and on oil-and-gas industrial facilities. The Ka-32A11BC has been acknowledged by experts as one of the world's best firefighting helicopters; it is a symbol of the Global Helicopter Firefighting Initiative (GHFI) – a program intended to improve the operating efficiency of specialized firefighting helicopters.

Counting Saigas With the Aid of Kalashnikov Drones

The World Wildlife Fund (WWF) of Russia has summed up the results of saiga accounting in the Astrakhan region and in the Republic of Kalmykia by using ZALA AERO unmanned aerial vehicles manufactured by the Kalashnikov Concern. According to the data obtained, over 5,000 species were recorded in protected areas, which is slightly lower than expert estimates of the last few years.

Within a month after the aerial survey, experts were busy decrypting aerial photographs obtained from UAVs and their analytics. From June 19th to 26th, experts flew over three highly protected natural territories – the main locations of modern saiga habitat: the Black Lands reserve, the Mekletinsky nature reserve in the Republic of Kalmykia and the Stepnoy nature reserve in the Astrakhan region. The results of image processing showed that the recorded saiga population in the surveyed territories amounted to 5150 animals, including 573 (11%) males and 2049 (41%) saiga of the current year of birth.

'Methods previously used for accounting of saiga from vehicles gave a major error in the accounting accuracy, and using small aircraft or old UAV models for aerial surveys scared away animals, which not only complicated their accounting, but could also have a negative effect at certain stages of their life cycle. We are very pleased that the new domestic UAV models manufactured by ZALA AERO allow us to obtain accurate data on the number and distribution of saigas without exerting any negative impact on animals', said Dmitry Dobrynin, head of saiga aerial surveying.

The research results will help scientists not only monitor the dynamics of the number and age and sex structure of the saiga population of the Northwest Caspian Sea, but also optimize the conservation measures in the modern location of the species.

'We plan to carry out work in winter period using the UAVs with infrared equipment at the next stage of developing possible methods for accounting of saiga, we also analyze the possibility of using space images for these purposes,' said Valery Shmunk, director of the Russian Caucasus WWF Russia branch.

A report with detailed accounting results was sent to the Ministry of Natural Resources of Russia, the Black Lands Reserve and the Stepnoy Nature Reserve.

Technologies for Arctic

Concern Radioelectronic Technologies of Rostec State Corporation began a research and development of a microwave installation of a new generation for high-quality pasteurization and disinfection of food and agricultural crops for storage and processing in the Arctic region.

Today, the state is tasked with the effective use and development of the potential of the Arctic zone of the Russian Federation. The implementation of projects in the energy, transport and other spheres in the Arctic will inevitably require the reliable functioning of life support systems, including the creation of food reserves for the population. Currently, imported food products dominate the territories of the Arctic zone. The most acute question is about fresh, biologically high-grade dairy products. Traditional pasteurization of milk even under the most severe conditions does not produce complete disinfection of the product and does not allow to obtain guaranteed quality and purity.

In order to supply biologically safe products from the southern to the northern regions, it is necessary to use effective methods of processing agricultural products. One of the promising innovations is the use of microwave energy as one of the most relevant areas in agriculture.

Microwave processing technology has a number of positive qualities. Among its main advantages – a significant saving of time and energy. It allows to save all nutrients, vitamins and minerals in raw materials. Microwave technology can be successfully used for processing milk, bakery products, dry wines, beer, ham, soft drinks and pre-cooked products.

EASA RECOGNITION

Flight test experts of the European Aviation Safety Agency (EASA) completed the second session of the MC-21-300 validation program. During the certification tests EASA experts evaluated the behavior of MC-21-300 aircraft in various modes at altitudes till 12,000 m. The flights were performed with a large and low take-off weight, in the conditions of front and rear centering.

The operation of the integrated aircraft control system in the normal mode has been verified. Testers rated the aircraft's behavior at minimum handling speeds of take-off and landing, including with an imitation of engine failure.

Yuri Slyusar, President of UAC said: 'The MC-21-300 is undergoing flight tests in order to obtain Russian and European type certificates. The completion of the second session of certification flights by EASA testers is another step in this direction. In parallel, at the Irkutsk Aviation Plant we are expanding the production of MC-21-300 aircraft intended for initial customer's delivery'.

The first session of the certification flights of EASA experts took place in January 2019. In September 2018, EASA test crew completed a special course in theoretical and practical training, as a result of which they obtained permission to fly on MC-21-300 aircraft.

TESTING MI-38

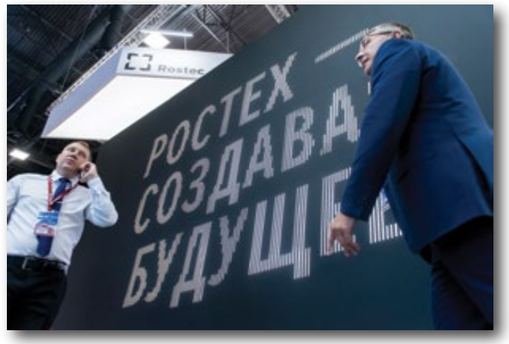
Specialists of the Mil Moscow Helicopter Plant, a subsidiary of the Russian Helicopters holding (part of Rostec) finished a series of Mi-38 flights conducted under the instrument flight rules (IFR), as well as in conditions of extremely high temperature and high altitude. Test results were delivered to the Federal Air Transport Agency Rosaviatsiya to make additions to the helicopter type certificate.

In particular, the helicopter made more than 50 flights in the city of Astrakhan, successfully confirming the possibility to operate at ambient temperatures of up to +45 degrees Celsius. High altitude tests were conducted at Mount Elbrus. The results confirmed the Mi-38's ability to fly in altitudes of up to 3000 meters above sea level. In addition, the helicopter made a series of 50 flights, during which the possibility of piloting and navigation was evaluated in the absence of visual visibility of landmarks and the horizon.

'Considering there's high interest in the helicopter from both Russian and foreign customers, we're trying to test and document the its capabilities to the maximum. In particular, we are planning to test a new surveillance system and certify new hardened main rotor blades (which will also be used in Mi-171A2) in the near future', said the Director General of Russian Helicopters, Andrey Boginsky.

Civilian Order Portfolio Exceeding 78 Billion

The portfolio of civil orders for the radio-electronic cluster (REC) of the Rostec State Corporation in the first half of 2019 reached 78.6 billion rubles. The share of civilian products in the total revenue structure grew to 25 percent, exceeding the figure for the same period of the previous year by 5 percent.



It is expected that the consolidated civilian revenue of REC enterprises is to exceed the mark of 70 billion rubles, according to the results of 2019, which is confirmed by the current contracting levels for civilian products at the level of 95 percent of the annual plan. The primary growth is achieved through the implementation of complex infrastructural projects that include equipping healthcare facilities with medical equipment, introducing smart city technologies in Russian regions.

'The high-tech electronic products sector is growing faster than the economy as a whole. It is logical that the electronic cluster is becoming one of the main growth drivers of the State Corporation. Sales of our civilian products grew by 55 percent and reached 67 billion rubles in 2018. This positive trend continues, the portfolio of civil orders exceeded 78 billion rubles, including a substantial formulated reserve for 2020. The current share of civilian revenue in the sales structure is 25 percent, our targeted benchmark is 60 percent by 2025', said Sergey Sakhnenko, Rostelech industrial director of the electronic cluster.

The total portfolio of cluster orders in the year's first half amounted to 280 billion rubles, including the contracts in the field of state defense orders and exports. The consolidated revenue for the year is projected at more than 300 billion rubles.

Helicopter Engine for Mi-38

The aircraft engine TV7-117V developed by the St. Petersburg-based enterprise UEC Klimov of the United Engine Corporation, which was designed for Mi-38 helicopters, has successfully proved its operability.

During the tests, the engine worked in continuous and alternating icing conditions in all operating modes, at heights of up to 4000 meters, at temperatures as low as minus 30 degrees Celsius.

As a result, confirmation of the possibility of efficient engine operation was obtained. This greatly expands the possibilities of operating helicopters. It is planned to obtain approval of the main modification from the Russian Air Register after completing the documents in the third quarter of 2019.

Testing the aircraft to perform operations under icing conditions is a prerequisite from the point of view of aviation regulations. Icing of an aircraft in clouds greatly affects the design characteristics which were formed by the engineering designers.

The TV7-117V turboshaft engine with a free turbine is designed and mass-produced at the UEC Klimov. The constructive design, electronic systems of automatic control and monitoring with full responsibility of the FADEC type provides high power with low fuel consumption and increased flight reliability. There are no analogues in fuel efficiency and take-off power in this class of engines.

The main technical characteristics of the TV7-117V: power on take-off mode – 2800h.p. (in emergency mode – 3140 h.p.), specific fuel consumption – 205 g / h.p. per hour, dry weight – 435 kg, the assigned life span of the main parts according to the resource management system – 2110 flight cycles.

MAIN TOPIC

FSMTC OF RUSSIA

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

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

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

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

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

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

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

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

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

Major areas of FSMTC of Russia activities shall be:

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

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

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

Record and registration of foreign trade contracts;

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

/RA&MG/

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

RUSSIAN EXPOSITION AT DSE VIETNAM 2019

Rosoboronexport (a Rostec company) is acting as the organiser of the joint Russian exposition at the Defense & Security Expo Vietnam 2019 (DSE Vietnam 2019), to be held at the International Centre for Exhibition in Hanoi, Vietnam on 2-4 October 2019.

'Rosoboronexport sincerely appreciated the show organisers' invitation to participate in DSE 2019 and decided to support the debuting exhibition in Vietnam, which is Russia's key partner in Southeast Asia,' says Director General Alexander Mikheev. 'Military-technical cooperation between the two countries has continued since 1953, and currently covers a broad range of weapons and military equipment. As part of its programme to modernise the national armed forces, Vietnam has become one of the largest customers for Russian-made defence products, and we are happy to say that, despite the growing competition, our weaponry still enjoys a great popularity here.'

The joint Russian exposition at DSE 2019 includes the Rostec companies Rosoboronexport (Stand E71), Uralvagonzavod (Stand E81), NPO Splav (Stand D71) and Scientific Research Institute of Applied Chemistry (Stand D71). The Russian delegation that will take part in the business programme comprises representatives of 12 defence enterprises whose extensive range of products enjoys high demand with Vietnamese and other Southeast Asian armed forces and security agencies. These include Kalashnikov Concern, Russian Helicopters, United Shipbuilding Corporation, Shipbuilding Corporation Ak Bars, Morteplotekhnika Research and Design Institute, Moscow Research Institute Agat, Remdizel, etc.

Security will be one of the key topics at DSE 2019. Rosoboronexport has brought to Hanoi a wide variety of products for armed forces, special services and anti-terrorist agencies. The company's exposition showcases a number of Kalashnikov Concern designs: the Dragunov SVD and SVDS sniper rifles, the KS-K 18.5-mm military shotgun, the Vityaz-SN submachine gun, the Kalashnikov AK-15, AK203 and AK204 assault rifles, and the Kalashnikov Pecheneg assault rifle.

Rosoboronexport is presenting the Tigr and Taifun-K (Typhoon-K) armoured vehicles for special forces, as well as communications systems and close-combat weapons, including with non-lethal munitions.

The exhibition will include a conference on defence and security. At 1400 local time on 3 October, Rosoboronexport will present a report entitled 'Counteracting terrorism: Systems and solutions'. Other Russian participants are also expected to deliver reports at DSE 2019.

Rosoboronexport hopes that the Russian-made examples of weaponry and military equipment intended for all uniformed services will prove of significant interest to foreign delegations. The company and associated manufacturers are prepared to hold exhaustive presentations of their products and discuss cooperation opportunities with potential customers.

Delegations of the Vietnamese and other regional ground forces will have an opportunity to familiarise themselves with best-selling armoured vehicles that have proved their worth in real combat, including the world's most popular tank, the T-90S; the newly designed T-90MS and upgraded T-72 tanks; the BMPT Terminator fire support armoured fighting vehicle; and the BREM-1M armoured recovery vehicle. Also presented at the exhibition are the Iskander-E theatre missile system, the BMP-3 infantry fighting vehicle and the BTR-82A armoured personnel carrier.

Rosoboronexport is presenting a range of naval products in Hanoi: the Gepard 3.9 class frigate, the Project 22160 patrol ship, the Project 21980E special-purpose boat and the Karakurt-E and Sarsar class small missile ships manufactured by Shipbuilding Corporation Ak Bars. The naval exposition also features the UGST deep-water self-homing torpedo designed by Morteplotekhnika Research and Design Institute.

'I am confident that Defense & Security Expo Vietnam 2019 will start a good tradition of arms forums in Vietnam, and that the event will grow to become a leading itnernational defence exhibition,' Alexander Mikheyev notes. 'For Russia, it opens new strategic partnership opportunities for further development of bilateral military-technical cooperation with Vietnam.' /RA&MG/

'Rosoboronexport sincerely appreciated the show organisers' invitation to participate in DSE 2019 and decided to support the debuting exhibition in Vietnam, which is Russia's key partner in Southeast Asia. Military-technical cooperation between the two countries has continued since 1953, and currently covers a broad range of weapons and military equipment. As part of its programme to modernise the national armed forces, Vietnam has become one of the largest customers for Russian-made defence products, and we are happy to say that, despite the growing competition, our weaponry still enjoys a great popularity here.'

Alexander Mikheev

MAJOR CONTRACTS

Rosoboronexport Delivers the First Batch of the S-400 Package to Turkey

The first batch of the S-400 Triumph long-range SAM system, designed by the Almaz-Antey Air and Space Defense Corp., was delivered to Turkey. The contract for the delivery of the S-400 Triumph was signed by Rosoboronexport in Moscow in April 2017. By far it is the largest ever export contract signed with a NATO member.

'Rosoboronexport met the first part of its obligations to the Turkish partners. Since July 12, a total of 30-plus special flights have been provided to carry the first batch of the package to Turkey. Part of Turkey's specialists have already received training in Russia. The rest will be delivered according to the schedule approved by the parties. While we are at this, most of the customer's group of specialists will receive training in maintenance and operation of the system. Today we are negotiating further cooperation in this line to include the option of setting up licensed production of specific elements of the S-400 in Turkey,' – says Rosoboronexport's Director General and cochair of the Russian Engineering Union Alexander Mikheev.

'The S-400 deal has gone a long way in strengthening not only Turkey's air defense, but the strategic partnership between our countries as well. Both countries enjoy full-fledged mutual confidence. Rosoboronexport is resolved to pursue every possible line of cooperation to broaden contacts with Turkey, implementing mutually-beneficial projects in several spheres to include helicopter-building, combat aviation, and air defense,' added the company's head.

> ***'Rosoboronexport met the first part of its obligations to the Turkish partners. Since July 12, a total of 30-plus special flights have been provided to carry the first batch of the package to Turkey. Part of Turkey's specialists have already received training in Russia. The rest will be delivered according to the schedule approved by the parties. While we are at this, most of the customer's group of specialists will receive training in maintenance and operation of the system. Today we are negotiating further cooperation in this line to include the option of setting up licensed production of specific elements of the S-400 in Turkey.'***
>
> *Alexander Mikheev*

> ***'Rosoboronexport already has concrete results of its efforts to promote civilian and service weapons: in 2018, we signed the first export contract for the supply of Russian hunting sniper rifles and ammunition. Today we have new serious customers from the countries of the Asia-Pacific region and the Arab East, there are requisitions from them. Moreover, Rosoboronexport is ready not only to supply finished products to the world market, but also to assist foreign partners in the joint development and production of Russian weapons. For example, in March 2019, a joint venture to produce Kalashnikov assault rifles of the latest AK-200 series was launched in India.'***
>
> *Alexander Mikheev*

The major advantage of the S-400 is its versatility. The system has everything there is to fight all types of aerodynamic threats, as well as ballistic missiles, even mid-range ones. The Triumph is superior to its foreign counterparts in major features several times over. Besides, the system can be integrated into global national AD systems, incorporating elements and components originated in other counties, without compromising its performance.

Besides it during the Army 2019 International Military and Technical Forum being held in Kubinka near Moscow, JSC has signed a number of contracts with foreign customers for the supply of Russian small arms and close combat weapons.

'The Russian industry produces the entire range of close combat weapons, which have proved indispensable in real combat situations, earning excellent reputation and respect around the world. The new contracts not only demonstrate consistently high demand for small arms and grenade launchers and their ammunition being developed by Russian arms makers, but also indicate a global trend towards a growing demand for effective means to counter terrorism and crime. Rosoboronexport is ready to meet this demand fully,' said Alexander Mikheev, Director General of Rosoboronexport.

In addition, Rosoboronexport has been conducting active marketing efforts to export Russian-made civilian and service weapons: dozens of commercial proposals related to the ORSIS T-5000 rifles, Saiga-9, Saiga-12 carbines, many other designs and their ammunition are under consideration by potential foreign buyers. There is also interest among foreign customers in the Vepr carbines and civilian versions of the Tigr sniper rifles. It's because of the high demand that a new section on Russian-made civilian and service weapons has started to be set up by Rosoboronexport on its website.

'Rosoboronexport already has concrete results of its efforts to promote civilian and service weapons: in 2018, we signed the first export contract for the supply of Russian hunting sniper rifles and ammunition. Today we have new serious customers from the countries of the Asia-Pacific region and the Arab East, there are requisitions from them. Moreover, Rosoboronexport is ready not only to supply finished products to the world market, but also to assist foreign partners in the joint development and production of Russian weapons. For example, in March 2019, a joint venture to produce Kalashnikov assault rifles of the latest AK-200 series was launched in India,' the head of Rosoboronexport said.

/RA&MG/

PEACEFUL SKY IS WHAT WE DO

For over 40 years, JSC 'Radiozavod' has been developing control systems and suits for Land Forces air defense units at all levels of command. This unique combination allows to create a fully functional vertical structure of automated AD control at minimal cost, enabling actual integration with operational and strategic level automated control systems, continuity of system, software and interface solutions, as well as control using a single end-to-end path (from the operational and strategic command post to the weapon inclusive).

For many years, this unified Land Forces AD control system has been based on Polyana-D4M1 system being the integrating element of a multicomponent combat information system, functioning on the basis of a suite of radar stations, systems, interacting and subordinate AD forces and equipment, as well as communication means interfacing in space and time in order to ensure efficient command of AD formations and units.

The automated control system of the AD anti-aircraft missile brigade (combined grouping) Polyana-D4M1 is intended for automated command of the central and regional level AD forces and equipment, anti-aircraft missile brigades, mixed groupings of various AA missile systems (suites), such as S-300, Buk, Tor, Tunguska, through the related command posts (CP). It also enables receipt of information from digital radars, coordination and interaction with aviation command posts.

The system is mounted on 4 trucks and includes a combat command post (CCP), a command staff vehicle (CSV), and two mobile power plants.

In its standard configuration, the system provides simultaneous operation with 3 en-route radar data sources, an aircraft or helicopter radar monitoring system, 6 controlled systems (CPs of anti-aircraft missile systems), 4 interacting CPs and the superior command post. The system enables to process for up to 500 aerial targets within an aerial and ground visibility area of up to 1600 km.

The automated control system of the AD anti-aircraft missile brigade (combined grouping) Polyana-D4M1 is intended for automated command of the central and regional level AD forces and equipment, anti-aircraft missile brigades, mixed groupings of various AA missile systems (suites), such as S-300, Buk, Tor, Tunguska, through the related command posts (CP). It also enables receipt of information from digital radars, coordination and interaction with aviation command posts.

On top of the mobile version, Polyana-D4M1 also includes an independent automated workstation (IAWS) which is intended for outfitting fixed command posts of AD forces. This system version was designed for duty in times of peace, control of AD forces and equipment from protected command posts in times of war, and maintaining the service life of mobile automated AD control systems.

On top of the mobile version, Polyana-D4M1 also includes an independent automated workstation which is (IAWS) intended for outfitting fixed command posts of AD forces. This system version was designed for duty in times of peace, control of AD forces and equipment from protected command posts in times of war, and maintaining the service life of mobile automated AD control systems..

At the regiment/division/battery levels, the AD grouping control system can use the unified battery control posts Ranzhir-M1 mounted on KAMAZ vehicle chassis and PU-12M7 mounted on K1SH1 (BTR-80) chassis, which provide for the command of the combat actions of subdivisions armed with anti-aircraft missile and artillery short range systems Tor-M1 (M2E), Osa-AK (AKM), Strela-10M2 (10M3), Tunguska-M1, Shilka, PAAMS Igla-S and storage device ZU-23 using automated control equipment.

In combination with Ranzhir-M1 and PU-12M7, Russian anti-aircraft missile systems can be integrated with one another or with anti-aircraft missile (radio) systems of other countries.

The main functions of the unified battery command posts are:

- coordination of combat actions of controlled systems in their interaction area;
- simultaneous reception, processing, identification and display of aerial situation information from all sources;
- reception, processing and display of target commands, general type commands and commands from the superior command post;
- determining the priority and mapping of targets, target designation;
- performing operational/tactical and information computing functions utilizing a digital terrain map;
- assessment of combat vehicle condition and battle readiness.

To enable fire control for subdivisions equipped with AD artillery and mobile missile systems, with or without the mobile control post PU-12M7, a radio equipment suite can be supplied with:

- the automated control module (ACM) of the platoon/battery commander;
- individual automation suites (IAS) of the anti-aircraft shooter.

The automated control module enables simultaneous information and technical interaction with the superior command posts, radar data source, and controlled systems, with up to 9 individual automation suites.

The individual automation suite provides with information and technical interaction with the superior command post (automated control module of the AA artillery platoon commander).

The radar data processing capability must be provided in order to form a fully functional AD grouping command system. To enable this function, the automated radar data processing post PORI-P2M (2VM) is intended for the acquisition, processing and display of radar information from the interacting controlled facilities can be used. Thus, this product provides a unified source of aerial situation data for automated AD and aviation control systems.

Implementation of an integrated approach to the design of Land Forces AD equipment control systems makes JSC 'Radiozavod' a standing leader in the area of providing state-of-the-art ACS to the military forces. The company develops and manufactures competitive high quality products which were proven not only in Russia, but also abroad, in a tough market environment. /RA&MG/

INTERNATIONAL MILITARY-TECHNICAL FORUM ARMY 2019

ROSOBORONEXPORT: SERVICE WEAPONS FROM A RELIABLE SUPPLIER

On September 17, 2019, in the framework of the research and practice conference, devoted to the 100th anniversary of Mikhail Kalashnikov, JSC Rosoboronexport, part of the Rostec State Corporation, signed an agreement on cooperation and partnership with Non-profit Organization 'M.T. Kalashnikov Union of Russian Gunmakers'. During the Army 2019 International Military-Technical Forum held near Moscow, Russian special arms exporter Rosoboronexport announced the signing of a number of contracts with its partners for the supply of small arms and close combat weapons abroad.

'The Russian industry produces the full range of close combat weapons which have proved their indispensability in actual combat situations, thereby earning reputation and respect in many countries worldwide. The new contracts not only demonstrate strong and steady demand for small arms and grenade launcher weapons and their ammunition produced by Russian arms makers, but also indicate a global trend of increasing demand for effective equipment to counter crime and terrorism. Rosoboronexport is ready to meet this demand in full.'

Alexander Mikheev

'Rosoboronexport already has tangible results of its efforts to promote civilian and service weapons: in 2018, we signed the first export contract for the supply of Russian hunting sniper rifles and ammunition for them,' said Rosoboronexport's Director General Alexander Mikheev at ARMY 2019.

After the adoption of amendments to the Russian Law on Weapons In 2017, Rosoboronexport was granted the right to export civilian weapons, in addition to military-grade ones, to law enforcement and security forces of the partner countries. This created the most comfortable conditions when concluding package supply contracts and enabled the company's partners to acquire the full range of Russian weapons they need from one reliable exporter. Rosoboronexport is actively promoting Russian-made civilian and service weapons on the world market: dozens of commercial offers for the ORSIS T-5000 rifles, Saiga-9 and Saiga-12 carbines, MR-18 shotguns, Viking pistols, many other weapons and their ammunition are under consideration by potential foreign buyers. There is also interest among foreign customers in Vepr carbines, civilian versions of the Tigr sniper rifles.

'The Russian industry produces the full range of close combat weapons which have proved their indispensability in actual combat situations, thereby earning reputation and respect in many countries worldwide. The new contracts not only demonstrate strong and steady demand for small arms and grenade launcher weapons and their ammunition produced by Russian arms makers, but also indicate a global trend of increasing demand for effective equipment to counter crime and terrorism. Rosoboronexport is ready to meet this demand in full,' said Alexander Mikheev.

The signing of the agreement on cooperation and partnership with Non-profit Organization 'M.T. Kalashnikov Union of Russian Gunmakers' aims to increase the volume of exports to the external market of non-military and service

'The market of non-military and service weapons is the new area of our work. Nevertheless, by now Rosoboronexport has already fulfilled one contract on this subject matter and has prepared over 30 commercial offers to partners from 20 countries in the amount of around 2.5 billion roubles. I am confident that by means of our joint efforts with the Union of Russian Gunmakers we will be able to increase considerably the share of Russian products in this fairly concentrated market segment and to support our enterprises.'

Alexander Mikheev

Vepr-12 VPO-205-01 Smoothbore Weapons. Combat Semiautomatic Smoothbore Carbines

VPO-205 is currently one of the most effective tactical smoothbore rifles, capable of accomplishing a wide range of missions facing security services. Its modular design allows tailoring the weapons to the specific needs of the customer, while the availability of special brackets ensures the detachable equipment is mounted in a manner that meets the requirements of the user. The weapon is reliable and demonstrates flawless operation when firing all types of 12 Gauge cartridges. The steel frame patterned after the RPK light machine gun provides the weapon's immunity to deformations, as well as its fault-fee operation in various adverse conditions.

Main characteristics	
Barrel length, mm	570
Caliber	12x76 mm
Sighting range, m, max	100
Full length, mm	1,117
Length, buttstock folded, mm	865
Barrel length, mm	
Empty weight, kg	4.4
Magazine capacity, cartridges	8

SAIGA 9
Self-loading carbine

The Saiga-9 self-loading carbine is a derivative of the PP-19-01 Vityaz-SN submachine gun. Its design utilizes the blowback operation principle. The weapon is fitted with a metal skeletal folding stock, plastic fore grip and a pistol grip. It features an open sight. The carbine has a receiver-mounted Picatinny rail to allow for optical and collimator sights to be installed at user's discretion. A lock has been introduced in the design of the trigger to exclude butt-folded firing.

Main characteristics	
Cartridge	9x19
Effective range, m	min 100 m
Overall length, mm	827
Length, butt folded, mm	589
Barrel length, mm	367
Empty weight, kg	3
Magazine capacity, cartridges	10

Rosoboronexport is actively promoting Russian-made civilian and service weapons on the world market: dozens of commercial offers for the ORSIS T-5000 rifles, Saiga-9 and Saiga-12 carbines, MR-18 shotguns, Viking pistols, many other weapons and their ammunition are under consideration by potential foreign buyers. There is also interest among foreign customers in Vepr carbines, civilian versions of the Tigr sniper rifles.

weapons, as well as cartridges for them. Besides, the agreement shall serve the purpose of better understanding between the main Russian exporter of special products and manufacturing enterprises constituting the Union of Gunmakers on the issues of foreign customers' needs and market trends.

'The market of non-military and service weapons is the new area of our work. Nevertheless, by now Rosoboronexport has already filled one contract on this subject matter and has prepared over 30 commercial offers to partners from 20 countries in the amount of around 2.5 billion roubles. I am confident that by means of our joint efforts with the Union of Russian Gunmakers we will be able to increase considerably the share of Russian products in this fairly concentrated market segment and to support our enterprises,' said Alexander Mikheev, who is also holding position of deputy chairman of the Union of Russia's Machine Builders.

Rosoboronexport undertakes pro-active marketing work in the world market on the issue of exporting non-military and service weapons of Russian production. Potential foreign customers are currently considering commercial offers on various modifications of the Saiga carbines, guns MR-18, MR-135, MR-156, MR-27 and MR-43, Viking pistols developed and produced by the Kalashnikov Concern, part of the Rostec Corporation, rifles ORSIS T-5000M, Vepr carbines, cartridges for them and various accessories. Foreign customers are also explicitly interested in civilian modifications of the Dragunov sniper rifle under the trademark of Tigr.

The practice of the longstanding work of Rosoboronexport shows that the company has all the necessary competencies to export not only military equipment and materiel, but also civilian, as well as dual-use products. The main potential customers for non-military and service weapons are the police and special services of foreign countries, as well as numerous shooting sports and hunting associations.

Rosoboronexport's long-term practice suggests that the company has all the necessary competencies to export not only weapons and military equipment, but also civilian and dual-use products. The main customers of civilian and service weapons are the police, special services of foreign countries, as well as numerous sports and hunting clubs in North and South America. /RA&MG/

GLOBAL MARKET

Rosoboronexport's long-term practice suggests that the company has all the necessary competencies to export not only weapons and military equipment, but also civilian and dual-use products. The main customers of civilian and service weapons are the police, special services of foreign countries, as well as numerous sports and hunting clubs in North and South America.

TIGR 308
Carbine

The Tigr 308, ver. 02, is patterned after the SVD sniper rifle. It has a plastic skeletal butt with a rotatable cheek pad. The fore grip is made of plastic. The receiver has a side rail for optical sights. The weapon features an open sight. The barrel is fitted with a small-size flame suppressor.

Main characteristics	
Cartridge	.308WIN
Effective range, m	Max 300
Overall length, mm	1120 or 1175
Barrel length, mm	565 or 620
Empty weight, kg	3.9
Magazine capacity, cartridges	10

DEFENSE MASTERPIECES

Russian High-Precision Weapons Holding

In February of this year, the High-Precision Weapons Holding (a part of the Rostec Corporation) was celebrated the 10th anniversary of its work on the global market. Years by years 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.

Also every year Holding is increasing deliveries both to the Armed Forces of the Russian Federation and to the foreign market. According to an SIPRI expert, 'the Russian companies ride the ground-swell of boosts in military spending and arms export. Eleven companies from the top 100 list are Russian ones. Their income has increased by a total of 48.4%'. It also can be noted that the 'High-Precision Weapons Holding' belongs to the top 10 world's defensive rankings by an overall production and supply increase rate.

The High-Precision Weapons Holding 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 Shipunov KBP Instrument Design Bureau, the Tula Arms Plant, The Tulatochmash, the Nudelman Precision Engineering Design Bureau, the Kovrov Electromechanical Plant, the V.A.Degtyaryov Plant, the VNII 'Signal' and others. Most of them are national and international leaders in their segments.

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/EM, 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'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.

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.

There is no doubt that the main task of the 'High-Precision Weapons Holding' is to strengthen the defense capability of Russia and to supply the Russian Army with the most modern and the most reliable high-precision weapons. Within the scope of the contract, the holding regularly transmits to the Russian Ministry of Defense the corresponding quantity of planned weapons. Due to the holding, the Russian Army is armed with the best weapons in the world. At the same time, it is important that the holding itself also supplies the same weapon to the world market, where it enjoys consistent success.

Middle East states are always been and remains the most important strategic partner of the High-Precision Weapons Holding. The participation of the holding's enterprises in IDEX-2019 is an important stage of friendly and mutually beneficial cooperation in defence area.

/RA&MG/

High-Precision Weapons Holding' belongs to the top 10 world's defensive rankings by an overall production and supply increase rate.
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.

EXPORT OF THE BEST

From July 31st to August 2nd, a large meeting which was attended by more than 150 participants was held in Rostec with representatives of the State Corporation in foreign countries. Heads of Rostec and a number of holdings, industrial directors, heads of departments of the central office spoke at the meeting. Work with representatives was carried out in the divisions of the Corporation and Rosoboronexport for the purposes of analysis of the 2018 results and setting objectives for the near future. More on the results of the year of the export, plans and capabilities of Rostec in the world – in our material.

Export Beats Records

In 2018, Rosoboronexport delivered products overseas for a record amount of 13.7 billion dollars, the largest for its entire period of existence. A solid portfolio of foreign orders for the Russian military equipment reached the figure of 55 billion dollars. We managed to achieve these indicators in the conditions of an utmost difficult foreign policy situation, the most powerful sanction pressure on the Russian defense industry complex, on the State Corporation and its organizations, as well as unfair competition. The final figures for the supply of Russian military products and an impressive portfolio of orders demonstrate that the efforts of competitors did not lead to significant results. Work of local level representatives of Rostec was of great importance in achieving record results.

'Last year's record results are not the reason to rest on our laurels. There are quite enough problems in the sphere of Russian military-technical cooperation. Firstly, it is settlements with partners. The sanctions caused damage in this regard, although this issue can be resolved, including by converting contracts into national currencies. Secondly, the difficult geopolitical situation does not allow us to count on a sharp increase in military-technical cooperation in the near future', noted on the current situation Sergey Chemezov, General Director of Rostec.

Today, Rostec representatives around the world are doing a great job of finding new markets, but this is a long and laborious process. A possible solution here could be to increase the share of exports of civilian products and technologies from Rostec.

Transition to Civilian Tracks

The State Corporation's development strategy until year 2025 sets ambitious goals of increasing the share of civilian products in total revenue up to 50 percent. This indicator amounted to slightly more than 30 percent according to the results of 2018. Significant increase of the civilian products production which are in demand both in the Russian and foreign markets is to be made in the next five years. Rostec representative offices in foreign countries have an important informational and analytical role in solving this problem.

Their task is to provide the Corporation and its organizations with the required information, data on potential partners and recommendations for entering new markets. It is due to the close and productive cooperation with Rostec representative offices that Corporation organizations will be able to form an effective sales system and competently build service processes for their civilian products. Extensive experience in cooperation with foreign structures through the MTC will help Rostec representatives organize the promotion of Russian civilian products.

The work of representative offices in the most technologically advanced countries of the world has its own peculiarities. It should be aimed primarily at attracting technology and investment in Rostec organizations. It is planned to pay more attention to the promising Asian direction in this matter: India, China, South Korea, Singapore and other countries. Unfortunately, due to the sanctions imposed, cooperation with Western companies in the field of technology transfer and joint Research and Advance Development seems extremely difficult. 'They lose their business opportunities, money and the voluminous Russian market at the same time', added Sergey Chemezov. – But this is the choice of the political leadership of Western countries. I think that is short-sighted.'

Peaceful Products for the Whole World

If Russian weapons are traditionally in high demand all over the world, then in the 'civilian' sphere we have to work more actively. Rostec is a unique conglomerate of defense industry enterprises with great opportunities for diversification of production. The corporation can offer the world community a wide range of civilian products.

For example, the Russian Helicopters holding company introduces new models of civilian helicopters for various purposes on the market. The multi-purpose Ansat and Mi-171A2 vehicles made a demonstration tour in countries of the Southeast Asia in 2018, which resulted in the signing of a number of contracts. The civilian sector of the domestic helicopter industry is actively developing, and the excellent reputation of our military vehicles helps to promote the civilian ones abroad. A lot of work is being done on after-sales service and repair of helicopter equipment on the spot. Such a corresponding center was opened in Peru last year, it is planned to open centers in other countries. The organization of a support system for the entire life cycle of Rostec products abroad is one of the promising areas of the Corporation's development.

The Shvabe holding company offers comprehensive lighting projects Svetly Gorod (Bright city) for the cities, which have been successfully implemented for several years in the regions of Russia. In addition, Shvabe and other Rostec enterprises in cooperation carry out the construction and equipping of medical centers, including the production of modern neonatal equipment. Today, Schwabe medical equipment is supplied to 95 countries.

Another example of the civilian products that can adequately represent the State Corporation in the world are telecommunication equipment and robotics of the Roselectronika holding. The most striking civil project of the holding, implemented in 2018, was the construction of information and telecommunications infrastructure for the Football World Cup. The solutions of Roselectronics ensured the unprecedented quality of television broadcasts and uninterrupted communication for viewers from 220 countries.

KAMAZ heavy load trucks and specialized machinery are also actively exported. The auto giant shipped just over 4 thousand cars and assembly sets of parts in 2018 only. KAMAZ was recognized as the Best Russian Exporter 14 times. PJSC AvtoVAZ does not fall behind KAMAZ and: the export of a passenger car manufacturer in 2018 increased by 57percent compared to the previous year and amounted to about 38 thousand cars. Lada branded cars are sold in 34 countries.

The Rostec strategy is determined up to the year 2025 and involves solving the problem of the State Corporation reaching the level of global players. The development is focused on the production of smart civilian products and their promotion in fast-growing world markets, as traditional markets have already reached maturity. And here the role of Rostec representatives in foreign countries is significant. Using their knowledge, experience and connections, they promote new Russian products for the market, find out the needs of local businesses and government agencies, formulate product requirements and, importantly, service. The development of the export capabilities of the Corporation is mostly in their hands. /RA&MG/

MAIN AEROSPACE BRANDS

Rosoboronexport presented the Russia's latest combat and transport aircraft

Rosoboronexport (part of the Rostec State Corporation) presented the Russia's latest combat and transport aircraft at the MAKS-2019 International Air Show. Rosoboronexport exhibited more than 160 pieces of military hardware mainly for the Air Force and Air Defense Forces. Its large-scale kinetic installation, demonstrating the Su-35 and MiG-35 multipurpose fighters, the Il-76MD-90AE military transport aircraft, the Mi-38 utility helicopter, the Orlan-10E UAV and the Viking SAM system, was a novelty for international defense exhibitions.

'MAKS is a traditional platform for aviation premieres. This year, Rostec's display includes 250+ new models of aircraft, avionics, aircraft engines and airfield equipment, including over 40 items that are being showcased at MAKS for the first time. I am sure these products will attract a lot of attention of our foreign partners,' said Rostec CEO Sergey Chemezov.

The Su-57E fighter (manufactured by KoAAP named after Yuri Gagarin) and the Il-112VE military transport (built by VACM) were centerpieces of the military part of Russia's display at MAKS-2019.

'At MAKS 2019, Russian manufacturers will be unveiling the fifth-generation Su-57E multi-role fighter jet and the Il-112VE light military transport aircraft, the hottest and most anticipated new products of recent years. Rosoboronexport is ready, at the request of foreign partners, to present these aircraft and turn a new page in promoting state-of-the-art aircraft systems in the world market. I'm sure the interest in them will be massive,' said Alexander Mikheev, Rosoboronexport's Director General and Deputy Chairman of the Russian Engineering Union.

The advanced Su-57E fifth-generation fighter jet from Sukhoi (a subsidiary of the United Aircraft Corporation) and the Il-112VE light military transport aircraft from Ilyushin (a subsidiary of the United Aircraft Corporation) have received the necessary export permits and Rosoboronexport has the right to offer them to foreign customers.

The Su-57E is a fifth-generation multi-role aircraft system designed to accomplish a wide range of missions against air, ground and surface targets. It can be used in any weather, day or night, and in a severe jamming environment.

Its main advantages compared with 4th generation aircraft systems are stealth due to a reduced radar and infrared signature, high immunity of both avionics and aircraft armament system, as well as a strong supersonic cruise capability.

At the same time, the latest Russian fighter surpasses 4++ generation aircraft in terms of key properties:

- multi-mission capability;
- automation and AI technologies incorporated into target engagement processes;
- all-azimuth and multiple target capability, the use of long-range precision-guided weapons;
- super-maneuverability.

The set of features of the Su-57E fighter gives it superiority over the fifth generation aircraft available on the market today at a lower life cycle cost. This fact has been recognized by many world experts in weapons and military equipment.

The Il-112VE light military transport aircraft is the export version of the Il-112V developed for the Russian Air Force and intended for the transportation and airdropping of cargo, vehicles, equipment, ammunition and personnel.

The major competitive advantages of the Russian Il-112VE light military transport aircraft are:

During MAKS 2019, Rosoboronexport showed more than 80 product presentations for representatives of foreign customers, including over 50 presentations of Air Force equipment and about 30 ones of Air Defense assets. The full-scale MiG-35, Su-35S, Su-34, Su-30SME, Yak-130, Yak-152 and Su-57 aircraft were demonstrated to partners in the outdoor display area.Scale models of the Yak-130 combat trainer, the Mi-35M transport/attack helicopter, the Mi-28NE attack helicopter, the Ka-52 reconnaissance/attack helicopter, the Ka-31 radar picket helicopter, the Pantsir-S1 air defense missile/gun system, the Buk-M2E and Tor-M2KM SAM systems with modular combat and maintenance assets were on display at Rosoboronexport' stand.

- versatility enabling a wide range of transport missions, including air-dropping of cargo and special forces groups, transportation of personnel with organic weapons, delivery of weapons, ammunition and materiel, casualty evacuation, etc;
- state-of-the-art avionics that makes it possible to perform combat missions day or night, in any weather and in different climatic conditions;
- the dimensions of the cargo compartment of the Il-112VE expand the capabilities for transporting cargo, including self-propelled and non-self-propelled equipment;
- the Il-112VE is equipped with two new higher-power and more fuel-efficient engines, the TV7-117ST, and AV112 propellers controlled by a single automatic control system which increases flight safety and provides high take-off and landing performance allowing the aircraft to be operated from short runways, including unprepared fields;
- on-condition maintenance of the Il-112VE obviates the need for major overhauls, which ensures that the required level of equipment operational readiness is maintained at minimum operating costs within the service life limit of 30,000 flight hours or for 30 years;
- the presence of advanced handling and drop equipment on board the aircraft that allows loading and unloading without the use of additional special equipment;
- compliance with ICAO flight accuracy and safety;
- capability to operate independently, including from unimproved airfields.

As part of MAKS' business program, Rosoboronexport negotiated with more than 40 foreign delegations led by defense ministers, air force and air defense commanders, chiefs of general staffs and their deputies. A number of representatives of the company's partners took part in familiarization flights on the MiG-35, Yak-130 and Su-30SM aircraft, as well as on the Mi-38 medium utility helicopter.

It is important to note another important point: Rosoboronexport JSC has invited 120 delegations from 65 countries to the MAKS 2019 International Air Show.

'Today, MAKS has become the main platform for showcasing new Russian military aircraft. Traditionally, the show serves as a starting point for many important negotiations for the supply of aircraft, helicopters and air defense systems, as well as for joint projects in these areas. 2019 will not be an exception. This year, our partners will be able to see demonstration flights of the Su-57 fifth-generation fighter here for the first time, and Rosoboronexport is ready to hold consultations on its export version, including with the involvement of specialists from the aircraft's developer,' said Rostec CEO Sergey Chemezov.

'At MAKS 2019, we'll unveil the new Ilyushin Il-78MK-90A refueling tanker and the Il-112VE light military transport aircraft, tell about a number of major changes in the upgraded Mi-28NE and Mi-171Sh helicopter versions tailored for special and counter-terrorism operations, and also introduce the latest precision guided air-to-surface weapons,' said Alexander Mikheev, Director General of Rosoboronexport, Deputy Chairman of the Russian Engineering Union.

During MAKS 2019, Rosoboronexport showed more than 80 product presentations for representatives of foreign customers, including over 50 presentations of Air Force equipment and about 30 ones of Air Defense assets. The full-scale MiG-35, Su-35S, Su-34, Su-30SME, Yak-130, Yak-152 and Su-57 aircraft were demonstrated to partners in the outdoor display area.Scale models of the Yak-130 combat trainer, the Mi-35M transport/attack helicopter, the Mi-28NE attack helicopter, the Ka-52 reconnaissance/attack helicopter, the Ka-31 radar picket helicopter, the Pantsir-S1 air defense missile/gun system, the Buk-M2E and Tor-M2KM SAM systems with modular combat and maintenance assets were on display at Rosoboronexport' stand.

As part of MAKS' business program, Rosoboronexport negotiated with more than 40 foreign delegations led by defense ministers, air force and air defense commanders, chiefs of general staffs and their deputies. A number of representatives of the company's partners took part in familiarization flights on the MiG-35, Yak-130 and Su-30SM aircraft, as well as on the Mi-38 medium utility helicopter.

On the sidelines of MAKS 2019, Rosoboronexport signed a cooperation agreement with the Government of the Yaroslavl Region, the regional branch of the Engineering Union of which is supervised by Alexander Mikheev.

'Constructive and trusting relations with Russian defense enterprises and the regions where they operate are critical for Rosoboronexport. Thanks largely to the well-established cooperation and understanding on their part of the importance of arms exports for the development of world-class high technologies in the country and support from the executive branch at all levels, we have managed to deliver abroad more than 800 combat aircraft, including assembly kits for licensed production, more than 1000 military and civil-

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

The advanced Su-57E fifth-generation fighter jet from Sukhoi (a subsidiary of the United Aircraft Corporation) and the Il-112VE light military transport aircraft from Ilyushin (a subsidiary of the United Aircraft Corporation) have received the necessary export permits and Rosoboronexport has the right to offer them to foreign customers.

MAKS 2019

The advanced Su-57E fifth-generation fighter jet from Sukhoi (a subsidiary of the United Aircraft Corporation) and the Il-112VE light military transport aircraft from Ilyushin (a subsidiary of the United Aircraft Corporation) have received the necessary export permits and Rosoboronexport has the right to offer them to foreign customers.

ian helicopters, and air-to-surface weapons totaling over $40 billion, as well as air defense systems worth over $25 billion since the company's establishment in 2000,' added Alexander Mikheev.

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

Rosoboronexport was set up by RF President's Decree as a federal state unitary enterprise tasked to implement the national policy in the area of military-technical cooperation between Russia and foreign countries. Since 1 July 2011 Rosoboronexport has been operating as an open joint stock company. Rosoboronexport operates under the strict supervision of the Russian President, the Russian Government and in full conformity with the UN arms control treaties and the relevant international agreements.

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

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

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

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

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

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

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

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

RUSSIA WILL BE THE STAR OF EURASIA AIRSHOW 2020

Eurasia Airshow 2020 will be held at Antalya International Airport on 22-26 April 2020. The aim of the event is to develop an extremely substantial business volume in commercial and military aviation industries. Furthermore, it is the only aerospace trade show to include flight demonstrations in Turkey.

It is important to underline that Eurasia Airshow has fully targeted the Eurasian market in terms of participants and achieved success in this regard. The Eurasia Airshow 2018 was attended by visitors from 67 countries, from Russia to Qatar, from Iran to UK, from Ukraine to Poland. Worldwide leading companies such as Boeing, Rolls-Royce, Sukhoi, UAC, Antonov, BAE Systems, Rostec, Saab, Qatar Airways, Thales, Honeywell, GE Aviation, Pratt Whitney, Dassault Systems, Goodrich, IRKUT have participated in the Eurasia Airshow 2018. And Turkish Local Industry has been successfully represented by Turkish Airlines, Turkish Aerospace, Aselsan, Havelsan, Alp Havacılık etc. In total 343 companies has contributed.

The Chairman of Capital Exhibition who organize the Eurasia Airshow Hakan Kurt said: 'We had an very succesful edition of Eurasia Airshow in 2018. Also Russian companies got really good deals. Especially for this year. Russia will be the star of the Eurasia Airshow 2020. Depends on the S-400 air defence systems deal and the upcoming fighter deal there will be very efficient deals on the ground (According to the S-400 air defence systems deal and the upcoming fighter deal we can say that there will be very efficient deals settled on the ground)'. Kurt continued: 'Eurasia Airshow will have more innovation, decision maker, delegation and business for their participants'.

Key Figures	Numbers
Countries	67
Company	343
Trade Visitor	27000
Public Visitor	106000
Trade Volume	$15 Billion
Delegation	163
Aircraft on static	81
Flight Demonstration	104
Accredited Media	253
Exhibition Area	410 000 sqm

Source: Eurasia Airshow 2018 Final Report

/RA&MG/

Sergey Kulik

SECURE RESCUE AT ANY HEIGHT

Unique autonomous rescue parachuting back-pack system for emergency escape

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

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

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

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

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

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

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

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

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

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

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

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

New SPARS® escape solution provides the following advantages:

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

The SPARS® General Specifications

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

Actual Landing Impact Loads:

Acceleration directions:

'chest-to-back' – up to 8÷10 g

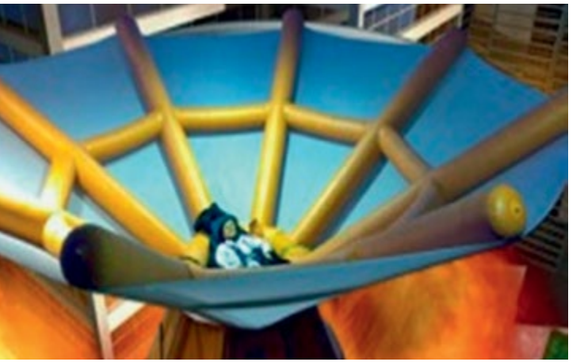
'side-to-side', 'head-to-pelvis' – up to ± 6 g

Acceleration Exposition Time – less than 0.5 s

Acceleration Growth Velocity – less than 500 1/s

User's age – 18÷70 years

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 Patens, 3 Trade Marks) and abroad under PCT (Patent Cooperation Treaty) procedures 2 'umbrella' requests for SPARS® have entered national level in 15 countries and covered 78% skyscrapers and 95% potential SPARS® manufacturers. 13 Patents of the US, China, Japan, Canada, South Korea, Singapore, the Ukraine, Indonesia, Malasia and Australia have been already received.

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

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

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

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

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

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

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

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

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

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

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

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

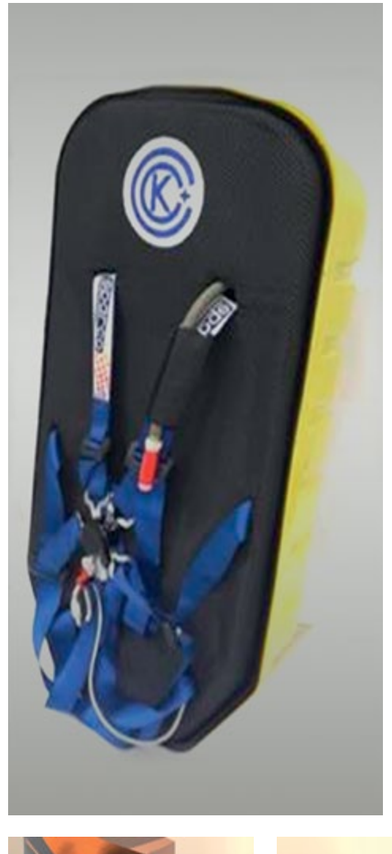
Furthermore, the SPARS® estimated potential market capacity is worth over $3.5 billion in commercial sector alone. The Governments market is bigger but for accepting that new technology implementation it may require some updates of the appropriate local norms and regulations.

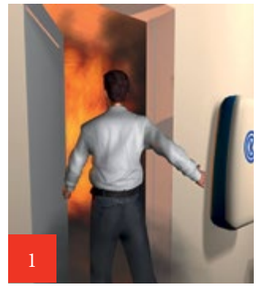
/RA&MG/

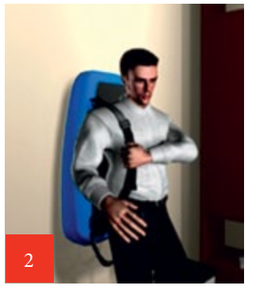
There are following innovations in the proposed SPARS® technology:

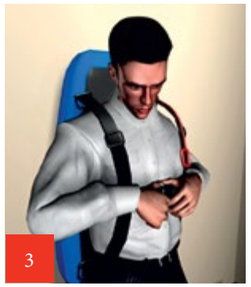
1. A brand new free parachuting technology (means and escape method) was created for emergency escape from heights higher than 50 m where practical methods for safe evacuation of a person are not available on the market.
2. Sinergy solution based on specially designed and produced from film-laminated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

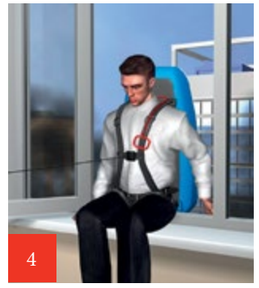
The Special National Standard (GOST) for shock acceleration limits for untrained human using new type of lodgment Rescue Parachuting Systems was issued.
The Crash test dummy Hybrid-III 50% percentile was instrumented, calibrated with the help of centrifuge, certified and used as anthropomorphic instrument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

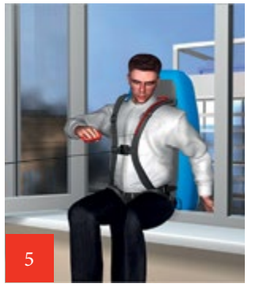












INTERNATIONAL AEROSPACE, MILITARY, NAVY AND TECHNOLOGY GUIDES

In 2019

ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
'RA&MG' №11 (42)	August 27th	**MAKS-2019** (27.08-01.09.2019, Russia, Moscow)
'RA&MG' №12 (43)	September 16th	**AVIATION EXPO CHINA 2019** (18-20.09.2019, China, Beijing)
'RA&MG' №13 (44)	October 01th	**CHINA HELICOPTER EXPO 2019** (10-13.10.2019, China, Tianjin) **SEOUL ADEX 2019** (15-20.10.2019, Korea, Seoul)
'RA&MG' №14 (45)	September 23th	**DSE Vietnam** (02-04.10.2019, Vietnam, Hanoi)
'RA&MG' №15 (46)	October 28th	**BIDEC 2019** (28-30.10.2019, Bahrain, Manama)
'RA&MG' №16 (47)	November 02th	**Defense & Security 2019** (04-07.11.2019, Thailand, Bangkok)
'RA&MG' №17 (48)	November 16th	**Dubai Airshow 2019** (17-21.11.2019, UAE, Dubai)
'RA&MG' №18 (49)	December 08th	**Gulf Defense & Aerospace 2019** (10-12.12.2019, Kuwait, Al Kuwait)

In 2020

ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
'RA&MG' №01 (50)	January 20th	**DEFEXPO INDIA 2020** (05-08.02.2020, India)
'RA&MG' №02 (51)	January 30th	**SINGAPORE AIRSHOW 2020** (11-16.02.2020, Singapore)
'RA&MG' №03 (52)	February 20th	**IADE Tunisia 2020** (04-08.03.2020, Tunisia, Ariana)
'RA&MG' №04 (53)	February 20th	**VIDSE 2020** (04-06.03.2020, Vietnam, Hanoi)
'RA&MG' №05 (54)	March 01th	**DIMDEX 2020** (16-18.03.2020, Qatar, Doha)
'RA&MG' №06 (55)	March 10th	**ArmHiTec 2020** (26-28.03.2020, Armenia, Yerevan)
'RA&MG' №07 (56)	March 15th	**FIDAE 2020** (31.03-05.04.2020, Chile, Santiago)
'RA&MG' №08 (57)	March 15th	**SOFEX 2020** (31.03-02.04.2020, Jordan, Amman)
'RA&MG' №09 (58)	April 05th	**DSA 2020** (20-23.04.2020, Malaysia, K.Lumpur)
'RA&MG' №10 (59)	April 08th	**Eurasia Airshow 2020** (22-26.04.2020, Turkey, Antalya)
'RA&MG' №11 (60)	April 25th	**ILA Berlin Air Show 2020** (13-17.05.2020, Germany, Berlin)
'RA&MG' №12 (61)	May 10th	**HELIRUSSIA 2020** (21-23.05.2020, Russia, Moscow)
'RA&MG' №13 (62)	May 12th	**KADEX-2020** (28-31.05.2020, Kazakhstan, Astana)
'RA&MG' №14 (63)	May 20th	**EUROSATORY-2020** (08-12.06.2020, France, Paris)
'RA&MG' №15 (64)	July 05th	**FARNBOROUGH Airshow 2020** (20-24.07.2020, Great Britain, London)
'RA&MG' №16 (65)	August 10th	**ARMY-2020** (25-30.08.2020, Russia, Moscow)
'RA&MG' №17 (66)	August 20th	**GIDROAVIASALON 2020** (September 2020, Russia, Gelendzhik)
'RA&MG' №18 (67)	August 30th	**ADEX 2020** (08-10.09.2020, Azerbaijan, Baku)
'RA&MG' №19 (68)	September 01th	**Africa Aerospace and Defence 2020** (16-20.09.2020, South Africa, Pretoria)
'RA&MG' №20 (69)	September 10th	**ADAS 2020** (23-25.09.2020, Philippines, Manila)
'RA&MG' №21 (70)	September 15th	**Istanbul Airshow 2020** (24-27.09.2020, Turkey, Istanbul)
'RA&MG' №22 (71)	October 05th	**EURONAVAL 2020** (20-23.10.2020, France, Paris)
'RA&MG' №23 (72)	October 20th	**INDO DEFENCE 2020** (04-07.11.2020, Indonesia, Jakarta)
'RA&MG' №24 (73)	October 25th	**Airshow China 2020** (10-15.11.2020, Zhuhai, China)
'RA&MG' №25 (74)	November 02th	**BIAS 2020** (18-20.11.2020, Bahrain, Manama)
'RA&MG' №26 (75)	November 10th	**IDEAS 2020** (24-27.11.2020, Pakistan, Karachi)
'RA&MG' №27 (76)	November 25th	**EDEX 2020** (07-10.12.2020, Egypt, Cairo)
'RA&MG' №28 (77)	November 30th	**Expo Naval 2020** (December 2020, Chile, Valparaiso)

HIGH-PRECISION WEAPONS

JSC ‘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.

‘High-Precision Weapons‘
Kievskaya str., 7, 121059,
Moscow, Russia

Tel: +7 (495) 981-92-77
Fax: +7 (495) 981-92-78
http://www.npovk.ru