RUSSIAN AVIATION & MILITARY GUIDE

Special analytical export project of Industrial Weekly

№ 04 (22), May 2018

FSMTC of Russia
Solutions for a wide range of tasks

Rosoboronexport
Exclusive state intermediary agency

Best weapons
Russian holding creates innovative arms

World exclusive
Unique system for rescue from any height

Defense innovations for the Middle East countries

SOFEX JORDAN
SPECIAL PARTNERSHIP

Russian Aviation Military Guide

#4 (22) May, 2018

'Industrial Weekly' special export project

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

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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

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EDITORIAL

Presumption of Security

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 secure people's safety, rivalry among sellers of weapons and defense systems increases in order to achieve such goals as increasing profits and market share. SOFEX-2018 presents in Jordan the best weapons and innovations for global security, which are the undisputed world leaders on price and quality in their segments.

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

Taking part in SOFEX-2018 Russia continues the policy of open partnership with the countries of the Middle East. Russia has a wide product line that meets all the needs of defense in this region.

Valeriy Stolnikov

SHOOTING AND TRAINING CENTER IN VLADIVOSTOK

SIBER Holding, Chinese DeWe Group and Far East Agency for investment attraction and export support, which is an autonomous non-profit organization, signed a memorandum on the construction of a shooting and training center in Vladivostok. They plan to develop the facility to become a tourist cluster in future. The center will use small weapons produced by the manufacturers affiliated to Rostec State Corporation like Kalashnikov Concern, High-Precision Complexes Science-cum- Production Association and Tula Arms Plant. A cluster to come into being on the basis of the center will cater for tourists, in particular, from China, who will be able to practice at the fire range and take part in paramilitary events of technical character. As the SIBER press service informed, the newly created shooting center will be an important supplement to the Primorskoye Koltso (Primorye Ring) entertainment and sports cluster, which is going to be built in the near future.

FOR A PROSPECTIVE AIRCRAFT

Holding Technodinamika has developped high-speed synchronous generators GSR-90/120 prototypes for a prospective aircraft with a hire electric power consumption feature. 'The serial production of generators like GSR-90/120 will significantly contribute to the reduction of the Russian aircraft industry dependence on foreign components,' said Igor Nasenkov, Technodinamika General Manager. 'In the long run, such power plants may be installed on a wide range of aircraft, from MC-21 and wide-body long-haul liners in civil aviation to transport aircraft.' Currently, Technodinamika is completing the GSR-90/120 prototypes preparation for full-scale testing, including functional, mechanical and thermal tests. A distinctive feature of the generator is the possibility of its use on board an aircraft without a constant speed drive in a range from 10800 to 24000 rpm.

THE CONFIGURATION OF HELICOPTER

The Indian party has approved the configuration of Ka-226T light-weight multi-purpose helicopter designed by Russian Helicopters (a member of the Rostec State Corporation). The helicopter is expected to be assembled by a joint enterprise Indo-Russian Helicopters Limited in India. As noted by Andrey Boginsky, General Director of Russian Helicopters, approval of the helicopter's appearance means that the technical aspects of the project have already been agreed upon. 'The Indian party has declared one's readiness to issue RFP for the supply of 200 helicopters, following which we can start preparing contract documents,' he added.

Gold and global brand BelOMA

Products under the Belarusian brand BelOMA are very well known throughout the world, in that region and in the countries of the Middle East. The history of the Belarusian Optical and Mechanical Association (BelOMA) springs from foundation of the Minsk Mechanical Works named after S.I. Vavilov (MMW) in 1957 (the first products – cameras and the machines for optical instruments and devices processing).

In view of expansion of production volume and nomenclature of the products being manufactured, in 1971 the Belarusian Optical and Mechanical Association has been founded on the basis of the MMW named after S.I. Vavilov. BelOMA held the leading position in the optical branch of the USSR and solved the tasks on development and production of special-purpose items and the consumer goods. The plants which were parts of the Association specialized in production of particular kinds of products:

BelOMA has been awarded with the Order of the Red Banner of Labour, 228 workers, experts and employees have been awarded with medals and orders of the USSR, 28 experts have been awarded with the ranks of the Laureates of the State Awards of BSSR and the USSR, 2 Laureates of the Lenin Awards, 3 employees have been awarded with the ranks of the Heroes of Socialist Labour.

BelOMA has also been awarded with 'Gold Globe' prize and Diploma – for the outstanding contribution to development of the national economy and integration into world economy, 'Birmingham Torch' prize and Diploma – for success in survival and development under difficult conditions, other prizes.

In 2009 the enterprises which were the parts of BelOMA have been reorganized into public corporations (Zenit-BelOMA Public Corporation, Diaprojector Rogachev Plant Public Corporation, Svet Zhlobin Factory Public Corporation).

At present, in spite of universality and multiproduct character of production, BelOMO as before is the Company famous for its specialization – production of laser, optoelectronic and optical-and-mechanical systems and devices. The Company manufactures sights, binoculars, night vision devices and many other products of special destination. The innovation project of BelOMO Holding – production of domestic thermal imaging devices.

High quality, reliability, technological efficiency, durability and ease of exploitation were always the attributes of the products of BelOMO Holding. The products completely correspond to the national and international standards requirements. This means that also in the future BelOMO Holding can work with expansion of the assortment of the products being manufactured and their active sales promotion in the world markets.

High-Tech Equipment for the Asia Market

Being a State Corporation Rostec affiliate, the holding company Shvabe has concluded a trilateral agreement on cooperation in the field of promoting national high tech in the Southeast Asia market. The agreement was signed by the Shvabe holding, Singapore company Progression Pte. Ltd. and Russia-Singapore Business Council (RSBC).

The signing of the agreement took place in the framework of the annual business forum 'Russia-Singapore Business Dialogue'. The parties agreed on cooperating and interacting with the Center for Promoting Russian high-tech companies overseas and Presenting investment projects founded on the basis of Progression Pte. Ltd. State Corporation Rostec took part in the Russian-Singapore Business Dialogue forum as a general partner. The Russian delegation was headed by Nikolai Volobuev, Rostec Deputy General Manager and Alexey Gruzdev, Deputy Minister for Economic Development.

It is worth noting that Rostec-supported Russian-Singapore Business Council founded in 2017 in Singapore a Center for Promoting of Russian Technologies overseas and presenting investment projects. It was inaugurated in December 2017 during Rostec General Manager Sergei Chemezov's visit to Singapore. As of 2018, three cluster expositions with the participation of Schwabe in the Pharmaceuticals and Medicine section are to be organized on the center site. They will be accessible to the public in April, May and from August through October.

The holding delegation also took part in the plenary session of the Russian-Singapore Business Dialogue forum dedicated to the Russia - Singapore interaction in the field of innovation and digital technologies pertaining to healthcare, smart city management, investment cooperation of countries and other topics.

ANNIVERSARY OF THE CSTO JOINT STAFF

On 28 April 2018 there was celebrated the 15th anniversary of foundation of the Joint Staff of the Collective Security Treaty Organisation. The CSTO Joint Staff, being a permanent working body of the Organisation, is responsible for drafting proposals relating to the military component of the CSTO.

The CSTO Joint Staff is tasked with the formation, operation and employment of the CSTO Collective Forces (Troops), the preparation and holding jointly with the defence departments of the Organization member states of joint operational and combat training events, military technical cooperation, coordination of joint training of personnel and specialists for the Armed Forces of the CSTO member states. The CSTO Joint Staff made a great contribution to the development of normative legal documents aimed at creating and developing all components of the collective security system.

For 15 years, the CSTO Joint Staff has played an organizational and coordinating role in forming the Collective Rapid Reaction Force (CRRF), Collective Rapid Deployment Force (CRDF), Peacekeeping Force (PKF) and Collective Aviation Force (CAF). The total strength of the multilateral CSTO Collective forces is over 26,000 servicemen.

Since 1 January 2018, the CSTO Joint Staff has been operating with the new staff list. The principle of coalition guidance has been implemented. The Chief of the Joint Staff is appointed from the Russian Federation. Three Deputy Chiefs of the Joint Staff and two Chiefs of its Directorates are appointed from the Republic of Armenia, Republic of Belarus, Republic of Kazakhstan, Kyrgyz Republic and Republic of Tajikistan. The new staff list includes specialists of the Arms and Special Troops, including the Aviation, Air Defence, Reconnaissance, Signal Communications, RChBD, Engineer Troops, EW and Topographic Services.

BEST PILOTS AND AIRPLANES

Young crews of MiG-31 fighters, the naval aviation of the Pacific Fleet, completed the first flight in the clouds in Kamchatka. In Kamchatka, the planned training of young fighter pilots of a separate composite regiment of naval aviation of the Pacific Fleet for combat alert on air defense continues. Crews of MiG-31 high-altitude fighter aircraft conducted flights in the clouds in the conditions of the snow cyclone that came to the peninsula. In difficult weather conditions, in the daytime and at night, the pilots practiced pilotage of instrumental control in limited visibility, take-off and landing at low clouds and collaborative experience.

India's MoD Delegation in Russia

The delegation of India's Ministry of Defense (MoD), led by Mr. Apurva Chandra, Director General Acquisition of the Ministry of Defense of India, visited the industrial site of Izhevsk-based Kalashnikov Group, Rostec's member. The guests were given a tour of the production facility, demonstrating the modern manufacture of Kalashnikov assault rifles of various modifications. Besides, they were given the opportunity to test numerous Kalashnikov's weapons on a range.

'India's military, like the rest of the world, knows Kalashnikow's legendary designs perfectly well. Today gave us the opportunity to see the entire production cycle and test assault rifles ourselves. What we have witnessed proves the plant's capacity to provide uninterrupted production of hi-tech equipment in quantity. While assembly of the latest AKs has already gone in full swing, we saw good potential for future growth and transition to production of state-of-the-art designs in the future,' noted Mr. Apurva Chandra after examining Kalashnikov's operation lines.

Being consistent with all requirements, which one would expect a modern weapon to meet, the AKs exported today are the most advanced production modifications of the AKs. Apart from supply of end products, Rosoboronexport assists in starting their licensed manufacturing at foreign customers' sites. Every year, Asian and Latin American states supported by Rosoboronexport manufacture dozens of thousands of licensed copies of Kalashnikovs.

'We are ready to help India construct a facility similar to what the Mr. Apurva Chandra-led delegation saw today to produce modern weapons and future Kalashnikov's designs. Rosoboronexport has substantial expertise to accommodate needs of our partner. Russia's special arms exporter can cooperate with any state or private facility in India subject to the country's Ministry of Defense choice,' said Director General Alexandr Mikheev of Rosoboronexport.

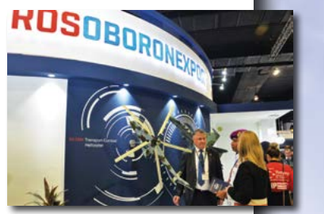
'The Kalashnikov Group demonstrated to our Indian partners capabilities of our revamped operation, its effectiveness, flexibility, and capacity to take up production of cutting-edge equipment in almost no time, as well as boost the production rate, provided more orders come into our hands. We have made emphasis on providing at a moment's notice transfer of technologies essential for production of our weapons to any defense facility in India. We hope that the issue of setting up production of Kalashnikov assault rifles gives way to specific solutions in the near future for us to take up implementing our mutually beneficial intentions,' added Deputy Director General Arkady Privalov of the Kalashnikov Group.

Assistance in starting production of Russian-made military equipment abroad is one of the main lines of business of Rostec's Rosoboronexport.

During his official visit to Russia Mr. Apurva Chandra, Director General Acquisition of the Ministry of Defense of India, went to various industrial facilities and held a number of talks on future projects paving the way for broader cooperation. The Indian delegation saw the National Helicopter Building Center in Moscow, Yantar Baltic Shipyard in Kaliningrad, Almaz-Antey AD Group in St. Petersburg, and Aviastar-SP (Ulyanovsk-based Ilyushin Aviation Complex).

Interest of DSA-2018

Rosoboronexport at Russia's joint exposition at DSA 2018 (Malaysia) showed military equipment, developed and manufactured by Russian defense enterprises for South-East Asia. Specialists believe that one of the most promising export future are the Su-family of multirole supermaneuverable fighters, namely Su-35 and Su-30MKM, as well as MiG-29M multirole tactical fighter, and Yak-130 combat-trainer.



Besides, South-East Asia presents one of major opportunities for the growth of export of Russian helicopters. Under the circumstances Rosoboronexport put on display at DSA-2018 all types of helicopters, which are tailored for operations in complex climatic conditions and superior to their opponents in terms of cost-effectiveness. As always, customers' interest was piqued by the Mi-171Sh and Mi-17V-5 transports, as well as Mi-35 gunship with troop carrying capacity due to their versatility, unique capabilities, unsurpassed by their contenders, and ability to operate in tropics and hard-to-reach mountainous areas notorious for height and air temperature fluctuation.

Russia's Ka-226T light utility helicopter and Mi-28NE attack helicopter, also brought to DSA 2018, owe their considerable export potential in the region to their high combat and operational performance. Foreign delegations at exhibition also showed high interest to naval, army and air defense equipment, particularly to the Pantsir-S1 gun and missile system Igla-S MANPADS.

TWO SHIP-BASED KA-226T

Kumertau Aviation Production Enterprise (KumAPE) of Russian Helicopters Holding Company (part of Rostec State Corporation) delivered another two ship-based Ka-226T rotorcraft to the customer, thus completing contract execution ahead of schedule. The helicopters successfully accomplished the entirety of acceptance tests and are to join the special-purpose state aviation fleet shortly.

The current delivery is the third in line: at the end of March 2017, KumAPE hosted a ceremonial handover of the first two ship-based Ka-226T with another two helicopters delivered in December 2017.

'The enterprise's contractual obligations have been fulfilled in advance, and four rotorcraft delivered earlier are already inducted into the special-purpose aviation. Ka-226T has demonstrated an excellent performance in challenging sea conditions. I am sure that such experience will boost the demand for this helicopter both in Russia and abroad,' highlighted Andrey Boginskiy, Director General of Russian Helicopters Holding Company.

As distinct from the 'land-based' version, light utility ship-based Ka-226T helicopter features a blade folding system of the main rotor. Moreover, the helicopter boasts the state-of-the-art avionics suite, its components and systems are fit for operation under aggressive conditions of marine environment. Owing to its small dimensions, the helicopter can be deployed on ships and low-displacement vessels. Ship-based Ka-226T helicopter is intended for performing search and rescue and transport missions round-the-clock in standard or adverse weather.

COOPERATION AGREEMENT

The Roscongress Foundation and Moscow State Institute of International Relations (University) under the Ministry of Foreign Affairs of the Russian Federation have concluded an agreement on cooperation. The document was signed by Roscongress Foundation CEO Alexander Stuglev and Moscow State Institute of International Relations Vice Rector Artem Malgin. The parties agreed to cooperate in order to ensure the highest-level preparation and holding of congress, exhibition, and social events in Russia and abroad, involving Moscow State Institute of International Relations. Cooperation will consist of bilateral and multilateral consultations, webinars, forums, roundtables, seminars, conferences, joint projects and initiatives, youth projects, as well as conducting practice-oriented studies on areas of joint activities.

Tecmash in 2017

Tecmash Concern has summed up the results for 2017. More than 40 military-cum-technical cooperation contracts were fulfilled and a 45% increase in civilian production output was recorded during the reporting period.

For instance, the Concern delivered all the main targets under the State Defense Order, fulfilled more than 40 military-cum-technical cooperation contracts, and decreased the number of toxic assets almost by half. Eight federal target programs and ten restructuring projects have also been completed in 2017.

The annual volume of civilian goods production went up by 45%. It was RUR 11.2 billion last year against RUR 7.7 billion in 2016. New civilian products including drilling equipment and refrigerators, have been designed and put into batch production by the holding facilities as part of the Rostec overall strategy implying a 50%, increase of civilian products share by 2025.

Science-cum-production Concern Tecmash was founded by the Rostec State Corporation in 2011. The Tecmash holding structure includes 36 enterprises of the ammunition industry. Highly effective models of military hardware manufactured by the Tecmash holding are used in more than 100 countries around the world.

The scope of the Concern affiliates civilian production encompasses the fossil and power production complex equipment, industrial and medical refrigeration equipment, agricultural machinery and consumer goods.

Light Aircraft TVS-2DTS

The Rostec State Corporation launches manufacturing of TVS-2DTS light aircraft at the facilities of the Ulan-Ude Aviation Plant (U-UAZ), a member of the Russian Helicopters holding company. The aircraft will be utilised for regional passenger operations, initially – in Siberia and the Russian Far East where a new airline company will be established for these purposes.

The agreement on local airline operations was signed during the Russian Investment Forum in Sochi by the Ministry of Industry and Trade of the Russian Federation, the Ministry of Transport of the Russian Federation, representatives of the Republic of Buryatia and the Sakha Republic (Yakutia), as well as the Russian Helicopters holding company. According to the agreement, new TVS-2DTS aircraft manufacturing facilities will be built at U-UAZ by 2019. During the period of 2021-2025, the plant agrees to supply at least 200 vehicles for regional aviation.

TVS-2DTS is a lightweight multipurpose aircraft with an all-composite structure. It is equipped with an avionics system allowing to operate it during any time of day or night and in any weather conditions. Another advantage of the aircraft is that it does not require any special take-off or landing site. Its cruising speed reaches 350 km/h, load-lifting capacity – 3.5 tons, and the maximum flying range is 4,500 km.

TVS-2DTS aircraft will replace the obsolete An-2 aircraft built in USSR and abroad that are still massively used by regional airline operators. The vehicle was first demonstrated by the Rostec State Corporation at the MAKS Air Show in 2017.

RUSSIA-INDIA: MILITARY-TECHNICAL COOPERATION

The Russian Foreign Ministry's press center hosted presentation of a photo book titled Russia-India: Milestones of Military-Technical Cooperation. The event was organized jointly by the Russian Foreign Ministry and JSC Rosoboronexport, part of the Rostec State Corporation.

The event was attended by Sergey Goreslavsky, Deputy Director General of Rosoboronexport, Yury Kaptelkin, Director of the Office of the Company's Director General, Ambassador Extraordinary and Plenipotentiary of the Republic of India to Russia Pankaj Saran, as well as representatives of the Russian Foreign Ministry, Russia's Federal Service of Military-Technical Cooperation, Rostec State Corporation, and Russian defense enterprises involved in military-technical cooperation.

'The history of military-technical cooperation between Russia and India, which dates back almost six decades, is most clearly and exhaustively presented in the book. This cooperation began with a modest episode concerning a donation of two Il-14S aircraft in the de-luxe version by the head of the Soviet state to the Indian government. It has steadily evolved and today, within the framework of the strategic partnership between the two countries, shows the widest variety of the forms and types of relations: supply of military and dual-use products, joint ventures, licensed production of arms and military equipment, as well as joint R&D efforts on advanced weapons,' said Sergey Goreslavsky. The photo book was prepared under the sponsorship of Rosoboronexport and with the assistance of the Company's employees, whose professional activities have been intrinsically associated with India for dozens of years. It includes previously unpublished photos of bilateral meetings and negotiations, including summits, ceremonies for the transfer of military equipment, its operation, joint exercises, and many others. Two hundred thirty pages of a peculiar photo record encompass the entire period of Russian-Indian military-technical cooperation. The text of the book tells about the formation, development and current status of the partnership between the two countries.

Development of the CR929 program

CRAIC, the joint venture of United Aircraft Corporation (UAC) and Commercial Aircraft Corporation of China (COMAC), has officially announced the commencement of Joint Concept Definition Phase (JCDP) within the program of CR929 aircraft development.

CRAIC General Manager Mr. Guo Bozhi emphasized that the formal commencement of JCDP was of great significance to promote the deep participation of potential suppliers in product definition, optimize airborne systems and aircraft technical concepts.

JCDP stage shall allow China and Russia joint team, together with key worldwide potential suppliers within JCDP phase of CR929 program, to perform a more thorough review of requirements to the main airborne systems: Propulsion System, Landing Gear, Environmental Control System, Avionics and others.

Chief CR929 Program Designer from Russian side Maxim Litvinov explained that this stage shall foresee more detailed analysis of technical aspect with regards to RFP Working Packages that are planned to be released by the end of 2018.

JCDP includes RFP stage during which airframer requests proposals from potential suppliers of the systems and equipments.

JCDP stage within CR929 Program doesn't include interaction in relation to the power propulsion system. As for this system, RFPs to the potential suppliers of long range wide body aircraft program were sent in December 2017 and the answer to such requests is expected to be received by the end of this May.

Completion of RFP-related procedures within the Chinese-Russian long range wide body aircraft program is expected at the end of 2019.

Rosoboronexport in 2018

JSC Rosoboronexport (part of the Rostec State Corporation) will make active exhibition efforts in 2018 to expand the reach of Russian defense manufacturers' displays. 'We consider participation in international defense exhibitions as one of the key areas of the Company's marketing activities. In 2018, our delegations will visit 23 events in various regions of the world. Particular attention will be paid to the most promising markets such as the Asia Pacific region, the Middle East and Latin America,' said Alexander Mikheev, Director General of Rosoboronexport.

The Company will organize joint Russian displays and will also present its stands at five venues in the Asia Pacific region and in three Middle Eastern states. In addition, there are plans to participate in three exhibitions to be held on the territory of the CIS countries, two European countries, and also in the South African Republic.

'Clearly, the exhibitions held in Russia continue to be priority and probably most productive for us. This year, Rosoboronexport traditionally organizes its displays at the Army Forum, International Helicopter Industry Exhibition (HeliRussia 2018), Interpolitex and will exhibit its promoted products at the International Far East Naval Salon 2018 in Vladivostok for the first time,' said Alexander Mikheev.

Rosoboronexport is continuously working to promote military-technical cooperation with new partner countries and increase its presence in various regions of the world. To meet these challenges, the Company makes its debut at new exhibition platforms.

'To strengthen our military-technical cooperation with the Philippines that received a major boost in 2017, we will for the first time organize a Russian display at the Asian Defense & Security (ADAS) 2018 Exhibition and Conference, to be held in September in Manila. I am confident that our participation will strengthen Russia's position on the highly competitive Asian and Pacific arms market,' added the head of Rosoboronexport.

Rosoboronexport is the only state-owned arms trade company in the Russian Federation authorized to export the full range of military and dual-purpose products, technologies and services. It is a subsidiary of the Rostec Corporation. Founded on 4 November, 2000, now Rosoboronexport is one of the leading world arms exporters to the international market. Its share in Russia's military exports exceeds 85 percent. Rosoboronexport cooperates with more than 700 enterprises and organizations in the Russian defence industrial complex. Russia maintains military technical cooperation with more than 70 countries around the world.

FIDAE 2018

JSC Rosoboronexport (part of the Rostec State Corporation) was organizing the Russian exhibit at the International Air and Space Fair FIDAE 2018 (April 3-8? Santiago, Chili). The official Russian delegation at the show was headed by Deputy Director of the Federal Service on Military and Technical Cooperation Anatoly Punchuk. Rosoboronexport's Deputy Head of the Department on Defence Technologies and Space Stanislav Andrukovsky was appointed the head of the combined delegation of the Rostec State Corporation and the special exporter.

'Rosoboronexport is considering the Latin American region as one of the most important and promising for the development of military and technical cooperation. Currently we are interacting on different projects related to all the services and branches of the armed forces, including our active cooperation on the modernization and re-equipment of the regional countries' air forces. The models of the aviation equipment, offered to the customers, have competitive combat, functional and operational features and characteristics, and are fully adapted for the use in the climatic conditions of the Latin American countries,' said Stanislav Andrukovsky.

Among the displayed items, the most promising for the Latin American market are the multipurpose Su-30 fighters of different modifications, multifunction MiG-29M/M2 fighters, (combat) trainers Yak-130, combat helicopters Mi-28NE, combat attack and reconnaissance helicopters Ka-52, multipurpose Mi-17 type helicopters as well as light multirole choppers 'Ansat' and 'Ka-226T'. The great demand for the modern Russian combat planes is justified by their high airworthiness, technical and tactical characteristics as well as combat capabilities to perform different missions.

The popularity of the Mi-17 type helicopters is determined mostly by their multi-functionality, high transportation performance, outperforming competitors, and enhanced survivability. Many Latin American counties have already tested the efficiency of these helicopters in hard-to-reach mountainous areas with rapid changes of heights and atmospheric temperatures, as well as in dusty conditions without any reductions in the operational life of the main assemblies.

'An extensive business program is planned for the period of the exhibition, which includes meetings with representatives of the different region's countries to discuss promising areas in the area of space technology and outer space infrastructure,' added Stanislav Andrukovsky.

TV7-117ST: premier at MFD-2018

In Moscow at the III International Forum of Engine Building (MFD-2018) the United Engine Corporation first time was demonstrated a full-scale specimen of the state-of-the-art TV7-117ST engine for the Il-114-300 airliner.

TV7-117ST is a base engine for the power unit of advanced Il-112V light military transport aircraft, and the civilian modification of the engine, TV7-117ST-01, will become the operational engine for the Il-114-300 regional passenger-carrying aircraft whose commercial output is to be revived in Russia. TV7-117ST-01 engine will also be certified as per the civilian standards.

More powerful as compared to the previous modification TV7-117SM, TV7-117ST-01 will increase the capacity of Il-114-300 and reduce the run time of the aircraft. Operation of the unified engine on the Il-112V and Il-114-300 aircraft will enable a reduction of production costs and will become an example of military technology transfer to the civilian sector.

Bench tests of TV7-117ST on an advanced test bench of UEC-Klimov started in September 2016. A year later, in September 2017, UEC commenced the flight tests of the power unit onboard of the Il-76LL flying laboratory. The first stage was completed in December 2017. As a result, the TV7-117ST engine and the AV-112 propeller were cleared for the first flight of Il-112V.

TV7-117ST engines are entirely made of Russian parts, units and assemblies. They are jointly manufactured by a variety of UEC enterprises.

It should be recalled that the import substitution programme for manufacturing of TV3-117/VK-2500 helicopter engines designed for most Mi and Ka helicopters has been successfully implemented at UEC-Klimov since 2014. In 2015, commercial output of the VK-2500 engines was launched in Russia.

After-sales service for military equipment

Rosoboronexport (part of the Rostec State Corporation) has discussed the issues of modernization and development of the technical readiness provision system for the military equipment supplied to foreign customers. The theme of the after-sales service of materiel was discussed at the meeting of the 'Equipment and weapons of the land forces' panel of the Science and Engineering Board of the 'Oreltechmach' public company, a part of the 'Proekt-Technika' Corporation.

'The present-day market of weapons and military equipment specifies very stringent requirements to the military products as far as the support of their technical and combat readiness for the complete lifecycle is concerned. This results in the desire of foreign customers to conclude total package procurement contracts, which clearly determine supplier's and customer's obligations on the after-sales service of purchased military equipment for the whole operating life. Rosoboronexport takes into account this trend in the global arms market and constantly develops its capabilities in relation to the offered products and services', said Rosoboronexport's Deputy Director Igor Sevastianov.

In the past several years the after-sales service of the exported military products has become a very important factor to provide a competitive ability, to which much attention is now paid both by the foreign customers and suppliers of those products. Rosoboronexport's experience in the area of foreign trade activities shows that the requirements of company's partners to the provision of successful and effective use of weapons and materiel are increasing.

Besides, Rosoboronexport is interested in the rise of attractiveness and effectiveness of the after-sale service of supplied products as fine-tuned business processes in this area are becoming a source of stable income and profit markup for the companies of the Russian defence industry.

'Today we are cooperating successfully with the 'Proekt-Technika' Corporation on the after-sales service of our supplied products. This is one of the global leaders on the development and production of solutions in the area of mobile and stationary infrastructure for special purposes. Within the concept of the comprehensive approach to maintenance, we have already successfully completed and continue to execute a number of contracts in Venezuela, the Republic of Cyprus, Uganda and the United Arab Emirates', noted Igor Sevastianov.

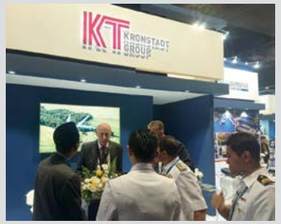
It was also acknowledged at the meeting that the companies of the defence industry should develop and offer to their foreign customers electronic operating documentation and electronic illustrated interactive catalogues, which now become an obligatory condition for purchasing the main nomenclature of the equipment.

CERTIFICATE FOR KA-226T

Russian Federal Aviation Agency (Rosaviation) has issued a supplement to the certificate for Ka-226T helicopter that allows the machine operation at high temperatures. The document makes it possible to start exporting the helicopters to countries with the hot climate. The Rosaviation issued certificate has become a result of testing, carried out by Russian Helicopters specialists and Iran Helicopter Support and Renewal Company technicians in Iran in September 2017. The testing was done in order to prove normal functioning of the machine at outdoor temperature of up to 50 °C.

'The potential users of our helicopter had a chance to learn about its capabilities at a news conference we had upon completion of the testing in Iran last fall. Naturally, the official approval will help us negotiate with companies interested to purchase the machine', Russian Helicopters Holding Director General Andrey Boginsky acknowledged.

KRONSTADT GROUP AT DSA & NATSEC ASIA



Kronstadt Group presented its Unmanned Aircaft Systems in Kuala Lumpur at Defence Services Asia 2018.

Kronstadt Group in delegation under the auspices of JSC 'Rosoboronexport' at DSA & NATSEC ASIA 2018 which was taking place on April 16 to 19. Defence and Security Ministries' officials and industry professionals got acquainted with Russia's latest developments in UAV technology during the first overseas appearance of Orion-E Medium-Altitude Long-Endurance Unmanned Surveillance Aircraft System.

DSA is the top Defence and National Security event for South-East Asia and ranked among top-5 global defence exhibitions, providing an excellent platform to share latest ideas, products and technologies for army, navy and airforce from around the world.

'Being part of Russia's official delegation chaired by Rosoboronexport is both an honor and an excellent opportunity to present our defence solutions to the Asia Pacific region,' stated Kirill Dybko, Executive Vice-President of Kronstadt Group. 'We are happy to witness a growing interest in our latest UAV solutions on behalf of regional clients.'

Russian 'Viking'

JSC Rosoboronexport (part of the Rostec State Corporation) is starting the promotion to the foreign markets of the newest air defence missile system (ADMS) 'Viking' (a 'Buk-M3' type ADMS).

'That's good news for us and our foreign partners. The 'Viking' complex preserves the best characteristics of the famous line of the 'Buk' air defence missile systems and represents the milestone in the development of the medium-range ADMS. The producers allotted unique characteristics to it, which are in line with the current requirements in the area of force and infrastructure protection from the strikes of present-day and future air assault weapons in conditions of radio-electronic countermeasures and firing. The 'Viking' has no countertypes today in the world armaments market,' said Rosoboronexport's Deputy Director General Sergey Ladygin.

The multimissile highly mobile medium-range air defence missile system 'Viking' is the next step in the development of the famous 'Kub' – 'Buk' ADMS line. In comparison with the 'Buk-M2E' ADMS, its range of fire has increased nearly by 1.5 times – up to 65 kilometers. Besides, the number of simultaneously fired targets has also increased by 1.5 times, which is 6 by each self-propelled launching installation, and the number of ready-for-launch air defence guided missiles in one firing position made of two combat units has grown up from 8 to 18.

ADMS 'Viking' has received a number of unique features, which were not previously available in any air defence missile system. For instance, it has a capability of integrating launchers from the 'Antei-2500' ADMS, which provides for the capability of target engagement at a distance up to 130 kilometers and will boost the efficiency of the whole AD grouping in the fight against enemy's pilot-controlled aviation.

The 'Viking' was developed and designed with the account of the world market trends. Its technical characteristics allow the system to be adapted to the greatest possible extent for the priorities of Rosoboronexport's foreign customers. The combat control station of the 'Viking' has a possibility of integration with the organic radar system as well as with other radars, including the ones produced outside Russia, but possessing required characteristics. Besides, the ADMS envisages a capability of the autonomous use of the firing sections and even separate self-propelled firing installations, which enlarges the total defended area and increases the number of covered sites. In addition, it helps to minimize the expenses for the air defence configuration set up.

'Commissioned by the Russian Armed Forced 'Buk-M3' system and its export version 'Viking' have proved a very high level of combat efficiency during their daily operation and exercises. The 'Viking' has a very high kill probability in relation to enemy's aviation, attacking elements of precision-guided munitions, as well as tactical ballistic missiles, maritime and ground targets,' added Sergey Ladygin.

Next Generation Helicopter Engine

United Engine-building Corporation, a part of the Rostec State Corporation, has started works on development of a prospective helicopter engine of the next generation. New construction materials and additive technologies, as well as 3D-printing, will be used in the process of development.

In addition to proven effective technologies and materials, new design visions and aviation engines production methods will be implemented in the process of development. The contractor of the project Saint-Petersburg 'ODK 'Klimov' is planning to implement the technologies that were already used for other ODK aircraft engine models, such as PD-14 engine for civil aircraft MC-21, a prospective engine for Su-57 fighter of the fifth generation and BK-2500M helicopter engine. New construction materials and additive technologies, as well as 3D-printing, will be used in the process of development.

'While developing new products and technologies, the Rostec State Corporation has a unique chance to use the resources of not a single company or research center but employ the united effort of all companies that are parts of the corporation to contribute to the process of development of brand new equipment for aviation industry', Aviation Cluster Industrial Director of the Rostec State Corporation commented.

The sample engine is expected to be complete in 2021 while the power unit is supposed to be ready for serial production in 2025. The weight of the unit will be reduced by 15 per cent compared to existing competitive models while its operation costs will be 30 per cent lower.

Russian security products

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

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

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

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

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

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

For upgrading BMP-2 and BMD-2

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

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

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

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

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

LARGEST EXPORTERS OF RUSSIA

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

LARGEST IMPORTER TOP-100

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

VLADIMIR PUTIN and KING ABDULLAH II

Relations between Russia and Jordan are developing steadily and positively. This applies to all areas of cooperation, including political and military-technical blocs. The exceptionally friendly nature of relations between countries is underscored by meetings between the two leaders – President of Russia Vladimir Putin and King of Jordan Abdullah II. It is enough to recall the recent meeting that took place in February this year in frame of the working visit King Abdullah II to Russia.

During that meeting in the Moscow Kremlin the President of Russia and King Abdullah II were discuss various aspects of Russian-Jordanian cooperation and topical issues on the international and regional agenda – particularly, the situation in Syria and the Middle East settlement.

President of Russia Vladimir Putin said: 'Your Majesty, we met exactly one year ago, in January last year. You and I, as well as our colleagues are keeping in contact with each other. Personal meetings are certainly always important. Today we will talk about bilateral relations and the situation in the region, but at the beginning of our meeting allow me to remind you that this year we celebrate 55 years since the establishment of diplomatic relations. I think we have every reason to hope that we will continue to strengthen mutual trust and cooperation.'

King Abdullah II of Jordan said: 'Mr. President, thank you again for your kindness and your hospitality. I am always very delighted and warmed by the opportunity to see my dear brother. And as you mentioned, this is an auspicious year marking the special relationship and the anniversary of the relationship of our two countries. But equally important, based on our meeting this time last year, was the leadership that you showed as well as the joint cooperation between our two countries on bringing better days to Syria. Your directives a year ago have allowed, I think, much stronger Jordanian-Russian coordination, and we have been able to make good political grounds in southern Syria. This is due to your guidance and your vision of trying to solve the issues there as quickly as possible.

So I want to thank you and your colleagues for the very close interaction that we have had. I am sure that this year will be a better year. And also, I want to thank my brother, the President, for his dedication to work very hard to find a solution for both the Israelis and Palestinians and, hopefully, bring more hope to our region.'

last year's meeting that Vladimir Putin referred to, was held in January 2017 also in the Moscow Kremlin. That visit was also at the invitation of the Russian President. The discussion focussed on current issues in Russian-Jordanian cooperation and prospects for expanding trade, economic and humanitarian ties, as well as on current international and regional issues.

Vladimir Putin noted then: 'I am greatly pleased that our dialogue steadily continues and that we are always in contact. In the course of your visit today we will certainly talk about bilateral relations and the situation in the region, naturally, with a focus on sore spots, including efforts to reach a settlement in Syria.

At the beginning of our conversation I would like to thank you for supporting the process that began in the capital of Kazakhstan, Astana. Thanks to our joint efforts, the process is developing on the basis of a very important decision that was taken – the cessation of hostilities, a ceasefire between government forces and the armed opposition.

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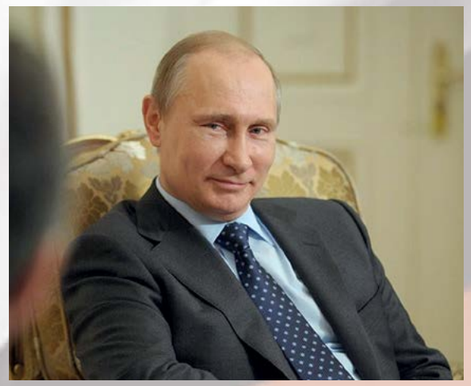
President of Russia Vladimir Putin



I consider it very important to note that the participants in the Astana process have declared that it is impossible to resolve the Syrian problem by military means. And we very much hope that the Astana talks will serve as a sound foundation for the continuation of this negotiating process also in Geneva.'

King Abdullah II of Jordan said: 'Mr. President, I am truly delighted to be back and seeing my brother and my friend again here in Moscow. And I cherish not only the special relationships that we both have, but the special relationship between two our countries.

I am looking very much forward to our bilateral relations and discussions this evening on many issues where Russian plays such a pivotal role, not only internationally but specifically in our region. We fully endorsed and supported the Astana process and we are very grateful for Russia's role in being able to do this, because this will bring, I hope, an inclusive future to all Syrian people.

Again, we will work very closely with you as we proceed to the Geneva talks and other talks, and the role of Russia can only help advance the challenges, because without Russia we will not be able to find solutions to not only the Syrian problem but other regional problems in the Middle East.

We both said many years ago that the challenge that our countries face, that the world faces, is this war on international terrorism. We have been speaking to many in the world who have not listened to your views and our views. But I am glad that I'm here today in Moscow to share not only the friendship but the same vision of bringing stability to our region. I thank you, Mr President, for allowing us to be here with you today.'

One can not but recall one more historic meeting between the two leaders, which took place in November 2015 in Sochi. At that meeting, Vladimir Putin outlined the objective principles of cooperation between the two friendly countries. The President of Russia said: 'We maintain constant contacts with you. Today, when there is such a serious struggle against international terrorism, it is obvious that we must join our efforts. I am happy to state that our military and official services are working in this direction.'

King Abdullah II of Jordan said: 'My dear brother, I thank you very much for seeing me today, on a day when you have many weighty issues on your shoulders. I would like to offer my condolences and those of the Jordanian people for that tragic terrorist heinous attack on the innocent Russians that lost their lives through the Metrojet terrorist attack, as well as the loss of your pilot today. I believe that this compels the international community to work stronger together both militarily and diplomatically in the context of Vienna, which is something that you have been a strong sponsor of.

You know, Mr. President, I have said for many years that the only way of finding a political solution in Syria is with the strong role that

'I have said for many years that the only way of finding a political solution in Syria is with the strong role that both you and Russia play for a political solution for the Syrian people. Your fight against Daesh is a fight that all of us have to do together not only in Syria and Iraq but also both you and I have said that this a global war, a war that binds all of us together.'

King of Jordan Abdullah II

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President of Russia Vladimir Putin

both you and Russia play for a political solution for the Syrian people. Your fight against Daesh is a fight that all of us have to do together not only in Syria and Iraq but also both you and I have said that this a global war, a war that binds all of us together.

Daesh, Al Qaeda and their offshoots want this to be a fight against humanity. And you and I have both hoped for many years about the holistic nature of this challenge – how we have to combine international efforts not only in our region but to fight this in Africa, in Asia, in Europe as well as our region.

So these are not only the challenges we face in Syria and Iraq, but also we have seen terrorism in Saudi Arabia, in Beirut, and unfortunately recently in Paris as well as Mali.

I know that this is a fight that both you and I, our countries and many others in the world are determined to win. Again, this is an opportunity for all of us in the international community to come together and fight this fight as part of a coordinated international body. I again commend the very strong relationship between our two countries and between you and myself. I have known you for many years and our relationship has always been a strong one, and I know that it will continue to move from strength to strength.'

And also remember the memorable visit of the King of Jordan to Moscow in August 2015, when he, together with Vladimir Putin, watched the largest aviation forum MAKS-2015. Vladimir Putin at that time noted: 'We are very pleased to have this chance to have a separate meeting with you on the sidelines of MAKS-2015 to discuss the situation in the region and look at our bilateral relations. I imagine you have found plenty to interest you at MAKS-2015, all the more so, Your Majesty, as you are a military man.

Of course, it will be a pleasure to discuss development in our bilateral contacts with you. I know that our government colleagues in both countries are working with each other. I propose that we talk about all of these matters now.'

King of Jordan Abdullah II said: 'Mr. President, thank you very much. Again, I am very impressed today with the air show, it was truly a very memorable occasion to be here with you this afternoon. I was especially touched by the programme you have for the youth, especially with technology and science – that was very impressive.

I am delighted to be back here in Moscow, and as you well know, we have a very strong and important relationship between our two countries that you have continued to build between our two nations I am looking forward to being able to discuss many of the major challenges in our region that have been plaguing us for several years, and the vital role that you and Russia have been playing for such a long time and continue to play to bring stability to our region.

Not only trying to bring Israelis and Palestinians closer together to find a peaceful solution to that long and difficult conflict, but also, as you know, I have said for many years, as we try to find a solution for Syria, I have believed that the only way we can find a solution for Syria is the vital role that you and your country play to find a political solution for all parties to bring stability to that country that has endured so much. So, your role and the role of your nation is vital for our area, and I am delighted to be back here in Moscow to listen to you and to be able to exchange with you and my colleagues here in Moscow, so, thank you for having us back here.' /RA&MG/

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King of Jordan Abdullah II

SOLUTIONS FOR A WIDE RANGE OF TASKS

Dmitry Shugaev: 'The countries of the Middle East and North Africa altogether make up almost 50% of Russian total defense exports'

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

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

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

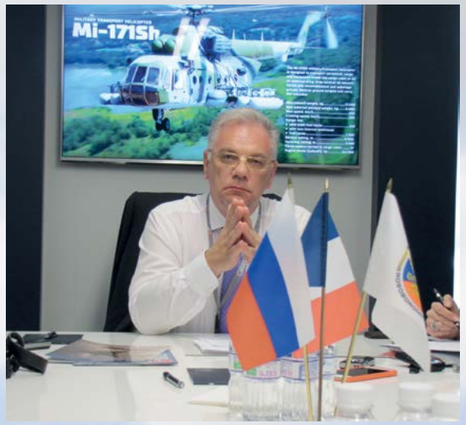
Federal Service for Military-Technical Cooperation is an agency that controls and supervises all the activities related to military-technical cooperation and issues licenses. From strategic point of view the FSMTC of Russia plays the role of government policy 'conductor' in the field of military-technical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

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

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

– First of all, I'd like to note that Russia is second in the list of world top exporters of military purpose products. It is not a secret that last year our defense exports exceeded $15 bln. The major part of this export is aviation equipment; export of the equipment related to aviation varies in the range of 40-50% of the total volume. Of course, we positively appreciate this fact, and we wish exporters of other weapon types to achieve these figures as well.

At the same time we understand, that the market of mili-



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

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

tary purpose products (MPP) is a very specific market having cyclic nature. A number of factors should be taken into account, including modernization programs of defense ministries, financial solvency of countries that in its turn depends on their general economic health. Therefore, defense exports can hardly be expected to soar. Russia is aimed at building long-term relationships that will provide for sustainable growth of our 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 is the share of the Middle East and North Africa in Russian defense exports and the country's export order portfolio? What military and defense equipment is in demand among the countries of the region?

– The countries of the Middle East and North Africa altogether make up almost 50% of Russian total defense exports, which is a considerable share. Our country's military- and dual purpose products are traditionally in great demand with the countries of the region. We are totally satisfied with the current state of our military-technical cooperation with these countries as well as with the pace at which we are moving forward. As for specific types of equipment that are popular with our partners in the Middle East and North Africa one cannot but mention armor materiel, air defense means, anti-tank missile systems and small arms.

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

– No doubt, the main competitive advantage of the Russian equipment, from the point of view of any foreign customer, is its quality-price ratio. As for its operation in the countries of the Middle East and North Africa I will add another important factor highly assessed by our partners after many years of usage. This is high efficiency and excellent capabilities of our weapons and equipment in extreme climatic conditions. I believe these two major advantages altogether make our military purpose products so popular with regional customers.

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

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

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

– At present, some operators of our military equipment in the region are facing the necessity to repair and modernize the equipment produced in the USSR and supplied earlier. I can say with full confidence that all those products, as well as the Russian origin military equipment, have considerable potential for renovation. As an example, there are several large-scale projects on repair of domestic armored materiel and air defense systems under implementation that are quite successful. Our country is ready to offer a comprehensive service program of maintenance, repair and upgrade of our military products according to the highest quality standards.

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

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

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

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

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

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

– There is much discussion about the positive influence the operation of Russian Air Force in Syria has had on Russian defense exports. Please, if you can, name any particular type of equipment that has been ordered by a foreign customer due to its successful implementation in Syria?

– Since the very start of the Russian Air and Space Forces counterterrorist operation in Syria, the demand among foreign customers for the Russian military-purpose products has significantly increased. At the same time one has to realize that signing a contract is a time-consuming multi-phased process with lots of preparatory work to be accomplished before a deal can materialize.

We are having a busy time marketing the systems that are successfully used in Syria. You might be aware that S-300 and S-400 air defense systems, Pantsyr S-1 surface-to-air missile and anti-aircraft artillery weapon system, Kornet-E antitank guided missile system and other air-launched weapons are in the top wishing-list of our customers. Of course, the increased popularity of these weapons is to an extent due to their successful performance in Syria.

– Some of the systems used in Syria are the ones that have gone through comprehensive modernization with their performance substantially increased…

– Modernization of arms and military equipment produced in the USSR is a full-fledged area of military-technical cooperation of our country with its foreign partners. Competition with Eastern Europe, CIS and China has recently become rather tense. Nevertheless, the countries that use our equipment should well understand that high quality work on improving performance and ensuring safety of defense equipment can be only carried out by certified enterprises and under the supervision of Russian experts in relevant fields. At present Su-24 and MiG-29 aircraft, Mi-8 and Mi-24 type helicopters, T-72 tanks and BMP-1 infantry combat vehicles are being successfully overhauled and modernized in the region.

– What can you say about Russian Safe City Project and its defense export prospects?

Well, Defense Ministries and their various agencies remain major customers of the Russian military equipment in the region. And there is no surprise about it since they require our state-of-the art systems to successfully carry out their basic function which is to protect their countries' sovereignty and territorial integrity.

At the same time, there is growing interest in the military-purpose products from the Ministries of Internal Affairs and other security agencies. Despite the fact that so far it has been limited to procurement of small arms we hope that our cooperation with these agencies can turn out mutually beneficial and fruitful.

As for the Safe City, we have made our presentations and respective proposals to partners. Some of them have expressed much interest in the project. Still at this stage it is too premature to talk of any specific contracts on the Safe City.

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

– Are the countries of the region interested in producing Russian equipment under license and establishing joint ventures for maintaining and servicing Russian equipment on-site?

– It is no secret that many countries of the Middle East and North Africa are seeking to advance their defense industry. And, to our satisfaction, they consider Russia as a qualified and reliable partner that can help them do it.

Taking into account the volumes of equipment supplied to the armed forces of the region, Russia is pretty much interested in launching service centers for our equipment here. At present, we are exploring a number of projects on aviation and armor materiel, as well as air defense systems maintenance centers. Hopefully we will soon come up with some mutually beneficial solutions.

As for license production of Russian military equipment, we proceed from the premise that at first partners have to procure large consignments of finished products. Only after that we can start a reasonable discussion of production under license.

– Is Russia open today for new cooperation ties?

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

The relationship with partners within the pattern 'end products only' is being gradually replaced by comprehensive cooperation in the field of high-technology products. And we are ready for this kind of cooperation as a country that has built its own defense industry. We are ready for cooperation and we will help our partners to create systems they need today.

– Can you give any particular examples worldwide?

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

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

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

– Is it really strong?

– Yes, it is. Russian weapons and military equipment have made a good showing in the world. Today experts state that our weapons are: first, highly technological; and, second, proving their 'mission survivability'. In addition, it is relatively easy to maintain our weapons. Combination of the above mentioned factors explains why our products are so popular in the world.

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

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ments of experts of the global market of military purpose products.

– And did Soviet equipment prove its high efficiency?

– Yes, it did. And it is still doing so. For example, Vietnam has been our partner in the field of military-technical cooperation for a long time for one reason only: Vietnamese army uses soviet military equipment for decades and is satisfied with it and with Russian products supplied in replacement of older soviet equipment.

– Does it ring true amid the evidently growing competition in the weapon market…

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

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

– During the Saudi monarch's recent official visit to Russia the two countries reached agreement on such Russian weapons S-400, TOS-1A, AK-103, AGS-30, Kornet-EM). Is Russia open to technology transfer or is it just about finished products supplies?

– Yes, our countries have agreed on supplies of S-400 'Triumph' anti-missile defense system, TOS-1A anti-tank guided weapon system, Kornet-EM anti-tank guided missile system, as well as AGS-30 and AK-103. At present we are discussing the practical implementation of the agreements reached. And, to our full satisfaction, talks are proceeding in an utterly constructive and open manner.

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

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

There is also a downside of the medal for European companies that are forced to follow the sanctions. It is not only that they are bearing considerable losses as a result of this. It will also be extremely difficult for them to return to the Russian market after the sanctions are lifted. Perhaps, it will be even impossible as all the niches they used to have already been taken by their rivals.

Our partners complain that they have a kind of a 'fatigue' about the sanctions. Everybody understands that this should be stopped, because nobody gains from it. We shall see how things turn out. The Russian Federation has never shut any doors or burnt down bridges. We take the situation in a pragmatic and unimpassioned way.

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

– Those who lost the Russian market have suffered most. In a longer term our industry can gain from sanctions. Russian manufacturers due to the imports substitution program and new cooperation ties are at minimum risk of contractors refusing to supply parts or equipment because of some politically motivated reasons. They are not at risk of having to delay supply dates or to negotiate new conditions with their customers. If a MPP is manufactured completely within the country, it is a guarantee for its national army that everything will be done in a time. And it is a big competitive advantage in the opinion of foreign customers. /RA&MG/

Ka-52 TO TEST NEW MISSILE WEAPON

'Russian Helicopters' Holding Company together with the Russian Ministry of Defence will conduct tests of the newest guided missiles on Ka-52 ship-based reconnaissance and combat helicopter. Specialists of the Holding Company will also test on-board equipment and armament of the helicopter for their resistance to electromagnetic fields.

Currently, the tests are performed on four Ka-52K prototypes. One of the helicopters is being prepared for tests to evaluate the resistance of avionics and air weapons to external electromagnetic fields. The second helicopter undergoes preliminary tests at the airfield, and on the third helicopter a new inertial navigation system is tested.

The fourth Ka-52K prototype is at the testing site of the Rusian Ministry of Defence, it is planned to test new guided missile weapons on this helicopter.

'Ka-52K helicopters are going through the final stages of the tests, and the Holding Company is ready to start serial production of this helicopter in the near future. We note interest of the Russian ministry of Defence in this helicopter. The design of the helicopter allows it to be placed on the decks of frigates, anti-submarine destroyers and the Admiral Kuznetsov aircraft carrier. Moreover, the Ministry of Defence made a decision to develop Russian helicopter carriers,' Andrey Boginsky, CEO of Russian Helicopters Holding Company, noted.

During tests Ka-52 helicopter was significantly improved. The helicopter was equipped with the state-of-the-art target sight systems and weapon control systems, combat survivability of the helicopter was enhanced and autonomous deployment system was improved. These modifications provided the Ka-52K with a range of competitive advantages as compared to the similar helicopters of foreign production.

Ka-52K helicopter is the next product in the range of sea helicopters designed by Kamov Design Bureau. The helicopter is designed for patrolling, fire support of assault forces when landing, performing anti-airborne defence missions on the forefront and in tactical depth, under any weather conditions and at any time of day or night. State-of-the-art on-board equipment ensures helicopter navigation in conditions with no visual references at sea.

Ka-52K helicopter differs from the baseline model by availability of a shortened folded wing, which was upgraded for the installation of heavy weapons, and a blade-folding mechanism, which ensures its compact arrangement inside a ship's hold. Reduced dimensions of Ka-52 ship-borne helicopters allow increasing the number of helicopters located on a ship to maximum. Armored cockpit and unique ejection system provide pilots with the maximum safety level, which cannot be ensured on any helicopter of this class produced abroad.

Another important feature of the Ka-52K is the use of corrosion resistant materials, which is conditioned by the necessity of helicopter's operation in conditions of humid marine climate. The helicopter is equipped with a single-point refueling and a modernized air conditioning system ensuring ventilation of sea rescue suits of the crew members. In addition, the helicopter is equipped with short-range radiotechnical navigation system, which was not used on the baseline model. /RA&MG/

INNOVATIONS AT SOFEX-2018

Rosoboronexport Shows Modern Russian Equipment for Special Units

Rosoboronexport, Rostec's member, presents Russian exposition at the International Special Operations Forces Exhibition SOFEX-2018 (Amman, Jordan). The head of the special exporter's delegation is Valery Varlamov, charge of one of the company's departments. The gamut of Russian weapons and systems brought to Amman is accounted for by the magnitude of today's threats and challenges facing the Middle East and North Africa, let alone the heightened interest of foreign partners in them. Besides, many of them proved their outstanding characteristics in combat fighting as part of Russia's Aerospace Force contingent in Syria.

Being one of the largest exhibitions of gear and systems for special operations forces in the Middle East and North Africa, SOFEX has been conducted since 1996. Russia started coming to the event in 1998. Hosted by Marka RAF base of Jordan, SOFEX is conducted under auspices of King Abdullah II of Jordan and His Royal Highness, LtGen, Prince Faisal Bin Al Hussein.

'SOFEX is a serious platform presenting abundant opportunities to meet partners from Jordan and other Mideastern and North African states. I have no doubt that Russia's exposition will stir interest in everyone. Naturally, the visitors will be able to learn lots of useful facts about most demanded on the world market weapons labeled 'Made in Russia.' They include 100-plus pieces of military equipment deployed in special operations units of Russia's Ministry of Defense, Ministry of Interior and Federal Security Service boasting considerable experience in fighting terrorism, drug trafficking, and organized crime,' says Alexander Mikheev, Director General of Rosoboronexport.

In the Russian exposition the following developments are presented: Russia's booths house Tigr- and Tayphoon-K-family vehicles, BTR-80/80A/82A personnel carriers, A-220M 57mm light artillery system, Kornet-E and Kornet-EM AT missile systems, night sights and vision devices, compact radars, RPO PDM-A Shmel-M rocket-assisted enhanced-range infantry flame thrower, 2B24 82mm mortar, MGK Bur small grenade launcher, various grenade systems and small arms from pistols to sniper rifles and to Kalashnikov's latest assault rifles, as well as man-portable AD systems Igla-S and Verba, Strlets-based super-short range SAMs for the Igla MANPADS, RShG-2 rocket-assisted assault grenade, ammunition, etc.

Another reason to visit the company's booth is to have a look at the unique characteristics of the TOS-1A heavy flame-thrower, which among other Russian systems enjoys consistently high demand on the world arms market. In the Middle East, the weapon's popularity has been on the rise recently due to its outstanding performance in large-scale anti-terrorist operations.

All visitors at exhibition can test their shooting skills at the russian SKATT simulator of the 5.56mm AK-101 Kalashnikov assault rifle, 9mm Yarygin magazine pistol, and 9mm Kedr submachine gun.

Since Russia and Jordan enjoy strong and time-tested ties, its military and technical cooperation established as far back as 1981 has been progressing so far. After 2000, Jordan received IL-76MF transports and Kornet-E ATGMs. The country started production of the Russian-designed RPG-32 Nashshab (Arabic for archer) grenade launcher.

'The military and technical cooperation between Russia and Jordan have a considerable margin for future growth. Plans include meetings with military and political authorities of the host nation to discuss current and future projects in the sphere. Russian specialists will also participate in the Middle East Special Operations Commanders Conference to pave the way for the actual event the next day,' stresses 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

Alexander Mikheev,
Director General of Rosoboronexport

'We consider participation in international defense exhibitions as one of the key areas of the Company's marketing activities. In 2018, our delegations will visit 23 events in various regions of the world. Particular attention will be paid to the most promising markets such as the Asia Pacific region, the Middle East and Latin America.

Clearly, the exhibitions held in Russia continue to be priority and probably most productive for us. This year, Rosoboronexport traditionally organizes its displays at the Army Forum, International Helicopter Industry Exhibition (HeliRussia 2018), Interpolitex and will exhibit its promoted products at the International Far East Naval Salon 2018 in Vladivostok for the first time.

To strengthen our military-technical cooperation with the Philippines that received a major boost in 2017, we will for the first time organize a Russian display at the Asian Defense & Security (ADAS) 2018 Exhibition and Conference, to be held in September in Manila. I am confident that our participation will strengthen Russia's position on the highly competitive Asian and Pacific arms market.

SOFEX is a serious platform presenting abundant opportunities to meet partners from Jordan and other Mideastern and North African states. I have no doubt that Russia's exposition will stir interest in everyone. Naturally, the visitors will be able to learn lots of useful facts about most demanded on the world market weapons labeled 'Made in Russia.' They include 100-plus pieces of military equipment deployed in special operations units of Russia's Ministry of Defense, Ministry of Interior and Federal Security Service boasting considerable experience in fighting terrorism, drug trafficking, and organized crime.'

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Alexander Mikheev

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. This year JSC Rosoboronexport will mark 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. Director General of Rosoboronexport – Alexander Mikheev.

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

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

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

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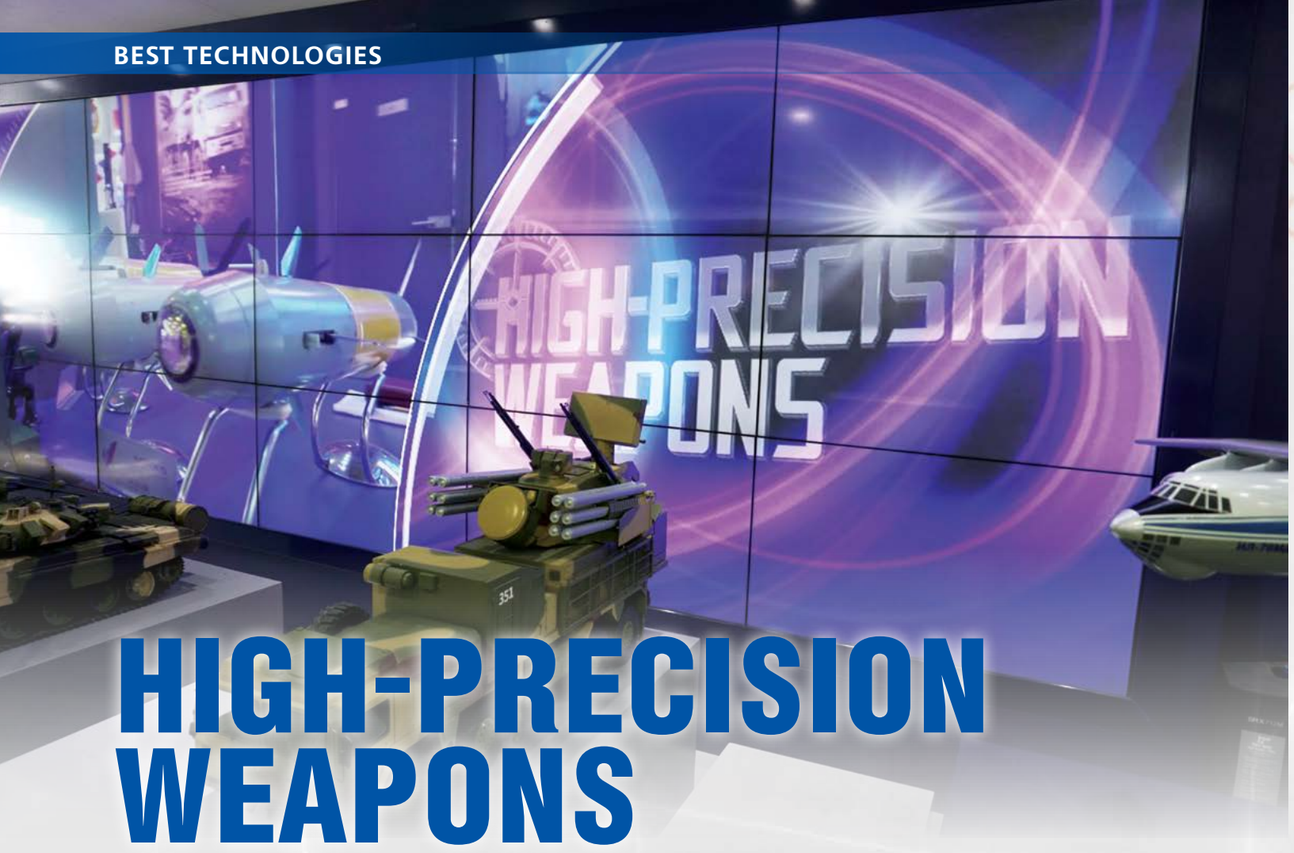
The first Soviet state intermediary agency for military-technical cooperation with foreign countries was created on 8th May 1953 after the USSR Council of Ministers had decided on forming the General Engineering Department within the then Ministry of Domestic and Foreign Trade. Other special foreign trade bodies were created later on to provide for further expansion of military-technical cooperation activities. In the late 1990s there were two federal state unitary enterprises in Russia acting as state arms exporters Rosvoorouzhenie State Corporation and Promexport.

In November 2000 the two enterprises were merged into a single one – Rosoboronexport Federal State Unitary Enterprise, the sole state intermediary for export/import of defence products, by the Presidential Decree No. 1834 dated 4th November 2000 aimed at restructuring the system of military and technical cooperation of the Russian Federation with foreign states, and improving its performance. Since September the 1st, 2014 Rosoboronexport has been operating as a joint stock company.

Core areas of activities of Rosoboronexport

- **Export / import of all types of conventional weapons, military and dual-use equipment and services.**
- **Organization of licensed production of armaments and military equipment abroad, joint R&D efforts with foreign partners.**
- **Maintenance and repair of earlier supplied weaponry and military equipment.**
- **Modernization of Russian-made weapons and military equipment.**
- **Training foreign specialists in Russia and customer countries in the operation and maintenance of supplied military equipment.**
- **Technical assistance in the construction of military infrastructure facilities: defense plants, airfields, depots, ranges, training centers.**

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.



HIGH-PRECISION WEAPONS

The Russian Holding creates the best innovative weapons

Products of the High-Precision Weapons Holding (part of Rostec Corporation) are well known all over the world, including in the Gulf countries. Russian brands like 'Pantsir-S1', 'Kapustnik-B', 'Konkurs', 'Metis-M1' and others made by High-Precision Weapons Holding are determining technological and combat future of high-precision systems all over the world. This Russian holding is the primary designer and manufacturer of Russian high precision weapons is engaged in producing the world's best types of high precision weapons. Professionals and guests of the SOFEX 2018 in Jordan may fully see it in the exhibition.

Russian High-Precision Weapons holding (was founded in 2009) includes 19 enterprises being mostly world leaders in their production and technology segments. The holding consists of a number of largest leading defense enterprises that are well known on the world arms market. It is sufficient only to mention such brands as Shipunov KBP Instrument Design Bureau, Tula Arms Plant, Tulatochmash, Nudelman Precision Engineering Design Bureau, Kovrov Electromechanical Plant, V.A. Degtyaryov Plant, All-Russian Scientific Research Institute Signal, and others. Most of them are national and international leaders in their segments.

Holding is the world largest science and technology complex engaged in developing and creating high-precision weapon systems for combat tactical zones. The company being a member of Rostec Corporation, the world largest engineering corporation, is among the leading designers of state-of-the-art weapons in the world.

The weight of the holding company and its products in terms of strengthening defensive power of Russian army and delivery of the newest weapons to word markets can hardly be overestimated. There is a fast growing number of high precision systems and importance of tasks performed with them in the biggest armies of the world. Thus, over the recent five years Russian Armed Forces have had increasing purchase volumes. Export volumes of the latest weapons are also increasing. According to Alexander Denisov, Director General of High-Precision Weapons, JSC 'in view of defense and industrial sector mission we are considering well-timed and full fulfillment of purchase obligations as a priority task.'

According to military experts among the calling cards of the company is first of all the above-mentioned 'Pantsir-S1' air defense gun and missile system made by Tula instrument design bureau (KBP), ship-based 'Palma' air defense artillery system armed with 'Sosna-R' missiles, 'Kapustnik-B' fire control system, 'Kornet-E', 'Konkurs', 'Metis-M1' antitank missile systems, 'Krasnopol', 'Arkan' guided missile systems and others. The majority of weapons being exported by High-Precision Weapons is second to none in the world in terms of performance and efficiency.

An average annual increase of the company's export deliveries is 25-40% that is certainly a world record in the sector of high precision weapons. Middle East, North Africa, Arabian Gulf countries and India are among the most stable

The global success of High-Precision Weapons has been also proven by Stockholm International Peace Research Institute (SIPRI) which has given the holding 39th position in a global rating of world arms manufacturers.

The holding activities increase every year both at internal market (it is a major supplier of high precision arms for Russian Armed Forces) and external market. Export to various regions of the world grows on a constant basis. Annual export gain is 25-40%. Such stability is also record-breaking for the whole Russian engineering industry. The holding purports to double military equipment supplies by 2020. Among the most stable export regions are Middle East, Gulf states, Northern Africa and India. Its export-oriented activity has been increasing lately at promising markets of South East Asia, Latin America, Central and South Africa.

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

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

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

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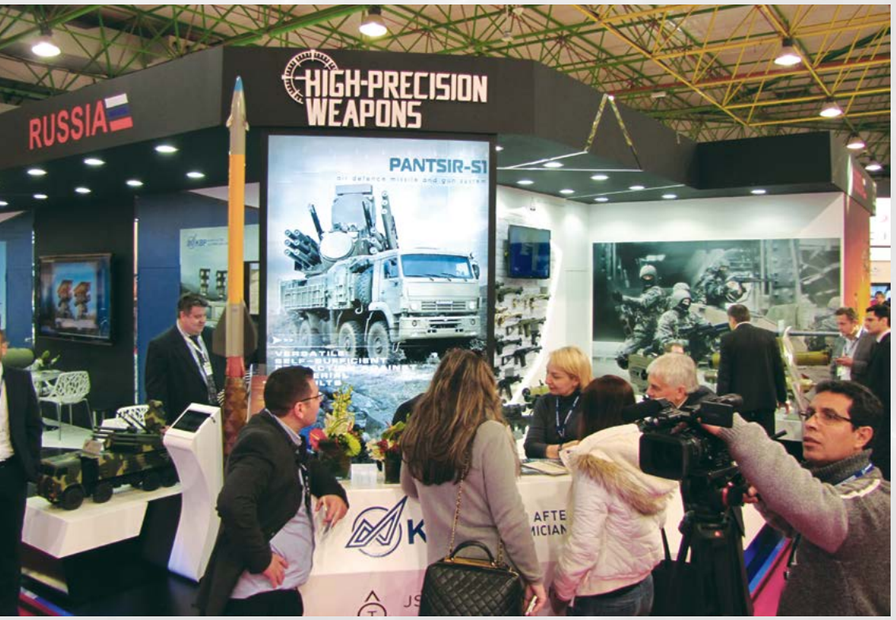
It is no coincidence that currently 'Pantsir-S1' is among the top 10 rated ground weapons in the world. Escalation of tensions, military operations in unstable regions, all this only adds the Russian air defense system a fair-minded attractiveness to strengthen defensive power of many countries. Besides,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

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

The newest defensive sensation from High-Precision Weapons Holding was the presentation of anti-aircraft artillery weapon system 'Pantsir-ME' in Saint-Petersburg in 2017. The creation of new innovative defense complex confirms the fact that Russian High Precision Weapons Holding is one of the world leaders in creating modern weapons. There was an absolute sensation in the world of military innovation. The system provides the ultimate protection against modern air threats, including

small-size unmanned aerial vehicles. The naval missile and anti-aircraft artillery weapon system 'Pantsir-ME' provides the ultimate protection against modern air threats, including low-flying and small-size unmanned aerial vehicles.

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



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

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

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

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

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

The well-known 'Krasnopol' artillery guided projectile (AGP) developed by KBP Instrument Design Bureau (Tula, Russia) is in service with the Russian Army and with armies of several other countries. 'Krasnopol' showed itself very well at demonstration tests, battle exercises and local conflicts when fired from both the152 mm artillery systems (D-20, 2S3, 2S3M, 2S19) and foreign-made 155 mm artillery systems (M109 family, G5, G6 and Bofors).

Both Russian-made (1D20, 1D22, LTsD-3M developed by Polyus, Moscow) and foreign-made (DHY307 made by CILAS, France) laser designators/rangefinders are used for the 'Krasnopol' system.

Despite of the fact that a number of countries have been conducting intensive research work aimed at development of self-contained mm-waveband and IR-wave band seekers, the artillery ammunition load should comprise highly precise ammunition with semi-active laser homing head because main task of conventional artillery is to engage observed targets, including obscured and low-contrast targets – firing points, engineering constructions, concealed vehicles and equipment.

This fact is also confirmed by foreign specialists. As reported by US sources, 75% of combat operations in Iraq involved guided ammunition firing against targets with low thermal signature. As noticed by the US specialists 'The use of 'fire-and-forget' ammunition in this situation is complicated and expensive'.

Therefore, in foreseeable future the systems with semi-active laser homing will be in demand, as judging by the experience gained during the recent years nature of probable armed conflicts has changed and artillery missions, in particular, are accomplished not by means of a massive attack but means of engagement of selected targets, including urban warfare operations in presence of civilians. Accomplishment of such missions requires participation of a human being in selection of a target.

The field experience of the 'Krasnopol' system, new demands made by the future operational tactics for artillery guided weapons with laser semi-active homing became the reason to produce a new generation high precision artillery system, which is characterized by the following improvement directions:

- Extension of firing range;
- enhancement of AGP lethality providing for total engagement of strongly fortified targets;
- increase of relative frequency of combat use under conditions of wind, cloudiness, night;
- use of automated FCS;
- simplification of AGP handling in terms of fire preparation and loading;

The holding enterprises are mostly involved in development, production, upgrade, repairs and sale of arms, military and special-purpose equipment. Besides, the holding is a world trend setter as to a number of some high precision weapons since many products were made at holding-owned enterprises and later recognized worldwide. The holding designers form a technological benchmark dedicated to advanced weapons development even today.

With the said purpose KBP developed the 'Krasnopol-M2' system that provides the following advantages over the standard 'Krasnopol' system: the firing range of the new system is significantly extended; new projectile lethality is almost two times higher than that of a standard 'Krasnopol' projectile and provides unconditional kill of future tanks and strongly fortified fire positions; does not require mating of two sections unlike in the 'Krasnopol-M2' projectile; provides flexible cyclogram of onboard systems activation on the trajectory to ensure optimal guidance trajectories; the 'Krasnopol-M2' FCS provides automated fire control and input of the projectile flight time cyclogram into projectile; FCS ensures day-and-night combat application and automated calculation of the system's firing settings.

The rocket-assisted grenade launchers earned a reputation of convenient, efficient and popular close range engagement asset. Further, the introduction of various types of warheads has considerably broadened their application range. Their high combat power (comparable to that of artillery projectiles), as well as small dimensions and low weight, allowing employment as shoulder-weapon, turns them into one of the main infantry fire support means in a wide range of missions.

The experience of law enforcement and counter-terrorist operations shows that in most cases such missions take place in urban areas or separate buildings. This eliminates the possibility or hampers the employment of combat vehicles for engagement lightly-armoured vehicles and low-vulnerable targets concealed in shelters or terrain and

The newest defensive sensation from High-Precision Weapons Holding was the presentation of anti-aircraft artillery weapon system 'Pantsir-ME' in Saint-Petersburg in 2017. The creation of new innovative defense complex confirms the fact that Russian High Precision Weapons Holding is one of the world leaders in creating modern weapons. There was an absolute sensation in the world of military innovation. The system provides the ultimate protection against modern air threats, including small-size unmanned aerial vehicles. The naval missile and anti-aircraft artillery weapon system 'Pantsir-ME' provides the ultimate protection against modern air threats, including low-flying and small-size unmanned aerial vehicles.

KBP Instrument Design Bureau have been over a long time involved in the researches aimed to extend the firing range and enhance accuracy of grenade-launching (flame-thrower) system rounds, as well as increase the payload relative to the total weight of the weapon. The R&D resulted in rocket-assisted infantry flame-thrower of increased range and power with thermobaric warhead (RPO PDM-A), adopted for service with Russian Army in late 2003, which proved the efficiency of the solutions implemented by KBP into the new method of grenade-launcher (flame-thrower) rounds propulsion.

Further, based on the design of RPO PDM-A, KBP developed a small-size grenade-launcher system (SGLS) 'BUR'. The wide range of missions and specific requirements of a number of defence and law enforcement agencies, for which this multifunctional weapon was intended, determined a need for system approach to its development.

The launcher features a metal plate with a dove-tail side-rail for mounting the sights which are zeroed with a particular launcher. The grip incorporates a miniature generator providing an electric pulse required for launch. The grenade-launcher rounds comprise a launch container, motor and grenade itself. The container and motor are uniform for all types of rounds, whereas only a grenade payload varies. However, the warhead is designed in such a way that the payload variation does not affect the exterior ballistics, allowing employment of optical sights for firing all types of grenades.

The governmental testing of 'BUR' SGLS is successfully completed. The small-size grenade-launching system is intended for: engagement of manpower in urban environment, inside buildings, fortifications, as well as exposed on various terrain (including mountainous areas); inactivation of soft-skinned and lightly-armoured vehicles. The system allows firing from limited space rooms. The system ensures reliable firing within the whole operational temperature range: from minus 40°C to plus 60°C and in adverse conditions.

While developing the SGLS the designers managed to create a highly accurate rocket assisted grenade launcher allowing effective engagement of wide range of targets depending on the mission scenario at ranges up to 650 m. To guarantee high accuracy of firing a 'reactive-active' grenade propulsion principle was introduced, since standard methods, e.g. increase of the booster motor power or employment of sustainer motor running during the flight, lead to increased size and weight of the weapon or higher dispersion respectively.

The 'reactive-active' propulsion principle implies jet thrust acceleration of the grenade placed in a barrel fixed to the jet engine and simultaneous active acceleration in the moving barrel due to gas bleeding from the engine chamber. Further, the barrel and engine stop, inducing additional acceleration to the grenade.

Thus, the energy induced to the grenade is increased (doubled) and accordingly grows the muzzle velocity compared to that of the conventional design grenade launchers with similar container length. However, high grouping of shots is maintained.

The efficiency rate was practically proved in the course of the system testing at KBP and by subcontractors.

Creation of highly efficient and at the same time easy in operation grenade launching system allows unreachable for the small-arms. Under such circumstances the weapon should be extremely lightweight (to allow higher ammunition carrying capacity), highly maneuverable (small dimensions) and accurate, as well as possess long firing range and powerful warhead.

engagement of most targets in close-range battle, as well as flexible response to the changing combat environment due to employment of various warheads. The system may become a demanded light weapon for various services of defence and law enforcement agencies.

Another defense masterpiece by High-Precision Weapons is 30mm antipersonnel automatic grenade launcher AGS-30 dedicated to kill manpower and vehicles both on open terrain and in trenches, rooms, behind natural and artificial obstacles. The grenade launcher kit includes three ammunition boxes and 18 belts with 10 links each. Loaded rounds are placed in paper cartridges and put in sealed metal boxes 48 pieces each. Rate of fire is 400 shots per minute.

AGS-30 is equipped with mechanical and optical sights. According to customer's choice the launcher may be fitted with day-and-night sighting system. It can also use radar sight to monitor situation and conduct aiming fire in zero optical visibility conditions.

This grenade launcher has a number of advantages which ensure its uniqueness in close combat. Small size and its mount design features ensure quick firing position change, capability of shooting from windows and unprepared positions. Thanks to wide limits of traverse one can quickly switch fire upon a sudden target. In travel position mount and grenade launcher can be densely folded and carried on back slings. AGS-30 has been used by Russian Army and National Guard units.

The above-shown products are examples of the highest level and quality of weapons made by High-Precision Weapons company. So far High-Precision Weapons is certainly among the key designers of high precision arms worldwide. More details of its products can be learnt at the largest international exhibitions (including SOFEX 2018) and arms shows permanently attended by the Russian holding company. /RA&MG/

FOR LAND FORCES

Around 1000 items of land forces equipment to the foreign customers

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

'Land forces materiel and military equipment produced in Russia are very popular and have a well-deserved authority among foreign armies. Our military equipment turns out to be much more attractive than foreign equivalents due to its characteristics, 'effectiveness-cost' criterion and a capability to operate in difficult environmental and climatic conditions. The total volume of its export since 2001 until now has reached nearly 25 bln US dollars, and today we note the increase in demand in the countries of South-East and Central Asia, Central and Western Africa and Latin America,' said Rosoboronexport's Deputy Director Igor Sevastianov.

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

'Today Rosoboronexport offers a variety of land forces equipment and materiel to the foreign customers. The list of offered products includes around 1000 items. They are mostly designed for the armed forces, but there is a substantial part of civil and dual-use products in our portfolio of orders. For instance, over 18 thousand KAMAZ, URAL, GAZ and UAZ based vehicles designed for the transportation of cargoes and personnel have been supplied to the Asian, African and Latin American countries since 2001,' added Igor Sevastianov.

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

'KB RADAR': FROM BELARUS – TO ALL OVER THE WORLD

JSC 'KB Radar' – Managing Company of the 'Radar Systems' Holding – is one of the leading research and production enterprises of the military-industrial complex of the Republic of Belarus, and one of the recognized world leaders in its segment. The products of the enterprise are well known and are used practically on all continents of the world.

JSC 'KB Radar' – Managing Company of 'Radar Systems' Holding, whit has been set up with the purpose of joint coordinated implementation of the processes of development and commissioning of radar systems and EW assets, other military and dual-use systems in accordance with the specialization and regulations of the Managing and Participant companies of the Holding, based on the latest achievements of science and innovative technologies.

The 'Radar Systems' Holding is one of the leading organizations of the Military and Industrial Committee of the Republic of Belarus conducting the uniform policy in the sphere of defense, development of the military industries sector, cooperation of the Republic of Belarus with foreign states in military technologies.

The Holding would perform a 'turnkey' work cycle – from development to production and follow-up of the equipment designed, training the Customer's specialists in its operation, maintenance and repairs.

The Holding joins the companies with a long-standing record, offering their specialization, unique technologies and achievements.

The company's history starting from April 6, 1974 when a special department was set up at the Science Research Institute of Automation Means (city of Minsk), is the history of selfless service of the team of scientists, specialists, all employees in the interests of the country, strengthening its defense, scientific and industrial potential.

9th March 2006 is today's company founding date. The RUE 'KB Radar', based on resolution of the Minsk City Council, was registered in the Unified State Register of Juridical Entities and Individual Entrepreneurs as Entry No 190699027.

From 30 December 2010, the company bears the legal status of an Open Joint Stock Company (JSC 'KB Radar'). Currently 100% of the shares belong to the State.

In connection with establishment of the 'Radar Systems' Holding, as from 17th October 2011 the company was re-named into JSC 'KB Radar' – Managing Company of 'Radar Systems' Holding controlled by the State Military and Industrial Committee of the Republic of Belarus.

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Sergey Kulik

SECURE RESCUE AT ANY HEIGHT

Unique autonomous rescue parachuting back-pack system for emergency escape

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

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

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

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

The SRS. Ltd company in outsourcing cooperation with 18 leading Russian and foreign aerospace companies has fulfilled full-scale research and development activities to 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; skyscraper's management company; offshore platform management; air-borne attractions & entertainment companies etc.) should only require a free window exit sized 1000x500 mm at the appropriate height to use Autonomous Pneumo Transformable Escape Chute and propose to its clients an additional exceptional secure service with limited warranty.

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

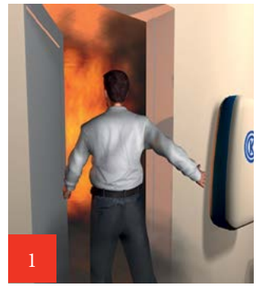
Furthermore, the SPARS® estimated potential market capacity is worth over $3.5 billion in commercial sector alone. The Governments market is bigger but for accepting that new technology implementation it may require some updates of the appropriate local norms and regulations.

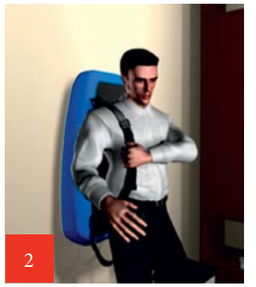
/RA&MG/

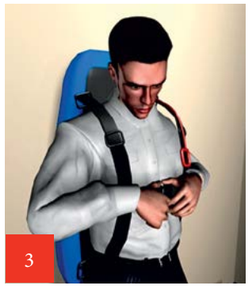
There are following innovations in the proposed SPARS® technology:

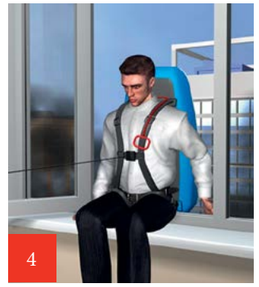
1. A brand new free parachuting technology (means and escape method) was created for emergency escape from heights higher than 50 m where practical methods for safe evacuation of a person are not available on the market.
2. Sinergy solution based on specially designed and produced from film-laminated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

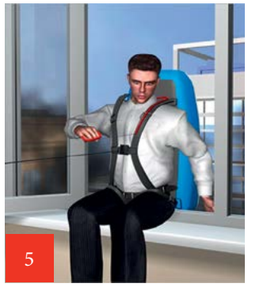
The Special National Standard (GOST) for shock acceleration limits for untrained human using new type of lodgment Rescue Parachuting Systems was issued.
The Crash test dummy Hybrid-III 50% percentile was instrumented, calibrated with the help of centrifuge, certified and used as anthropomorphic instrument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











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INTERNATIONAL AEROSPACE, MILITARY, NAVY AND TECHNOLOGY GUIDES IN 2018

	Release dates	Additional distribution
'RA&MG' №01 (19)	March 09th	**DIMDEX 2018** (12-14.03.2018, Qatar, Doha)
'RA&MG' №02 (20)	April 10th	**DEFEXPO INDIA 2018** (11-14.04.2018 Chennai, India)
'RA&MG' №03 (21)	April 23th	**Eurasia Airshow 2018** (25-28.04.2018, Turkey, Antalya)
'RA&MG'№03 (21)	April 23th	**ILA Berlin Air Show 2018** (25-29.04.2018, Germany, Berlin)
'RA&MG'№04 (22)	May 04th	**SOFEX 2018** (08-10.05.2018, Jordan, Amman)
'RA&MG'№05 (23)	May 21th	**KADEX-2018** (23-26.05.2018, Kazakhstan, Astana)
'RA&MG'№06 (24)	August 20th	**ARMY-2018** (21-26.08.2018, Russia, Moscow)
'RA&MG'№07 (25)	September 10th	**GIDROAVIASALON-2018** (13-16.09.2018, Russia, Gelendzhik)
'RA&MG'№08 (26)	September 17th	**Africa Aerospace and Defence 2018** (19-23.09.2018, South Africa)
'RA&MG'№09 (27)	September 24th	**ADEX 2018** (26-29.09.2018, Azerbaijan, Baku)
'RA&MG'№10 (28)	September 26th	**Istambul Airshow 2018** (27-30.09.2018, Turkey, Istambul)
'RA&MG'№11 (29)	October 15th	**Future Forces 2018** (15-19.10.2018, Czech, Prague)
'RA&MG'№12 (30)	October 22th	**EURONAVAL 2018** (23-26.10.2018, France, Paris)
'RA&MG'№13 (31)	November 05th	**Airshow China 2018** (06-11.11.2018, Zhuhai, China)
'RA&MG'№14 (32)	November 07th	**INDO DEFENCE 2018** (07-10.11.2018, Indonesia, Jakarta)
'RA&MG'№15 (33)	November 10th	**BIAS 2018** (14-16.11.2018, Bahrain, Manama)
'RA&MG'№16 (34)	November 26th	**IDEAS 2018** (27-30.11.2018, Pakistan, Karachi)
'RA&MG'№17 (35)	November 27th	**JIAE 2018** (28-30.11.2018, Japan, Tokyo)
'RA&MG'№18 (36)	December 01th	**EDEX 2018** (03-05.12.2018, Egypt, Cairo)
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The 'Russian Aviation & Military Guide' is English-language international magazine distributed all over the world.

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