INTERNATIONAL AVIATION & MILITARY GUIDE

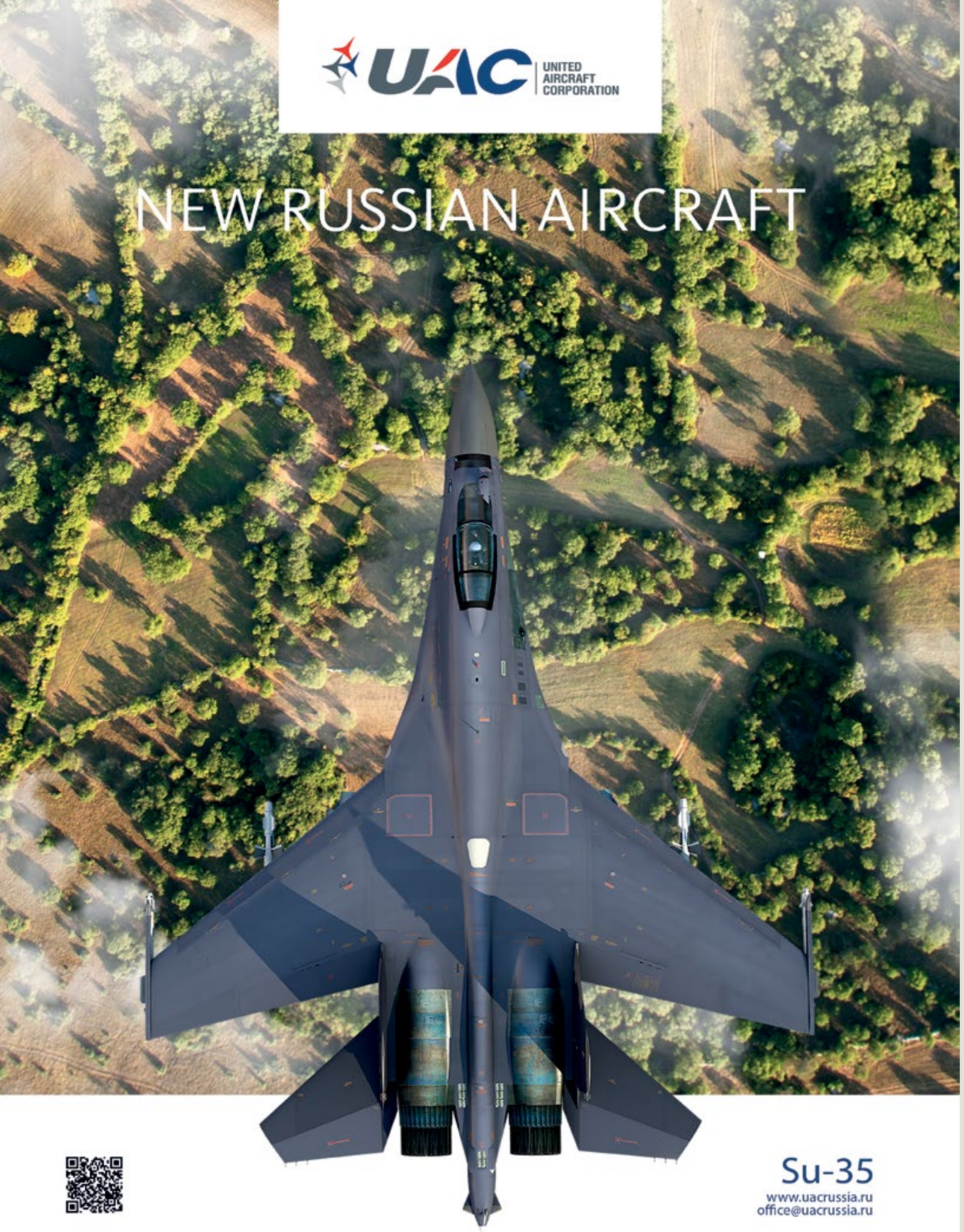
Special analytical export project of the United Industrial Edition

№11 (29) November, 2018

High technologies and solutions for ASEAN and South-East Asia

INDO DEFENCE 2018 EXPO & FORUM

SPECIAL PARTNERSHIP



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EDITORIAL

The best offers for ASEAN

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

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

One can predict raise of defense means market in times like this. But together with developing of defense technologies in order to safety, rivalry among sellers of weapons and defense systems increases in order to achieve such goals as increasing profits and market share. INDO DEFENCE 2018 EXPO & FORUM presents in Indonesia the best Russian 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 INDO DEFENCE Russia continues the policy of open partnership with the ASEAN-countries and with Asia and the Pacific region, of course... Russia has a wide product line that meets all the needs of defense on this continent and ready propose the best technology and the best price offers.

Valeriy Stolnikov

COOPERATION WITH SOUTHERN AFRICA

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

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

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

RUSSIAN LADA IN GLOBAL MARKET

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

Engine Components for MC-21

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

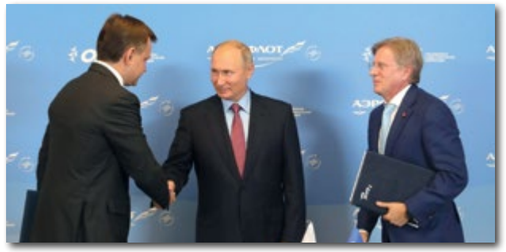
The new alloy has been used for making high pressure compressor discs and a turbine for the PD-14 engine created for the first Russian short and medium-haul MC-21 aircraft. According to current estimates, its implementation, along with other innovative technical solutions, will increase the life of these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

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

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

Aeroflot and UAC sign agreement for 100 Superjet 100 aicraft

Aeroflot and the United Aircraft Corporation have signed an agreement for delivery to Aeroflot, the national carrier, of 100 Superjet 100 (SSJ100) aircraft. The document was signed by Aeroflot CEO Vitaly Saveliev and UAC President Yury Slyusar during the Eastern Economic Forum in the presence of President of the Russian Federation Vladimir Putin.



Under the agreement UAC will deliver 100 SSJ100 aircraft to Aeroflot between 2019 and 2026. The aircraft will be configured with 12 seats in business class and 75 seats in economy class. The final contract documents will be signed after the parties agree on material terms of the transaction and obtain necessary corporate approvals.

Vitaly Saveliev, CEO of PJSC Aeroflot, said:

'We have signed the largest aircraft delivery agreement in Aeroflot's history, under which the Company will receive 100 modern Russian-built SSJ100 aircraft. Including the expected delivery of 50 MC-21, by 2026 Aeroflot will operate 200 Russian-built aircraft. Aeroflot has historically been the largest operator of Russian aircraft and has helped to improve all Russian aircraft models currently in operation. It is Aeroflot's top priority to act in the interests of Russian aviation and our country.'

Yury Slyusar, President of PJSC UAC, said:

'We have worked with Aeroflot for many years. As the first and largest operator of SSJ100 aircraft, Aeroflot has significantly helped the development of Russia's aircraft industry. The signing of the new agreement marks the next stage of our cooperation and joint contribution to the development of the aircraft industry and the expansion of regional and international air connections. We are happy to continue working with Russia's leading airline.'

Aeroflot currently operates 49 SSJ100 aircraft and is expecting the delivery of the 50th aircraft. Aeroflot's first commercial SSJ100 flight took place on 16 June 2011 between Moscow and Saint Petersburg. Today, SSJ100 aircraft operate on routes to Belgorod, Nizhny Novgorod, Orenburg, Perm, Saratov, Sochi, Syktyvkar, Tyumen, Chelyabinsk and other cities. SSJ100 aircraft also fly to international destinations including Dresden, Vilnius, Gothenburg, Bucharest, Zagreb, Ljubljana, Riga, Sofia and Tivat.

COMPONENTS FOR THE INDIA SPACE CENTRE

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

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

'India is continuing to actively increase its pace of space exploration and is spending more than $1.2 billion per year in this field. The country is already ranked fifth among the space powers and intends to strengthen this position. The first supply of ferrites for Indian civilian satellites allows us to open a new area of cooperation and gain a foothold in this fast-growing market. Thanks to the expansion of cooperation with India, in 2018, we already expect to quadruple the share of exports of ferrite products compared to last year,' says Rostec's Executive Director, Oleg Yevtushenko. Ferrite Domen Scientific Research Institute manufactures around 40% of all ferrite products in Russia. The Space Applications Centre of the Government of India produces civilian satellites, which are used for telephone communications, radio broadcasting and satellite Internet. In addition, the organization develops optical and microwave sensors for satellites, and software for signal and image processing.

ZENIT & LEICA

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

Replacement for Makarov Pistol

The Central Scientific Research Institute of Precision Engineering (TSNIITOCHMASH), part of Rostec, has created a 9x21mm pistol that may replace the legendary Makarov handgun. The new pistol is being tested at ranges. The tests are expected to be completed in December 2018.

The new firearm is developed for the benefit of the Ministry of Defence of the Russian Federation and law enforcement services. It should replace the Makarov pistol (PM) which is in Russian military and police service. PM is also the main personal weapon of officers of the armed and security forces in former member-countries of the Warsaw Pact, as well as in China.

'The new pistol for the Ministry of Defence is being tested at ranges. According to a directive of the Ministry of Defence, official tests are scheduled to be completed in December 2018. Then a decision on its supply for the Russian Armed Forces will be made,' said Albert Bakov, General Director of TSNIITOCHMASH.

The Makarov semi-automatic pistol was adopted into service in 1951. While developing it, Nikolay Makarov, a Soviet firearms designer, used the system of the Walther PP, produced since 1929, as a basis. However, the designer significantly improved the pistol: he simplified the design and made it more solid and less dependent on external conditions.

'This project proves again that Russia has all knowledge and capabilities that are necessary to create high-quality small arms, including short arms. Such a product requires a wide range of expertise from basic sciences to metallurgy. Many countries with developed machine industries can't afford to develop their own pistols. There is no doubt that the project of our specialists will be noticed on the market,' said Sergey Abramov, Conventional Armament, Ammunition and Special Chemistry Cluster Industrial Director of the Rostec.

Rostec implements a large-scale development program of the Armament cluster in accordance with the approved Strategy. The latter implies the average annual growth of revenue by 17% in roubles up to 2025, as well as increasing operational efficiency and entry into global markets.

Helicopter Engine Maintenance in Asia

JSC UEC-Klimov (part of the Rostec's United Engine Corporation) and Vietnamese Helicopter Technical Service Company have signed a distributor agreement on maintenance of TV3-117 and VK-2500 civil helicopter engines. The companies will support the operation of the engines and main gearboxes in 12 Asian countries. For this purpose, the Center for Integrated Logistics Support will be created in Vũng Tàu (Vietnam) by the end of this year.

The partners have signed the agreement today in Saint Petersburg. Within the framework of the deal, Helicopter Technical Service Company, that provides maintenance of Russian built helicopters, will distribute TV3-117 and VK-2500 civil helicopter engines designed by UEC-Klimov in Indonesia, Malaysia, Cambodia, Thailand, Vietnam, Myanmar, Laos, Australia, India, China, Bangladesh and Sri Lanka. UEC-Klimov will repair power units, supply engines, components, assemblies and spare parts, and train the staff in maintenance of civil engines and VR-12/VR-252 main helicopter gearboxes.

'By developing the system of after-sales support of aircraft engines in Asia, we will be able to increase the attractiveness of our products for local customers. Our offer to the partners is not an individual product – it comprises the whole range of related maintenance services. We are ready to provide support of the power units throughout their life cycle. Such approach will help reduce the duration of engine maintenance and repair and lower the machine operation costs,' noted Anatoly Serdyukov, Industrial Directorof Rostec's Aviation Cluster.

Within implementation of the agreement, the Center for Integrated Logistics Support of UEC-Klimov will be established in Vũng Tàu (Vietnam) by the end of this year. It will include a center for mid-life repair of civil helicopter engines, a warehouse of spare parts and assemblies, and a representative office of UEC-Klimov. The aviation authorities of the Socialist Republic of Vietnam are expected to issue the certificate to the Center in December 2018 after completion of pilot repair of one engine.

'The negotiations on the cooperation were held within UEC-Klimov's 2018–2022 service development program. As a result of these negotiations, our enterprise has entered a new market. We believe that we will become reliable partners providing prompt and high-quality after-sales support and repair of power units operated not only in Vietnam, but across the entire Southeast Asia,' said Alexander Vatagin, CEO of UEC-Klimov.

TEST COMPLEX FOR PD-35

United Engine Corporation (UEC), a part of Rostec, will build a test complex for the prospective PD-35 aircraft engine, which is proposed to be used in the Russian-Chinese CR929 aircraft. The testing facilities will be created at JSC 'UEC-PERM ENGINE'. There will be about 40,000 square meters of production, administration and accommodation, and engineering areas with state-of-the-art equipment on the premises of the out-of-town test facility in Russia's Perm Krai. The cost of the project is about $300 million, the first test stands will be built in 2021.

'The most important objectives during the implementation of the prospective PD-35 project include exhaustive tests of both separate subassemblies and full-size engines. To achieve this, we are creating infrastructure that meets the latest requirements. We have already started preparing designs for facilities. I would like to remind that PD-35 is one of the most significant developments in Russian aviation. I am convinced that the joint project on creating the engine for the prospective Russian-Chinese CR929 aircraft, based on the PD-35, will combine the best technological and managerial competencies of the two countries and will become an example of successful international partnership in the sphere of high technology', said Victor Kladov, Director for International Cooperation and Regional Policy Department of Rostec.

UEC started the development of the PD-35 engine in the summer of 2016. The bypass turbofan engine is expected to have increased thrust (up to 35 tonnes) and to be installed in prospective wide-body aircraft.

The PD-35 project widely uses the scientific and technical reserve obtained during the development of the newest Russian PD-14 engine for the prospective MS-21-300 aircraft.

Currently, the design of the PD-35 engine has been determined, cooperation between industry enterprises has been established, and issues related to breakthrough technologies for project implementation have been identified. This allows creating a competitive engine of the late 2020s. A family of high thrust engines may be created on the PD-35 base.

On September 20, 2017, during Aviation Expo China 2017 held in Beijing, UEC signed a cooperation memorandum with the Chinese company AECC Commercial Aircraft Engine Co., Ltd. (AECC CAE) on the development of a gas turbine engine for the prospective CR929 Russian-Chinese long range wide-body aircraft (LRWBA).

Rostec continues to implement a large-scale program on developing its Aviation Cluster in accordance with the approved strategy stipulating the main goals such as increasing ruble revenue by an average of 17% until 2025, increasing the share of civilian products in the revenue to 50%, improving operational efficiency and getting into global markets.

New High-Precision Artillery Projectile

Techmash Concern (part of Rostec) is developing a concept for a new 152 mm correctable artillery projectile. Its key feature is trajectory correction in the final stage of flight, i.e., immediately after firing, the ammunition piece will move ballistically, like a conventional projectile, but in the vicinity of the target, it will use its own control system to correct its trajectory.

'It is a new 152 mm correctable projectile for artillery of that caliber. It is difficult to build a control system into ammunition of this type due to the high dynamic loads that the projectile undergoes at the moment of firing, while it is spinning within the barrel bore and during the flight. At a spin rate as high as 30,000 revolutions per second, optics do not work – the picture is blurred. We are considering several ways to correct the projectile trajectory in the final stage, including aerodynamic surfaces on the fuse and mini jet engines,' said Deputy CEO of Techmash Alexander Kochkin.

Now design specifications and general outline of the new projectile are being developed. The design does not have a name yet. The new projectile should fall in the middle price range – cheaper than guided projectiles like the Krasnopol type, but more expensive than conventional projectiles.

'Rostec pays special attention to developing and producing high tech products and promoting them on the international market. I am sure the new correctable projectiles that are being developed by Techmash will interest our foreign partners in a number of countries, including the Middle East,' said Sergey Abramov Industrial Director of the cluster of conventional weapons, ammunition and special chemistry at Rostec.

Rostec is implementing a large-scale Armament Cluster Development program, with an approved Strategy targeting 17% annual revenue growth in rubles by 2025 while improving operational efficiency and entering the global market.

Ammunition for Drone Manufacturers

Techmash (part of Rostec) is ready to adapt ammunition to meet the needs of drone manufacturers. Companies of the concern produce a wide range of air ammunition, such as aerial bombs whose weight ranges between 2.5 kg and 50 kg.

'Currently, we are considering the drone manufacturers who are interested in cooperation, i.e. for whom we can adapt our samples. At the same time, we are adapting grenade launchers manufactured by JSC 'SPA 'Bazalt' to make them compatible with drones,' said Aleksandr Kochkin, Deputy CEO of Techmash.

Rostec is actively expanding military-technical cooperation with its partners, including organization of licensed production of its ammunition abroad. In 2014 Rosoboronexport signed a contract for transferring a license for production of Techmash's Mango tank ammunition to India.

'We believe that key mechanisms for promoting our products include transition from supplies to technological and industry partnerships. We are ready to adapt our technologies and solutions to meet our customers' needs. Such forms of cooperation are especially interesting for our partners,' said Sergey Abramov, Industrial Director of the cluster of conventional weapons, ammunition and special chemistry at Rostec.

Rostec continues to implement a large-scale program on developing its weapons cluster in accordance with the approved strategy stipulating the main goals such as increasing revenue by an average of 17% in rubles until 2025 and improving operational efficiency and getting into global markets.

CONTRACT WITH INDIA FOR S-400

On October 5, 2018, in Delhi Rosoboronexport (part of the Rostec State Corporation) signed a contract to supply India with the S-400 Triumph long-range air defense missile systems (ADMS).

‘The S-400 supply agreement with India is a new landmark in the history of military-technical cooperation between our countries. The deal demonstrates the highest level of trust and understanding between India and Russia. I am sure that this agreement will also be a new impulse for strengthening and deepening our cooperation in civil industry.‘ said the Head of Rostec State Corporation Sergey Chemezov.

The main advantage of the S-400 lies in its versatility. The system is able to engage both all types of aerodynamic targets and ballistic missiles, up to intermediate-range ballistic missiles. The Triumph is far superior to its foreign counterparts in maximum engagement range and minimum engagement altitude, emplacement/displacement time, as well as in a number of other key characteristics.

‘The contract for the supply of S-400 Triumph air defense missile systems to India is the biggest for the entire period of military-technical cooperation between Russia and India and the largest in history of Rosoboronexport. Today we begin to execute it‘ said the Head of Rosoboronexport Alexander Mikheev.

Regular meetings between the leaders of Russia and India give strong impetus to the development of relations between the countries and play an important role in expanding and strengthening military-technical cooperation, which has been underway since 1960. Since then, exports of Russian military products to India have exceeded $65 billion.

‘Rosoboronexport is prepared to cooperate with India in any areas. At the moment, a number of other major contracts for the supply of Russian weapons to India are in the final stages of preparation and we hope they will be signed soon,‘ Alexander Mikheev said. /IA&MG/

> *‘The contract for the supply of S-400 Triumph air defense missile systems to India is the biggest for the entire period of military-technical cooperation between Russia and India and the largest in history of Rosoboronexport. Today we begin to execute it.‘*
>
> ***Alexander Mikheev***

FOR ARMED FORCES AND SPECIAL UNITS

Rosoboronexport (part of the Rostec State Corporation) took part in the 22th International State Security Exhibition, Interpolitex 2018 (VDNKh, Moscow). During Interpolitex 2018, Rosoboronexport undertook aggressive marketing efforts to promote the entire range of security products for security agencies and private partners of foreign countries. The Company has invited over 80 delegations from more than 60 countries of the world to the exhibition.

'Promotion of state and infrastructure security tools and services to the world market has been chosen as one of the drivers of achieving Rosoboronexport's strategic objectives. An unprecedented rise in terrorist and extremist threats in almost all regions of the world reinforces the urgency of this area of activities. The Russian industry has a high level of competence in these matters, while the practicality and a wide range of use of weapons, military and special equipment produced in our country have been repeatedly proved in actual combat conditions,' said Rosoboronexport's Director General Alexander Mikheev.

The exhibition was held in three halls of Pavilion No. 75 and in an open area totaling over 25,000 square meters. Rosoboronexport's exhibit comprised more than 100 models of weapons and military equipment developed and produced by Russian defense enterprises. At the Company's stand, experts tested skills in shooting the Kalashnikov MMG-AK-101 assault rifle and MP-446 Viking self-loading pistol mockups on the SKAT small arms trainer.

At Interpolitex 2018, Rosoboronexport also showcasев a wide range of means of ensuring law and order, combating terrorism, protecting high-priority and critical infrastructure facilities, extended borders, as well as anti-UAV systems, electronic warfare capabilities and confidential communication facilities.

Equipment offered by Rosoboronexport for the armed forces and special units for combating terrorism and organized crime were presented at a static display. It is very popular in many regions of the world and includes the KAMAZ-53949 mine-resistant vehicle of the Typhoon-K family, the Tigr special wheeled armored vehicle, and also special vehicles on the Ural chassis.

/IA&MG/

RUSSIAN DEFENSE INNOVATIONS

Rosoboronexport advances cooperation with Indonesia and ASEAN countries

Rosoboronexport, a member of the Rostec Corporation, is to set up a joint Russian exposition at INDO DEFENCE 2018 Expo & Forum. The Indonesia's Tri-Service Defence event is held at Jakarta International Expo Kemayoran. Hosted by the Ministry of Defence, INDO DEFENCE 2018 Expo & Forum is recognized as the indispensable place to be, learn, network and do business. Held concurrently with the 5th INDO MARINE 2018 Expo & Forum, the expo is the biggest Indonesian's No.1 Tri-Service Defence Industry Event. INDO DEFENCE 2018 Expo & Forum includes the international conference, free technical product presentation, live product demonstration and network with industry experts. Russian participation in this EXPO is traditionally large-scale and representative.

'The year 2018 marks the 60th anniversary of the first deliveries of Soviet military products to Indonesia. New bright pages continue to be added to the history of military and technical cooperation between our countries. Indonesia continues to receive modern Russian aircraft and helicopters, armored vehicles and other systems. For many years, Rosoboronexport has been an exhibitor at INDO DEFENSE, the International Exhibition of Arms and Military Equipment, held in Jakarta. In November this year, the Company will once again organize the joint Russian display here,' said Alexander Mikheev, Director General of Rosoboronexport.

Sixty years ago, Indonesian armed forces needed total modernization to protect the country's territorial integrity and sovereignty. In this regard, negotiations on the supply of Soviet weapons and military equipment began in 1957. The GAZ-69 light off-road vehicle, which won a tender from Western competitors in 1957, was the first in this line. 100 vehicles were delivered for the Indonesian Air Force and another 400 for army units later. These 1950s-era light trucks are still in use by the country's armed forces.

In 1958, the parties agreed on the supply of dozens of MiG-15UTI fighter trainer aircraft and MiG-17 fighters, Il-28 bombers and Il-14 transport aircraft to Indonesia. The Indonesian navy was also re-equipped. In particular, two Project 631 submarines and four destroyers were ordered in 1958 and came to Indonesia as early as 1959, where the ships were given Indonesian names Sanjaya, Sultan Iskandar Muda, Sawunggaling and Siliwangi.

Russia continued military and technical cooperation with Indonesia. "In general, the total value of military deliveries to Indonesia exceeded $2.5 billion since November 1992. During that period, BTR-80A armored personnel carriers and BMP-3F infantry fighting vehicles, AK-100 series Kalashnikov assault rifles, Su-27SK, Su-27SKM, Su-30MK and Su-30MK2 fighters, Mi-35 and Mi-17 helicopters, as well as other weapons and military equipment have been supplied to Indonesia," Alexander Mikheev added.

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

EXPORT REGULATIONS

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.

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

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

'The year 2018 marks the 60th anniversary of the first deliveries of Soviet military products to Indonesia. New bright pages continue to be added to the history of military and technical cooperation between our countries. Indonesia continues to receive modern Russian aircraft and helicopters, armored vehicles and other systems. For many years, Rosoboronexport has been an exhibitor at INDO DEFENSE, the International Exhibition of Arms and Military Equipment, held in Jakarta. In November this year, the Company will once again organize the joint Russian display here'.

Alexander Mikheev

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

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

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

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

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

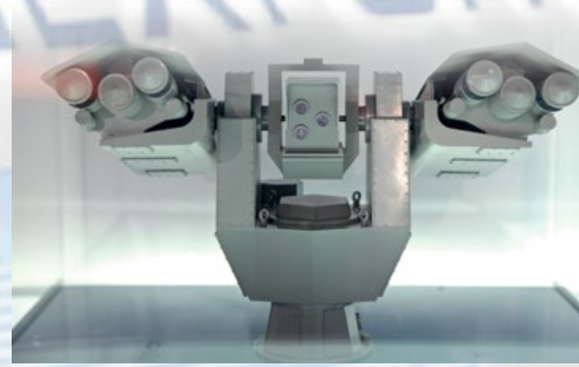
Core areas of activities of Rosoboronexport

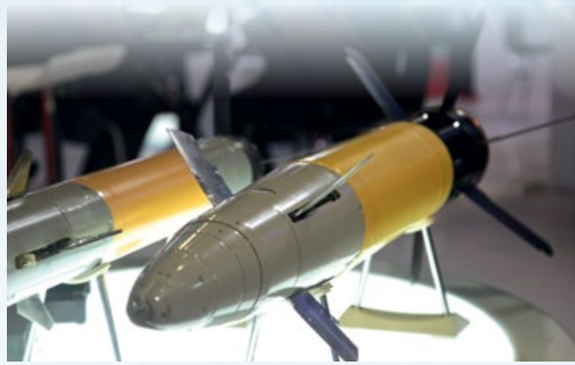
- **Export / import of all types of conventional weapons, military and dual-use equipment and services.**
- **Organization of licensed production of armaments and military equipment abroad, joint R&D efforts with foreign partners.**
- **Maintenance and repair of earlier supplied weaponry and military 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 pursues a marketing strategy targeted to expand the geography, range and volume of export deliveries. A number of special programs and projects for exporting products to specific countries have been developed based on a comprehensive analysis of the arms markets and foreign partners' needs. Rosoboronexport seeks to operate flexibly and efficiently in the market, using modern and advanced marketing and customers' settlement methods.

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

Russian export to the region makes emphasis on aviation equipment. Company's specialists believe that the most promising export future faces the Su-30 family of multirole fighters, MiG-29M/ M2 multirole tactical fighter, and Yak-130 combat-trainer. African partners also get their attention piqued by the Mi-171Sh military transport helicopter, Mi-35 gunship with troop-caring capacity, and ANSAT.





FROM 1950s TO FUTURE COOPERATION

Russia offers several variants of submarines to its foreign partners. Among them, Kilo class is highly recognised. Around 70 ships have already been constructed to the Kilo class basic design and its upgraded versions. They were inducted into the Russian Navy and navies of friendly countries. Kilo class boats and most other Russian conventional submarines as well were designed by Rubin Design Bureau. It was founded in 1901 and since that time, nearly 1000 submarines have been built to its designs. Rubin has been engaged into international defence cooperation for 60 years: 112 submarines designed by Rubin were delivered to 15 countries. Indonesia holds the record in receiving the largest ever batch of Russian-built single-type submarines, namely twelve Whiskey-class boats (Project 613). Some of them were in service until 1990.

Historical Background

Russia and Indonesia began their submarine cooperation in the late 1950s.

In 1959, Soviet naval ships approached the coast of Indonesia for the first time. Cruiser *Admiral Senyavin*, flying the flag of the Soviet Pacific Fleet Commander and escorted by two destroyers, visited Surabaya. Around the same time, two diesel-electric submarines of Project 611 (Zulu class) accomplished 150-day semi-circumnavigation cruise from the Russian North to the city of Vladivostok around Africa, Australia and New Zealand. As soon as nuclear submarines became available, the Soviet Navy established its permanent presence in the Pacific Ocean.

As is known, the Soviet Union offered unqualified support to the announcement of independence by Indonesia in 1945-1950 including support in the UN Security Council. Moscow declared its 'full support to the righteous struggle of the people of Indonesia against colonialism.' All this was backed up by presence of Soviet military specialists who helped the locals to operate Soviet military equipment that was arriving aplenty.

Totally, Moscow handed over to Jakarta a cruiser of Project 68-bis (cruiser *Irian* served in the Indonesian Navy in 1962-1972), ten destroyers of Project 30-bis and 12 submarines of Project 613 (Whiskey class). 'The Soviet underwater force in the 1950s was mainly based on the Whiskey-class submarines that were later upgraded and rearmed many times. They served for many years and some of them even outlasted the collapse of the Soviet Union. That was a reliable and robust submarine and veteran submariners recall them with warmth,' writes Captain Sergei Titushkin in his memoires. Over two hundred Whiskey-class submarines were constructed. They were simple by design and reliable in operation, which contributed to their quick mastering by the crew. These boats were being built at several shipyards simultaneously with construction rate being very high, up to 73 units a year.

In 1961, in the city of Vladivostok, the training of Indonesian crews was under way. The major focus was made on the technical aspects: operation of weapons and technical facilities, detailed study of materiel, correct actions during weapon inspections and checks. At the same time, Indonesian submariners had a basic course of the Russian language and, according to one of the eyewitnesses, 'their talents for languages, as well as for many other things, exceeded all expectations and so, the further training continued in Russian.' One may say that Indonesian and Soviet sailors trained together: the first two submarines sailed to Indonesia in 1959 and that was 'the first sailing experience of diesel Whiskey-class submarines in equatorial waters and that experience was invaluable,' recollect participants of the cruise.

The Soviet Union sent a large squadron of ships (a cruiser, seven destroyers and six submarines) to the Indonesian shores during a heated dispute about the future of West Irian (Eastern part of New Guinea). In June 1962, they arrived to Surabaya but did not have to take part in the conflict, as it was resolved politically. Yet, submarine crews had gone through intensive training and went to sea for reconnaissance and probable combat engagement but then were withdrawn to the base. Thereafter preparation for transfer of ships to Indonesia continued. While submarines were being refitted in dock, the Indonesian crews

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went on with their training. The sailors successfully passed the exams and the submarines went to a test range to the north of the Bawean Island for manoeuvring trials. In February 1963, Indonesian submariners practised combat skills and then performed three-stage torpedo firing, each stage becoming more and more sophisticated. Simulated attack against escorted target moving by altering course was the most difficult stage. All exercises were successfully completed.

Though Indonesia resumed procurement of Russian weapons only in 2003, it had acquired a few naval ships of Soviet projects ten years before. In 1993, Jakarta purchased dozens of ships of former German Democratic Republic's Navy including 14 amphibious ships and 10 minesweepers. Sixteen ASW ships of Project 1331M, built in the late 1980s, feature good manoeuvrability in rough sea in spite of their relatively small size. Presently they are mainly used to patrol territorial waters. These procurements demonstrated Indonesia's adherence to Soviet ships, which are still being operated along with the ships built in UK, the Netherlands, South Korea and Germany.

Present-Day Capabilities

Contemporary market of weapons is oriented to partnership and transfer of technologies. It has become a practice to select a foreign partner based on competition. Procurement of new military equipment (including submarines) is associated with the transfer of technological know-how, which contributes to the indigenous submarine-building capability.

Obviously, capability to design conventional submarines requires a systematic approach, i.e. setting up a design agency, refurbishing of shipyard and construction of infrastructure. Russia is one of the few countries that has all the technologies required for design of various ships. Joint design of a ship might be a possible variant of cooperation with a friendly nation. In case of joint design works, the requirements of the Navy could be the cornerstone of new project as well as training of designers could be envisaged, i.e. transfer of technologies to the maximum extent possible can be realised.

Rubin Design Bureau is an integrated supplier that ensures the entire cycle of works: research and development, detailed design, procurement of components, construction, trials and commissioning of the ship and its subsequent operation including refits and upgrade. Rubin is in constant interaction with various shipyards and wide range of equipment manufacturers.

Now, two series of conventional submarines – improved Kilo class and Lada class – are being constructed at the Admiralty Shipyards in St. Petersburg. The Admiralty Shipyards is a state-of-the-art centre of Russian non-nuclear shipbuilding and the oldest shipyard in Russia. It was founded by Peter the Great in 1704 and since that time over three thousand ships, including hundreds of submarines, have slid down its ways. Dozens of those submarines are still being operated by the Russian Navy and navies of friendly nations.

Russia is striving for quickest renewal of its Navy including the non-nuclear fleet. It takes three years to build the Project 636 submarine (Kilo class), including trials. Construction time of Lada-class submarine is now from three to four years, though, as the number of ships in the series increases, the time required to build one submarine decreases.

The improved Kilo class submarines commissioned by the Russian Navy in 2014-2016 operate in the Black Sea Fleet now. Deployment of those ships showed their high efficiency and that of the missile complex, in particular. Russian non-nuclear submarines are the only ones in the world that have performed salvo firing in combat conditions.

Admiralty Shipyards continues to build Kilo class sisterships.

Multi-purpose diesel-electric Kilo class submarine is designed for anti-submarine and anti-surface warfare, protection of naval bases, coastal areas and sea communications as well as for reconnaissance and other missions. It is a double-hull submarine with improved hull lines, large reserve of buoyancy and high floodability. Its compartments are divided by waterproof bulkheads. This design helps the boat to remain afloat during emergency flooding of one compartment and retain combat availability. The submarine is equipped with state-of-the-art means for reducing the self-noise down to natural noise of the ocean, which allows it to detect targets in advance, attack enemy ships with anti-ship missiles from the distance that exceeds its detection by the enemy, and evade in time from enemy's attacks.

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Major systems of Kilo class including combat system, navigation and sonar complexes, radio communication system have been upgraded. Some changes have been made to improve habitability. Improved Kilo class submarine features advanced on-board systems designed by Russian manufacturers in the 21st century. This class of submarines has a significant modernization margin that makes it possible to provide a tailor-made design. Due to well-proven building technologies, refit/modernization and well-established cooperation with equipment suppliers, boats can be built in the shortest possible time. Post-sales support including supply of spares is also well organized.

These boats carry exceptionally powerful weapons as compared to similar submarines of other countries. The Kilo class submarines are armed with versatile weapons, as they are capable of fighting against surface ships and submarines as well as attacking land targets. Nowadays, none of the European countries is offering an export submarine with the missile complex capable of engaging land-based targets. Russian submarines with missile complex, capable of powerful strikes both against surface and shore targets located at a considerable distance, in our opinion, are very attractive for the country that is selecting an optimum proposal for the development of the state-of-the-art submarine. /IA&MG/

RUSSIAN AIRCRAFT FOR ASEAN

The best proposals from UAC in the civil and military segments

The United Aircraft Corporation (UAC) is a major Russian aircraft manufacturer and one of the biggest in the world. UAC was established in 2006 and its member companies are leading in a wide range of aviation industries: development, production, sales, operational support, warranty and servicing, modernization, repair, and disposal of civil and military aircraft. The main provisions of UAC's Development Strategy through define the principles and directions for dynamic development of the Corporation in order to gain the status of one of the world's largest aircraft-manufacturing centers with a widely-diversified product range.

Now UAC unites more than 80 per cent of design and production assets of Russian aircraft industry. It also manages all key and most promising programs of development of the industry. UAC, which under one company represents the most well-known Russian aviation brands such as Sukhoi, MiG, Tupolev, Yakovlev and others, is today one of the world's biggest manufacturers and suppliers of aircraft. Thanks to the success of its products UAC is one of the world's leading aircraft manufacturers. UAC's revenues have been lately growing on average more than 20% per year. Superjet 100 civil airliners, Su-30 and MiG-29 fighters, Yak-130 operational trainers are among the most popular aircraft exported by UAC. UAC is working to simplify foreign market procedures, which is good news for present-day and future UAC's partners worldwide.

Moreover, one year ago as part of an effort to expand foreign presence UAC was given a military-dedicated foreign trade license to be implemented on a direct basis. The military-dedicated foreign trade license has been issued by Federal Service for Military and Technical cooperation. This helps UAC improve maintenance and repairs of equipment previously delivered abroad, which includes every Su, MiG, Il, Yak and Tu airplanes.

Alongside with the right for direct maintenance and repairs of the equipment previously delivered abroad, the document also specifies UAC's capabilities to update such equipment and train foreign personnel to maintain and repair UAC products. Besides, the license authorizes UAC to establish joint ventures abroad which can maintain and repair aircraft.

The license enables UAC to proceed to coordinated efforts in this area, develop a single enterprise after-sale service system based on current experience and ensure the most efficient activities at markets with several brands available.

The new capabilities confirm there is a steadily growing demand for UAC aircraft. Moreover, operational reliability and relatively low prices become increasingly significant. In this regard there is a reasonable increase of export of Russian aircraft having better reliability, up-to-dateness and well-balanced prices both for airplanes and further maintenance.

According to experts, it is Russian aircraft which in terms of life-cycle cost appear today as the most attractive in international markets.

UAC products include many aircraft which are proven international best-sellers. Thus, Su fighters are exported by Russia in the hundreds making these fighters among the most selling worldwide. In 2011-2014s Su planes were the first in amount: in four years customers have received 139 aircraft, while Lockheed Martin delivered only 89 and Boeing delivered 60 planes.

UAC places big stakes on supplying fighter planes given that many countries plan to have their aircraft fleets upgraded. Among the most world popular planes is Yak-130 operational trainer which has been already delivered and being delivered to many countries. This is a top-class aircraft. It can be upgraded as a light fighter or close support plane which is highly demanded by Indian Air Force.

However, Russian aviation export is notable not only for military aircraft. In recent years rather good results have been shown by civil segment for which UAC has been making big plans. Among Russian civil aircraft the Superjet 100 regional aircraft of a new generation is the most popular at foreign markets. The aircraft combines new aircraft engineering technologies, passenger convenience, significant economic advantages for airlines, proper environmental specifications.

The key advantage of Superjet 100 is lower operational costs as compared to its 100-seat competitors. Operational costs are minimized due to higher fuel efficiency and lower take-off weight. According to the aircraft operation study, its ownership cost is averagely 15-20% lower than the other similar class aircraft. The highly competitive lease rate supported by a state guarantee of depreciation value is also worth being taken into account.

SSJ100 capable of carrying 98 passengers is the first in its class aircraft featuring five-across seating, with big 32 inch distance between seats. Thanks to a combination of wider seats and higher cabin (over 2 meters) SSJ100 has more cabin space and bigger stowage bin capacity than such of competitors. The airplane has been built with the use of the latest design procedures and technologies by leading manufacturers such as French Snecma (engines) and Thales (avionics), US Goodrich (wheels) and Honeywell (APU). The interior has been designed by Italian office Pininfarina. In February 2012

PJSC UAC was established in accordance with RF Presidential Decree No. 140 dated February 20, 2006 'On Joint-Stock Company United Aircraft Corporation' for the protection and development of the scientific and industrial potential of the Russian aircraft industry, the security and defense of the state, and the concentration of intellectual, industrial, and financial resources to implement long-term aviation programs.

At present, UAC encompasses about 30 enterprises and is one of the largest players on the global aviation market. Companies within the structure of the Corporation hold rights to such world-famous brands as 'Sukhoi,' 'MiG,' 'IL,' 'Tu,' 'Yak,' 'Beriev,' as well as the new SSJ 100 and MS-21 brands.

Priority activity areas of the Corporation are the design, production, testing, operation, warranty and service maintenance of aircraft for civil and military purposes. UAC companies work in the spheres of the modernization, repair and disposal of aircraft, as well as the training and qualification-upgrading of flight crews.

To date, the largest share in the production structure consists of military products both for the RF Ministry of Defense and foreign customers. From 2013 onwards, the bulk of military-equipment deliveries are bound for the domestic market.

In 2013, nine aircraft repair plants of the RF Ministry of Defense were transferred to UAC. As a result, in 2014, the serviceability of the RF Air Force fleet increased from 40% to 65%.

UAC seeks to increase the proportion of civil aviation in its sales structure, primarily by ramping-up SSJ100 serial production and launching the production of its prospective MS-21aircraft family. A significant backlog of orders for both these products ensures uninterrupted utilization of UAC's production capacities in the mid-term.

The Corporation's assets are located in various regions of Russia, and there are joint ventures with foreign partners operating in India and Italy. In total, UAC's enterprises employ more than 98,000 people.

the aircraft was certified by European Aviation Safety Agency (EASA).

According to UAC President Yuri Slyusar the Corporation has stable rate of mass production of Superjet 100. There are plans that every year more than 30 such aircraft shall be delivered to customers. Today about one hundred SSJ100s are being operated including those in other world regions, from South America to Southeast Asia.

Currently with available manufacturing capacities UAC enterprises are capable of producing up to sixty Superjet 100 per year. The Russian aircraft sparkles profound interest in Southeast Asia and Latin America. Experts confirm that in the context of 70-100-seaters this aircraft is becoming the most attractive for many international airlines. When interviewed Yuri Slyusar says UAC is intended to focus on further development of the Superjet 100 aircraft family to offer customers a range of regional planes.

It is worth noting that today a business jet version of the SSJ100s is also available. Following the results a number of measures, including auxiliary fuel tanks installation and other engineering solutions the range of the business version of the SSJ100 is increased to about 7,000 km-long nonstop flight.

At the several international Airshows the United Aircraft Corporation demonstrated its Superjet 100 aircraft with a VIP interior and very high comfort standards. The Superjet 100 aircraft as well as the new Russian MC-21 aircraft family from UAC both demonstrate an optimal combination of commercial effectiveness and maximum passenger comfort. The Superjet 100 in its VIP configuration enjoys high demand. After a number of enhancements such as installation of additional fuel tanks and other system improvements the flight range of the VIP-version of the Superjet 100 was increased to 7,000 km that should satisfy the needs of most demanding customers.

The demand for UAC's military product lineup is stable, however it in particular has risen considerably after successful performance of such aircraft as the Su-35, Su-34, Su-30SM and MiG family fighters in real combat missions. Russian-made aircraft have once again proven their high combat effectiveness and flight and technical characteristics.

From 6 to 9 September this year Russian Gelendzhik city hosted the 12-th International Exhibition and Scientific Conference Hydroaviasalon-2018. Hydroaviasalon was managed by the United Aircarft Corporation (UAC) to promote its amphibious aircraft. During the Show the JSC Beriev Aircraft Company signed contracts to deliver Be-200ChS

amphibious aircraft to the companies from the USA and Chile. Agreement with the American company Seaplane Global Air Services makes provision for the delivery of four aircraft with an option for six more aircraft of the same type. The first two aircraft will be equipped with the Ukranian D-436TP engines, all the other aircraft will be equipped with SAM-146 engines of the Russian-French production. Contract with the Chilean company Asesorias CBP Ltda. is intended for delivery of two Be-200ES and an option for three more aircraft. Moreover, in the course of negotiations with the representatives of the Israeli company SHZ Aviation, the parties discussed an opportunity for SHZ Aviation company to finance the acquisition of Be-200 amphibious aircraft by the foreign customers from Asia. Indonesia, Thailand, Vietnam, Malaysia and Philippines were mentioned among the top-priority countries. The Be-200 has demonstrated its capabilities numerous times and has taken part in fire-fighting missions in France, Germany, Portugal, Italy, Greece, Malaysia and China. It has been piloted by French, American and Italian pilots and all of them expressed a high opinion of its performance and versatility.

The international authority of the UAC is also growing, thanks to the success of its international and domestic aviation projects. For example, a great deal of attention is shown around the world is to company CRAIC – the joint venture of United Aircraft Corporation (UAC) and Commercial Aircraft Corporation of China (COMAC). This year CRAIC 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 is 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 was received. Completion of RFP-related procedures within the Chinese-Russian long range wide body aircraft program is expected at the end of 2019.

One of the last major UAC's contracts is related to the civilian segment. Aeroflot and the Corporation have signed an agreement for delivery to Aeroflot, the national carrier, of 100 Superjet 100 (SSJ100) aircraft. The document was signed by Aeroflot CEO Vitaly Saveliev and UAC President Yury Slyusar during the Eastern Economic Forum in the presence of President of the Russian Federation Vladimir Putin.

Under the agreement UAC will deliver 100 SSJ100 aircraft to Aeroflot between 2019 and 2026. The aircraft will be configured with 12 seats in business class and 75 seats in economy class. The final contract documents will be signed after the parties agree on material terms of the transaction and obtain necessary corporate approvals.

Vitaly Saveliev, CEO of PJSC Aeroflot, said: 'We have signed the largest aircraft delivery agreement in Aeroflot's history, under which the Company will receive 100 modern Russian-built SSJ100 aircraft. Including the expected delivery of 50 MC-21, by 2026 Aeroflot will operate 200 Russian-built aircraft. Aeroflot has historically been the largest operator of Russian aircraft and has helped to improve all Russian aircraft models currently in operation. It is Aeroflot's top priority to act in the interests of Russian aviation and our country.'

Yury Slyusar, President of PJSC UAC, said: 'We have worked with Aeroflot for many years. As the first and largest operator of SSJ100 aircraft, Aeroflot has significantly helped the development of Russia's aircraft industry. The signing of the new agreement marks the next stage of our cooperation and joint contribution to the development of the aircraft industry and the expansion of regional and international air connections. We are happy to continue working with Russia's leading airline.'

Aeroflot currently operates 49 SSJ100 aircraft and is expecting the

delivery of the 50th aircraft. Aeroflot's first commercial SSJ100 flight took place on 16 June 2011 between Moscow and Saint Petersburg. Today, SSJ100 aircraft operate on routes to Belgorod, Nizhny Novgorod, Orenburg, Perm, Saratov, Sochi, Syktyvkar, Tyumen, Chelyabinsk and other cities. SSJ100 aircraft also fly to international destinations including Dresden, Vilnius, Gothenburg, Bucharest, Zagreb, Ljubljana, Riga, Sofia and Tivat.

/IA&MG/

According to the strategic goals of the United Aircraft Corporation (UAC), by 2035 the share of civil products in its revenues should reach 45%, more than doubling from its current level of 20%. In total, UAC's share of the total world's civil aircraft market should also reach 4.5% by 2025 from the current level of less than 1%.

The share of accessible military aircraft market should also rise from current 20% to 45% by 2035. The accessible market will consist of all countries except NATO-member countries and their historical allies and from 2030 the Chinese market. Not later than in 2025 UAC will become profitable by net profit and by 2035 will become a profitable business that is attractive to investors, lowering its dependency on the government in investments.

The main tasks of the UAC's market strategy are:

a) securing government requisites in state security including transportation security;

b) maximizing international sales in segments of civil regional, mainline and widebody jet aircraft;

c) preserving existing market share in military aviation while expanding in transport and special purpose segments;

d) achieving a balanced lifecycle stage product mix.

The overall effect from implementing measures to increase workforce effectiveness, capital management optimization, investment optimization, production facilities optimization and non-core assets sales will exceed 700 billion rubles by 2035. By that time the Corporation will provide more than 50,000 high-efficiency jobs, the yearly dividends should exceed 30 billion rubles, and payable taxes should exceed 200 billion per year.

KORNET-EM

MULTI-PURPOSE LONG-RANGE MISSILE SYSTEM

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

Advantages and Operating Features

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

System provides firing by all missiles of 'Kornet E' family.

HIGH-PRECISION WEAPONS

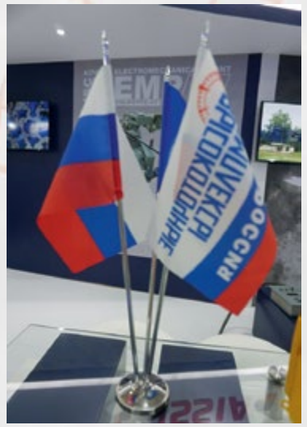
The Russian Holding creates the best innovative weapons for South East Asian Nations

Products of the High-Precision Weapons Holding (part of Rostec Corporation) are well known all over the world, including the ASEAN countries (Association of South East Asian Nations). Russian brands like 'Pantsir-S1', 'Kapustnik-B', 'Metis-M1', 'Bur', 'Kornet-E/EM' 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 INDO DEFENCE 2018 EXPO & FORUM – The Indonesia's Tri-Service Defence event (Jakarta International Expo Kemayoran, Indonesia) may fully see this in the exhibition.

Russian High-Precision Weapons holding (was founded in 2009) 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,



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/EM', '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.

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.'

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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, Africa, Arabian Gulf countries and India are among the most stable importers of the company-made products. Recently there has been also increasing export activity in the markets of Southeast Asia, Latin America, Central and South Africa. Besides, according to military experts there is every reason to believe that by 2020 export delivery volume of High-Precision Weapons Holding may have been increased twice. It is clearly seen at nearly every international armament exhibition where the holding company takes part, its products (both at displays and open sites) are leading objects of regard for experts and ordinary visitors. This is also because everybody wants to take a closer look at famous 'Pantsir-S1' or 'Kornet-E/EM' 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 groundswell of boosts in military spending and arms export. Eleven companies from the top 100 list are Russian ones. Their income has increased by a total of 48.4%'. It also can be noted that the High-Precision Weapons Holding belongs to the top 10 world's defensive rankings by an overall production and supply increase rate.

The weight of the holding company and its products in terms of strengthening defensive power of Russian army and delivery of the new-

est 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.

An average annual increase of the company's export deliveries is 25-40% that is certainly a world record in the sector of high precision weapons. Middle East, North Africa, Persian Gulf countries and India are among the most stable importers of the company-made products. Recently there has been also increasing export activity in the markets of Southeast Asia, Latin America, Central and South Africa. Besides, according to military experts there is every reason to believe that by 2020 export delivery volume of High-Precision Weapons Holding may have been increased twice. It is clearly seen at nearly every international armament exhibition where the holding company takes part, its products (both at displays and open sites) are leading objects of regard for experts and ordinary visitors.

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.

One of 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-E/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-E/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-E/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-E/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-E/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-E/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-E/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-E/EM' system to engage modern and future tanks bearing in mind the tendency to growth of their armour protection.

Such performance specifications endow 'Kornet-E/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-E/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.

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.

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;

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 unreachable for the small-arms. Under such circumstances the weapon should be extremely light-weight (to allow higher ammunition carrying capacity), highly maneuverable (small dimensions) and accurate, as well as possess long firing range and powerful warhead.

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 40oC to plus 60oC 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.

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.

Creation of highly efficient and at the same time easy in operation grenade launching system allows 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 military exhibition in ASEAN – INDO DEFENCE 2018 EXPO & FORUM and at the other arms shows permanently attended by the Russian holding.

/IA&MG/

AD ACS Polyana-D4M1

INCREASING OF EFFECTIVENESS OF AD GROUPING OPERATION

Automated control system over AD anti-missile brigade Polyana-D4M1

To provide reliable defense in military units as well as in government control objects and important industrial areas against air attack weapons it is necessary to create a modern air defense system.

Automated control system Polyana-D4M1 is used as a main element of AD system. Polyana-D4M1 is a flexible integrated system able to be an air defense control system of any state.

ACS Polyana-D4M1 is a backbone complex of multiple-element combat information system functioning on the base of a set of radars, anti-missile complexes, interacting and subordinate AD forces and means interacting in time and space in order to provide the effective control over military units.

Complex of the article is mounted on 4 vehicles and includes combat control post (CCP), command-staff vehicle (CSV) and two mobile power plants. Besides the mobile model, the article ACS Polyana-D4M1 has autonomous workplaces (article 9C929) meant for the equipping of command posts of AD troops.

Objects of control for ACS are anti-missile complexes of long (of C-300), medium (of BUK) and small (TOR type) range. Polyana-D4M1 provides defense with AD means for the area of 800x800 km. Moreover, up to 500 air objects may appear simultaneously in the responsibility zone.

ACS Polyana-D4M1 provides the following:

– collection and processing of radar information from subordinate and interacting means, air situation notifications;

- collection and processing of ground situation data;

- control over alert forces;

- elaboration of recommendations for control over subordinate units and sections and interaction support by means of automated solving of tasks of target distribution, combat actions coordination, effort distribution in interaction zones at repelling air and space attack;

- automated exchange of operational-tactical information and command-awareness information with higher level and interacting objects using data transmission equipment;

- solving of calculation tasks and recording of the results.

Article 9C929 provides full solving of functional tasks of Polyana-D4M1

Interior of the article ACS Polyana-D4M1

article, it copies all equipment in ACS Polyana-D4M1 and may serve as a main, alternate command post as well as an auxiliary one for stationary deployment.

Automated control technical means complex of MANPAD from the composition of mobile control post PU-12M7

When conducting modern combat actions the importance of AD formations significantly grows, especially of those that are equipped with portable air defense complexes. Such mobile complexes appear to be most enduring on the battlefield in the conditions of total electronic and space reconnaissance, and, therefore, the most effective in organizing countermeasures against enemy aviation. Besides, the effectiveness of air defense is greatly affected by the quality of MANPAD units control system functioning given the dynamic and rapid change of air situation.

Specialists of JSC Radiozavod developed the automated control technical means complex for AD units equipped with MANPADs, which allows to significantly extend functional abilities of units with different MANPADs.

It is possible due to the following:

- increasing of controllability of system elements due to introducing individual means of targeting;

- increasing of commands drill precision provided by using satellite orientation system;

- simplifying the procedure of MANPAD targeting provided by using interactive aiming system;

- increasing the size of the affected area by increasing the number of controlled elements and the range of information interaction.

Automated control technical means complex of MANPAD includes automated control module of the commander and up to nine individual automation complexes of MANPAD gunners.

Automated control module includes complex of automation facilities (PC of laptop type, data transmission equipment, navigation device), power supply facilities and radio communication set for organizing radio channels of telecode and voice communication with higher command post, radar and MANPAD gunners.

MANPAD unit interaction scheme

Each individual automation complex includes visualization device combined with the protective goggles, spatial orientation device and tactical vest with radio transceiver for organizing radio communication, computing unit (minicomputer), accumulator batteries, and micro telephone headset.

When conducting combat action the platoon commander uses air situation data from higher command post or radar in automated mode to carry out control over gunner actions by issuing target designation command from his computer to computing units of gunners.

The gunner, who received a command from the platoon commander for using the weapon in the form of target mark on the visualization device, turns to the direction of the target and then using interactive aiming system controls the change of coordinates and target movement direction. When the target enters impact zone, the MANPAD seeker captures it. The further actions of the gunner are defined by instructions for MANPAD firing. After launching the missile and hitting the target, the gunner changes the missile and sends a message to the commander about combat readiness by pushing one button.

Using of automated control system for units with portable air defense developed by JSC Radiozavod will allow to significantly increase their combat effectiveness due to earlier target designation (orientation and aiming at target before the visual or thermal imaging contact with target is established) and optimal distribution of target among gunners and also due to the increased operations security of units (gunners may be in shelter until the target enters impact zone of a MANPAD).

There is a possibility to use this complex for control over AD formations equipped with antiaircraft guns.

Picture of a MANPAD gunner, equipped with individual automation kit

MILITARY SHOW in PRETORIA

Africa Aerospace & Defence 2018: specific region, special site

The 10th edition of International Conference and Exhibition of arms and military equipment for all types of the Armed Forces 'Africa Aerospace and Defence – 2018' held on September 19-23 in Pretoria (The Republic of South Africa) at Waterkloof Centurion air base ended on high note with a spectacular showcasing of air-acrobatics gracing the Tshwane skies. Russian participation in the exhibition was perhaps not so large-scale, but very noticeable and important. Russia introduced the name of military equipment, specifically designed for the harsh conditions of Africa. Reliability and performance of Russian technology on the continent is well known. Therefore, a high interest in Russian proposals was not accidental. The official Russian Delegation was headed by D.E.Shugaev, Director of FSMTC of Russia.

The Exhibition is being held since 1992 and it is the largest exhibition of Land, Naval and aerospace equipment on the African continent. The main subjects – equipment and technologies connected with defence and aerospace subject (military and civil), military and civil aviation, arms and means for defence, all necessary for the Air Force, aviation and space branch, ground support means of the Air Force and aviation.

The organizers of the event – the Ministry of Defence and Military Veterans of the Republic of South Africa, South African Aerospace, Maritime and Defence Industries Association (AMD), the Armaments Corporation of the South Africa (ARMSCOR) and the Commercial Aviation Association of Southern Africa (CAASA).

The 2018 version of Africa Aerospace and Defence (AAD) brought together African and global business leaders and high-ranking military delegations for weeklong engagements and robust discussions on a myriad of topics, notable cyber security and the global contribution to peacekeeping efforts.

President Cyril Ramaphosa certainly signaled his support not only for the event as such, but also for an outreach to captains of the industry around the world and for expanding relationships with them, as AAD was his inaugural opening as the Commander-in-Chief of the South African National Defence Force. In keeping with this year's theme of 'Unlocking Africa's aerospace and defence potential', AAD2018 presented business opportunities on a continental and global front.

'The African Aerospace and Defence exhibition offer a massive opportunity for all present to identify areas of synergy and convert them into joint ventures,' the President said. The exhibition played host to 415 exhibitors from 40 countries, as well as 71 official delegations and attracted over 32000 trade visitors on the three trade days. On the two open days over the long weekend, no less than 55000 members of the public passed through the gates. This attendance is an example of the growth of the exhibition despite the hard-economic times being faced in South Africa and globally.

The organizer of the Russian exposition of the military-purpose products was JSC 'Rosoboronexport'. On the total area of 470 sq. meters stands it was showed productions of such enterprises as JSC 'UAC', JSC 'USC', JSC 'Russian Helicopters', 'HPW' JSC, JSC 'Tecmash'. Foreign specialists and visitors of the Russian exposition could familiarize themselves with

Aleksandr Rybchuk,
Top Specialist of Vympel Shipyard JSC:

'Vympel Shipyard JSC presented a number of products with the displacement of up to 2,400 tons both of military and of civil use at the AAD-2018 exhibition. Among the presented military items were Molniya missile boat, Grachonok anti-saboteur ship, Mangust fast patrol boat, Lamantin patrol boat; and seagoing passenger-carrying hydrofoil vessel Kometa 120M.

The primary goal of the participation in the exhibition was to present our products to eventual buyers. Our products are of high consumer appeal. For example, Mangust is fast-speed and highly mobile. Grachonok anti-saboteur ship is very effective in preventing acts of sabotage. It can also be successfully used in military operations. The new project Lamantin is used for patrolling. Kometa passenger-carrying vessel for 120 passengers, which is a rebirth of a well-known Soviet project of the same name, is of persistently high interest.'

Dmitry Novikov,
IMEX Department Head of JSC 'Research and Production Enterprise 'Rubin':

'The Research and Production Enterprise 'Rubin' presented its advanced pilot projects at the exhibition in RSA. Among them were a base set of the air defense control subsystem of the unified troop (forces) and weapons control system at the tactical level of Barnaul-T as a part of a planning module, tracked chassis reconnaissance and control module. The reconnaissance and control module collects and processes air information, ensures the operative command communication with higher-ranking control points, subordinate and coordinating points, provides for the planning of unit actions and task communication, and also ensures the automated control of air defense battery military equipment and personnel. The product provides for the effective backfiring against a concentrated hostile attack integrating heterogeneous air defense missile systems.

JSC 'Research and Production Enterprise 'Rubin' also presented the reconnaissance and control vehicle of the man-portable air defense system platoon commander, which excited interest. It is equipped with modern automated, communication and data exchange equipment and provides for the effective control of AA sniper sections, their response coordination, improvement of mobility and survivability under any battle conditions.

We communicated with technical experts from several states at the exhibition. One of them (a representative of Belgium) stated a very interesting assessment which, I think, shows the actual state of things in the manufacturing of control systems in Russia. He said that Russia is behind western states in terms of the element base, but is ahead of the curve as regards the algorithmics and software'.

the samples of the military-purpose products, which were represented in the form of models, patterns and advertising material.

Among them: Mi-28NE, Ka-52, Ka-226T helicopters; MiG-29M2, Il-76MD-90A, IL-112V aircraft, Amur-950 and Amur-1650 submarines, 22160 Project patrol ship; Kornet-EM and Metis-M1 antitank guided missile systems; Bakhcha combat module; Shmel-M and Varna flame-throwers; different types of small arms, ammunition and rounds.

Within the framework of the business schedule of the exhibition the meetings and negotiations were with the representatives of other countries on the issues of the current and perspective projects.

Russian helicopter products had at the exhibition large interest. The African countries are traditionally one of the largest operators of Russian-made helicopters. The total fleet of Russian-made rotorcraft on the continent exceeds 700 units. On top of all, a service center to maintain civil helicopters of Mi-8/17 type was established at Denel Aviation premises in RSA.

Russian Helicopters Holding Company (part of Rostec) presented the unique capabilities of advanced models of civil Mi-171A2, Ansat, Mi-38, Ka-62 and Ka-226T rotorcraft and the financial instruments offered to the customers for procuring new helicopters.

Mi-171A2 and Mi-38 helicopters offered to African customers are primarily used in civil aviation – for cargo, passengers and VIP transportation. These rotorcraft sport excellent flight performance, reliability, capability of operation within the wide range of conditions and temperatures, versatility, easy operability and maintainability. Moreover, Ansat helicopter is to be presented to national security, defense and law enforcement agencies. It is designed for cargo and passenger transportation, police and EMS missions, surveillance and SAR operations.

At the same time, Russian Helicopters Holding Company's representatives participated in the event's expansive business program.

The Company's delegation was meet partners from African countries during forums and roundtable discussions.

'This expo is one of the main platforms to promote helicopters in Sub-Saharan Africa and we are hoping to reach a number of agreements here that will be transformed into the actual contracts in the future. Russian-made rotorcraft are very well known on the African continent for their long-term and successful performance of humanitarian missions and casualties' evacuation during emergency relief. Superior flight performance, reliability, capability of operation within the wide range of conditions and temperatures make Russian-made rotorcraft one of the best offers for the African market', highlighted Andrey Boginsky, Director General of Russian Helicopters Holding Company.

Several highlights were witnessed this year and included amongst others: The Paramount Group's announcement of the establishment of Paramount South Africa, a transformed Black-Owned Enterprise constituted to provide the future capability requirements of South Africa's defence, police, border and peacekeeping forces.

Denel showcased its RG41 8x8 armoured, fitted with a 30 mm modular combat turret. The RG41 is a new generation wheeled armoured

Bogdan Terekhov,
Department Head of NPO Splav:

'At the exhibition in RSA, NPO Splav, as the developer of multiple-launch rocket systems, first of all presented the MLRS main range. The most heavy system is the Smerch MLRS which allows to solve a wide range of any battle targeting tasks over a distance of up to 90 km. Together with the system itself, we also presented the whole set of missiles with different combat equipment – five options in all, which allow to attack both heavy weapons and lightly-armored vehicles, manpower, and fuel-oil depots – fundamentally, any target which may appear in the operational activity. Famous Grad MLRS is a more mobile and simple system which we can offer. This system has already been upgraded several times; now it is the automated complex with almost new distant-range weapons.

Our equipment is well-known in the region. It may be said that nearly a half of armed forces in Africa are equipped with our MLRS. Officers who use our equipment often return thanks for the quality and reliability of our systems. These words are worth much! After all, what do army men want? They need reliable and adjustable equipment that would not give bother, would not be pain in the neck. In our case, the systems are tried and tested. They have been produced a while and are reliable to comply with all the requirements which can arise under real combat conditions'.

combat vehicle and a cost-effective solution for clients who require a combination of high mobility, protection and fire power. Airbus fixed the spotlight on its South African industrial partnerships, alongside its product portfolio. Some of the returning exhibitors who notably intensified their participation included MILKOR, a South African defence company, which develops and supplies a wide range of defence and security products.

East Africa was also well represented by SAFAT, a division of the military industry corporation MICSudan who exhibited for the second time, showcasing 122 products including static aircraft and their latest technology in Smart Air Surface Pumps guided by GPS known as precision guided bombs (BK-3). The Airforce of Zimbabwe K-8 Karakorum light attack fighter aircraft was also flown with a support CASA 212 on static display. Squadron 2 was well represented at the show once again as audiences were able to see six Gripens in formation, two Gripens in the mini-war and a solo gripen display flown by Major Geoffrey 'Spartan' Cooper and a 2v1 combat routine.

BELOMO Holding presented a new series of scope sights for sniping weapons at the international defense exhibition in RSA: sights GS 3-12x50, GS 4-16x56, GS 5-25x56 which can be mounted on rifles of all main calibers from 7.62 mm to 12.7 mm. The sights conform to all international standards; the controls are set up as per the system familiar to professional riflemen using foreign optics.

Among other significant developments presented is a compact collimating sight presented for the first time abroad. The current configuration sight is not expensive due to the optimization of process solutions applied, without depreciation of quality and retaining the technical characteristics. The sight is an excellent supplement to combat rifle systems like the Kalashnikov assault rifles and analogues.

The presentation of a new holographic sight at AAD-2018 should be specially focused on. It is a joint development with the Russian JSC 'Vavilov State Optical Institute' (St. Petersburg). There was also a thermal imaging sight with a distance meter for sniping weapons presented for the first time in this region.

A display stand of the Jordanian Jadara Equipment & Defence Systems Co PSC enterprise was also presented at the exhibition. BELOMO Holding cooperates with Jadara in the field of development of optics for different systems.

Keeping with tradition, AAD2018 also enabled the unlocking of the potential of South Africa's youth. AAD's youth development programme (YDP) ensured that thousands of school learners got exposed to the aerospace and defence technologies on display. They had the opportunity not only to engage with exhibitors, but also to explore career possibilities in the high-technology industry and military environment.

As Defence Minister Nosiviwe Mapisa-Nqakula said: 'Since much of the world has already entered the fourth industrial revolution with its nano-technology and artificial intelligence (AI), South Africans should be part of it.' CAASA, the commercial aviation association of South Africa, was the lead partner for AAD2018.

At the close of the exhibition, the baton was handed over to AMD: The South African Aerospace Maritime and Defence Association. President Ramaphosa observed that AAD is a national asset that has value for many departments and agencies of government and pledged the highest office's support to this expo as it brings together the largest gathering of the aerospace and defence industry players and buyers.

'AAD lives by the mandate of showcasing high technologies for the benefit of South Africa, its neighbours and the world at large and so we wish to thank all our exhibitors and sponsors for their contribution to another successful edition. We look forward to welcoming them all back in 2020 on 16 to 20 September' said Leon Dillman, CEO of CAASA in conclusion. /IA&MG/

Igor Markin,
Deputy Director General of Economics of Tula Arms Plant PJSC:

'Tula Arms Plant PJSC presented a wide range of military products at the exhibition in RSA. First of all, I am referring to 9M113M guided missile of the Konkurs-M complex. This missile has given a good account of itself. The product has been produced a while and is delivered to many countries of the world being still popular among other things thanks to the efficiency and reliability. It has a wide range of use – from +50 to –50. It is jam-resistant, it has the increased penetrating power… Generally, it is a high demand and advanced missile.

We also presented a 9 mm AM small-size assault rifle, 9 mm AS special assault rifle, 9 mm VSS special precision rifle, and other products at the AAD-2018 exhibition in RSA. The presented rifles can be of different colors including a camouflage coating for the desert. Our rifles, just as all Russian weapons, are reliable, easy, convenient, user-friendly, and have high combat qualities. Although our enterprise was at the exhibition in RSA for the first time, we are sure of the prospectivity of this region for the Tula Arms Plant products, which by their characteristics completely comply with the needs of the African military.'

ADEX-2018 in BAKU

The 3rd Azerbaijan International Defence Industry Exhibition

The International Defence Industry Exhibition 'ADEX-2018' was held on September 25-27, 2018 in Baku (the Republic of Azerbaijan) with the assistance of the Ministry of Defence and the Ministry of Defence Industry of the country. More than 220 companies from 29 states participated in exhibition. The organizer of the event was the exhibition company 'Caspian Event Organizers LLX'. The main subjects were arms and military equipment of the Army, Air Force, Navy and interior troops. ADEX 2018 became the largest International Defence Exhibition in the region.

The 3rd Azerbaijan International Defence Exhibition ADEX 2018 was held at Baku Expo Center in the capital of Azerbaijan from the 25th to the 27th of September. This large-scale event enjoys the status of a major regional exposition of weapons and military equipment; ADEX 2018 is a grand display of modern weaponry and equipment, where the force and power of Azerbaijan's military and industrial complex was showcased. The President of the Republic of Azerbaijan H.E. Ilham Aliyev sent a greeting letter to the participants of the exhibition.The initiator of the exhibition is the Ministry of Defence Industry of the Republic of Azerbaijan, and the exhibition is also supported by the Ministry of Defence of the Republic of Azerbaijan. The exhibition was organised by Caspian Event Organisers, CEO.

This year, 224 companies from 29 countries took part in the ADEX. The exhibition were features 11 national stands from Azerbaijan, China, France, Iran, Israel, Russia, Serbia, Turkey, the Republic of Belarus, Ukraine, Pakistan, and representing leading companies from these countries. Many countries have expanded the area of their national expositions; the top four with the largest number of companies represented are Turkey (41 companies), Russia (25 companies), Israel (14 companies) and Belarus (10 companies). In total, companies and delegations take part at the exhibition from 44 countries. The registration sponsor of the ADEX 2018 exhibition is the Secretariat of the Defence Industry of Turkey.

The organizer of the Russian exposition of the military-purpose products was JSC 'Rosoboronexport'. Stands of 21 Russian organizations was placed on the area of 363 sq.

Dmitry Glushkov,
Commercial Director of Polet JSC (Ivanovo Parachute Plant):

'Ivanovo parachute plant exists for more than 90 years in the market of parachute equipment, next year marks the 95th anniversary of the enterprise. The company produces a full range of parachute equipment for civil purposes. For all types of troops and law enforcement agencies in Russia and a number of foreign countries.

Although Polet has been working with Azerbaijan for eight years to supply landing and rescue parachute systems, we took part in the ADEX exhibition for the first time. We consider the market of Central Asia to be very promising due to the fact that the entire post-Soviet space exploits aviation technology and landing facilities of Soviet developments.

We came to the last ADEX with the purpose of marketing intelligence – to get acquainted with the spectrum of everything that is represented here. I liked that the program of visiting official delegations was formed in advance. That is, things stated by the organizers of the exhibition are actually carried out here. I think that the prospects in this market for us are very big, also in terms of product supply to the countries that traditionally participate in ADEX.'

Dmitry Zhidkov,
Deputy General Director of Shvabe Holding:

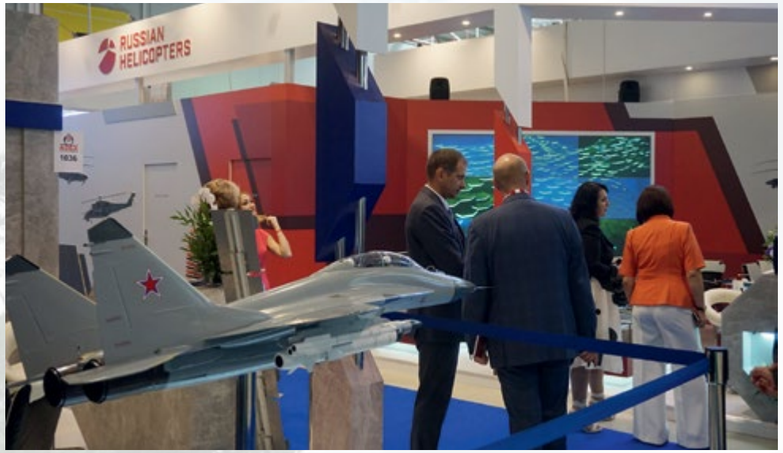
'At the exhibition in Baku Shvabe Holding presented the products of two enterprises: Novosibirsk Instrument-Making Plant and Krasnogorsk Plant Named after S.A. Zverev. Among the most popular prototypes are night vision sights for small arms, thermal imaging monoculars (including a universal night vision monocular), thermal imaging sights, pancratic optical sights, collimator sights, laser target indicators of both visible and invisible spectrum, sniper sights, stabilized binoculars and other full-scale prototypes.

Products of Shvabe Holding in Azerbaijan have a fairly stable interest of representatives of the Ministry of Defense of the Azerbaijan Republic, enterprises of the optical-electronic industry. This is also facilitated by the fact that the enterprises of the Holding have since the Soviet times been on good cooperative terms with the Azerbaijan enterprises. It is known that the equipment was supplied with the products of our defense enterprises, which later became part of the Holding. Currently, the license to carry out independent foreign trade activities in relation to the defense products allows the Holding (Shvabe JSC) to carry out mutually beneficial cooperation in terms of spare parts supply, repair and modernization of military-purpose equipment produced by the Holding.

There is no need to speak about the quality of Shvabe products – it is at the highest possible level, and this is well known all over the world. Our clients particularly often talk about the high operational suitability of the Holding products that work reliably and efficiently in any conditions, are simple and, maintenance-friendly and show high efficiency. At the same time, we constantly introduce new developments, rely on the latest trends in technological progress, while maintaining the key competitive qualities – reliability, operational suitability, affordability.'

Maxim Stepanov,
Deputy Director of AlmaDK LLP (Republic of Kazakhstan):

'At the ADEX-2018 exhibition, our company presented a wide range of special and military-purpose products, both for security agencies and rescue organizations. We have also introduced training and military pyrotechnics designed for personnel training – smoke-puff charges, imitation cartridges, which simulate the detonation of grenades, mines and shells, but without fragments. Our products are in demand both in Kazakhstan and in many other countries. One of our key competitive advantages is a reasonable price with very high quality. We produce everything in Kazakhstan, but we can deliver to any part of the world without difficulty. We consider ADEX a very successful exhibition, we participated in it for the second time already, and the practical results of our participation are already evident.'



meters, 19 of them represented the military-purpose products, among them: JSC 'Rosoboronexport', JSC 'RPC 'Uralvagonzavod', JSC 'Tecmash', JSC 'Russian Helicopters', JSC 'RAC 'MiG', JSC 'Shvabe', JSC 'Tactical Missiles Corporation'. In the form of models, patterns and advertising material the information on more than 537 exhibits of the military-purpose products were represented at the Russian exposition.

Among those represented by Russia at ADEX-2018, special attention was paid helicopter equipment – Ka-52 combat reconnaissance attack helicopter, Mi-35M transport combat helicopter, Mi-26 heavy transport helicopter, Mi-28NE combat helicopter. Also traditionally a lot of interest aroused armoured vehicles – T-90S modernized tank (T-90MS, T-90SK), BMPT tank support combat vehicle, BT-3F armored personnel carrier, BMP-3MS armored mine-clearing vehicle, BMP-3F infantry combat vehicle.

The experts and guests of the exhibition paid great attention to Russian products in the field of antitank guided missile systems – Kornet-E/EM, Khrizantema-S self-propelled antitank system, and air defence missile complexes and systems – 9K331MKM Tor-M2KM air defence missile system with combat and technical modular means, 9K317E Buk-2E air defence missile system, Igla-S 9K338 manportable air defence missile system, modernized antiaircraft mounting ZU-23/30M1.

A special place in the Russian exposition was given electronic warfare means – 1RL257E ground-based electronic warfare module, RB-531BE multifunctional system for electronic countermeasures against communicational facilities. Besides that, different types of ammunition, sights, communication means and individual protective equipment were represented.

For the first time, at the ADEX-2018 JSC 'VPK' was presented GAZ-233014 special vehicle and its modifications (233114 Tigr-M multipurpose vehicle with combat remote weapon station Arbalet DM and 233115 Tigr-M special purpose vehicle).

Nikolay Semenenko,
Managing Director of JSC NIMI Named After V.V. Bahirev (Mechanical Engineering Research Institute Named After V.V. Bahirev):

'At the exhibition in Azerbaijan this year NIMI presented the traditional line of ammunition for tank, field and naval artillery used by the active army of the Russian Federation – from 76 mm to 152 mm. And since NIMI is the developer and manufacturer of shots for tanks, field and naval artillery, traditionally, all exhibitions show great interest in our exposition. Among the particularly striking NIMI developments there is, for example, 125 mm tank shot 3VBM17 with an armor-piercing sub-caliber shell, which is one of the most powerful shots for modern tanks.

At the same time, exhibition is not only an occasion for us to show products and opportunities of NIMI, but also a place to meet our colleagues, friends and partners. Military equipment implementing our shots is presented in almost all post-Soviet countries. And, I would say, in a decent amount. And many countries in one way or another already possess the technology that was developed by our enterprise and put into service in Soviet times. Naturally we are working with these countries both in the framework of products supply and with a view to prospective joint projects. We talked about this with representatives of different countries at an exhibition in Baku.

Successful fulfillment of contracts under military and technical cooperation is one of the key tasks for NIMI n.a. V.V. Bahirev. For this purpose the enterprise has all necessary conditions: many years of experience, trained personnel, production base and coordinated cooperation of industrial enterprises. At the same time, it is already obvious that today the sanctions policy implemented against Russia by a number of Western countries make our partners appreciate us as suppliers even more – I mean, our scientific potential, our production competencies, and our reliability.'

Among the innovations presented by the Russian delegation at the ADEX-2018, particular attention (including that of President Ilham Aliyev) was drawn to the project of a new integrated technology center, presented by 'UVZ-Spetsservis' company. The demand for this project is due, among other things, to the objective needs of the Republic of Azerbaijan in maintaining of a large fleet of ground forces equipment in good condition.

What is the peculiarity of this project...

'UVZ-Spetsservis' company has proposed a truly new solution for the Armed Forces of Azerbaijan to create an integrated technology center for maintenance and repair of ground forces equipment. Unique character of this center is that it employs completely new technologies, for example, 'Graphite' software and hardware system, which allows you to approach the solution of all issues related to the equipment maintenance and repair on the system level.

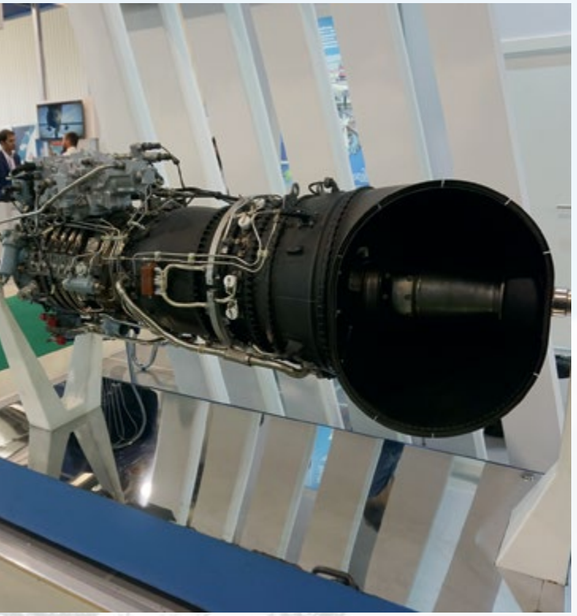
This includes the creation of regulatory reference information, electronic equipment accounting, creation of electronic passports, assistance to repair crews to ensure quality service and repair of equipment, ability to monitor the implementation of all operations, accounting for logistics of all spare

Igor Kulikov,
Director for Military-Technical Cooperation and External Relations of Uralvagonzavod:

'At the exhibition in Baku Uralvagonzavod presented a large product line of the Corporation, as well as programs for after-sales service, repair, modernization. That is, almost all the opportunities that can be performed by us in Azerbaijan, where the fleet of armored vehicles is presented mainly by T-72 and T-90 tanks, as well as various engineering vehicles based on them. We actively cooperate with Azerbaijan, we offer various programs for servicing and modernizing of equipment. And these are of high demand.

One of the peculiarities of Azerbaijan is the large amount of our equipment, which was produced in Soviet times. These are T-72 tanks, armored vehicles, infantry fighting vehicles... This equipment works reliably today, performing all the tasks. At the same time, prospects for their modernization are fairly high. And we, being a party to military-technical cooperation, can carry out direct after-sales service for this equipment, its repair and modernization...

At the same time, the market of Azerbaijan is highly competitive; companies from other countries come here trying to offer their services in this area. Of course, we are defending our right as a developer of armored vehicles for further work on its modernization, since the solutions incorporated in the technology are our intellectual property. We are actively working to counter unfair competition from a number of foreign companies.'



Dmitry Bruskov,
Director General of CJSC KSF Peredovaya Tekstilschitsa:

'At the exhibition in Baku, we presented the traditional products of 'Peredovaya Tekstilschitsa' – fabrics of 'the last hope', as I call them. What does the 'last hope' mean? When the bullet flies, the last hope is a bulletproof vest. Made of our fabric. When the plane is hit, the pilot's last hope is a parachute. Made of our fabric. When the ship is sinking, the last hope is a life raft. Made of our fabric.

In Baku at the ADEX-2018 we also presented a new perspective fabric with zero permeability. This is a high-strength fabric developed for parachutes with unique characteristics, created at the instructions of our specialized industry enterprises. In Russia, the fabric is already being introduced in new parachute systems.

'Peredovaya Tekstilschitsa' is one of the leading developers and manufacturers of innovative fabrics with special characteristics not only in Russia, but in the world as well. We are constantly expanding our product line, creating new fabrics made of promising materials. For example, we are working today on new ballistic fabrics, we are creating fabrics of special fire resistance, next generation covering fabrics, etc.

And although, of course, the specificity of our products is that the marketing result is determined primarily by the work of manufacturers and suppliers of final products, I can state: literally unique historical competence of our enterprise allows us to feel confident in any market. We do not concede to anyone neither in quality, nor in price nor in technology.'

parts and so on... Application of this software hardware complex allows significantly reduce the time of maintenance and repair of the equipment.

The new technical center comprises production workshop, designed for a certain number of maintenance and repair sites for ground forces vehicles, as well as a warehouse for spare parts and materials. In parallel with this, conditions are created for arrangement of a software and hardware complex and a number of related elements of this technical center. By and large, the project represents a higher level of organization of repair and maintenance work using new technological approaches and advanced technical solutions. Experts say that there are no analogues to the project in the market.

Moreover, it is important that the solutions proposed in Baku have already been tested in practice in Russia and have sufficient flexibility resources, allowing in practical terms to adjust the project to the realities and desires of the customer.

Within the framework of the business schedule were hold the presentations of the results of innovative researches, products and technologies, as well as bilateral meetings with the representatives of the official delegations and manufacturing enterprises.

The Ministry of Defence Industry of Azerbaijan and its related structures and plants, and ANAMA, actively participated at the exhibition. Here, the industry professionals was able to get acquainted with the new products of defence complex many nations and witness both the current and growing capabilities of the Russian military-technical complex.

Director General of the 'MART GROUP' company:

'Our company has been well-known for many years, we are primarily engaged in electroshock weapons for citizens and for the police, for law enforcement agencies. The 'MART GROUP' stand at the exhibition in Baku presented models of civilian and police contact-distance stun guns, inspection and video inspection devices 'Periscope-185' and 'Periscope-PRO', police electric-shock shields 'SKALA' of various modifications, and other developments of the 'MART GROUP' engineers.

Among the new products, we can distinguish an electro-shock shield and a metal detector with the function of an electric-shock weapon. This metal detector is unique, there are no analogues in the world. This is the so-called hybrid, which allows turning a metal detector into a weapon that can stop the enemy by literally one button. All our products are easily rechargeable.

Currently, MART GROUP is actively expanding its export activity, today the company has representatives in more than 30 countries. We see that although this market is highly competitive, our company occupies a strong position. And from the point of view of innovative developments, we are definitely among the world leaders. Moreover, we have a full-cycle production – from idea to implementation.'

The exhibition, occupyed three halls of the Baku Expo Center as well as open spaces, is 10% larger this year. ADEX 2018 presented the following sectors: Air Defence (AD) and Missile Defence (MD) Systems; Military Shipbuilding; Development and Upgrade of Weapons Systems; Military Research; UAV Systems; Robotic Systems; Small Arms, Ammunition and Accoutrements; Demilitarization Systems; Missile and Artillery Rounds; MLRS; Electro-optical and Laser Technology; Armoured Vehicles; Submarines; Cyber-security of Naval Forces; EW & C4ISR Systems; Machinery and Equipment of Railway Troops; Technology and Equipment for Manufacture, Maintenance and Disposal of Weapons, and many more. Such well-known companies as Aselsan, CETC, Damen, MBDA, Norinco, IAI, Roketsan, Rosoboron Export, Thales and others will participate with demonstrations of military equipment. Alongside the other sectors, this year's exhibition will widely feature the military aviation industry sector where famous corporations such as MIG, TUSAS, Leonardo, United Aircraft Corporation (UAC), Motor Sich, Russian Helicopters and Aeronautics Group.

Companies from around the world occupied a separate open exhibition area deserving special attention. The outdoor area was host a static exposition of weapons, military and special equipment, logistics, as well as a variety of products required for daily activities of the army and the day-to-day life of their personnel.

The ADEX 2018 exhibition breaked the record for the number of visits by foreign delegations. 34 high-level official delegations from 23 countries of the world visited the event, which is more than at previous exhibition. Among the countries sending delegations to the ADEX exhibition for the first time were Egypt, Uzbekistan and Kazakhstan. As part of the exhibition, it were negotiations between the heads of foreign delegations and representatives of Azerbaijani departments and entities, where the prospects of bilateral military-technical cooperation were discussed. A special negotiation zone was been designated in the third hall of Baku Expo Center for holding such bilateral meetings. The immense interest shown in ADEX on the part of international delegations and companies once again confirmed the high status and importance of Azerbaijan as an important strategic partner.

As is tradition, the business program of ADEX 2018 was rich in thematic events with informative and eye-catching content; these events included presentations in the field of innovative research, developments and technology in the field of national defence and security.

More than half of the exhibitors have expressed that they usualy plan to use the exhibition to present new products. The exhibition became an active demonstration platform for armament, military transport of local and foreign production, new technologies, materials and the achievements of other branches of science and industry, to foment their intro-

Nikolay Gaichuk,
First Deputy Director – Deputy Director for Commerce of Zenit-BelOMO JSC:

'Our enterprise was established in 1973 as one of the leading manufacturers of photographic equipment and optical devices in the USSR, so we have accumulated vast experience and unique competencies. The company's director is Alexander Vladimirovich Radchenko.

Sights with the brand name 'POSP', 'PO' and 'PK' are known around the world due to their user and maintenance-friendliness and high quality. At present, the enterprise is part of 'BelOMO' Holding with General Director Doctor of Technical Sciences, Professor Vyacheslav Aleksandrovich Bursky.

At the exhibition in Baku, our holding presented optical-electronic, laser and optical-mechanical products. Our holding is the leader in this sphere in Europe. We have extensive experience in export supplies to more than 70 countries, also with the help of special exporters of the Republic of Belarus, we work a lot with customers from the Russian Federation and from other countries of the former USSR. The quality of our products is well known, and the company constantly develops new solutions and releases new products. Due to the fact that the holding has its own scientific and technical center 'LEMT' (Director – academician of the National Academy of Sciences of Belarus, doctor of physical and mathematical sciences, professor Alexey Petrovich Shkadarevich) and unique specialists, our products have a very high level of innovativeness, embodying the most advanced technologies and new developments.'

duction into production at enterprises of the defence-industry complex. Among these innovations were the IHTAR Anti-Drone System (ASELSAN), the tactical interaction simulator (Zen TacSim), VITTA unmanned aerial vehicles; a range of products from Arsenal; Corvette sea vehicles from Dearsan; rockets and missile complexes from Roketsan; simulators and training games from Simsoft; vehicles from Yugoimport; the 7,62x51mm machine gun Arsenal MG-M2 (Arsenal); military uniforms and accessories from Trud; camouflage clothing from Baku Weaving Factory; the 'National Boat' concept from SSBC Ltd; and much more.

This year all of Azerbaijan solemnly celebrated the glorious date in its history – the 100th anniversary of the formation of the Azerbaijan Democratic Republic and the 100th anniversary of the creation of the Armed Forces of Azerbaijan. The participation of Museum of Military History and the National Museum of the History of Azerbaijan has made the exhibition even more spectacular; they both exhibit unique expositions of weapons and uniforms, which are dedicated to these landmark occasions in the history of Azerbaijan.

The programme also included a performance of the military orchestra of the Armed Forces of Azerbaijan, a demonstration of a unique method of gunpowder drawing by Burhan Imranoglu, and an art exhibition of paintings by children of the Dirchelish Youth Socio-psychological Rehabilitation Centre.

The ADEX exhibition provided an opportunity for industry professionals to get acquainted with modern defence technologies and samples in a variety of MIC industries, and met the latest developments of military equipment that are being offered for export on the world's arms markets. ADEX became be an excellent platform to demonstrate the latest weapons and to finalize new agreements in the field of international military-technical cooperation. **/IA&MG/**

Boris Obnosov,
Director General of Tactical Missiles Corporation JSC:

'TMC constantly takes part in the ADEX exhibition in Baku. Moreover, directors of our leading enterprises are always present. I believe that this is the most important market for our country. At the same time, I personally am not satisfied with Russia's presence here, it is clearly not enough... Knowing the needs of Azerbaijan, I understand that this is a rich and capacious market for mutual cooperation. Because one thing is to talk about peace and friendship, and another thing is actual cooperation. I see how companies from other countries are actively moving here, trying to oust us, even from seemingly unshakeable segments that are historically firmly occupied by the Russian weapons.

We should not think that inertia will take care of this. We must really interact, actively promote ourselves, because the market won't wait long. At the same time, the Russian administration is doing everything necessary – signs agreements, determines the possibilities... And then is the time for the producers and exporters, like our company, to move into action. In general, we must be more active and more persistent... Russian products must be of high quality and affordable – as they say, 'cheap and cheerful'. At the same time, after-sales service shall be fast, efficient, high-quality. One more important indicator is time to failure. The reliability of our weapons must be simply flawless.'

INTERNATIONAL AEROSPACE, MILITARY, NAVY AND TECHNOLOGY GUIDES IN 2018-2019

In 2018

ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
'RA&MG'№09 (27)	September 24th	**ADEX 2018** (26-29.09.2018, Azerbaijan, Baku)
'RA&MG'№10 (28)	November 05th	**Airshow China 2018** (06-11.11.2018, Zhuhai, China)
'RA&MG'№11 (29)	November 07th	**INDO DEFENCE 2018** (07-10.11.2018, Indonesia, Jakarta)
'RA&MG'№12 (30)	November 26th	**IDEAS 2018** (27-30.11.2018, Pakistan, Karachi)
'RA&MG'№13 (31)	December 01th	**EDEX 2018** (03-05.12.2018, Egypt, Cairo)

In 2019

ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
'RA&MG'№01 (32)	February 12th	**AERO INDIA 2019** (14-18.02.2019, India, Bangalore)
'RA&MG'№02 (33)	February 15th	**IDEX 2019 / NAVDEX 2019** (17-21.02.2019, UAE, Abu Dhabi)
'RA&MG'№03 (34)	March 24th	**LIMA 2019** (26-30.03.2019, Malaysia, Langkawi)
'RA&MG'№04 (35)	April 01th	**LAAD 2019** (02-05.04.2019, Brazil, Rio de Janeiro)
'RA&MG'№05 (36)	April 28th	**IDEF 2019** (30.04-03.05.2019, Turkey, Istanbul)
'RA&MG'№06 (37)	May 12th	**IMDEX ASIA 2019** (14-16.05.2019, Singapore)
'RA&MG'№07 (38)	May 26th	**SITDEF 2019** (16-19.05.2019, Peru, Lima)
'RA&MG'№08 (39)	May 14th	**Security Week Russia 2019** (28-31.05.2019, Russia, Moscow)
'RA&MG'№09 (40)	June 16th	**Paris Air Show 2019 Le Bourget** (17-23.06.2019, France, Paris)
'RA&MG'№10 (41)	June 16th	**ARMY 2019** (25-30.06.2019, Russia, Moscow)
'RA&MG'№11 (42)	June 24th	**IMDS-2019** (26-30.06.2019, Russia, Saint Petersburg)
'RA&MG'№12 (43)	August 18th	**MAKS-2019** (27.08-01.09.2019, Russia, Moscow)
'RA&MG'№13 (44)	September 16th	**AVIATION EXPO CHINA 2019** (18-20.09.2019, China, Beijing)
'RA&MG'№14 (45)	October 01th	**INMEX SMM India 2019** (03-05.10.2019, India, Mumbai)
'RA&MG'№15 (46)	October 13th	**SEOUL ADEX 2019** (15-20.10.2019, Korea, Seoul)
'RA&MG'№16 (47)	October 28th	**BIDEC 2019** (28-30.10.2019, Bahrain, Manama)
'RA&MG'№17 (48)	November 02th	**Defense & Security 2019** (04-07.11.2019, Thailand, Bangkok)
'RA&MG'№18 (49)	November 16th	**Dubai Airshow 2019** (17-21.11.2019, UAE, Dubai)
'RA&MG'№19 (50)	December 08th	**Gulf Defense & Aerospace 2019** (10-12.12.2019, Kuwait, Al Kuwait)

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