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Special analytical export project of the United Industrial Edition

№03 (34), Special edition for ASEAN

The best Innovations for Malaysia and ASEAN states

LIMA'19 LANGKAWI

SPECIAL PARTNERSHIP

Russian Aviation & Military Guide

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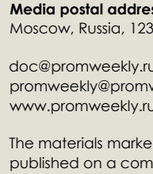

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The best offers for Malaysia and ASEAN

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. LIMA'2019 presents on Langkawi the best world (Russian also) aerospace innovation for global market, which are the undisputed world leaders on price and quality in their segments.

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

Taking part in LIMA'2019 Russia continues the policy of open partnership with ASEAN states and other countries of AsiaPacific. Russia has a wide product line that meets all the needs of this region and ready propose the best technology and the best price offers.

Valeriy Stolnikov

RUSSIAN MEDICAL EQUIPMENT IN DUBAI

Shvabe Holding demonstrates Russian equipment for anesthesiology and neonatology at one of the largest international exhibitions in the field of medicine and health care, Arab Health 2019 in Dubai. The leading doctors from more than 150 countries become familiar with the holding's medical equipment.

On its stand, Shvabe presents an intensive care incubator IDN-03 for nursing the premature newborns weighing from 500 grams and a compatible neonatal infrared heater 'Radiant Heat-BONO'. The other products on display for the foreign doctors include the phototheraputic and anesthesia-respiratory equipment for children, along with a multifunctional inhalation anesthesia device MAIA-01. Today it is the only device made in Russia that combines artificial lungs ventilation, anesthesia and complex monitoring of the breathing mixture.

The device is manufactured on commercial scale by one of the leading enterprises of Shvabe Holding – the Ural Optical and Mechanical Plant named after E.S. Yalamov (UOMZ).

'Our exposition features a line of medical products that are successfully used by hundreds of Russian medical facilities, and are in high demand abroad. This event will help to lay a foundation for the new lasting partnerships and expand a footprint of the holding in the Middle-East marketplace', said Ivan Ozhgihin, Deputy Director General at Shvabe.

The international exhibition Arab Health has a 40-year old history. Annually it brings together the largest manufacturers of medical equipment, developers of new technologies and experts in the pharmaceutical field. It is expected that this year about 4200 companies will present their products.

Service center in Egypt

Russian Helicopters Holding Company (part of Rostec State Corporation) is completing the creation of maintenance, repair and overhaul (MRO) center for Mi-8/17 helicopters based at the facilities of Helwan Factory for Developed Industries (HFDI) in Helwan (Egypt). The Holding Company is to certify the MRO center in Egypt in 2019.

During the first stage, the center will be carrying out maintenance and overhaul of Mi-8T and Mi-17-1V helicopters operated by EAF. Future plans include mastering of a Mi-17V-5 type.

Within 2015-2018 the Holding Company fitted HFDI with the required equipment and conducted personnel training at the Aviation Training Center of Novosibirsk Aircraft Repair Plant. Moreover, basing on the audit results of the MRO center Mil Moscow Helicopter Plant has already issued a statement on the center's readiness to perform helicopter overhaul.

'One of the key objectives of JSC 'Russian Helicopters' is to organize a system of after-sales support providing first-class service throughout the complete life cycle of Russian-made rotorcraft. The holding intends to continue expanding its global network of authorized service centers. Over the past three years, in cooperation with our partners from HFDI we have performed a tremendous job establishing the MRO center for Russian-made rotorcraft at the factory's facilities. The Egyptian side is already in process of performing a pilot Mi-8T and Mi-17-1V overhaul upon the results of which we plan to proceed with certification of the center', announced Igor Chechikov, Deputy Director General for After-Sales Support of JSC 'Russian Helicopters'.

'Egypt is a long-standing and strategically important partner for Rostec. We cooperate in a wide range of areas. At the same time, helicopter industry and after-sales service of equipment are one of the key areas of our cooperation,' said Viktor Kladov, Director for international cooperation and regional policy at Rostec. 'Certification of the helicopter service center in Egypt opens up new opportunities for expanding cooperation with local partners.'

Mi-8/17 helicopters developed by Mil Moscow Helicopter Plant (part of Russian Helicopters Holding Company) are world-famous. Reliable and low-maintenance, they remain in constant demand. They are capable of medevac and humanitarian missions, cargo and passenger transportation (including VIPs). Military-transport Mi-8/17 helicopters are designed to transport service personnel and to carry cargo inside the cabin and on the external sling. These rotorcraft are employed for patrol or search-and-rescue operations and can also carry armament. Not once have they been used for combat operations in flashpoint conflicts as well as for anti-drug operations and missions against illegal armed groups.

Mi-172 to Equatorial Guinea

As part of the contract with the government of Equatorial Guinea, Russian Helicopters holding company (part of Rostec State Corporation) produced and transferred to the customer two Mi-172 helicopters manufactured at Kazan Helicopters (KVZ). The vehicles have already been sent to Central Africa.

One of the helicopters produced under the contract was delivered in the Salon VIP modification. The vehicle is designed for transportation of up to 12 passengers in greater comfort. The custom-made interior is equipped with all the necessary up-to-date hardware and uses high-quality materials. The second Mi-172 has been transferred in the passenger modification. It can transport up to 26 people in comfortable conditions.

'Equatorial Guinea is a long-time partner of Russian Helicopters. In 2006, we also delivered two Mi-172 helicopters in Salon VIP and Passenger modifications to the country. I would like to note that Russian helicopters are popular in Africa due to their advantages: reliability, easy operation, good price/quality ratio. Therefore, I am sure that this contract will not be the last one,' said the CEO of the Russian Helicopters holding company, Andrey Boginsky.

The Mi-172 is one of the Mi-17 pattern helicopters that is certified for passenger transportation and has established itself as a reliable vehicle with a high level of safety. The Mi-172 is a classical single-rotor helicopter with an antitorque rotor and a twin-engine power unit. The improved performance of the helicopter meets special requirements for passenger transportation. In addition to the passenger and VIP modifications, there are also transport, medical and evacuation, search and rescue, military and firefighting models of this vehicle. Specific features of the Mi-172 include the large power reserve of the power unit, excellent altitude characteristics, a spacious cockpit, various options of avionics, and autonomous preparation for flights and maintenance.

The Mi-8/17 pattern helicopters are designed for operation in any climatic conditions as they can be used in a wide temperature range (from -50°C to +50°C). Today, there are a total of 400 Mi-8/17 helicopters in countries on the African continent.

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.

Aviation Revenue to Reach $15 Billion

The inclusion of the United Aircraft Corporation (UAC) will enable Rostec's aviation cluster to increase its revenue to 1 trillion rubles ($15 billion), and make the State Corporation join the ranks of the world's leading aircraft manufacturers, says the Director of Rostec's aviation cluster, Anatoliy Serdyukov.

Russia's President, Vladimir Putin, signed a decree on the transfer of a 92.31% stake in UAC to Rostec on October 24. According to the signed decree, the process of merging the aircraft corporation with Rostec structures will take a year and a half. The inclusion of UAC in the State Corporation's control loop will mean that the entire aircraft production chain can be combined into one, which will strengthen production cooperation between aircraft manufacturers and parts suppliers.

'For Rostec, integration with the UAC is a landmark moment. The share of the aviation cluster in the State Corporation's overall revenue will be approximately 50% – around 1 trillion rubles. This means that the aircraft manufacturing unit will become the most powerful one in the State Corporation, and Rostec will be at the same level with the world's leading aircraft manufacturers,' said the Director of Rostec's aviation cluster, Anatoliy Serdyukov.

The total revenue of Rostec's aviation cluster in 2016 was 534.7 billion rubles; for UAC it was 417 billion rubles. In line with the development strategy of the aviation cluster, it is planned to increase this indicator by an average of 14% per year in ruble terms until 2025. The new structure with a larger turnover will be more attractive to investors. Rostec's other priority projects will include the creation of MS-21 medium-range aircraft – it is expected that about 55 billion rubles will be invested in this by 2025.

Rostec continues to implement a large-scale program for the development of the aviation cluster in accordance with the approved Strategy, the main objectives of which are to develop civilian production, improve operational efficiency, and gain access to global markets until 2025.

NAVAL MATERIEL FOR THE EXTERNAL MARKET

Alexander Mikheev, Director General of Rosoboronexport (part of the Rostec State Corporation), and Renat Mistakhov, Director General of the Ak Bars Shipbuilding Corporation, signed a cooperation agreement and a joint action program to promote naval materiel in the external market in 2019–2023.

'The agreement will undoubtedly strengthen Rosoboronexport's positions on proposals for naval forces. We are closely monitoring trends in the world weapons market, we are leading some of its directions, and we ourselves are making the rules of the game that competitors have to follow. The documents signed will make it possible to manufacture products that meet the needs of foreign customers as much as possible, and also provide technology transfer – a highly demanded service today – with our very responsive and reliable protection of the results of intellectual activity of the Russian developers and manufacturers,' said Alexander Mikheev.

The purpose of signing the documents is to organize effective interaction between the companies in developing, manufacturing and promoting Ak Bars Shipbuilding Corporation's military, special, civil and dual-use products and services in external markets.

'I am very pleased to consolidate cooperation with the leading exporter of Russian weapons. We see Rosoboronexport as a reliable partner with many years of experience in external economic activities. I'm sure that our joint efforts will help the Corporation meet its primary strategic goal of increasing the revenues from the current level of 38.5 billion rubles to 100 billion rubles by 2025. In addition, I wish to note the social value of the agreement for Tatarstan: today the Corporation unites 10 enterprises and organizations that employ about 10,000 people. The portfolio of foreign orders for our products supports the modernization of production, permanent employment and growth in incomes,' said Renat Mistakhov.

Under the agreement signed, Rosoboronexport will consider Ak Bars as a possible participant in various military and technical cooperation projects with foreign countries, including in the course of its international naval market research. As is known, Rosoboronexport has been appointed the organizer of the joint Russian displays at international defense exhibitions abroad. In this role, the Company stands ready to provide organizational and information support to the Ak Bars Corporation.

Cooperation with India in Space Sector

Rostec has supplied a secondary mirror for the telescope of the Indian Mount Abu InfraRed Observatory (MIRO). The mirror was produced at Lytkarino Optical Glass Factory (LZOS), one of the plants of a high-tech Holding Shvabe, at the request of the Belgian manufacturer of the telescope. The manufacturing process lasted a year and a half.

The key component of the telescope is made of astrositall. The production process comprises several stages, including milling, aspherization, computer-controlled polishing, as well as automated finishing. The mirror was certified and accepted by the customer in early November. To transport it to India, the LZOS specialists also created a special container, a cargo handling device and auxiliary equipment.

'Every suchlike mirror has its own characteristics. The distinctive features of the mirror for the Indian telescope are its special shape and surface quality. With every new contract, mathematical processing of monitoring results used for this purpose is improving and becoming more complex, as astronomers want to obtain an increasingly high-quality image and minimize scattering from the mirror,' said Alexey Patrikeev, CEO of Shvabe.

LZOS, an enterprise controlled by Rostec, is a top producer of optical glass, sitall, large astronomical mirrors and space lenses in Russia. Its share on the Russian and global market for optical materials totals 98% and 7% respectively.

'India is our traditional and long-standing partner, and we confidently expect to expand and enhance our cooperation, including in the space sector. New Delhi continues to scale up space exploration, the country's spending in this area exceeds USD 1.2 billion per year. Today, India ranks fifth among space nations and intends to strengthen its position. In turn, Rostec is ready to offer products and technologies that our Indian customers need,' said Victor Kladov, Director for International Cooperation and Regional Policy at Rostec.

Rostec continues to implement its ambitious program to develop and promote radio-electronic products in accordance with the approved 2025 Strategy, whose main objectives are to enhance the operational efficiency, increase the share of civilian products in revenue to 50% and enter fast-growing global markets.

Rostec is a Russian State Corporation established in 2007 with the purpose of facilitating the development, manufacture and export of high-tech industrial products for both civil and military purposes. It incorporates over 700 entities that currently form 11 holdings operating in the military-industrial complex and 4 holdings active in civil industries, as well as over 80 directly supervised organizations. Rostec's portfolio includes such well-known brands as AVTOVAZ, KAMAZ, Kalashnikov Concern, Russian Helicopters, VSMPO-AVISMA, Uralvagonzavod, and others. Rostec companies are located in 60 regions of the Russian Federation and supply products to the markets of over 100 countries. In 2017, Rostec's consolidated revenue reached RUR 1.589 trillion, its consolidated net profit was RUR 121 billion, and EBITDA – RUR 305 billion. According to Rostec's Development Strategy, the mission of the Corporation is to ensure Russia's technological advantage on highly competitive international markets. One of Rostec's key goals is to implement new technological way of living and to promote digitalization of Russia's economy.

Lens Manufacturing for Astrophotography

Shvabe holding company (part of Rostec) has resumed the manufacturing of MC Rubinar 10/1000 Macro, a telephoto camera lens for close-up, landscape, architectural and sports photography. It is particularly popular with amateur astronomers as it can capture clear images of the lunar surface, stars and planets of the Solar System.

The manufacturing of MC Rubinar 10/1000 Macro was launched at Shvabe's Lytkarino Optical Glass Factory (LZOS). Fifty items have already been produced and another fifty will become available on the market in the second half of 2019. These lenses are compatible with the majority of reflex and non-reflex cameras and are offered by offline and online photo equipment stores.

'We have relaunched Rubinar, a lens that has been legendary since the Soviet times, at a new level. Modern-day photo equipment is made on digital facilities with advanced technologies for the processing of optical and mechanical parts. Given Rubinar's excellent quality we anticipate high demand both in Russia and beyond. Putting in place manufacturing facilities like these is part of Rostec's strategy that aims at large-scale diversification and at growing the share of civil-purpose products to 50% by 2025,' said Oleg Yevtushenko, Rostec's Executive Director.

Compared to other Rubinar products, the 10/1000 is distinguished by its compactness, light weight and high image quality. With its technical specifications, this classic lens caters to the needs of both amateur and professional photographers.

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.

Center for Russian aircraft in Peru

The maintenance and repair center for Russian-made helicopters Helicentro Peru has been launched in Lima at the facilities of the Peruvian Air Force Maintenance Service – SEMAN. Built in partnership with Russian Helicopters (part of Rostec State Corporation), the center will provide maintenance for Mi-type aircraft.

The official opening ceremony was attended by CEO of Russian Helicopters Andrey Boginsky and Chief Commander of the Peruvian Air Force Rodolfo García Esquerre.

The facility will be used by Helicentro Peru to repair Mi-17 civil helicopters operated in the region, and by Russian Helicopters to overhaul Mi-17 aircraft of the Peruvian Air Force.

'The establishment of the maintenance and repair center for Russian helicopters in Peru is of strategic importance – it will enable to provide the full range of work without taking out fuselages from the country. Although the center has just started its operation, it has already orders until 2023 – nearly 40 helicopters have been planned for repair during the next five years. In addition, the advantageous geographical location of Peru and the enterprise's production capacity would enable to accept orders from other countries of the region,' noted Andrey Boginsky, CEO of Russian Helicopters.

'Peru is the major importer of Russian-made aircraft in Latin America. This country is currently operating over 100 Russian helicopters,' said Viktor Kladov, Rostec's Director for International Cooperation and Regional Policy. 'We continue to create a unified system for managing the life cycle of our helicopters in Peru. The opening of the aircraft maintenance center is significantly enhancing our positions in Latin America that is a top-priority region for Rostec.'

Rosaviatsiya said 'Yes'

Federal Air Transport Agency (Rosaviatsiya) certified the increase in take-off/landing altitude of Ansat helicopter to 3,500 m. Major change approval is issued on the basis of trials conducted in summer 2018 at Mount Elbrus. The document allows Ansat to operate in high-altitude conditions.

Before that the helicopter take-off and landing altitude was limited to 1,000 m, restricting its use in elevated areas. During certification tests Ansat successfully completed a series of take-offs and landings at altitudes up to 3,500 m, including simulation of one engine failure and autorotation mode, thus confirming its capability to operate in high-altitude conditions.

'The major change approval for increase of take-off and landing altitude of Ansat gives us new opportunities to bring in new customers from countries with such complex terrain. For example, during the South Asian Heli Tour conducted in late 2018 we saw interest from potential helicopter operators in Vietnam, Thailand, Cambodia and Malaysia. We received approximately 30 requests for delivery of Ansat helicopters, and improvement of flight performance will benefit our subsequent customer negotiations', noted Andrey Boginskiy, Director General of Russian Helicopters Holding Company.

'Ansat is one of the main strategic projects for the Corporation. Successful flight tests at the altitude of over 1000 meters have proven reliability and the highest standards of equipment efficiency,' said Industrial Director of Rostec's Aviation cluster Anatoly Serdyukov.

'We plan to continue to upgrade and improve Ansat's performance'.

Ansat is a light twin-engine utility helicopter serially produced at Kazan Helicopters. As per the type certificate, the helicopter design makes it possible to carry out quick conversion from cargo to passenger version capable to transport up to seven people. In May 2015 a major change approval was obtained for EMS version of the helicopter. Ansat is certified for operation in ambient air temperatures from minus 45°C to plus 50°C. In July 2018 a major change approval was obtained for extension of service life of Ansat assemblies.

EQUIPMENT TO THE TIANWAN NPP

The Roselectronics Holding of Rostec State Corporation installed the radiation-resistant television equipment to monitor nuclear fuel reloading at the Tianwan Nuclear Power Plant (China). The equipment was supplied as a part of construction of two new power units at the Nuclear Power Plant. It was the first export supply of equipment of such kind. Earlier Rostec has already supplied its solutions to the Tianwan NPP: automated workstations, industrial controllers and radiation control systems.

Special cameras may operate at a distance of 30 cm from the nuclear fuel assemblies at extremely high radiation levels (up to 1x107 rad/hour) and with a significant dose of total radiation accumulated over the entire period of operation (up to 2x108 rad). The plain equipment in similar conditions instantly gets out of order. The supplied systems consist of a television camera with a guiding device and an attachment fitting to be installed in the zone exposed to radiation, and the receiving equipment to be installed in the control room and not exposed to radiation.

The thermal imaging systems supplied to the Tianwan NPP were developed by the HVDC Power Research & Development Institute RASTR belonging to Roselectronics Holding and are a product of cooperation between several Roselectronics enterprises. Each system component is a unique technological solution contributing to the overall high quality and reliability of the equipment.

'China is our key partner in a wide variety of industries, including the nuclear energy sector', noted Viktor Kladov, the International Cooperation and Regional Policy Director at Rostec. 'Installation of the Russian systems at the strategic facility of the People's Republic of China is an indication of the highest level of relations between our countries and high confidence in the Russian equipment'.

China is one of the major trading partners of the enterprises of Roselectronics Holding. Side-by-side with the China Electronics Technology Corporation (CETC), the holding develops research and development cooperation in the field of radio electronics, including the joint development and production of multi-system high-precision navigation receivers (modules). In total, seven agreements have been signed between Rostec and Chinese state corporations covering various areas of cooperation in the field of civilian and dual-purpose technologies.

Cooperation in Southeast Asia

The Russia-Singapore Business Council (RSBC) and the Singapore Manufacturing Federation (SMF), representing the interests of the country's manufacturing companies, have signed a cooperation agreement. The parties have agreed to expand the multilateral cooperation between companies of the two states, primarily Rostec's enterprises, in high technology areas that are most relevant for the Singaporean partners.

The agreement has been signed by Deputy Chairman – Executive Director of the Russia-Singapore Business Council Sergey Pronin and President of the Singapore Manufacturing Federation, candidate to the Parliament of Singapore Douglas Foo. The document also provides for establishing joint certification centers to promote Russian manufacturers' products in Southeast Asia.

'I firmly believe that this agreement will boost expansion and intensification of the cooperation between Rostec's enterprises and companies of the Southeast Asian countries,' stressed Rostec Deputy CEO, RSBC Chairman Nikolay Volobuev. 'Singapore is a leading financial center in rapidly developing Southeast Asia. Therefore, by strengthening our presence, we are laying the foundation for long-term collaboration between our enterprises and companies of all states in the region.'

The official ceremony of signing the agreement took place within the Exhibition of Russian Technologies being held in Singapore on November 12–29. The exposition is organized at the facilities of the Center for Foreign Promotion of Russian High Technology Companies and Presentation of Investment Projects located in TechPlace II – a largest industrial park of the country.

Within the event, the parties have also signed a trilateral agreement between the executive body of the Business Council – RS Trade House, Singaporean company Progression Engineering (S) Pte Ltd and Autonomous Nonprofit Organization 'Far East Investment and Export Agency'. The partners have agreed to jointly promote high-tech companies and investment projects of the Far East in Southeast Asia. Promotion will be

supported by the Center for Foreign Promotion established by the RSBC with the support of the Rostec State Corporation and RSTrade – international electronic information and service B2B Platform.

Rostec continues implementing the large-scale program for promoting the State Corporation's high tech products abroad in accordance with the approved Strategy that includes 17% average annual rouble revenue growth, increase in the share of civilian products in revenue up to 50%, improvement of operating efficiency and entry into international markets.

Cooperation with Southern Africa

Rosoboronexport JSC (part of the Rostec State Corporation) 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.

SADC was formed in 1980. Today it comprises 16 member countries, including South Africa, Angola, Tanzania, Mozambique, Zambia, Zimbabwe, Botswana, which are striving to establish a single financial, legal, and trade and economic space. Rosoboronexport actively holds meetings with SADC at various levels to discuss possible cooperation projects.

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. In addition, the possibility of organizing licensed production of Russian weapons and military equipment on their territory is being discussed with some countries.

Russia-ASEAN: strategic partnership

Russia-ASEAN summit which had been in November last year in Singapore showed that partnership real develops on many branches. The summit participants discussed the deepening of cooperation in trade, investment and humanitarian spheres, the strengthening of ties between the Association of Southeast Asian Nations and the Shanghai Cooperation Organisation, as well as current international and regional issues. Vladimir Putin took part in a plenary meeting of the Russia-ASEAN summit.

After the plenary session, the participants adopted a Joint Statement of the Russia-ASEAN summit on strategic partnership and the statement of the Russian Federation and ASEAN on cooperation in ensuring the security of information and communication technologies and their safe use.

The sides signed a memorandum of understanding between the Association of Southeast Asian Nations and the Eurasian Economic Commission on economic cooperation. This was done in the presence of heads of national delegations taking part in the summit.

Prime Minister of Singapore Lee Hsien Loong said: 'The last time ASEAN and Russia's leaders met was in 2016 in Sochi, to commemorate the 20th anniversary of ASEAN-Russia dialogue relations. I am very happy that since then we have made much progress in our partnership. ASEAN and Russia work together in a broad range of areas, from political security issues to economic, to social and cultural issues. Russia also participates actively in ASEAN-led fora like the ASEAN Regional Forum, the ASEAN Defence Ministers' Meeting-Plus the East Asia Summit.

Today's summit is timely because it gives both sides the opportunity to reaffirm our commitment, to further strengthen ASEAN-Russia ties. The two ASEAN and Russian leaders will issue a joint statement as well as a statement on cooperation in the field of security and in the use of information and communication technologies. We will also witness a signing of an MoU on economic cooperation. And these deliverables highlight the breadth and scope of the ASEAN-Russia relationship.

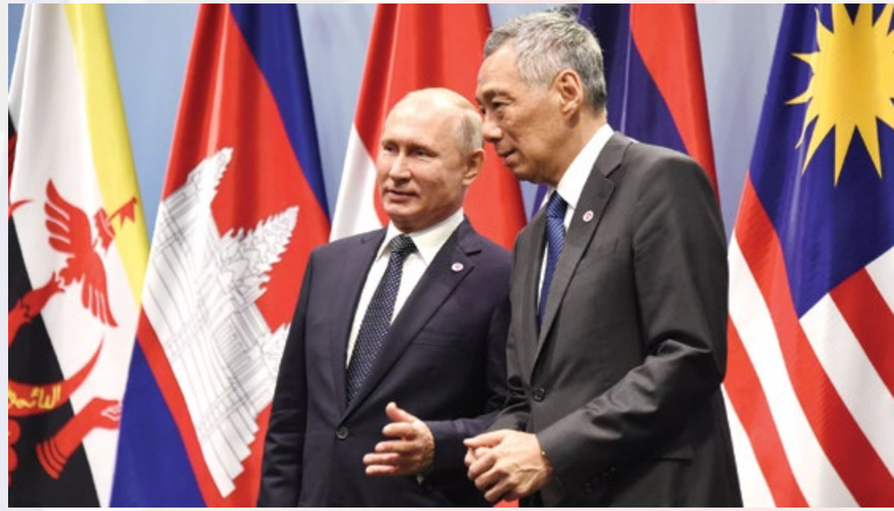
Singapore supports upgrading the ASEAN-Russia relationship to a strategic partnership. I am confident that this strategic partnership will enhance cooperation in areas which are of interest to both sides. And I look forward to our discussion with President Putin and our fellow ASEAN leaders on how we can further strengthen this dialogue partnership.'

President of Russia Vladimir Putin said: 'First of all, I would like to thank the Prime Minister of the Republic of Singapore, Mr Lee Hsien Loong, for the initiative to host the Russia-ASEAN summit. Russia pays great attention to the development of relations with ASEAN based on mutual respect and consideration for each other's interests.

At the May 2016 Sochi summit, which Mr Prime Minister just mentioned, we adopted a declaration and an action plan aimed at taking cooperation between Russia and ASEAN to the strategic partnership level.

Over the past two years, we have accomplished a lot together. Political dialogue intensified; Russia's permanent mission to ASEAN was established in Jakarta last year. We coordinate our approaches to key issues on the Asia-Pacific agenda, to the challenges and threats to regional stability, and enhance joint efforts to fight terrorism, drug trafficking and organised crime.

MAIN TOPICS



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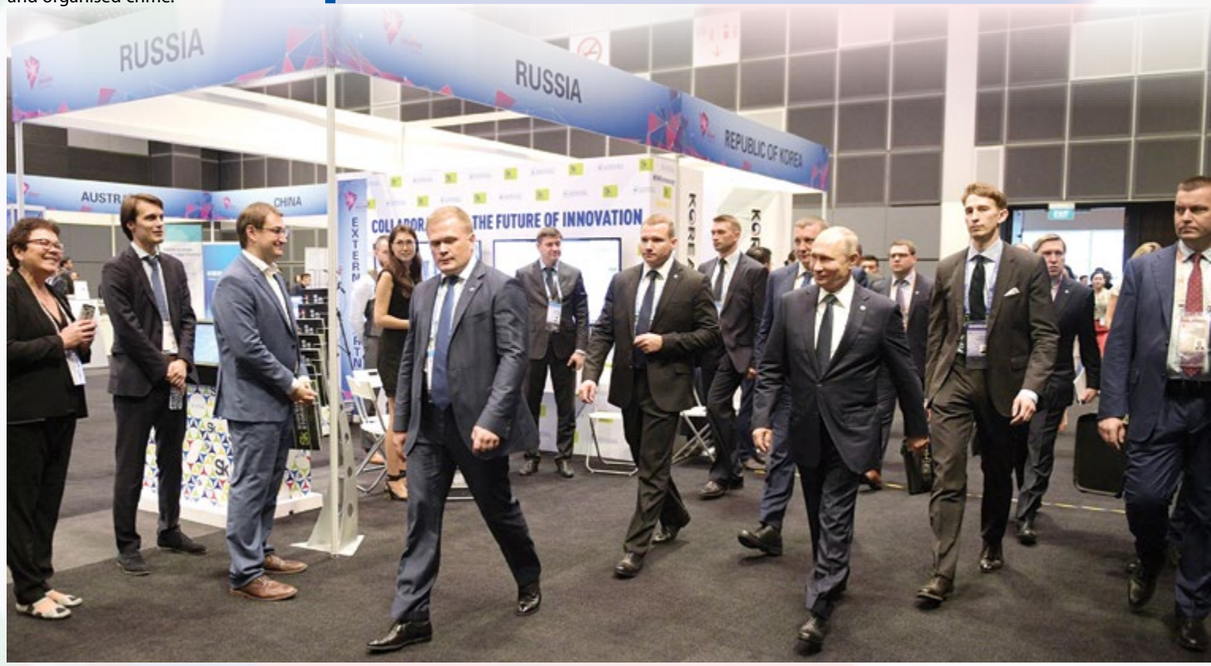

'Our foreign ministers hold annual meetings. The Russian Defence Minister takes part in the ASEAN Defence Ministers' meetings, and the Interior Minister attends the ASEAN Association of Chiefs of Police (ASEANAPOL) conferences. Contacts have also been established between Russian lawmakers and the ASEAN Inter-Parliamentary Assembly.'

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Economic relations are evolving steadily. In 2017, Russia's trade with ASEAN increased by 35 percent. Mutual accumulated investment exceeds $25 billion.

Our joint business cooperation roadmap containing about 60 joint projects in industry and high technology is being successfully implemented. There are cooperation programmes in energy and agriculture. The Russia-ASEAN Business Council is active too.

It would be useful to continue the work of the Russian delegation to the ASEAN Business and Investment Summit, which ended in Singapore yesterday.

In turn, business leaders from ASEAN countries are always widely represented at the St Petersburg and Eastern Economic forums in Russia. Taking this opportunity, I would like to invite ASEAN officials and business representatives to visit Russia to attend the next meetings of these forums in 2019.

We consider it important to establish regular dialogue between ASEAN and the Eurasian Economic Union. The signing of a memorandum of understanding between the Association and the Eurasian Economic Commission is a step in this direction.

We are grateful to our ASEAN partners for supporting the Russian initiative to pass a joint statement on information security aiming to more effectively combat cybercrime and to chart common approaches regarding the behaviour of states in the global information space.

Russia will join ASEAN plans to establish a chain of smart cities. Moscow, the Russian capital, leads the way in introducing urban digital technology. Moscow already proactively cooperates with Singapore on a bilateral basis. We hope that the region of this cooperation will expand on a reciprocal basis.

It goes without saying that close coordination in emergency response to natural disasters and industrial accidents is in high demand. We have finished working on a cooperation memorandum for preventing emergency situations and conducting clean-up operations. We hope that it will be possible to sign this document soon.

We are ready to continue helping ASEAN states in their efforts to check the spread of infectious diseases. We suggest tapping the potential of various programmes to raise the qualification of medical personnel at a biological safety and security centre that has opened in Vladivostok earlier this year. We could also consider holding joint exercises and practicing rapid response measures to combat dangerous infectious diseases.

In addition, I would like to note the sustained development of cultural and humanitarian ties between Russia and the ASEAN states.

Two weeks ago, Myanmar hosted the first meeting of the working group on education. We are implementing an action plan in the area of science, technology and innovation until 2025. A network of research centres of leading Russian and ASEAN universities has been operating since April.

It would be useful to organise educational and university forums on a regular basis. Russia successfully hosted such events in 2016 and 2017.

The holding of Russia-ASEAN youth summits helps strengthen ties between young people of our countries. The Republic of the Philippines is to host the next summit in 2019.'

/IA&MG/

RUSSIA at the LIMA'2019

Rosoboronexport presents the best and the newest aerospace and maritime innovations

Rosoboronexport, part of the Rostec State Corporation, is the organizer of Russia's exhibit display at the Langkawi International Maritime and Aerospace Exhibition (LIMA'2019). Russian aerospace and maritime enterprises are developing and producing unique means and solutions for any tasks. A large positive experience of mutually beneficial cooperation between Russia and ASEAN states these fields is a good foundation for the further development of partnership. At the LIMA'2019 Rosoboronexport presents traditional products of Russian enterprises, as well as the latest developments and results of promising design work.

The Langkawi International Maritime and Aerospace Exhibition (LIMA) is organized in association with the Government, Ministry of Defense and Armed Forces of Malaysia. The biennial exhibition made its debut in 1991. Rosoboronexport has attended all of the exhibitions.

The exhibition covers the following topics: civilian and military aviation, civilian and military helicopters, humanitarian assistance and disaster control, avionics, aircraft repair and modernization programs, precision weapon control systems, jamming systems, aircraft and naval weapons, underwater equipment, unmanned aerial vehicles, technical reconnaissance equipment, access control equipment, simulators and training programs. Russia has interesting and effective proposals practically in all the above areas.

At the LIMA'2019 Rosoboronexport showcases near 500 pieces of military equipment from Russian enterprises in aerospace and maritime areas.

Dear friends!

On behalf of Rosoboronexport, I welcome and congratulate you on the opening of the Langkawi International Maritime and Aerospace (LIMA) 2019 Exhibition.

The exhibition has been held since 1991 and attracts more and more exhibitors and visitors every year – their number has already reached half a million. Russia traditionally participates in LIMA, and we are proud that interest in our country's joint exhibit display organized by Rosoboronexport is growing every year.

In Langkawi, Russian manufacturers are showcasing the full range of military products in demand in Southeast Asia, as well as the world's bestselling items. Aircraft, helicopters, surface ships and non-nuclear submarines, as well as air defense assets stand out.

Rosoboronexport's partners appreciate Russian weapons and military equipment for their reliability, functionality and fail-free operation even under the most challenging conditions. These qualities have been proven in real battles during the antiterrorist operation in Syria. With such qualities and the world's best cost-effectiveness, Russia's weapons are beyond the reach of competitors.

Today, Rosoboronexport offers the widest scope of cooperation options, from direct deliveries of military products to establishing licensed production, setting up joint ventures to produce and maintain hardware, and the conduct of joint R&D projects. In addition, we have extensive experience in building infrastructure facilities of any complexity in the territory of foreign customers, and widely use the best offset programs.

We are closely following the trends in the international arms market, including in Southeast Asia, and striving to accommodate in our proposals the real needs and specifics of each partner, regardless of the scope of cooperation.

Alexander Mikheev,
Director General of Rosoboronexport

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

The ASEAN states and Asia-Pacific Region accounts for 45% of all of the Rosoboronexport's supplies. Today Russia has extensive military-technical cooperation with traditional partners in this region and are successfully developing new arms markets including the ones dealing with aerial and naval equipment. Much of the aviation, naval and unmanned aerial equipment presented in Langkawi was battle-tested during the counterterrorist operation in Syria. Now Rosoboronexport can observe foreign customers' growing interest in these products.

Rosoboronexport's specialists expect the following equipment to enjoy the greatest popularity in the Asia-Pacific Region: the Su-35, Su-30MKM and Su-30MKI air-superiority multirole fighters, Yak-130 training (combat training) aircraft, Ka-52 attack and reconnaissance helicopters, Mi-17 military-transport helicopters, Orlan-10E and Tachyon unmanned aircraft systems. Regional navies are expected to turn their attention to the Project 22356 and Project 11356 frigates, Project 20382 corvettes, Project 11661 Gepard 5.1 and Project 22160 patrol ships, Project 14310 Mirazh and Project 12150 Mangust patrol boats, submarines Project-636 and a number of naval weapons including the Ak-630M 30-mm automatic artillery system, AK-306 light artillery system and Rumb combat remotely-operated module. Foreign customers may also show interest in the integrated coastal security system presented by Rosoboronexport. The system ensures the security of maritime activities in the exclusive economic zone in peacetime and protection of sea lines of communications and military-economic facilities in wartime.

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

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

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

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

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.

EXPORT REGULATIONS

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.

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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/**

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Among the best and most reliable

United Aircraft Corporation presents combat and civil aircraft for ASEAN customers

United Aircraft Corporation (UAC), Russia's biggest aerospace concern and one of the world's leading manufacturers, is a key supplier of advanced aircraft to ASEAN and Asia-Pacific countries. Russian-made MiG, Sukhoi, Beriev, Ilyushin and other brands of aviation equipment, all of them produced by UAC subsidiaries, are widely known and highly reputed in the region. Shortly before this year's LIMA exhibition, in which the company is traditionally taking part, UAC President Yury Slyusar shared his thoughts about some of the Russian aircraft types which particularly meet the ASEAN needs.

– UAC is planning to exhibit a broad range of products at LIMA 2019. What will your exposition focus on?

- We decided to present those aircraft which are particularly of interest in Asia-Pacific, including future types, those which objectively meet the needs of both Malaysia and the ASEAN region in general. Russia has a long history of mutually beneficial relations with this region, which is well familiar with our products and values their key parameters such as reliability, efficiency and an optimal price-quality balance. In the past, we would focus on promoting Russian-made combat aircraft, whereas now we are equally active in marketing our civil products. UAC's projects in this domain are the best proof that our country is aiming for a serious portion of the local market.

- Experts believe that a number of Russian aircraft types have a high marketing potential in ASEAN, including the Sukhoi Su-35 fighter. What is your opinion?

- I would not argue with experts. The Su-35 is indeed an excellent airplane. The fighter is intended for intercepting and destroying all types of aerial targets in stand-off and close-air-combat scenarios. It has proved its high efficiency in establishing air superiority and against ground and sea-surface targets. This is precisely what the region needs as an aerial security asset.

The Su-35 incorporates the most successful technical solutions previously tested on the Su-27/Su-30 family of warplanes, which are well known in Asia-Pacific. In addition, the aircraft features a broad range of innovations, which significantly improve its handling characteristics and the effectiveness of combat use against aerial, ground and sea-surface targets. It can simultaneously engage aerial and ground targets.

The Su-35 combines the qualities of an advanced fighter (superagility, perfect active and passive detection equipment, supersonic speed, a long operational range and the ability to operate in groups) and a good tactical warplane (a broad inventory of munitions, an advanced multi-channel electronic warfare system, reduced radar signature and high battle damage tolerance).

This universal fighter can operate on its own, as part of a group and as a component in a network with aerial, ground and naval command centres.

- Is the aircraft easy to operate?

- It is very convenient and logical. It incorporates a uniform integrated information and control system, which provides the pilot with intellectual support and enables seamless interaction between the crew and the onboard equipment. The Su-35 is operated by the Russian Aerospace Forces, and has repeatedly demonstrated its excellent characteristics both in training and in actual combat situations.

- What can you say about the Su-32 bomber, which will also be presented at the Malaysian exhibition?

- This twin-seat fighter-bomber can engage aerial, ground, sea-surface and underwater targets, including small-sized ones, which is also very important for the ASEAN region. The Su-32 is highly effective both in autonomous operations and as part of a group, day and night, in good and poor weather, including in enemy jamming environments and under enemy fire.

- One of the highlights of the previous LIMA exhibition was the triumphant performance by the display team Russian Knights, which flies the latest Su-30SM heavy fighters. There is a steady interest in this warplane, which is among the key backbones of Russian combat aviation…

- This twin-seat fighter is currently the world's best in its class, and even our competition admits that… The Su-30SM is a superagile fighter fitted with a phased-array radar, thrust-vectoring engines and canard surfaces. It can use existing and future examples of precision air-to-air and air-to-surface munitions.

The Su-30SM is the latest iteration in the famed Su-30MK family of warplanes, which serve in many countries, including in Asia-Pacific, such as India and Malaysia. Hundreds of such airplanes have been manufactured and delivered to date. Their combat and flying characteristics are well known, and they absolutely surpass international equivalents in their class. The Su-30SM meets the contemporary requirements, including upgraded radar, radio communications equipment, IFF system, weapon inventory, ejection seats and other systems.

Much more could be said about this fighter, but I am convinced that anyone who has seen what it is capable of cannot remain indifferent. I hope that this year's LIMA will again feature a Russian Knights display.

- At the recent AERO INDIA exhibition, UAC staged a special pre-

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Su-30SM


Su-35


Yak-130


Be-200

sentation of the MiG-35 fighter. Are you going to bring the aircraft to Malaysia?

- There will be no special presentation, but we will certainly include the fighter into our exposition. The single-seat MiG-35 and the twin-seat MiG-35D are Generation 4++ multirole fighters; these modifications of the MiG-29K/Kub and MiG-29M/M2 warplanes feature higher combat effectiveness, greater universality and improved operational characteristics.

In layman's terms, the MiG-35 is intended for high-intensity armed conflicts and multilayered, intensive enemy air defences. It can be used in complex, multi-target scenarios in constantly changing theatre and tactical environments over the battlefield and engage both aerial, ground and sea-surface targets.

The fighter features fifth-generation information and sighting systems integrated into the onboard electronic equipment, the ability to use future aerial munitions, increased combat survivability thanks to an onboard defence system, and much more.

The fighter's advanced systems in combination with future munitions allow it to be successfully used in a great variety of scenarios, including aerial superiority, interception of contemporary and future aerial attack targets, delivering precision munitions against ground and sea-surface targets day and night in any weather, for aerial reconnaissance, etc.

Its other advantage is that its price and operating costs are some 20% lower on average than those of the direct competition. The MiG-35 is a highly modular design: maintenance and upgrades do not require pulling the aircraft apart, the requisite module can be easily replaced. For example, replacing the powerplant in the field takes just 58 minutes.

In terms of its combat capability, range of missions, effectiveness and cost-quality balance, the MiG-35 is a perfect warplane, one that can use the entire spectrum of existing and future Russian-made and international munitions. It perfectly suits the Asia-Pacific requirements for fighters in its class.

- We simply must ask you about the Yakovlev Yak-130 fighter, which effectively represents a whole new class of combat trainers…

- This twin-seat combat trainer is widely known and enjoys high demand virtually around the globe. It supports basic and advanced training for pilots of existing and future warplane types, including the super-agile fifth-generation fighters. Its guided and free-fall munitions allow for using the Yak-130 effectively as a combat aircraft. This combination of capabilities is extremely beneficial to countries with budget constraints. In addition, the aircraft's long service life and low operating cost bring down the cost of pilot training.

The Yak-130 has set a number of world rate-of-climb records for different altitudes, with and without a payload, indicating that the aircraft really has exceptional characteristics.

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- What can you say about the Yak-152?

- It is a very good new ab-initio trainer. Essentially, the Yak-152 is a component of a pilot training system for existing and future aircraft, which also includes simulators, computer-based training solutions and data recording equipment. Its aerodynamic design is very forgiving of pilot mistakes and ensures safety.

The aircraft is powered by an innovative diesel engine, advanced avionics, triple-redundant instruments, a unique ejection system, etc. It can be operated from short unpaved strips, which is very useful for many ASEAN and Asia-Pacific countries. Its simple design, easily accessible systems and assemblies make maintenance much easier. One other important factor is that the Yak-152 has a service life of at least 10,000 hours, or 30 years, or 30,000 cycles.

- When you mentioned future Russian civil airliners for the region, did you primarily mean the Irkut MC-21?

- Absolutely, UAC has serious plans for the MC-21. This new-generation family of civil aircraft is aimed at the largest segment of the global airliner market. Demand for aircraft of this class in the ASEAN countries and in the broader Asia-Pacific region is very high and expected to increase in the future. The MS-21 has better flying, operating, economic and consumer characteristics than any existing or future equivalents. Four MC-21-300 will take part in the ongoing flight test programme, and production aircraft will be put into operation shortly.

The development programme comprises two models: the MC-21-300 (160 to 211 seats) and the MC-21-200 (130 to 176 seats). Advanced technological solutions as applied to aerodynamics and propulsion, as well as the latest onboard systems and new solutions pertaining to passenger comfort make the airliners objectively competitive over products by other manufacturers. The interest in this programme is huge, we can see it at aerospace exhibitions when demonstrating the project.

The MC-21 is one of the world's most advanced aircraft. It is being developed and manufactured with the comprehensive use of digital technology. Fuselage components are manufactured and assembled on an all-new automated assembly line. The aircraft incorporates many composite components, making it more reliable, lightweight, efficient and easy to operate.

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Now that we have mentioned our civil projects, I simply must mention the SSJ100 family, which are now in operation around the world both in the standard and business configuration. The programme continues to develop: by 2022, we plan to offer the market an upgraded version of the aircraft. The aircraft will have its wing, fuselage, engines and systems modified, including a new wing and a new avionics suite.

We also expect a high interest in the unique Beriev Be-200 amphibian aircraft, whose primary firefighting role is very topical for virtually all the regions of the world. This airplane can operate from water at wave height of up to 1.3 m, and special anti-corrosion measures allow for its operation in the open sea.

Our lighter, multirole Be-103 amphibian can transport passengers and freights, serve as an air ambulance, for patrolling and monitoring…

I could go on and on about Russian aircraft, but the main thing is that Russia has been and remains a great aerospace power capable of manufacturing aircraft in all the market niches. We know what aircraft this region needs, and are prepared to offer them on advantageous conditions.

/IA&MG/


MC-21


Yak-152


MiG-35

SSJ100

Optimal new-generation regional airliner

Despite the fierce and often underhanded competition on the regional airliner market, Russia's new-generation Sukhoi Superjet 100 (SSJ100) 100-seater has undoubtedly carved itself a niche, with interested potential customers to be found virtually everywhere around the world, from Asia to Latin America. The global SSJ100 fleet grows steadily, including in the VIP configuration, and more carriers come to value the aircraft for its objective economic and technological advantages.

The SSJ100 was developed, and is manufactured and marketed, by Russia's Sukhoi Civil Aircraft Company (SCAC). The airliner represents a successful blend of the national aviation industry's decades-long experience and the latest achievements in the broader aerospace domain. The SSJ100 offers unsurpassed passenger comfort, significant cost benefits for carriers, a highly ergonomic cockpit and maximum environmental friendliness.

Years of operation around the globe resulted in tangible orders from different international carriers. In Bangkok in late February 2019, SCAC signed a firm order with Kom Airlines Company Ltd for six of the type in the 100-seat layout, to be delivered between 2019 and 2020. The contract is valued at some $300 in list prices. The first airframe is to be delivered in the autumn of 2019. Kom Airlines is planning to use its SSJ100s on both domestic and short-haul international routes. The airliners will be maintained by WishV. The Royal Thai Air Force already operates three VIP-configured SSJ100s.

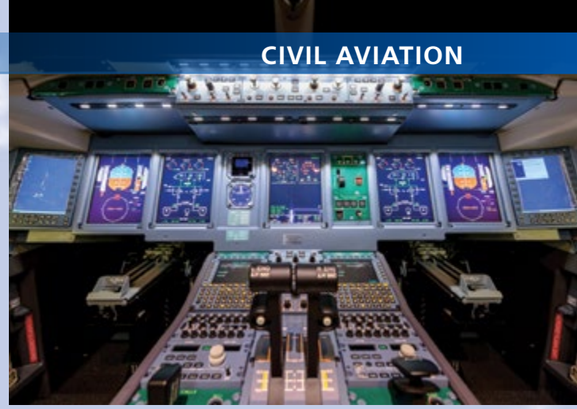
SSJ100 orders keep coming. In November 2018, Adria Airways provisionally committed to 15 of the type, with long-term lease deliveries to begin in 2019. In a separate deal, the partners agreed on setting up a joint SSJ100 MRO business at Ljubljana Airport in Slovenia. SCAC President Alexander Rubtsov, Adria Airways CEO Holger Kowarsch and AA Aviation General Director Martin Vorderwuelbecke noted that the agreement opens a new chapter in the development of relations between their companies.

'It is our great pleasure to cooperate with the Sukhoi company, as it will fully support the development strategy of Adria Airways,' Kowarsch said. 'In the last couple of years we analysed the Sukhoi Superjet 100 aircraft and established that the aircraft's technical and operational characteristics fit perfectly with our strategic goals.' He added that the SSJ100s would allow Adria to offer more of its CRJ and Airbus fleet for charter operations.

Said Rubtsov: 'We are aware that SSJ100 after-sales support for European carriers needs to be done professionally. Together with Adria Airways we will establish a joint maintenance and service organisation at Ljubljana airport for these aircraft. This service platform will ensure the operational reliability of these airplanes in Europe.'

Around the same time at Bahrain Air Show 2018, SCAC signed a contract to supply over 10 SSJ100s to the Dubai-based company Alexcina LLC, to be operated in the Middle East and elsewhere in the world. These airliners may be delivered to the customer's subsidiary Alexcina Airways and to its other clients. The parties have yet to agree on the cabin layout, the timeline for deliveries and other details.

The SSJ100 incorporates a number of innovative solutions that combine to make it one of the most convenient, comfortable and economical airliners in the world. The philosophy behind the SSJ100 comprises such principles as maximum passenger comfort, maximum revenue for the operators, the best onboard systems, high environmental friendliness, and maximally convenient maintenance for carriers.



The SSJ100 first flew in May 2008. Its maximum cruise speed stands at 0.81 M, and its cruise altitude is 12,200 m. The airliner's range is 2,960 m for the baseline version and 4,320 for the extended-range modification. The SSJ100 is powered by two SaM 146 turbofan engines. It features 1.5 tonnes lower CO2 emissions than the competition. The aircraft has been certified by AR IAC, EASA, and a number of national aviation authorities. The first production SSJ100 was put into operation in 2011.

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The SSJ100 is the first 100-seat airliner to feature a full-fledged fly-by-wire system, which optimises control of the aircraft, reduces crew workloads and helps save fuel. The cockpit features intuitive control systems whose design is based on crew feedback and recommendations.

Passengers will appreciate the spacious cabin, which offers the same level of comfort as the cabins of mainline aircraft. The SSJ100 has improved take-off and landing performance and can be operated in all weather conditions. All these factors enable operators to inaugurate new destinations and optimise their route networks and schedules.

The SSJ100 exceeds the ICAO noise and emissions requirements, resulting in a quieter and more comfortable cabin experience. Low fuel burn and low emissions are the key parameters making the SSJ100 one of the most environmentally friendly airliners.

SCAC is specifically focused on radically improving interaction with SSJ100 operators. This includes the introduction of the cutting-edge In-Service Data Analytics Programme (ISDAR) developed by the Russian company Connected Aircraft Enterprise.

The programme will engage all industry players in a uniform knowledge- and experience-sharing process. SCAC will obtain real-life operational data for the entire SSJ100 fleet, allowing it to do a better job of replenishing the parts depots, which is going to become a tricky business as the number of airliners in operation keeps growing.

The uniform knowledge and operational statistics database will additionally help improve the effectiveness of the maintenance programme, thus cutting AOG times.

The manufacturer will be using analysis of technical and operational statistics in a variety of ways, including further development of operating manuals. In technical terms, SCAC has introduced a specialised digital IoT platform that allows for the acquiring, storing, processing and visualisation of data, as well as integrating them with the company's other systems.

SSJ100 operators around the world will be able to upload operational data for their fleets into the system. SCAC, for its part, will be able to react to operators' individual requests and to speed up reaction times for issues related to improving the aircraft's dispatch reliability.

Some of SCAC's partners on the SSJ100 project, including MRO specialists, have already joined the platform. Connecting to ISDAP does not require the installation of any additional equipment on the aircraft; data is collected and uploaded to the system with the use of specialised applications, each of which comes in the mobile and PC versions.

Overall, both Russian and international SSJ100 operators are interested in and prepared to join the programme, which is expected to provide timely help both to the carriers and to all the industry players involved in the development, production and operation of the type.

One other factor increasing the airliner's appeal to potential customers is the deliberate expansion of the range of its applications and the number of available versions. As part of this process, VEB Leasing, United Aircraft Corporation (UAC), Vnukovo Airport's business aviation centre, Azimuth Airlines and National Reserve Corporation came together in Sochi in February 2019 to sign a letter of intent for the implementation of a domestic corporate charter project using SSJ100 aircraft.

Under the project, business-configured airliners seating up to 56 passengers will be utilised for ad-hoc, on-demand flights in the interests of major corporations, athletic teams, touring musicians and other entities interested in corporate transportation.

'UAC sees one of its key priorities in forming and promoting its range of civil aircraft products,' UAC President Yuriy Slyusar noted. 'The corporate charter niche is particularly appealing to us given its growth potential. Creating a corporate transportation platform with the use of the SSJ100 business variant is an important step in the development of our business. We believe this version of the aircraft can become a unique product that will provide for an optimal balance between the required comfort and economic effectiveness.'

The SSJ100 business variant is well known in the world: it has been promoted both in Asia and in Europe, and many potential customers have expressed their interest. One important factor here is that the aircraft's cabin is larger and more spacious than those of the comparable airliners in this class, providing for exceptionally high comfort and unrestricted possibilities (including as concerns cabin design and outfitting).

Industry expert believe the SSJ100 business version is currently one of the most advanced corporate jets. It combines ultra-modern technology with a high level of passenger comfort, and its price tag is comparable to equivalent corporate jets. **/IA&MG/**

SSJ100 orders keep coming. In November 2018, Adria Airways provisionally committed to 15 of the type, with long-term lease deliveries to begin in 2019. In a separate deal, the partners agreed on setting up a joint SSJ100 MRO business at Ljubljana Airport in Slovenia. SCAC President Alexander Rubtsov, Adria Airways CEO Holger Kowarsch and AA Aviation General Director Martin Vorderwuelbecke noted that the agreement opens a new chapter in the development of relations between their companies.

SCAC (www.scac.ru) was founded in 2000 specifically to develop and promote new civil aircraft models. The company is currently focused on further developing the SSJ100 in all possible modifications. SCAC is primarily engaged in the development, manufacture, marketing and maintenance of SSJ100 airliners. Its head office is situated in Moscow, and the production facility is in Komsomolsk-on-Amur.

RUSSIAN MASTERPIECES

High-Precision Weapons Holding creates technics of absolute effectivity and accuracy

The role of high-precision weapons is growing reasonably worldwide. Among the largest manufacturers of the most advanced weapons of such kind is Russian High-Precision Weapons Holding (part of Rostec Corporation). The company is well-known all around the world thanks to its high effective products which outperform foreign counterparts and successfully serve in armies of all world continents. The weapons made by this Russian Holding are also known in ASEAN states and among other countries ATR. In February of this year, the High-Precision Weapons Holding was celebrated the 10th anniversary of its work on the global market. All these years, the company's products enjoy consistently high demand in the world market for weapons and military equipment.

High-Precision Weapons 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.

It is evident that the demand for high-precision weapons only increases around the world. They do not miss. They are mobile, fast, maintenance-friendly, reliable, and the most modern. The newest technological solutions are used. 20 years ago, the proportion of high-precision weapons used in local conflicts amounted to up to 7%. In recent years, this share has increased by up to 90-95%. The most designs of the High-Precision Weapons Holding are the best in the world and determine the technological vectors of development in their segments.

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

The High-Precision Weapons Holding was founded in 2009. The holding consists of a number of largest leading defense enterprises that are well known on the world arms market. It is sufficient only to mention such brands as KBP named after Academician A.Shipunov, Tula Arms Plant (Tulsky Oruzheiny Zavod), Tulatochmash, Nudelman Precision Engineering Design Bureau, Kurganmashzavod, Kovrov Electromechanical Plant, V.A. Degtyaryov Plant, VNII Signal and others. Most of them are national and international leaders in their segments.

The products of the holding's companies are well known on all continents and much sought after on international arms markets. Interest in the products of the High-Precision Weapons Holding grows due to the objective situation.

The exports of the holding are based on warfare systems well known on the international market such as Pantsir-S1, Kornet-E/EM, Konkurs, Metis-M1, Igla-S, Verba, Shmel, Kapustnik, and others as well as on training systems, armored vehicles upgrade, and so on. The holding invests much into the development of promising designs of weapons and military equipment, enhances and augments its development and

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production potential, and invests in the development of models of tomorrow.

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

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Among the samples of products of the High-Precision Weapons Holding presented at LIMA'2019, for example, unique complex Kornet-E/EM, weapon system developed by KBP named after Academician A.Shipunov in the early XXI century remains to be one of the mostly demanded antitank missile systems in the world military market. Due to availability of a shaped-charge warhead primarily designed to engage heavy armour contributed by a thermobaric high explosive warhead of blast effect Kornet-E/EM ATGW has become an effective defence and attack weapon capable to destroy a wide range of targets on the modern battlefield. Open media read that the Kornet-E system, including self-propelled home-made versions, is being used intensively and effectively in the Middle East against all and any military armaments, equipment and manpower.

One of the biggest defense masterpiece from the Holding – man-portable air-defense system (MANPADS) Verba. It is weapons of the new generation, is a unique and second-to-none design. Verba has been developed by the Konstruktorskoye byuro mashynostroyeniya (RPC KBM). The Verba MANPADS was unveiled at the Army-2015 International Military-Technical Forum in Kubinka (Moscow region, Russia). Due to its performance and capabilities, this MANPADS is superior to all comparable foreign counterparts in use. The man-portable air-defense system is intended to be fired by one person. Verba is a further development of the well-known Igla-S system. Even though the new MANPADS looks similar to its predecessors, this is a fundamentally different weapon with new performance. Verba can successfully engage not only traditional air targets – aircrafts and helicopters – but also targets with low thermal radiation, such as cruise missiles and drones.

Also a famous development is complex Khrizantema-S – the best all-weather antitank missile system, which can change the tactics of armored warfare: a small group of combat vehicles anti-tank systems have the power to change the outcome of the battle. Only three cars are able to conduct actions against 14 tanks and damage a minimum of 60 percent of the equipment. This missile system can also fight with low-speed air targets, helicopters and aircraft. Russian Khrizantema-S is the most powerful anti-tank missile system of distant action that the world has ever known. Khrizantema-S is designed to provide a very important combat mission. Destruction of fielded and future main battle tanks, including those protected with explosive reactive armour (ERA), small-displacement surface vessels, low-flying aerial targets, fortifications, manpower under cover and in the open in the day- and night-time, under easy and difficult weather conditions, in the presence of dust and smoke.

Great interest is shown in the world and to small arms, created by the enterprises of the Holding. An example of such a development can serve BUR small-size system – the rocket-assisted grenade, which launcher earned a reputation of convenient, efficient and popular close range engagement asset. BUR was made by KBP named after Academician A.Shipunov, that have been over a long time involved in the

THE BEST WEAPONS

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searches aimed to extend the firing range and enhance accuracy of grenade-launching (flamethrower) 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 PDMA), adopted for service with Russian Army in late 2003. Further, based on the design of RPO PDM-A, KBP developed a small-size grenade-launcher system BUR.

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.

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Pantsir-ME takes a very special meaning represents in the holding's exposition at the IDEX-2019. The only systems in the world that combine within a single turret mount a powerful artillery armament, efficient multi-mode missile weapon and an integrated radar-optical weapon control system are the Russian Kashtan, Kashtan-M and Pantsir-ME developed at KBP, Tula. With two types of weapons within the systems that give them significant advantage these systems posses better performances of each weapon separately as compared to counterparts. Target handling capability and killing potential of one channel of these systems with missile-gun weapon is 2-4 fold higher that the same of the systems with only artillery armament. The difference in efficiency has increased with the advent of advanced targets (increase of their velocity at decrease of lateral dimensions). All combat operation processes – target detection, friend-or-foe identification, high threat target selection, assignment of a target designation for tracking assets, firing by missiles and guns, estimation of firing results and transfer of fire to another target, are carried out without crew participation.

Use of the target tracking radar with the phased-antenna array and the SAM with 20 km range within the Pantsir-ME system fighting module ensure simultaneous engagement of 4 targets as well as killing new types of upgraded anti-ship missiles and small-size surface targets.

At the exposition of the Holding at the LIMA'2019 there are still a lot of real weapons and military-technical masterpieces, which will have no analogue in the world or will not be soon.

/IA&MG/

SEA GHOSTS AND WHERE TO FIND THEM

Based on the designs developed by Rubin Design Bureau, Admiralty Shipyards is constructing two series of submarines – Kilo class and Lada class. Well-proven technologies of construction, refit and modernization, along with well-established cooperation with equipment OEMs enable creation of series of submarines within shortest possible time both for the Russian Navy and for foreign partners.

Russian Navy's Kilo class submarine Velikiy Novgorod. Credit Admiralty shipyards

At the end of 2018, Commander-in-Chief of the Russian Navy Admiral Vladimir Korolev set out plans for renewal of Russia's non-nuclear submarine fleet: 'Construction of Pr.636 diesel-electric submarines will be continued along with serial construction of at least 12 advanced conventional submarines of Lada class for the Russian Navy'.

Submarine St. Petersburg, the leading ship Lada class, is in service with the Russian Northern Fleet. Trials that continued since the moment of the Russian Navy flag raising in 2010 have shown that submarines of this class are perfectly suitable for operation under the conditions of heavy traffic in confined waters of the Baltic, as well as blue water of the Barents Sea and the White Sea with access to North Atlantic.

In the course of construction the first-of-the-class ship, many R&D solutions were adopted; the experience during the operation of St. Petersburg was gained. The year 2018 witnessed a milestone for this programme, as the second vessel in the series, Kronstadt, was launched. Majority of series production equipment which has passed all the tests and complies with the stated technical characteristics is installed on board Kronstadt.

Based on Lada, export modification of the project, Amur 1650, was developed. This ship is equipped with a powerful missile complex, capable to strike both underwater and surface targets, as well as to attack land targets. Another distinctive feature is extremely low noise level and high detection range.

Speaking at the ceremony of Kronstadt launching, Admiral Viktor Chirkov pointed out that due to the low noise level of the previous Kilo class submarine, western submariners nicknamed it 'the Black Hole'. 'Considering the increased stealth of Lada class submarines that can be neither seen nor heard by the opponent, this submarine may be called 'the Sea Ghost,' he suggested.

Igor Vilnit,
CEO Rubin Design Bureau:

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

Obviously, capability to design conventional submarines requires systematic approach i.e. setting up a design bureau, upgradation of shipyards and construction of infrastructure. Russia is one of the few countries that has all the technologies required for design of various ships. Rubin is an integrated supplier that performs the entire cycle of works: research and development works, detailed design, procurement of components, construction, trials and commissioning of the ship and its subsequent operation including refits and upgradation. Rubin works in constant interaction with various shipyards and wide range of OEMs.

Joint design of a ship might be one of the options in cooperating with friendly nations. Joint design works could be based on the requirements of the Navy from the very beginning of the design as well as training of designers i.e. transfer of technologies to the maximum extent possible'.

Second Lada class submarine Kronstadt at the Admiralty shipyards. Credit Admiralty shipyards

Alexander Buzakov,
CEO Admiralty Shipyards:

'Admiralty Shipyards is currently fine-tuning individual systems for the Lada class submarine Kronstadt. The vessel is undergoing mooring trials, which will continue until April 2019. The third submarine of the project, the Velikiye Luki, is in the hull assembly phase, with the first pieces of heavy equipment being installed. The Velikiye Luki is scheduled to be launched in November 2020. The shipyard is also working to build six Pr. 636.3 submarines for the Russian Pacific Fleet. The lead ship is to be delivered in 2019.

Importantly, we are continuing with both submarine projects while working at full capacity and carrying out massive renovations, which imply erecting new facilities and upgrading the existing ones. Once completed, this effort will have resulted in a state-of-the-art, hi-tech full-cycle construction and overhaul facility for non-nuclear submarines. With an annual output of up to four vessels, it will allow our company to cut production and repair times.

We have already put into operation a new hull shop, complete with a titanium fabrication section, and a battery charging station. Work is in progress to erect a bench testing facility and outfit the cleaning, painting and coating shops. We are also working to retool and upgrade our mechanical production facilities.

I would like to reiterate that we are upgrading our production capacities while continuing to work under the current contracts, and that all our projects remain firmly on schedule.'

The leading ship Lada class in service with the Russian Northern Fleet. Credit Rubin

Kilo class submarines are well-known at the export market. Around 70 ships based on the basic design and its upgraded versions have been already constructed and inducted into the Russian Navy and those of friendly countries. Amur 1650 is the next generation submarine. It is more compact: with similar weapons composition (six torpedo tubes with ammunition comprising 18 torpedoes and missiles), its standard displacement has been reduced from 2350 (Project 636) to 1765 tons. Due to automation, the complement has been reduced from 52 to 35 persons. Amur is equipped with large-area array sonar, the area of which is comparable with that of nuclear submarines.

Amur 1650 is bidding for P-75I, the Government of India tender for construction of six submarines in India with transfer of technologies. The design of the ship, proposed to India, includes equipping the submarine with AIP. Hydrogen is generated directly on board a submarine by means of diesel fuel reforming. Russian Ministry of Defence has also selected AIP based on the diesel fuel reforming technology for developing and fitting on non-nuclear submarines. Only in case of diesel fuel reforming the submarine gets the opportunity to store one type of fuel only and use it for diesel-generators, if any, as well as for AIP system. Hence, the submarine operational cost reduces. It is known that even for diesel submarines, the expenses for fuel turn to be a major part of operating expenditures.

Diesel fuel reforming ensures required submerged endurance. This is a possibility for non-nuclear submarines to operate in open theatres at a considerable distance from the bases, being able not to use unstealthy modes, including during deployment, avoiding threats from numerous and skilful enemy. Conditions, in which Russian submarines are operating, are distinctly different from the European ones. European ships operate on enclosed theatres, at short distances from patrol areas to own bases, and in presence of allied forces. However, as far as it is known, France and Germany have started works in the field of reforming, so the time has proven the correctness of the Russian Navy choice.

Russian Navy also orders well proven highly upgraded Kilo class submarines. Improved Kilo class submarines commissioned by the Russian Navy in 2014-2016 are now operating within the Black Sea Fleet. Operation of those ships showed their advanced capabilities including high efficiency of missile complex.

Serial construction of submarines of this class is in progress. In July 2017, first two submarines for Russian Pacific Fleet were laid: Petropavlovsk-Kamchatsky and Volkhov. **/IA&MG/**

The Admiralty Shipyards is a state-of-the-art centre of Russian non-nuclear shipbuilding

Over three thousand ships, including hundreds of submarines, have been built here

Pr. 636 in construction. Credit Admiralty shipyards

AERO INDIA 2019

Russia presented classic and innovative developments and proposals

AERO INDIA Exhibition which is organised from 1966 every two years has already carved a niche for itself globally as one of the premier aerospace exhibition. More then 60,000 business visitors and 1,000,000 general visitors attended AERO INDIA 2019, which was held from February 20 to 24 at the Yelahanka Air Base in Bangalore, India. Russian participation in AERO INDIA 2019 was sufficiently vivid and convincing, showing the further successful development of Russian-Indian relations in the field of aviation, aerospace and security.

Rosoboronexport, a subsidiary of the Rostec State Corporation, was showcasing the best products from the Russian defense industry at the AERO INDIA 2019 International Aerospace Exhibition.

'Russia is implementing major and ambitious high-tech manufacturing projects with India, which are regularly discussed by the Heads of both States at summit meetings. Our cooperation is fully in line with the Government of India's Make in India policy. In fact, Russia was the first country to support the program. More than two hundred Su-30MKI aircraft have already been assembled in India in cooperation with the HAL Corporation under a contract with Rosoboronexport. We'll soon start manufacturing Ka-226T helicopters in India at Indo-Russian Helicopters Limited, a Russian-Indian joint venture established in 2017. We are also actively cooperating on products for other services of armed forces. I am sure Aero India 2019 will open up new horizons for cooperation with Indian partners,' said Rosoboronexport Director General Alexander Mikheev.

Rosoboronexport was the organizer of the joint Russian display at the exhibition and encompassing products from 11 domestic defense enterprises and holding companies. In total, the company was exhibiting more than 200 pieces of defense hardware at its stands.

Of the products were displayed at AERO INDIA 2019, the newest Russian aircraft like the MiG-35 multifunctional front-line fighter, the Su-35 multi-role super-maneuverable fighter, the Il-78MK-90A tanker, the Il-76MD-90A(E) military transport aircraft, as well as the Yak-130 trainer (combat trainer) are of particular interest throughout the world and in the Asia-Pacific region.

In addition, according to Rosoboronexport, the Ka-226T day/night light utility helicopter, including its ship-based version, the Ka-31 radar picket helicopter, the Ka-27PS deck-based search-and-rescue helicopter and the Ka-52 scout/attack helicopter are promising in the region.

Air defense assets like the Pantsir-S1 self-propelled anti-aircraft gun and missile (SPAAGM) system, the Tor-M2E and Buk-M2E SAM systems and Igla-S MANPADS should be of equally great interest to foreign customers during the exhibition. in addition, it is expected that representatives of the security agencies of the Asia-Pacific countries will draw special attention to counter-terrorism solutions, security systems for high-value installations and airfields, as well as Russian-made EW assets and counter-UAV systems.

'Rosoboronexport appreciates the good partnership relations with its Indian customers. Last year, Russia and India took yet another set of significant steps towards each other by signing contracts for the supply of Russian military equipment and its production at national Indian enterprises, thus bringing the company's order book in India to $10 billion. We are not going to stop here and are ready to step up cooperation, including in the framework of the 'Make in India' program,' added Alexander Mikheev.

Within the AERO INDIA 2019 the delegation of JSC Rosoboronexport conducted a series of productive negotiations and consultations with the Indian partners on military and technical cooperation, which resulted in signing a number of contractual documents.

On the very first day of the show the Russian national exhibit was visited by Minister of Industry and Trade of the Russian Federation Denis Manturov and Minister of Defence of the Republic of India Nirmala Sitharaman, which contributed to the collective success of the Russian delegation's work at Aero India 2019 as well as underscored a special high profile of the Russian-Indian mil-tech cooperation.

'Russia is ready to offer to India not only the state-of-the-art military equipment, but also the technologies of production, i.e. the expertise, which we can share with each other in the framework of a wide industrial part-

Sergey Kulakov,
Head of delegation at AERO INDIA 2019, 'Almaz – Antey' Air and Space Defence Corporation':

'AERO INDIA 2019 proved a fairly dynamic exhibition, with representatives of dozens of international companies visiting our stand. They were interested both in our products and in possible cooperation. We also held fruitful and constructive talks with Indian partners, whom we have been working with for many years.

Almaz-Antey was exhibiting products which are particularly in demand in the region; we are in delivery talks with some of them – I mean primarily long-range systems. We also demonstrated upgraded versions of some systems already in service with the Indian Armed Forces. Our exposition included the S-400 Triumf, S-300VM Antey-2500, S-300 PMU2 Favorit and Buk-M2E SAM systems, as well as different modifications of the Tor system, including the Tor-M2E and Tor-M2K. Also presented were autonomous combat modules of the Tor-M2KM system and the Adjutant aerial target system.

Our exposition in Bangalore also included civilian products, such as the DMRL-3 Doppler weather radar and the ROSC-1 radar-optical perimeter security and anti-UAV system.'

Anatoliy Punchuk,
Deputy Director, Federal Service of Military-Technical Cooperation of Russia:

'Russia and India share a 60-year-plus history of dynamic defence cooperation, which is a cornerstone of the strategic special relationship between the two countries. We can boast both solid results and good prospects. India in 2018 was among the top three of Russia's leading defence partners with a portfolio of orders for Russian military products exceeding $10 billion. The combined total of our contracts with that country exceeded $12 billion over the past five years.

We appreciate it that our Indian partners are not succumbing to the Western sanction pressure, which is being used as a component of unfair competition aimed at driving Russia out of its traditional markets. India openly states that Russia remains its strategic partner, including in arms supplies. The Indian government is well aware of the fact that Russia offers it a special relationship, which implies, inter alia, technology partnership, equal innovative cooperation on shipbuilding, aerospace engineering, armoured vehicles, etc. None of our competitors offers, or is even capable of offering such a level of openness and interaction.

Russia and India enjoy long-standing relations of trust and true partnership. The contracts signed late last year demonstrate that our defence dialogue continues successfully. We have a number of promising projects to set up joint production ventures in India, which prove the high level of mutual trust between our countries.'

nership in line with the Make in India policy. The potential for the development of cooperation in this area is huge, and we are focused on its full achievement,' said Rosoboronexport's Director General Alexander Mikheev.

The main themes of the meetings with the leadership of the Ministry of Defence, Air Force and Navy, held in Bangalore, were the promising projects on the supplies and production in India of various types of the Russian military equipment, primarily within the implementation of the Make in India state programme, and on the after-sale services, maintenance and modernization. In particular, the parties went on with pro-active consultations on the project, which implies production of Ka-226T helicopters at the Russian-Indian joint venture Indo-Russian Helicopters Limited, for which purpose the Russian Helicopters Holding signed a number of appropriate memoranda with the Indian partners.

The Russian exhibition stands, represented by such leaders of the industry as the Public Joint Stock Company United Aircraft Corporation, JSC United Engine Corporation, JSC Russian Helicopters, JSC Almaz-Antey Corporation, JSC 'SPC 'Techmash', JSC Shvabe and others, familiarized Indian participants and visitors with hundreds of Russia's defence products, ranging from planes and helicopters to air defence systems.

Apart from that, the static demonstration, arranged by the organizers, hosted full-scale specimen of the sophisticated Russian-made aircraft, which are in the inventory of the Indian Armed Forces, i.e. Su-30MKI and MiG-29UPG warplanes and Mi-17V-5 helicopters. Those specimen, piloted by Indian airmen, took part in the opening ceremony of the air show and the programme of demonstration flights, while a team of Indian female parachute jumpers performed the first in the Aero India history female jump from the height of 1,5 km (5000 feet), to where they were delivered by a Russian-made Mi-17 helicopter. 'Willing horses of the Indian Air Force and its backbone,' that's what the local Indian newspapers in Bangalore called the Russian aviation equipment.

In general, the wok of the Russian delegation at AERO INDIA 2019 proved that Russia and India may be rightly proud of the highest level of friendly and trusted relations, which also spread on such a sensitive sphere as defence and security. With this in mind, the most obvious confirmation of a wide-scale character of the bilateral partnership is the portfolio of India's orders for the Russian military equipment, which equals to 10 billion US dollars.

Praveen Pathak
General Manager, Market Promotion and Export, BrahMos Aerospace:

'The BrahMos missile is an exemplary result of Russian-Indian defence cooperation. The missile is undoubtedly among the best in the world; it features a high level of universality in that it can be launched by a variety of ground, sea-surface and aerial platforms. At AERO INDIA 2019, we presented an upgraded BrahMos-NG missile for the Sukhoi Su-30MKI fighter; each aircraft can carry up to five such missiles. This enhances the Russian-Indian fighter's combat effectiveness. BrahMos-NG can be carried by the MiG-29, submarines and other platforms. We are convinced that this BraMos iteration will have a bright future. We expect to launch production of the new missiles within two or three years.'

Russian Helicopters Holding Company (part of State Corporation Rostec) took part in the AERO INDIA 2019 and showcased the shipborne version of Ka-226T helicopter as well as the vast range of civil-purpose helicopters. This year, the key exhibit at the Holding Company's booth was the mock-up model of a light shipborne Ka-226T helicopter. The naval version of Ka-226T features blade folding system of main rotor. Also, the helicopter boasts the state-of-the-art avionics suite, its components and systems are fit for operation under aggressive conditions of marine environment. Owing to its small dimensions, the helicopter can be deployed on ships and low-displacement vessels. Ship-based Ka-226T helicopter may be used to perform search and rescue, as well as transport missions day and night in standard and adverse weather conditions.

'No doubt, India is our strategic partner and at this show we are planning to discuss one of our key projects: the localization of production of Ka-226T in this country. Moreover, in view of the voiced interest in procuring light utility ship-based rotorcraft we shall put an increased focus on presenting the capabilities of naval version of Ka-226T. The helicopters in such configuration are being delivered to the Russian special-task aviation and already have a favorable track record. This rotorcraft may become a logical continuation of the current cooperation we are building within the scope of the 'Make in India' program', noted Andrey Boginskiy, Director General of Russian Helicopters Holding Company.

The Holding Company also showcased the mock-ups of Ansat and Mi-171A2 rotorcraft and conduct a set of negotiations on the prospective deliveries of these helicopters. India is to become one of the first foreign operators of Mi-171A2: currently the Holding Company is finalizing joint TC validation activities with the Indian authorities. The first Mi-171A2

Oleg Golubev,
Assistant Director General, Director of the Information and Analysis Centre, Izhevsk Electromechanical Plant Kupol:

'AERO INDIA 2019 once again proved the popularity of our key product, which is the family of Tor SAM systems. Our product's modular design allows for installing it on virtually any platform as requested by the customer, from trucks and trailers to naval ships and stationary positions. Of no lesser popularity is our all-new product, the Adjutant target system. The targets used in conjunction with the Adjutant allow for quality training with virtually all the existing SAM systems, including target practice emulating the most probable enemy targets. The system has an unrestricted upgrade potential: additional target types can be promptly added by modifying the profiles of the existing targets. The Adjutant can also be used in testing any types of SAM systems.

AERO INDIA continues as a leading arms exhibition in the region, it never stops evolving… Its air-defence segment keeps growing, and Russia dominates that segment by right. Russia also has its own projects to offer in the domain of anti-UAV solutions, which has been gaining popularity over the past several years.'

shall be handed over to the Indian customer in 2019.

Besides, the visitors of AERO INDIA could see the mock-up model of a utility Mi-38 helicopter. This is one of the most computerized civil helicopters in the world: The flight control and navigation suite enables automated enroute flight, landing, hovering and stabilization in any flight mode. The integrated on-board equipment suite IBKO-38 installed on Mi-38 supplies the crew with information of sufficient quality and quantity to guarantee top flight safety. Due to the implemented technical solutions Mi-38 surpasses other helicopters in its class in terms of load-/passenger-carrying capacity and major flight performance. Mi-38 is intended for operation in a wide range of climatic conditions including maritime, tropical and cold climates.

In addition to presenting its products, Russian Helicopters focused on discussing after-sales support of rotorcraft operated by the foreign customers. The new format of ASS offered by the Holding Company is aimed at structuring strategic relations with an operator and implies execution of long-term no-bid agreements and transition to life cycle support contracts.

At AERO INDIA 2019 Russian Helicopters Holding also organized the conference of potential suppliers of components for Ka-226T helicopter made in India with more than 30 Indian industrial enterprises as participants. Identifying the chain of local suppliers is a part of the project of setting up the production of Ka-226T helicopter in India.

In frame of the airshow Russian Helicopters and a number of Indian companies signed Memorandums of Understanding. The parties agreed to consider setting up the production of a number of Ka-226T helicopter assemblies and components in India. The MOUs were signed with the following companies Elcom, Valdel Advanced Technologies, Dynamatic Technologies, Integrated Helicopter Services and Bharat Forge, covering assemblies such as fuselage, blades, radiostation and landing gear.

'We have launched a new stage of Ka-226T project: identifying the chain of manufacturers among the Indian companies. I am positive that the agreements reached today will result in a long-term mutually beneficial cooperation at a later stage when the production of Ka-226T is transferred to the customer's territory', noted Andrey Boginskiy, Director General of Russian Helicopters Holding Company following the signing.

'The program of localization of production of Ka-226T helicopter in India is a key project within the scope of the 'Make in India' program. The contract provides for the delivery of 60 Ka-226T assembled in Russia and the production of 140 units in the territory of the partner country. That said, the project opens up ample opportunities: I am sure that the rotorcraft assembled in India will be in high demand in this country as well as in the third markets. In particular, we intend to take part in a bid for the delivery of 111 Naval Utility Helicopters for the Indian Navy. The selection of Ka-226T will allow India to reduce expenditures for transportation, maintenance, personnel training due to the localization of production in its own territory', highlights Victor Kladov, Director for international cooperation and regional policy at State Corporation Rostec.

'We are facing an ambitious task because the world has so far not seen such projects of transferring leading-edge rotorcraft production. To set up the production of Ka-226T helicopter, its assemblies and components, is not possible without the reliable Indian partners and future suppliers having a sufficient number of technological competences and work experience in the aviation sphere. The objective of current interaction between Russian and Indian industrial enterprises is to present the background information on the project, a joint discussion of technical issues and finding further ways of cooperation', stated Andrey Boginskiy, Director General of JSC 'Russian Helicopters'.

Light utility helicopter Ka-226T features coaxial main rotor system, maximum take-off weight of 3.6 tons and is capable of transporting up to 1 ton of payload. The main distinctive feature of the helicopter is its modular design. Ka-226T can be easily fitted with a transport cabin enabling the transportation of up to 6 people, or with modules carrying special equipment. Flight performance of Ka-226T helicopter, its environmental friendliness, cost effectiveness, state-of-the-art avionics suite and additional flight safety solutions make this helicopter one of the best in its class.

In 2015, Russia and India signed an agreement on cooperation in the sphere of helicopter manufacturing. According to the agreement the Indian Armed Forces will take delivery of 200 Ka-226T; at least 140 out of that number are to be produced in the territory of India under the program 'Make in India'. In May 2017, Russian Helicopters, Rosoboronexport and Hindustan Aeronautics Limited founded a joint venture that deals with localization issues.

/IA&MG/

Aleksei Mokhnatkin,
Deputy General Director, RC Module:

'At Aero India 2019, our company exhibited a broad range of its microelectronic developments intended both for aerospace and for the broader commercial market. These include video-stream and imagery processors, in particular specialised processors intended for deep convolutional neural networks, which are based on the in-house NeuroMatrix architecture.

In India, we primarily offer our off-the-shelf hardware/software solutions, including those for centralised control of UAVs, missiles, fixed- and rotary-wing aircraft. RC Module already has a number of contracts with Indian customers. On some of the projects, our Indian partners are involved in the production process. We are actively promoting our products globally, including to Southeast Asia and Europe. We frequently engage foreign partners in joint developments; these include work on a radiation-hardened processor, hardware and software for commercial satellites, and a medical module based on a neuroprocessor.

Our competitive advantages include proven high reliability and unique in-house designs. Each of our specialised products features its own unique characteristics which make it globally competitive. Our processors often beat conventional CPUs at imagery and video-streat processing and at interaction with neural networks, including in the terms of power consumption.'

Igor Ryapin,
Deputy General Director Commercial, Rubin Aviation Corporation:

'Rubin's chief objective in participating in AERO INDIA 2019 was to showcase our products and probe for possible cooperation on the market. The Indian market is indeed very much interested in our entire product range, from wheels, brakes and friction materials through metal ceramics, bimetals, carbons and composites to plunger pumps and generator drives. Furthermore, such products are already used in Soviet- and Russian-made aircraft operated in India. Now that our company has embraced new technology, we are prepared to introduce the regional market to our new capabilities. These include the development and manufacture, to customer specifications, of complex articles for any mechanical engineering sectors. Our company has the requisite design, testing and production resources for tackling problems of any complexity, including with regard to precision machining. Rubin is prepared to handle the entire production cycles, from the design stage to certification. We are also prepared to flex our position with regard to the customer's requirements and legislation. One important nuance is that we are working for the future.'

Oxana Zagorodnaya,
First Deputy General Director, Russian Aviation Co:

'Our company has been presented on the Indian market for over 20 years. We supply Indian customers with parts and components for civil aircraft and, via Rosoboronexport, for military aviation equipment. India is very important to us, it is our primary foreign customer. We have attended Aero India since 2005, the exhibition serves as an important platform for expanding our business opportunities on the international aerospace market. Russian Aviation Co has an in-house production line for standardised components. We also have nearly 30-year experience exporting parts and maintenance equipment for Russian- and Soviet-made aircraft. We operate under direct long-term agreements with leading Russian and CIS manufacturing and repair facilities. Our products are supplied to over 20 countries in Southeast Asia, Africa, the Middle East, Latin America and Eastern Europe.'

DEMONSTRATION TOUR

Russian Helicopters presented Ansat and Mi-171A2

Mi-171A2 and Ansat helicopters, manufactured by the Russian Helicopters holding company (part of State Corporation Rostec), completed a demonstration tour of the countries of Southeast Asia. Attendees of Airshow China in Zhuhai, China, as well as potential customers from Vietnam, Cambodia, Thailand and Malaysia, familiarized themselves with the capabilities of both aircraft. Full-scale demonstrations in these countries of the latest civil technology made it possible to reach specific agreements and create an extensive portfolio of orders for them.

The delegation of the Russian Helicopters Holding Company demonstrated key competitive advantages of Mi-171A2 and Ansat rotorcraft in Phnom Penh (Cambodia) during the South Asian Heli Tour and provided information to the guests of the event about the after-sales service system. In their turn, partners of Russian Helicopters presented financial instruments for purchasing Russian helicopters. Cambodia has become the second stop for Mi-171A2 and Ansat during the South Asian Heli Tour. Earlier, these Russian-made helicopters were showcased in Vietnam.

'Cambodia has a positive experience of operating Mi-8/17 family helicopters. Moreover, we see a growing demand for light rotorcraft in that country, as well as in Southeast Asia in general. Therefore, Phnom Penh was selected as one of the demo sites during the South Asian Heli Tour of Mi-171A2 and Ansat civil helicopters. Demonstrating our machines to the public has already proved to be efficient: after the Vietnamese stage of the Heli Tour we have noticed a high interest among potential customers and have managed to reach a number of important agreements,' said Andrey Boginskiy, Director General of the Russian Helicopters Holding Company.

The newest civilian helicopters Ansat and Mi-171A2 were also presented to potential customers of Thailand during the South Asian Heli Tour. The event at the U-Tapao airfield included flight display of Russian-made rotorcraft.

Moreover, during the presentation the Holding's specialists introduced key benefits of Mi-171A2 and Ansat helicopters, as well as the system of after-sales support, to the Thai operators.

'The Holding Company is striving to reinforce business relations with commercial and state customers in Thailand. The first deliveries of Ka-32A11BC helicopters to this country are scheduled by the end of the year; also, the potential operators show interest in Ansat and Mi-8/17 rotorcraft in various modifications, thus we believe, that showcasing our helicopters here is perfectly timed', noted Andrey Boginskiy, Director General of Russian Helicopters Holding Company.

Russian-made rotorcraft receive high praise from state and commercial customers in the Southeast Asia. Thus, Thailand is successfully operating the Mi-17V-5 medium utility helicopters.

'The Southeast Asia including Thailand is a strategic region of presence for Rostec where we intend to actively develop cooperation in various spheres. Helicopter industry is one of the most perspective areas of interaction. Such events as this demonstration tour are aimed not only at showcasing the benefits of our helicopters but also at strengthening our relations with the key partners in the region', noted Anatoly Serdyukov, Industrial Director of the aviation cluster of Rostec.

The Holding Company is also establishing a service center in this country. A Memorandum of Intent was signed with DATAGATE Company in February 2018. Fields of cooperation mentioned in this document include assistance in establishing the MRO center for Russian-made helicopters in the Kingdom of Thailand. The MRO center is expected to perform all types of scheduled maintenance and repair works, troubleshooting and replacement of components.

The final stop on the tour was a presentation in Kuala Lumpur, the capital of Malaysia. The Russian helicopters made demonstration flights over the Sepang F1 International Circuit Formula 1 track, and the holding's experts told guests about the key competitive advantages of the Mi-171A2 and Ansat and presented the after-sales service program.

The Ansat and Mi-171A2 went on demonstration tour of Southeast Asian countries after Airshow China, where they took part in the flight program. The helicopters covered almost 5,000 kilometers. In total, more than a thousand guests from state and commercial helicopter operators visited the flight shows. The helicopters exhibited their flight characteristics and their efficiency of use in high temperatures and humidity close to 100%. This fact was repeatedly noted by operators in the region during demonstration flights.

'The applications received over the month of our demo tour to supply of over 70 Russian helicopters worth more than half a billion dollars to the countries of the Asia-Pacific region over the next three years are vivid evidence of the competitiveness and relevance of Russian civilian helicopter technology abroad, a logical result of comprehensive government measures to support Russian civil export to world markets,' said Russian Industry and Trade Minister Denis Manturov.

'These are both hard and soft contracts. For example, in China, a contract was signed for 20 Ansat helicopters for the Association of Disaster Medicine of China. The remaining 50 helicopters are planned for delivery to Vietnam, Cambodia, Thailand and Malaysia,' said Russian Helicopters CEO Andrey Boginsky.

According to Boginsky, demand for civilian helicopters in Southeast Asian countries may amount to 420 helicopters in the next ten years. 'We are counting on a substantial share of this market, and the results of the demo tour suggest that we have every reason for this,' Boginsky said.

'Southeast Asia is one of the world's fastest growing industrial and financial regions. The demand for civilian helicopters in the countries of the region could amount to 420 helicopters over the next decade,' said Anatoly Serdyukov, Rostec's Aviation Cluster Industrial Director. 'It is strategically important for Rostec to strengthen its positions here in the helicopter industry. The agreements and arrangements reached in the framework of the demo-tour are the best confirmation of the potential of our machines.'

Ansat is a lightweight twin-engine multipurpose helicopter that can be used for the transport of goods and passengers, surveillance, search and rescue, and fire and medical evacuation operations. It has the largest cabin in its class of helicopters, and the cabin easily and quickly transforms to the configuration necessary. Ansat is certified for use in hot climates.

The Mi-171A2 is a mid-class multipurpose helicopter that combines the unique operating experience of Mi-8/17 helicopters with the latest developments of the holding. It can be used effectively and safely day or night, in high mountains, at low or high temperatures, high humidity and over water. **/IA&MG/**

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In 2019

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'RA&MG' №01 (32)	February 12th	**IDEX 2019 / NAVDEX 2019** (17-21.02.2019, UAE, Abu Dhabi)
'RA&MG' №02 (33)	February 15th	**AERO INDIA 2019** (20-24.02.2019, India, Bangalore)
'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 01th	**IDEF 2019** (30.04-03.05.2019, Turkey, Istanbul)
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'RA&MG' №07 (38)	May 14th	**SITDEF 2019** (16-19.05.2019, Peru, Lima)
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'RA&MG' №14 (45)	October 13th	**SEOUL ADEX 2019** (15-20.10.2019, Korea, Seoul)
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