INTERNATIONAL AEROSPACE & TECHNOLOGY GUIDE

Special analytical export project of the United Industrial Edition

№02 (33), February 2019

Innovative solutions for India and South Asia

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SPECIAL PARTNERSHIP

Russian Aviation & Military Guide

'International Aerospace & Technology Guide'
№02 (33) 2019, February 2019
Special Edition for Middle East

Special analytical export project
of the United Industrial Edition

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CONTENTS

EDITORIAL

The best offers for India and Asian-Pacific area

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. AERO INDIA 2019 presents in Bengaluru the best world (Russian also) aerospace innovations for global market, which are the undisputed world leaders on price and quality in their segments.

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

Taking part in AERO INDIA 2019 Russia continues the policy of open partnership with India and other countries of Asian-Pacific area. Russia has a wide product line that meets all the needs of this region and ready propose the best technology and the best price offers.

Valeriy Stolnikov

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.

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.

TEST COMPLEX FOR PD-35

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

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

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

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

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

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

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

18th anniversary of Rosoboronexport

On November 4, 2018, Rosoboronexport, which is part of the Rostec State Corporation, celebrated the 18th anniversary of its founding. The Company was established in 2000 by decree of the President of the Russian Federation.

'For 18 years, Rosoboronexport has become a world leader in the supply of weapons and military equipment and reached record levels. Today, Russia assuredly ranks second in the world in terms of the scope of military-technical cooperation. The Company's order book stands well above $50 billion, while the total value of deliveries has exceeded $150 billion over the years. We continuously improve and offer foreign customers more and more new models of military equipment, often the best in the world in performance and competitive in terms of price and quality. More than 200 Rosoboronexport employees have been awarded state and departmental awards for their great contribution to the development of military-technical cooperation with foreign countries,' said Rostec's Director General Sergey Chemezov.

In 2018, the Company was actively engaged in efforts to promote and exhibit their products. Rosoboronexport took part in 16 international exhibitions and forums, and 6 are yet to come before the end of the year. The Eurasian Air Show in Antalya, Turkey, the International Far Eastern Maritime Show in Vladivostok and ADAS 2018 in the Philippines were debut exhibitions for the Company. Rosoboronexport is expected to participate in yet another new exhibition, EDEX 2018 in Egypt, to be held late this year.

'Despite unprecedented competition, Rosoboronexport continues to strengthen its position in the global market. Just recently, we signed the biggest-ever contract in company history to supply India with the S-400 Triumph anti-aircraft missile systems. In 2018, we delivered weapons and military equipment to more than 40 countries of the world. At the same time, over 1,100 contract documents worth about $19 billion were signed, almost a quarter more in the whole last year. That statistics suggest that the quality of Russian weapons and their proven performance are a determining factor for our partners,' said Rosoboronexport's Director General Alexander Mikheev.

Rosoboronexport has expanded its catalog of military products over the year and is actively promoting a number of new pieces of military hardware on the world arms market, including the Buk-M3 Viking and Tor-E2 SAM systems, the Sprut-SDM1 light amphibious tank, the ships Karakurt and Sarsar, Il-78MK-90A tanker aircraft, and Il-76MD-90A(E) military transport aircraft.

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.

Service centers in China

The Russian Helicopters Holding Company and the Chinese company United Aviation Technology negotiated about establishing a maintenance and repair center for Russian helicopters in Shenzhen (China) as part of Airshow China 2018. The contract is to be signed by the end of the year. In February 2016 the holding company signed a framework agreement with CITIC Offshore Helicopters, AVIC International and Avicopter (which have formed the Chinese joint venture United Aviation Technology). The framework agreement provides for creating the maintenance and repair center for Russian helicopters Ka-32A11VS and Mi-171 in Shenzhen. The Chinese party also expressed interest in upgrading the maintenance, repair and overhaul base in Tianjin to carry out similar work.

'Currently, Russian Helicopters and United Aviation Technology are considering the draft general contract for creating a maintenance and repair center for the Ka-32A11VC and Mi-171 helicopters in Shenzhen and the draft contract for technical audit at the aircraft maintenance and repair base in Tianjin. At Airshow China we had another round of negotiations in order to sign both documents before the end of the year,' said Russian Helicopters CEO Andrey Boginsky.

AEROSILA ONE OF THE MOST EXPERIENCED COMPANIES IN THE WORLD

AEROSILA is a public company with modern research facilities and its own production plant. Established in 1939 as a design bureau for the development air propellers, the company has grown into a multi-profile manufacturer of aviation components with more than 60 years of production:

- auxiliary power units (APU) and other small size gas turbine engines
- air propellers and propfans
- lifting and propulsion mechanisms
- power converters for supersonic aircraft
- inflowing/exhaust fans and jet axial fans

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- base gas generators for small size main engines
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AIR PROPELLERS, PROPFANS & HYDROMECHANICAL GOVERNORS

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EFFICIENT USE guaranteed by

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- **MODERN TECHNOLOGICAL FACILITIES**
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- LIFTING & PROPULSION MECHANISMs
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VLADIMIR PUTIN AND NARENDRA MODI

Relations between Russia and India continue to develop the most favorable way. As evidenced by the private meetings of the leaders of the two countries and their involvement in the implementation of projects of business cooperation. For example, it was well illustrated by the meeting between the two leaders in Chine during the BRICS Countries' Cultural Festival, in Tashkent, the transfer to the first blog for Kudankulam NPP and many other meetings.

On August last year in congratulations to India's leadership on the 70th anniversary of independence Vladimir Putin praised India's economic, social and other achievements, and noted that the country has earned the respect it deserved on the international stage.

'Russian-Indian ties have always been based on friendship and mutual respect. The two countries have a long track record of fruitful bilateral cooperation in all areas, and coordinating efforts in resolving important matters on the regional and global agendas,' the President of Russia said in the message.

Vladimir Putin confirmed Russia's readiness to continue joint efforts to strengthen the special privileged partnership between Russia and India in the interests of the friendly peoples of the two countries, and with a view to ensuring international stability and security.

These words were fully confirmed and within the framework of the BRICS summit and BRICS Countries' Cultural Festival which took place on September in Xiamen. The programme included a variety of exhibitions, concerts, presentations and film showings. The event's main purpose was to acquaint the public with the BRICS countries' cultures.

Year before in the framework of Vladimir Putin's working visit to Uzbekistan to attend the anniversary SCO summit, the Russian president met with Indian Prime Minister Narendra Modi. At this meeting the President of Russia noted in particular, than 'India is our privileged strategic partner. Relations between our countries are built on long-standing traditions of friendship. This is fully reflected in our close and effective cooperation in economic and international affairs.

I am sincerely glad that in the course of the SCO summit today, India signed a memorandum of obligations as a step toward its status as a member of this organization. I am sure that the membership will happen in the very near future and that next year we will work with India within the framework of the SCO as a full member of this organization. This will give us an opportunity to work even more closely with our Indian friends now also within the SCO.

This year India has taken over the BRICS presidency. We are counting very much on your leadership in the organization and hope that India's presidency will also help strengthen this widely recognized international organization, whose influence is steadily growing'.

Indian Prime Minister Narendra Modi in turn said then: 'I would like to thank you for your constructive support of India's membership in the Nuclear Suppliers Group. Today, we launched the process of India's acquiring full SCO membership. I know that you have played a highly constructive role and I thank you for this. All of this goes to show what it means for India to have a true friend. I thank you from the bottom of my heart'.

Also last year there was the event a very important for business relations of the two countries – inauguration ceremony of Unit 1 of Kudankulam Nuclear Power Plant. The ceremony took place in videoconference format, and Vladimir Putin took part in the inauguration from the Kremlin (Moscow), Narendra Modi was in India on the inauguration ceremony.

Prime Minister of India Narendra Modi said: 'Today is indeed a special day. Today, Excellency Putin and I have the honour to dedicate Kudankulam Nuclear Power Plant Unit 1. I am particularly grateful to President Putin for

'Russian-Indian ties have always been based on friendship and mutual respect. The two countries have a long track record of fruitful bilateral cooperation in all areas, and coordinating efforts in resolving important matters on the regional and global agendas.'
Vladimir Putin

his presence at this event. And I am delighted that Jayalalithaa ji, Chief Minister of Tamil Nadu, is also present with us on this occasion.

Friends, in dedicating Kudankulam 1, we mark another historic step in India-Russia relations. Its successful completion is not just another fine example of the strength of our special and privileged strategic partnership. It is also a celebration of our abiding friendship. And it is only a start of our collaboration in this field.

It is perhaps not commonly known that at 1,000 megawatt, Kudankulam 1 is the largest single unit of electrical power in India. In years ahead, we are determined to pursue an ambitious agenda of nuclear power generation. At Kudankulam alone, five more units of 1,000 megawatt each are planned. In our journey of cooperation, we plan to build a series of bigger nuclear power plants.

Friends, today's event is also a joyful occasion for the team of Indian and Russian engineers, scientists and technicians. We salute their dedication and hard work and congratulate them for the fruits of their labour.

Friends, the story of human development has been of wide spread technological advancement and growing economic prosperity.

But, as we all know, it has not been without burden on our environment. I have a vision for India where achievements of our economic development are respectful to mother earth, and where the engines of our industrial growth are increasingly driven by clean energy. Kudankulam 1 is an important addition to India's continuing efforts to scale up production of clean energy in India. It also signals our joint commitment to build pathways of partnership for green growth.

Excellency President Putin, the success of our joint efforts in nuclear power generation is a proud achievement of our cooperation. It demonstrates our common resolve to grown and build on new dimensions of our ties.

Above all, it showcases your personal commitment, consistent support and strong leadership in transforming the substance and character of our relationship. For this I am grateful to you, Mr President.

The people of India associate naturally and with great ease with the people of your great country. And personally, I have always deeply valued our friendship. It is, therefore, only fitting that today we join together to dedicate the Kudankulam Nuclear Power Plant unit one to the strength and vigour of our friendship and cooperation. Long live Indo-Russian friendship!'

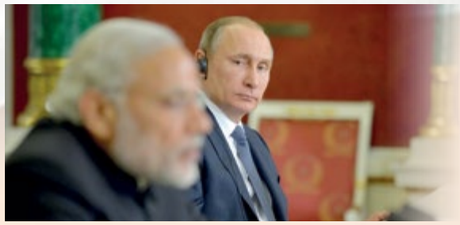
Vladimir Putin said: 'This is a big event for our Indian partner, for the Russian company that carried out this project, and for all of us. The power plant was built using the most advanced world technology, Russian technology, and was built by Russian and Indian specialists working together.

Cooperation in nuclear energy is an important part of the privileged strategic partnership between our countries. Our work together in this sector has great importance for our countries' development. This is not just about building a nuclear power plant and putting it into operation, but is a large-scale project to develop a new high-tech nuclear sector in India. This work involves transfer of skills and training of personnel and specialists in this area.

Russia is well known as a leader on the international market for nuclear technology and services. The nuclear power plants built by Russian specialists are reliable and meet the very highest safety standards. We are sharing with our Indian colleagues our experience and developments in this priority high-tech sector.

Unit one is starting work at its nominal capacity and a second unit will also come on line in the not so distant future, and this will substantially boost India's energy supply and bolster its economic position. Peaceful nuclear energy development will be essential for a vast, powerful and rapidly growing country like India to resolve its social and economic tasks.

Together with our Indian friends we have big plans in this sector. Work began on the power plant's third and fourth units in February this year. We plan to sign a general framework agreement and loan protocol for the construction of the third stage of the project by the end of this year. I would like to remind you that this project is being carried out using funds provided by the Russian Federation. Of the total project financing, 85 percent is in the form of a state loan provided by Russia'.



'India is our privileged strategic partner. Relations between our countries are built on long-standing traditions of friendship. This is fully reflected in our close and effective cooperation in economic and international affairs.'

Vladimir Putin

In relations between the two countries is always important stability. Russia and India demonstrates this stability of friendly relations for many years. Any difficulties cannot stop our friendship and our business ties. At one of a bilateral meetings Vladimir Putin stressed:

'As we all know, unfortunately, there has been a certain slump in our trade and economic cooperation. This is primarily due to external factors, of course: fluctuations in demand and supply, currency volatility. Therefore, our main task here is to use every opportunity to diversify Russian-Indian relations and to actively promote projects in such areas as high technologies, aviation and machine building, medicine and the diamond industry.

This is further promoted through regular contacts between Russia's Chamber of Commerce and Industry and the Federation of Indian Chambers of Commerce and Industry, between the Russian Union of Industrialists and Entrepreneurs and the Confederation of Indian Industry. I would like to note that leading Russian companies have gained a strong foothold on the Indian market and are actively involved in upgrading the Indian production base and developing its infrastructure. Among them are Rosatom, Gazprom, Russian Railways, Silovyie Mashiny, Lukoil, Sistema, Rosneft and Renova.' /IA&TG/

FRIENDS FORMAT RIC

Russia–India–China meeting in Buenos Aires

In December on the sidelines of the G20 summit, Vladimir Putin took part in the Russia–India–China (RIC) meeting with Prime Minister of India Narendra Modi and President of China Xi Jinping.

During that summit President of Russia Vladimir Putin said: 'First, I would like to express my gratitude to our Indian and Chinese partners for supporting the initiative of a trilateral meeting. I would like to note that Russia, India and China are bound by a centuries-long history of friendly relations, which we are building on the principles of neighbourliness, equality and mutual respect.

The last time when the RIC leaders held talks was 12 years ago, in 2006 in St Petersburg. They were indeed productive, with one of the results being the establishment of BRICS. At a meeting in the Russia-India-China format. Foreign Minister Sergei Lavrov, left.

Since then, our foreign ministers have held regular consultations. We have maintained links between our security councils, youth and academic communities. We believe that RIC has great prospects and cooperation within this trilateral format may efficiently complement the cooperation between our countries on a bilateral basis and within BRICS.

We proposed organising this meeting today because the situation in the world and the processes in our common region, Eurasia, require closer coordination of the three countries' approaches. Mainly, with respect to ensuring security and building constructive inter-state relations, considering an extensive contribution of our three countries to the global development, which is around 30 percent of the world's GDP at purchasing power parity.

It is important to adjust cooperation on the key issues of the economic agenda, including within the G20, to jointly protect the principles of just and honest competition in world trade and finance, and to assist in shaping the most open system of international economic relations that would be free of protectionism and politically motivated restrictions.

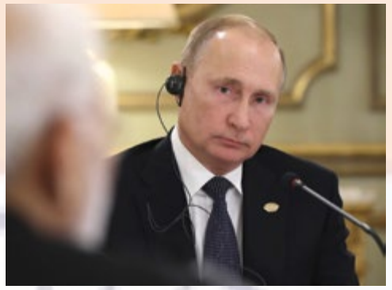
We could also get more actively involved in aligning large integration projects currently carried out with our countries' involvement such as the Eurasian Economic Union and China's Belt and Road initiative. New prospects arise for strengthening contacts between the ten ASEAN states and the Shanghai Cooperation Organisation.'

Friends, I expect that this meeting will be productive and we can further establish a regular schedule for such meetings. Specifically, they could happen on the sidelines of major summits and international events. Of course, it is important to continue trilateral coordination at other levels, and, when necessary, create additional mechanisms of cooperation.'

Prime Minister of India Narendra Modi said: 'I am glad to have this opportunity to have an informal top-level meeting here in Buenos Aires. It is the first summit in this format since the RIC summit in 2006 in St Petersburg.

I want to thank President Putin for initiating this informal meeting at the top level, which gives us an opportunity to freely and openly discuss some key matters that cause concern on the global level.

Your Excellencies, without a doubt, the world today is going through a period of serious change, instability and growing geopolitical tensions. There is serious pressure being exerted on the global leadership.



Multilateral relations and the world order based on common rules are being increasingly rejected by various unilateral, transnational and local groups, and different nations around the world. We can see this happening as sanctions are imposed outside the UN mandate and protectionist policies are gaining strength.

The Doha Development Agenda within the WTO has failed. Since the Paris Agreement, we have not seen the expected level of financial commitment on behalf of the developed countries in favour of the developing states. Therefore, when it comes to climate, justice is currently at risk. We are still very far from achieving the goals of sustainable development.

Certain weak economies are still vulnerable to natural disasters. In this international context, key powers like India, Russia and China bear a particularly big responsibility.

Our three countries account for one-third of the global population. We must support the politics of multilateral relations, work towards creating a multilateral world order for this purpose, as well as ensure compliance with international law.

In the RIC format, we must work on four aspects: regional and global stability, economic prosperity, exchange of experience in areas of mutual interest, and cooperation in response to new and recurring challenges as well as existing challenges.

I agree with President Putin. Whenever we meet on the sidelines of international events, we must find an opportunity to hold such top-level RIC meetings. I believe that currently there is a growing need for us three to meet and cooperate more frequently. We must play a special role at the global arena as well as seek ways to drive our countries' development forward. I would like to thank President Putin once again for restoring and giving a new lease of life to this format.

President of China Xi Jinping said: 'It is a great pleasure for me to be here with President Putin and Prime Minister Modi for an informal RIC meeting. I would like to thank Russia for organising this event.

China, Russia and India are three big countries that are making a serious contribution to global development. We are partners in global development, strategic partners. We have common interests and similar development goals.

We also bear a special responsibility for the future of the region and the world in general. Right now the world is facing new risks and challenges. Therefore, common development and close cooperation between our three countries in this context is becoming increasingly important for global stability and predictability.

In the past ten years, our three countries have been involved in an active dialogue and cooperation in the spirit of openness, solidarity, mutual understanding and trust.

We succeeded in achieving serious progress in this area. I hope that this meeting will also result in thorough talks with Prime Minister Modi and President Putin on RIC cooperation in the new environment, in order to improve our consensus, cooperation and coordination so that together we can promote peace in the whole world, stability and development.'

/IAATG/

RUSSIA AT THE AERO INDIA 2019

Rosoboronexport presents best and newest aerospace innovations

Rosoboronexport, part of the Rostec State Corporation, is the organizer of Russia's exhibit display at the AERO INDIA 2019. Russian aerospace enterprises are developing and producing unique means and solutions for any aviation and space tasks. A large positive experience of mutually beneficial cooperation between Russia and India in this field is a good foundation for the further development of relations, including within the framework of a large-scale state program Make in India. At the airshow in Bangalore, Rosoboronexport presents traditional aerospace products of Russian enterprises, as well as the latest developments and results of promising design work.

Aero India Exhibition which is organised every two years has already carved a niche for itself globally as a premier aerospace exhibition, with eleven successful editions organised since 1996. More then 60,000 business visitors and 1,00,000 general visitors attended Aero India 2017. Air Show of latest aircrafts of different countries are arranged at the venue during each day of the show for the benefit of visitors.

Aero India 2019 will provide a significant platform in bolstering business opportunities in International aviation sector. A rapidly growing economy and opening up of defence production to private sector, have given a major fillip to the defence industry in India. It has also become a hub for defence businesses in Asia.

Rosoboronexport is ready to showcase to indian and other foreign customers the most advanced aerospace and defence products. The exhibits include military aircraft, helikopters, service small arms, weapons and special technical means, specialty equipment, special-purpose weapons and gear, non-lethal weapons, border and critical facility surveillance equipment, law enforcement gear. At the exhibition in Bangalore there are a lot of Russian novelties, among which it is necessary to first of all name part of the global presentation of the AK200 series legendary Kalashnikov assault rifles manufactured by the Kalashnikov Concern.

'Export permits for the newest Kalashnikov AK200 series assault rifles have been obtained. From now on, Rosoboronexport may offer its partners the AK200, AK203, AK204 and AK205 versions, which will make their international debut at IDEX

Dear friends!

On behalf of Rosoboronexport, I welcome and congratulate you on the opening of the AERO INDIA 2019 International Aerospace Exhibition.

Rosoboronexport traditionally participates in the air show and sees it as an essential part of its marketing activities. The first edition of AERO INDIA was held in 1996 in Bangalore and over the years it has become one of the largest international exhibitions of Air Force weapons and military equipment and civil aviation, rocket and space industry, as well as air defense assets.

Aero India is being held by India, Russia's strategic partner, with which we have long-standing mutually beneficial relations. Big steps towards each other were taken last year. Rosoboronexport signed the biggest-ever contract in the history of military-technical cooperation between our countries. I am confident that the positive trend will continue in the future, and the exhibition in Bangalore in 2019 will open up new horizons of cooperation.

Air Force and Air Defense weapons and military equipment account for a significant percentage of Russian products of interest to India. We are well aware of how Indian partners see the development of their armed forces in these areas and we try to meet their needs and wishes in our proposals as much as possible.

Rosoboronexport offers India unique projects that fully comply with the Make in India concept. We are helping our partners and are ready to help further upgrade existing weapons and military equipment, supply the latest models from Russia, as well as develop and manufacture high-tech products in India together.

With its size and popularity in the world, AERO INDIA has provided us with a real window into the industrially developed Asia-Pacific region. On the margins of the exhibition, we have the opportunity to present the best Russian military products and I am sure that they will not be ignored.

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.

2019 and at AERO INDIA 2019,' said Rosoboronexport Director General Alexander Mikheev. 'In Abu Dhabi, Rosoboronexport will hold presentations of these rifles in the course of negotiations with foreign customers on the supply of small arms. We expect strong demand for them in the Middle East and around the world.'

The Kalashnikov AK200 series assault rifles are in line with all current trends in small arms development, while retaining the best qualities of the AK-47, the legendary brainchild of the great Russian gunsmith Mikhail Kalashnikov, whose 100th anniversary of the birth will be marked in 2019.

'Currently, AK200 series assault rifles are supplied to government customers in Russia and are also ready to be exported abroad to partners who impose more stringent requirements on small arms. The Kalashnikov AK200 series rifles are our strategic product in the export area. In the framework of exhibitions, we have scheduled a series of negotiations where, among other things, we will discuss the new AK series,' commented Vladimir Dmitriev, Director General of Kalashnikov Concern.

'At IDEX 2019 and AERO INDIA, Russia will showcase cutting-edge weapons and military equipment for countries in the Middle East region, which is of particular interest to Russian industry. The AK200 series assault rifles will be a key novelty that visitors to exhibitions will see. The newest Russian Kalashnikov rifles have a considerable export potential,' said Sergey Abramov, Industrial Director of the Armament Cluster at Rostec.

The AK200 series rifles have retained all the advantages of the traditional AK pattern: reliability, durability and ease of maintenance. The rifle is equipped with integral Picatinny rail and can be fitted with necessary detachable equipment for the effective use of the weapon in various conditions, including in reduced visibility.

The length-adjustable buttplate and a number of ergonomic solutions for optimizing controls enable the users to fully realize their shooting skills, regardless of their anthropometric indicators and the availability of a variety of personal clothing, gear and equipment. The AK200 series has successfully passed the testing program, meets all the requirements for modern small arms and is an effective small arms system.

It should be noted that military-technical cooperation between

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.

Russia and India is developing very successfully. There are visits, meetings at different levels, exchange of delegations, visits to enterprises and so on ... For example on April last year Mr. Apurva Chandra, Director General for Acquisition of the Ministry of Defence of the Republic of India, was in his working visit to the Russian Federation in order to get familiarized with the production facilities of the Russian defence industry enterprises and to conduct negotiations on promising projects of the military and technical cooperation between the two countries.

After the visit to the National Centre of Helicopter Building in the Moscow Region (part of the 'Helicopters of Russia'), where the Indian partners saw a dynamic flight demonstration of the Ka-226T helicopter, Mr. Chandra was received at the Baltic Shipbuilding Plant 'Yantar' in the city of Kaliningrad (part of the USC).

'Of course, the key Russian-Indian project, which we discussed here in Kaliningrad, was the continuation of building of 11356 project frigates for the Indian Naval Forces. We were pleased to visit the manufacturing workshops and see the ready hulls of the future ships, right on the place we got familiarized with the technologies, used at the plant. I would like to note that the Russian party continuously applies all the efforts to strictly fulfill its obligations,' underscored Mr. Apurva Chandra.

'We are happy to receive here in the Russian land such a representative delegation of the Indian Ministry of Defence and to demonstrate today to our partners the unique capabilities of the Russian shipbuilding enterprises on creation of naval equipment, including the well-known frigates of project 11356. A busy program of Mr. Chadra's visit speaks about the highest interest of the Indian party in the progressive development of the current and promising Russian-Indian projects in the military and technical area in general,' said Rosoboronexport's Director General Alexander Mikheev.

'Multipurpose frigates of project 11356 are reliable combat ships, which have been known to the Indian sailors for nearly twenty years. The armament of these ships also includes the 'BrahMos' missiles, jointly developed by the two countries. The Baltic Shipbuilding Plant is ready to actively participate in the further development of the Russian-Indian technological partnership, including the 'Make-in-India' Program by providing building of the frigates of this project in one of the Indian shipyards. Currently we are expecting the appropriate decision of our Indian colleagues. The specialists of the plant are ready to go to India to perform this important mission at short notice,' noted Eduard Yefimov, Director General of the 'Yantar' Plant.

During visit to Russia, Mr. Apurva Chandra attended the site of North-Western Regional Centre (NWRC) of the Almaz – Antey Corp., located in Saint Petersburg. NWRC of the Almaz – Antey Corp. is a unique defence and industry innovation technological park uniting six leading regional enterprises of the Corporation within the single territory: 'GOZ Obukhovskiy Zavod' JSC, 'ZRTO' JSC, 'KBSM' JSC, 'RIRV' JSC, 'VNIIRA' JSC, 'Zavod Navigator' JSC.

'Only a few countries nowadays have know-how and technical capabilities required for development and production of all the most up-to-date air defence systems and complexes. Russia is a leader in this field. The scientific research, production and laboratory testing base in Saint Petersburg offers further confirmation of it. I am glad to be able to visit your centre and get acquainted with its production line, equipment and test chambers. For the Indian Armed Forces, which has operated the Russian air defence facilities for half a century, it is important that the Indian sky is protected with the most

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.

up-to-date and reliable systems in the world,' – Apurva Chandra stated.

'Russia is ready to supply widest range of armament and military equipment for the air defence forces of India, including anti-aircraft missile weapon systems and electronic warfare systems, equipment connected with them, defence systems for the most important objects and large administrative centres, as well as many other items. And the Russian defence complexes against aircraft and missiles have been successfully tested in real conditions of large-scale warfare, proving themselves to be efficient weapons for confident undertaking of the most challenging operations,' – stressed Alexander Mikheev, Director General of Rosoboronexport.

'Air defence systems are the most elaborate articles, involving dozens of our enterprises in production. They use their exceptional, virtually monopoly competences, – Deputy Director General of Almaz – Antey Corp., Director of the North-Western Regional Centre Mikhail Podvyaznikov clarified the point. – We are proud to constitute inseparable part of the Russian-Indian military-technical cooperation and will participate in its continuous development as widely as possible'.

The Indian delegation during its visit was given acquaintance with serial production of Russian military equipment created on the NWRC premises. Besides, specialists of the enterprise demonstrated for the guests several variants of equipment tests in various climatic and environmental conditions in the modern test operations centre.

Also India's delegation visited Ulyanovsk-based Aviastar-SP, constituting a part of the United Aircraft Corporation's Transport Aviation Division. Russian specialists made a detailed presentation of Russia's state-of-the-art IL-76MD-90A and IL-78MK-90A aircraft.

The rather high interest of foreign specialists in the IL-76/78 family is attributed to its versatility, providing deployment in various roles to include fire-fighting, tanker, transport, flying hospital, airborne CP, and AWACS. The aircraft is suitable for regional airlift of troops, military equipment, and cargo, as well as their air dropping. The IL-76/78 can be deployed from unpaved runways, something to consider since not all military transports in the world can boast such capability. Being consistent with ICAO's noise and emission requirements, Russia's advanced Ilyushins also service international commercial lines.

Specialists tend to call the platform a 'Universal Soldier', capable of performing tasks in the most complex climatic and weather conditions anywhere in the world. Besides, its deep modernization encompassing deployment of new avionics makes its operation far easier, while replacement of the original D-30KP2 engines with modern PS-90A-76s results in better performance and cost effectiveness. Another point in favor of the new power plant is that it will run well even at +40 without trading off the take-off weight.

'Indian pilots have first-hand experience in flying Ilyushins catering to operational and tactical needs of their military. This explains our meticulous assessment of Russia's modern military transports and tankers, as well as AWACS aircraft based on the platform,' explains Mr. Apurva Chandra.

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

Last year Rosoboronexport marked its 18th anniversary.

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

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

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

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

Rosoboronexport pays great attention to both major billion dollars contracts and small deals. The company seeks to operate flexibly and efficiently by using modern and advanced marketing and customer settlement methods. The special exporter cooperates with more than 700 Russian defense-industrial enterprises and organizations,

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.

which enables it to offer partner countries the comprehensive and cost-effective solutions for strengthening their defense capability and national security.

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

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

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&TG/

THE OMNI-PURPOSE TARGET TRAINING COMPLEX ‘ADJUTANT‘

ADJUTANT OF HIS EXCELLENCY

Victory in the modern combat situation is achieved through combination of the following components: use of hi-tech weapon models, consistently high level of professional knowledge and practical skills of the specialists operating these weapons, and precision and operational flexibility of decision-making in the multi-tiered command system.

The proportion of state-of-the-art weapons is growing year over year, in line with the Russian Government's current armament update program aimed at providing the Armed Forces with the most recent models of weaponry and defense equipment. The new weapons are more technologically sophisticated, have extended circle of applications and improved time of response to emerging threats. To keep up, the combat crews operating the weaponry models need to acquire deep knowledge at the stage of familiarization with their functions and rules of their combat application, and to maintain the achieved high level of practical training.

'Train hard, fight easy,' wrote Aleksandr Vasilyevich Suvorov, the great Russian military commander. In practical terms, this old saying is still valid. It is especially relevant, when it comes to the modern situation with the troops' combat preparation, where, along with the training of each individual crew, it is increasingly important to organize the comprehensive multi-tier system for troops management.

Therefore, to achieve maximum practical competence of military units engaged in drill and combat missions, the training conditions must very closely approximate the real battle situation. In particular, for preparation of an air defense crew, it is necessary first to bring the practical skills of each crew member to full automatism using simulators, and second, to design and offer sophisticated (combination) target layouts for training and combat with comprehensive use of various types of targets, providing their maximum resemblance to the existing and future air assault weapons of a potential enemy.

Currently, the target fleet mostly consists of target missiles Saman-M and Strela-10M, with a small amount of Pensne target missiles and remaining Soviet targets Peniye, Kaban, and Strizh. These are all expendable, unreliable, and maneuver-restricted remakes of anti-aircraft guided missiles for obsolete air defense missile systems. Apart from poor reliability of the targets, there are substantial issues related to retrofit and maintenance of the target systems (launch units) whose current working lifespan exceeds 30-35 years.

In the coming years, the number of targets remade from old missiles will be naturally going down. With emergence of new models of short-, medium and long-range air defense systems in military service, the demand for state-of-the-art reusable targets will be annually growing. Another important consideration is that testing of the AM&SE models, primarily of the most recent and future-oriented types, requires not simply airborne targets, but the targets which could very convincingly simulate modern air assault weapons, especially smart weapons (SW). These targets should have high maneuverability and flight speed, minimum radar cross section (RCS), the capability to form sophisticated target groups, etc.

In 2015, the administration of Izhevsk Electromechanical Plant Kupol, JSC, with the approval from Almaz – Antey Air and Space Defence Corporation, JSC, analyzed the above-mentioned considerations and made a decision to carry out a proactive research and development project aimed at creation of an omni-purpose target training complex (OTTC) capable of generating a sophisticated target layout using various simulators of state-of-the-art air assault weapons for a wide spectrum of existing and future-oriented air-defense systems. The product was indexed 9Ф6021 (9F6021), while the project was codenamed Adjutant, which fully reflects the purpose of this system as the main 'aide de camp' for commanders of all ranks in the matters of drilling and training the combat crews, running all types of tests for batch and prototype air-defense systems, and carrying out actual firing with sophisticated target layouts.

'From the first days of the project, the OTTC structural design was discussed with the specialists of the

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'From the first days of the project, the OTTC structural design was discussed with the specialists of the Ministry of Defence of the Russian Federation responsible for education and combat training of air defense artillery units. This discussion resulted in an original concept of the system which had to comply with most of the wide range of requirements to modern training and simulation facilities and helped avoid loss of time and effort in the period of design of the OTTC component parts. The design documentation was promptly prepared, and the pilot samples of airborne targets and the whole system were manufactured'.

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'For today, the OTTC 9F6021 comprises a mobile ground control station with operator workstations, three types of airborne targets, outside-mounted air situation display systems, communication systems, and the life sustenance means for the personnel. A logistics module has been developed for accommodation and transportation of equipment for launch, maintenance and refueling of the targets. All airborne targets are reusable. The launch is performed using a mechanical thrower without powder boosters or compressed air, and the touchdown is parachuted.

The first type of airborne targets was developed on the basis of a classical layout airplane type UFV with a thrust propeller and is mainly intended for the initial training of the crews of air defense systems. These targets can only reach a maximum speed of 120 kph but have considerable duration of flight – more than four hours. The target can be equipped with a pair of remote activation tracers.

The second target type is also made on the basis of an airplane type UFV, but comprises a turbojet engine ensuring a higher speed of up to 100 m/s.

The third target type is intended for imitation of cruise missiles and gliding smart bombs at speeds up to 150-200 m/s. The target was updated, equipped with a turbojet engine, and is now capable of effecting all types of combat spatial maneuvers characteristic of UFV and cruise missiles, including preprogrammed automatic mode.

The fourth type is represented by airborne targets imitating helicopter type UFVs. The target is intended for dynamic and functional simulation of a combat helicopter, including hovering and 'bouncing', at distances up to 10 km away from the launch site.

Presently the preliminary tests of the OTTC prototype are successfully completed. The official tests of the system are scheduled for the end of the current year. Based on the results, the decision will be made concerning the time to launch the batch production and supply the Armed Forces of the Russian Federation with the first samples of this unique product that can substantially improve the training quality for the crews of state-of-the-art air defense systems.' /IA&TG/

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RUSSIAN AIRCRAFT AT THE AERO INDIA 2019

Full line up of UAC's proposals in civil and military segments

India has been and remains one of Russia's key partners in the field of international aerospace cooperation. The main participant of aviation projects from the Russian side is the United Aircraft Corporation (UAC), which is the major Russian aircraft manufacturers and one of the biggest in the world. As part of the development of a multi-faceted and mutually beneficial partnership with India and countries of the Asia-Pacific region, UAC participates in the Aero India 2019 – Exhibition and show. UAC's exposition covers an area of 266 sq. meters in hall C and presents a full line up of Russian Corporation's products. The visitors can see Yak-130, Yak-152, Su-30 SM, MC-21, T-50, Su-35, MiG-35, Il-114MP, Il-78MK-90A, Il-112V, Be-200, SSJ-100 and other aircraft models. It should be noted that according to experts, it is Russian aircraft which in terms of life-cycle cost appear today as the most attractive in international markets.

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

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

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

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

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

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

UAC continues to implement a large-scale program to create a new family of MC-21 passenger aircraft. With all the scope of this project, work on it is proceeding as planned and progressively. For example, at the end of last year Irkut Corporation (a UAC member) completed construction of the third MC-21-300, intended for flight tests. The aircraft was transferred from the final assembly shop to the flight test unit of Irkutsk aviation plant.

Testing results of the first MC-21-300 aircraft passing certification tests were taken into account in the production of the new aircraft. The components and units of the fourth flight test aircraft are being assembled at the Irkutsk Aviation Plant.

Currently, two MC-21-300 aircraft are taking part in flight certification tests at the airfield of Flight Test Institute named after M.M. Gromov.

The aircraft for static testing is tested in Central Aerohydrodynamic Institute (TsAGI). In December, the MC-21-300 aircraft fuselage was delivered here, which, after assembling the airframe, will join endurance tests.

President of UAC and Irkut Corporation Yuri Slusar said: 'In 2018 flight and ground certification tests of aircraft prototype confirmed the main design solutions. UAC enterprises have begun to manufacture parts and units of MC-21-300 aircraft intended for customer's delivery. Joining to the flight tests of new aircraft and production intensification of mass-produced airplanes are the main tasks of 2019.'

'We can confidently say that 2018 turned out to be productive for the aircraft industry. Construction of the new aircraft and certification tests of the first aircraft confirm that the MC-21 program is developing steadily. As part of the program, a deep modernization of aircraft manufacturing enterprises was carried out, new high-tech companies were created, an environment for development of promising civil aviation projects was formed,' – mentioned Denis Manturov, Minister of Industry and Trade of the Russian Federation.

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

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

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

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

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

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

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

In recent years rather good results have been shown by civil segment for which UAC has been making big plans. Among Russian civil aircraft the Superjet 100 regional aircraft of a new generation is the most popular at foreign markets. The aircraft combines new aircraft engineering technologies, passenger convenience, significant economic advantages for airlines, proper environmental specifications.

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

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

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

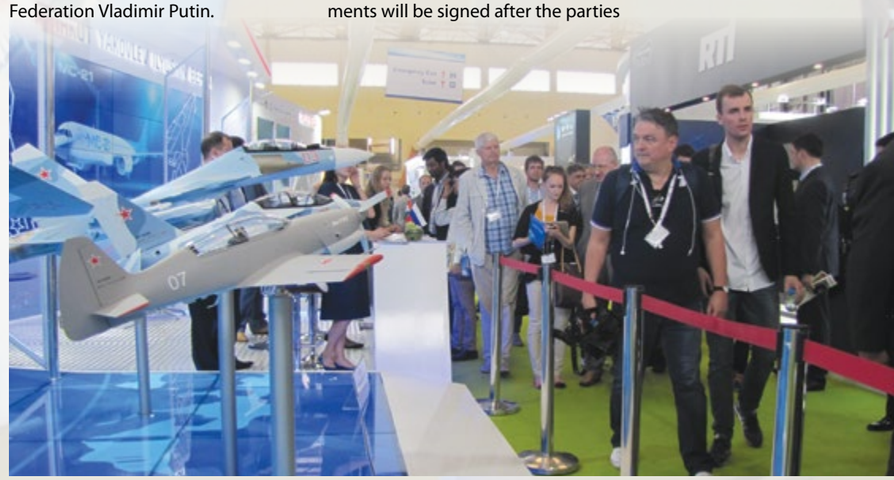
Currently with available manufacturing capacities UAC enterprises are capable of producing up to sixty Superjet 100 per year. The Russian aircraft sparkles profound interest in Southeast Asia and Latin America. Experts confirm that in the context of 70-100-seaters this aircraft is becoming the most attractive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

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

Under the agreement UAC will deliver 100 SSJ100 aircraft to Aeroflot between 2019 and 2026. The aircraft will be configured with 12 seats in business class and 75 seats in economy class. The final contract documents will be signed after the parties

DEVELOPMENT STRATEGY

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



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agree on material terms of the transaction and obtain necessary corporate approvals.

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

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

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

As one more example of the UAC market activity we can say that Sukhoi Civil Aircraft Company (part of UAC) and ADRIA Airways signed a Letter of Intent (LOI) for 15 SSJ100. Minister of industry and trade of the Russian Federation Denis Manturov said about it: 'The delivery is to be started at the beginning of 2019. They will be handed over under a long-term lease arrangement. In addition, both Parties signed Memorandum of Understanding upon establishing an SSJ100 Maintenance and Repair Organization (MRO) at Ljubljana Airport (Slovenia).'

The Sukhoi Civil Aircraft Company President Alexander Rubtsov, the CEO of ADRIA Airways Holger Kowarsch and AA Aviation's Managing Director Dr. Martin Vorderwulbecke indicated that the agreements signed opened a new chapter towards a strategic relationship between the Parties:

'It is our pleasure to partner with JSC 'Sukhoi Civil Aircraft Company'. They will totally support ADRIA Airways´ development strategy. During the past two years we were analyzing the SSJ100 type and came to the conclusion that all the technical and operational characteristics of this aircraft would suit best for our strategic goals' – said Holger Kowarsch. He also added that SSJ100 operation would allow to offer more of the current CRJ and Airbus aircraft for ACMI service.

Alexander Rubtsov stated: 'We realize that the SSJ100 after-sales support at the entry to the European market should be organized profoundly and professionally. Together with the ADRIA Airways we will create a joint maintenance and repair organization for SSJ100 at the Ljubljana Airport. That service platform will secure the operational reliability of SSJ100 aircraft in Europe'.

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

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

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

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

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

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

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

d) achieving a balanced lifecycle stage product mix.

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

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

Russian Corporation intends to seriously compete for the expansion of its share in the global market for civil aviation products. Last autumn UAC presented its annual Market Outlook for the next 20 years. The market outlook is based on UAC proprietary methodology and mathematical models and demonstrates the views of the Corporation on the development of air transportation and the demand for new commercial aircraft.

According to the forecast, UAC estimates the total demand for new passenger aircraft with more than 30 seats in 2018-2037 to exceed 43.6 thousand aircraft worth over US$6 trillion in 2018 catalogue prices. The market outlook is a comprehensive marketing analysis devoted to the civil aircraft segment of the world's aviation that analyses the tendencies and trends in the development of commercial air transportation in the world's regions and the whole world. Most attention is devoted to the passenger transportation segment as the most capacious both in terms of value and delivery numbers. This segment is also very important to UAC as, according to the Corporation's long-term development strategy, UAC's revenue from sales of commercial aircraft should reach 45% from total sales, outgrowing other revenue segments.

UAC President Yury Slyusar noted: 'The innovative development of the industrial model, increasing production rates of narrow- and wide- body aircraft are paving the way to new market segmentation approaches. The changing competition conditions are leading to further fleets optimization, adjustment of air transportation models, and the demand for new civil aircraft in general'.

According to the outlook, the annual passenger turnover rates during 2018-2037 will grow by 4.6% per year. Narrow body aircraft with 110 and more seats will be the most demanded by the airlines, capturing 68% of the whole market in quantity and 56% by value. The total demand for wide body aircraft will amount to almost 8 thousand aircraft, which is by value 40% of the total market in 2018 prices. Demand for new jet aircraft with 30-110 seats will amount to about 4 thousand aircraft – with only 3.1% of the total market value. The demand for turboprop aircraft will is estimated at 2.2 thousand aircraft. /IA&TG/

BEST TECHNOLOGIES

BENCHMARK HEAVY FIGHTER

New customers for Su-30MKI/SM family of warplanes

The Sukhoi Su-30MKI/SM family of fighter jets represents the world's most popular heavy combat aircraft in this class. The Armenian Defence Ministry in early February 2019 confirmed its intention to buy four Su-30SMs from Russia. Ministerial Press Secretary Artsrun Hovhannisyan pointed out that his country was 'for the first time purchasing advanced fighters, which should bolster the national armed forces' defensive and offensive capability'.

Armenia is the third member state of the Collective Security Treaty Organisation (CSTO) to have selected the Su-30SM for its air force. Russia, itself a CSTO member, supplies the most advances types of military equipment to its closest allies.

Kazakhstan was the first foreign customer for the Su-30SM, choosing the fighter as its only advanced warplane in operation. Deliveries began in 2015 and continued until 2018. The Kazakhstan Air Defence Force currently operates 12 of the type. A contract signed in 2018 calls for more Su-30SM deliveries to that country. As reported earlier, Kazakhstan's Defence Ministry is planning to purchase a total of up to 36 such airframes.

The Belarusian Defence Ministry expects to take delivery of its first Su-30SM batch in 2019 under a 2017 contract for 12 of the type.

The largest Su-30SM customer is the Russian Defence Ministry, which will continue to procure more such warplanes. No exact figures are being disclosed, but independent experts estimate that the Russian Aerospace Forces and naval aviation operate a combined total of over 110 Su-30SM fighters. This is the most ubiquitous advanced fighter in service with the Russian Defence Ministry. According to Maj-Gen Igor Kozhin, commander of the Russian Navy's naval aviation, deliveries of the type will continue under the programme to renovate the service's fleet.

Russia has, over the past several years, showcased the aircraft's Su-30ME export version at international exhibitions. Senior representatives of the Russian state arms exporter Rosoboronexport have announced intergovernmental agreements to supply such warplanes to Myanmar.

India remains the largest Su-30MKI/SM manufacturer and operator, with some 200 airframes licence-built to date by Hidustan Aeronautics Ltd (HAL) Corporation. HAL's current plans call for building a total of 222 Su-30MKI fighters.

The Su-30MKI/SM programme also includes overhaul and modernisation efforts.

India has achieved the greatest progress to date in terms of overhaul operations. Under the Make in India initiative, all MRO services on the type are provided by national enterprises with support from Russia's Irkut Corporation. In the future, these facilities could provide MRO on other countries' fighters.

India has also made impressive progress with expanding the inventory of precision munitions for its Su-30MKI fighters. This particularly concerns the BrahMos heavy supersonic standoff missile intended against sea-surface and land hard targets.

The first results of the programme to upgrade Russian Air Force Su-30SM warplanes were announced on the eve of Aero India Show 2019. While visiting the Irkutsk production facility in late January, Defence Minister Sergei Shoigu familiarised himself with fighters featuring expanded combat capability. According to reports, the modernisation package extends the warplane's detection and identification range for aerial targets and introduces new precision munitions against aerial, land and sea targets, with effective ranges of several hundred kilometres.

Experts believe Russia and India could achieve a synergy effect by working in concert to maintain and upgrade Su-30MKI/SM family fighters. /IA&TG/

YAK-130

Market Leader in the New Generation Combat Trainer Aircraft

The Russian Yak-130 aircraft confidently leads the market of the new generation combat trainer aircraft. The leadership was strengthened in January 2019 when Laos entered four Yak-130 aircraft into service. This event has drastically improved the combat capability of Lao Air Force that previously had no jet aircraft with sufficient fighting characteristics.

Presently Yak-130 aircraft are operated by Armed Forces of six countries. The Russian Aerospace Forces have received about 110 Yak-130 aircraft for both basic and advanced training of future military pilots. During the January visit of the Minister of Defence of the Russian Federation Sergey K. Shoygu to Irkut Corporation plant, it was announced that Yak-130 purchases would be continued.

Yak-130 is especially popular in the South-Eastern Asia. Apart from Laos, it has been adopted by Bangladesh and Myanmar. Earlier, the aircraft has been purchased by Algeria and Belarus.

The total number of ordered Yak-130 exceeded 160. The Italian M346 aircraft, designed on the basis of demonstrator Yak-130D, is being supplied to four countries that placed an order of 68 units. Korean trainer and combat-trainer T-50 family aircraft were chosen by five states (public sources mention a total order of 146 units). Meanwhile, T-50 is a supersonic aircraft with considerably higher life cycle costs.

Why Yak-130 is so highly demanded? First of all, it is the state-of-the art design philosophy of the aircraft. Subsonic flight and performance characteristics of Yak-130 are similar to those of the newest 4+ and 5 generation super-maneuverable fighters. Training aircraft of the previous generation had no such capabilities due to the low thrust-to-weight ratio and restrictions on the angle of attack.

The excellent flight performance of the Yak-130 were confirmed by 9 world records set by the aircraft in the C-1f class (serial land-based turbojet with a take-off weight from 6,000 to 9,000 kg). At heights of 6,000 m and 9,000 m, the Yak-130, without cargo, climbed, in 102 and 164 seconds respectively, breaking records set by the US strategic reconnaissance aircraft U-2C. While flying to a climb rate, the Yak-130 updated the record for lifting cargo to an altitude of 2,000 m, which was installed on a supersonic MiG-21 fighter.

The revolutionary innovation of Yak-130 is the possibility to change settings of the digital fly-by-wire system in order to simulate various classes of combat aircraft.

A number of customers highly appreciate Yak-130 for its great operational autonomy and possibility of basing on paved and unpaved airfields. Air intakes with shields closing at take-off and landing prevent foreign objects from entering the engine. The aircraft is equipped with an autonomous on-board oxygen generation system that eliminates the need for the expensive airfield infrastructure.

Notably, Yak-130 is a component of an integrated training system that includes classrooms, flight and specialized simulators, and flight data recording system. In the future, the system will include a new Yak-152 piston-engined aircraft for primary training that is now undergoing its flight tests.

The integrated training system produced by a single manufacturer, which allows to train a combat pilot from scratch, is a unique offer on the market. It allows to train highly skilled pilots in shorter time and at a lower cost.

The Yak-130 trump card, which predetermined his market success, is a high combat capability. Yak-130 combat trainer can use various types weapons. It can carry up to 3,000 kg payload. The weaponry set includes R-73E short-range missiles, KAB-500KR smart bombs with TV guidance system and a wide range of unguided weaponry. Thereby Yak-130 can fight various targets and be used for practicing combat application which is sufficiently cheaper than use a fighter aircraft. Furthermore, Irkut Corporation proactively works for increase Yak-130 combat capabilities. /IA&TG/

MC-21: betting on technical superiority

New jetliner from Irkut Corporation undergoes testing

Certification of the innovative passenger airplane MC-21-300 is to be completed in 2020, stated Yury Slyusar, President of the United Aircraft Corporation (UAC) and Irkut Corporation. Irkut acts as the prime contractor in the MC-21 Program. The plane is being developed by the Engineering Center located in Moscow. MC-21 is manufactured at the factory in Irkutsk, which also produces Su-30 family fighters and Yak-130 combat-capable trainer aircraft.

The MC-21-300 next-generation narrowbody jet shall win type certificate in 2020, says Yury Slyusar, President of the United Aircraft Corporation (UAC), who also heads Irkut Corporation, a member in UAC.

Irkut acts as the prime contractor for the MC-21 program. The Corporation's Engineering Center in Moscow is responsible for the design of the airplane, while the type's production line is set up at the factory in Irkutsk, which also makes the Sukhoi Su-30 family fighters and Yakovelev Yak-130 combat trainers.

The MC-21 manufacturer is well known in India. It supplied the Indian Air Force with an initial batch of the Su-30MKI fighters and assisted the Hindustan Aeronautics Limited (HAL) in mastering production of that type under license. In frame of the long-term Su-30MKI program, Irkut provides assistance to local maintainers in carrying out overhaul on Indian air force aircraft.

Today, certification trials involve two MC-21-300 operable prototypes, while a third, completed in the late 2018, is about to join in. The flight test program shall ultimately involve four aircraft.

Besides, two more MC-21-300 airframes have been built for ground testing at the Central Aerohydrodynamic Institute named after N.E. Zhukovsky (TsAGI). One of those has been under static tests since 2017. The other is being prepared for fatigue trials.

During flight trials, the operable prototypes climbed up to altitude of 12,500 m and accelerated to the speed corresponding to Mach number M=0.85. So far, the maximum duration of a test sortie has been 6.2 hours. The prototype aircraft successfully accomplished flight tests at high angles of attack, demonstrating safe recovery from 'stall' regimes.

Successful completion of flight tests and various trials on the ground in a volume required by the aviation authorities made it possible for the manufacturer to commence production of parts and assemblies for deliverable airplanes.

First shipments to customers are planned for 2020. The sales campaign passed a major milestone in 2018, when a contract with Aeroflot was signed. According to it, the national flag carrier and the leader of the Russian air transportation system shall receive fifty MC-21-300s by 2026. Initially, deliverable airplanes will come with a cabin configured for 16 business-class and 153 economy-class passengers. A high density layout also available for the MC-21-300 has a seating capacity of 211.

Airlines of various business models shall benefit from the MC-21 entering the air transportation market. The airplane offers the largest cross section among all contemporary narrow body jets and, therefore, makes it possible to better meet the specific requirements of airline customers. For instance, low-cost carriers (LCCs) will appreciate a cabin layout with a wide central aisle between the seat rows that can substantially reduce time for embarkation and disembarkation of passengers. Irkut hopes that the specious cabin and high comfort of the MC-21 will help airline customers win hearts and minds of the traveling public.

Low fuel consumption insured by a modern power plant of either U.S. or Russian origin is another MC-21's winning point. Customers can choose between the PW1400G-JM or PD-14, both being contemporary turbofans designed for highest fuel efficiency. For that same purpose, the MC-21 comes with a high aspect wing made of composite materials, the most advanced one for the given class of aircraft.

Simultaneously with flight testing and streamlining MC-21 serial production, the Russian aviation industry is striving to set up an aftersales support system to ensure seamless operation of modern jetliner types. Yury Borisov, deputy chairman of the Russian government, has said that this system shall commence functioning upon the MC-21-300 entry into service. Mindful of the MC-21 export potential, Irkut is looking for foreign partners to support aircraft operations in their region of the world.

Superb performance, specious high-comfort cabin, sales promotion measures (coming with special conditions for early customers) and a comprehensive customer care system make it possible for the MC-21 to capture a sizeable portion of the global market for medium range passenger jetliners. Plans call for a production run between nine and ten hundred MC-21s in the course of the next twenty years.

/IA&TG/

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&TG/**

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.

INTERNATIONAL AEROSPACE, MILITARY, NAVY AND TECHNOLOGY GUIDES IN 2019

In 2019

ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
'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)
'RA&MG' №06 (37)	May 12th	**IMDEX ASIA 2019** (14-16.05.2019, Singapore)
'RA&MG' №07 (38)	May 14th	**SITDEF 2019** (16-19.05.2019, Peru, Lima)
'RA&MG' №08 (39)	June 16th	**Paris Air Show 2019 Le Bourget** (17-23.06.2019, France, Paris)
'RA&MG' №09 (40)	June 24th	**ARMY 2019** (25-30.06.2019, Russia, Moscow)
'RA&MG' №10 (41)	June 25th	**IMDS-2019** (10-14.07.2019, Russia, Saint Petersburg)
'RA&MG' №11 (42)	August 27th	**MAKS-2019** (27.08-01.09.2019, Russia, Moscow)
'RA&MG' №12 (43)	September 16th	**AVIATION EXPO CHINA 2019** (18-20.09.2019, China, Beijing)
'RA&MG' №13 (44)	October 01th	**INMEX SMM India 2019** (03-05.10.2019, India, Mumbai)
'RA&MG' №14 (45)	October 13th	**SEOUL ADEX 2019** (15-20.10.2019, Korea, Seoul)
'RA&MG' №15 (46)	October 28th	**BIDEC 2019** (28-30.10.2019, Bahrain, Manama)
'RA&MG' №16 (47)	November 02th	**Defense & Security 2019** (04-07.11.2019, Thailand, Bangkok)
'RA&MG' №17 (48)	November 16th	**Dubai Airshow 2019** (17-21.11.2019, UAE, Dubai)
'RA&MG' №18 (49)	December 08th	**Gulf Defense & Aerospace 2019** (10-12.12.2019, Kuwait, Al Kuwait)

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ДЕНЬ ПЕРВЫЙ
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Главный форум
Инновационный союз ОПК России и Вооруженных сил РФ
«С 22 по 27 августа Министерство обороны Российской Федерации проводит Международный военно-технический форум «АРМИЯ-2017». Это третье по счету масштабное мероприятие, в котором примут участие крупные отечественные и зарубежные предприятия оборонно-промышленного комплекса, ведущие конструкторские бюро и научно-исследовательские институты.
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