

RUSSIAN AVIATION & MILITARY GUIDE

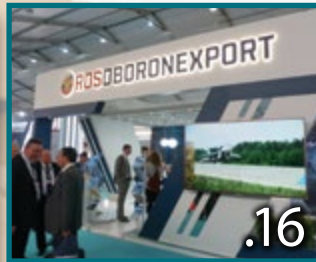
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EDITORIAL



The best offers for Egypt and Africa

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. Egypt's first tri-service defence exhibition EDEX-2018 presents in Cairo the best Russian weapons and 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 EDEX-2018 Russia continues the policy of open partnership with the Egypt and Africa's states. Russia has a wide product line that meets all the needs of this continent and ready propose the best technology and the best price offers.

Valeriy Stolnikov

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.

NEW AIRPORT IN MOSCOW

The Zhukovsky International Airport is ready to provide its infrastructure for the Vietnamese air carriers. Expansion of air connections between Russia and Vietnam will promote the development of the trade and economic relations between the two states. The Zhukovsky airport is ready to provide its capacities to Vietnam's air carriers. The airport can accept all types of aircraft without any takeoff weight restrictions. The main 5.4 km airstrip of the airfield is the longest one not only in Russia, but also in Europe and is the third longest in the world. This enables the airport to accept all types of aircraft without any takeoff weight restrictions. In 2017, Vietnam recorded a notable growth in the tourist flow from Russia: 570 thousand Russian citizens enjoyed their vacations in Vietnamese resorts last year – this is 32% more as compared to 2016. From January through March 2018, the Russian tourist flow to Vietnam increased by 15.8% versus the same period last year. 'Vietnam is a key air destination for Russian citizens. The passenger flow to Vietnam has been demonstrating a considerable annual growth,' said Rostec CEO Sergey Chemezov. 'Rostec will welcome the Vietnamese airlines as future operators of the airport. We can guarantee world-class services for air carriers and passengers. I firmly believe that expansion of air connections between Russia and Vietnam will promote the development of the trade and economic relations between the two states.'

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 ex-

porter 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 dis-



plays at international defense exhibitions abroad. In this role, the Company stands ready to provide organizational and information support to the Ak Bars Corporation.

'Rosoboronexport is proud to present Ak Bars products at international exhibitions. Navy representatives from the Company's partner countries pay great attention to the Gepard-class frigates, our bestsellers supplied to a number of countries. This year we have added new Ak Bars products to our catalog, namely the Sarsar and Karakurt-E class missile ships, which have generated enormous interest abroad, including through the battle-proven Kalibr cruise missile systems integrated into them,' added Alexander Mikheev.

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 infrastructure 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 part-

ner 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 interna-

tional 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.

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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.

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 enterpris-

es 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.

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 tril-

lion 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 cre-



ation 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.

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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 mar-



ket, 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.

Presentation in Cambodia

Russian Helicopters Holding Company (part of Rostec State Corporation) has presented its Mi-171A2 and Ansat civil helicopters and financial instruments for purchasing Russian helicopters in Phnom Penh (Cambodia) during the South Asian Heli Tour. 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.

Ansat is a twin-engine utility helicopter. The full-scale production of the rotorcraft is underway at Kazan Helicopters. According to its certificate, the helicopter design enables to promptly transform it either into

a cargo or into a passenger configuration enabling transportation of up to 7 persons.

Mi-171A2 is the most advanced model of the Mi-8/17 helicopter type. The aircraft is

powered by VK-2500PS-03 engines with a digital control system and features a more efficient X-shaped tail rotor and a new main rotor with composite blades and improved airfoil.

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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 inter-

ests 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.

Mi-171A2 for Chinese company

China General Aviation Service reaffirmed its intention to procure a batch of Mi-171A2 helicopters manufactured at the Ulan-Ude Aviation Plant (U-UAZ). Russian Helicopters Holding Company (part of Rostec State Corporation) is planning to manufacture six rotorcraft and deliver them to the customer by 2022.

'For the first time, we are ready to start mass production of Mi-171A2 for a foreign customer. I hope that this contract shall enhance the trust of potential operators in our new helicopter. It represents a giant step in the evolution of Mi-8/17 family and embodies advanced technical solutions that improve comfort, safety and flight performance of this rotorcraft. Currently, Mi-171A2 is undergoing the process of certification in China to be finalized next year,' highlighted Andrey Boginskiy, Director General of Russian Helicopters Holding Company.

The Mi-171A2 multi-purpose helicopter is one of the most highly anticipated new products of the Russian rotorcraft industry, the result of a major upgrade of the Mi-8/17 family helicopters. The design of Mi-171A2 has undergone more than 80 modifications. The helicopter is equipped with VK-2500PS-03 engines (a civil version of engines installed on Mi-28 com-

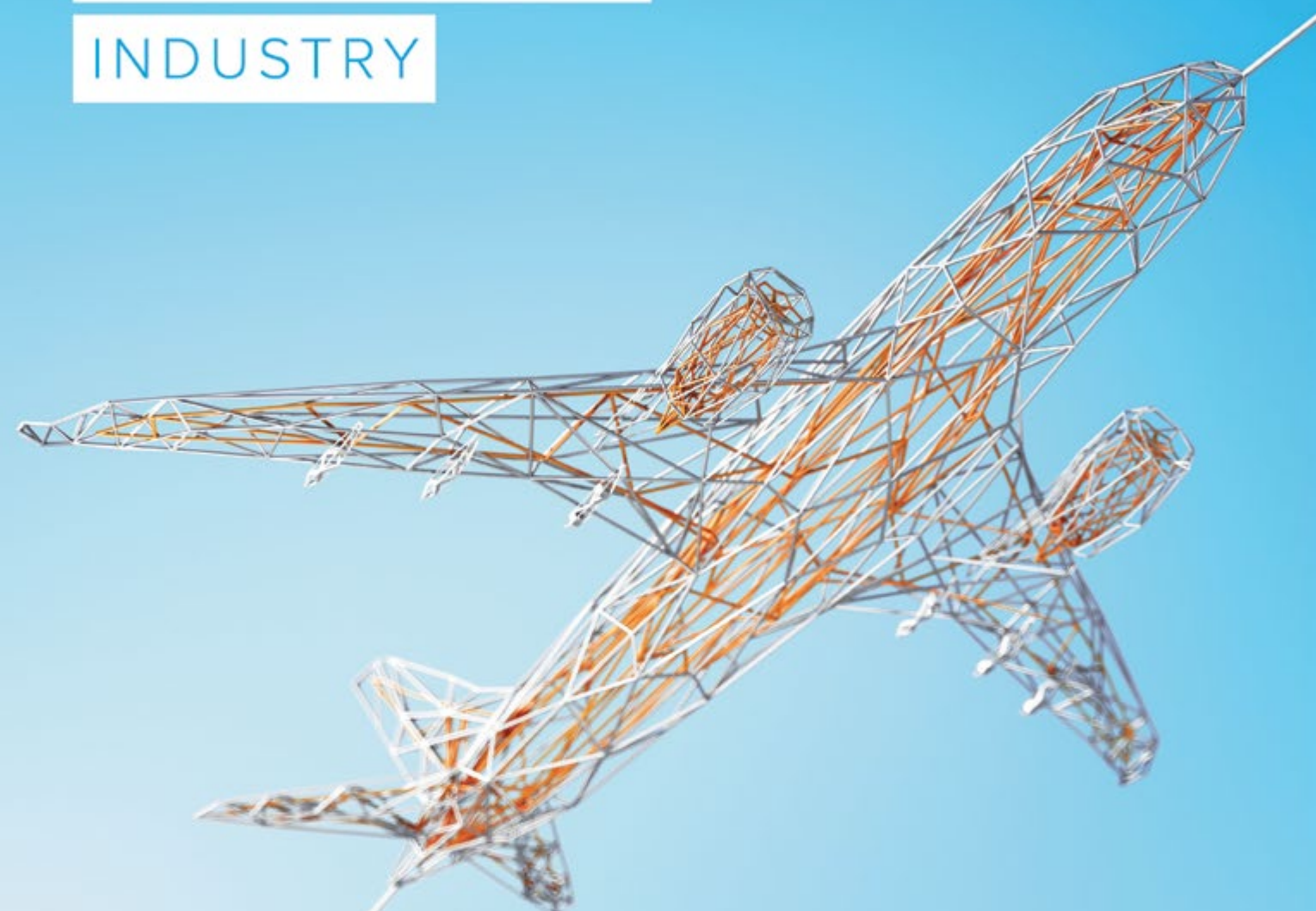


bat helicopters) with a digital control system. One of the main distinguishing features of the Mi-171A2 helicopter compared to Mi-8/17 helicopters is the new rotor system. The helicopter features a more effective X-shaped tail rotor and a new main rotor with all-composite blades of an improved aerodynamic configuration. Therefore, thanks to the aerodynamics alone, the thrust of the Mi-171A2 main rotor has increased by more than 700

kg, which has had a positive impact on the helicopter's flight performance.

In August 2017, the helicopter received a Category A certificate from the Federal Air Transport Agency of the Russian Federation, which means meeting the most stringent requirements to flight safety set for civilian helicopters. In January 2018, Mi-171A2 successfully proved the operation feasibility in severe climatic conditions at an ambient temperature of as low as -50°C.

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ABDEL FATTAH EL-SISI and VLADIMIR PUTIN

Relations between Russia and Egypt are notable for their particular stability and high friendship. Good mutual understanding and respect between the leaders of the two countries are the foundation for the development of cooperation at the present stage. Each meeting between President of Russia Vladimir Putin and President of Egypt Abdel Fattah el-Sisi confirms a confident course for reliable cooperation between the two states in the widest range of areas.

In his message of congratulations to President of the Arab Republic of Egypt Abdel Fattah el-Sisi on his winning the presidential election (March 30, 2018) Vladimir Putin noted the high quality of cooperation between our countries.

The message reads, in part: 'The election outcome has clearly confirmed the high regard the Egyptian public has for you, and the broad support for your course for solving current socioeconomic issues and strengthening stability in the country. Russia values its strategic partnership with Egypt. I hope that together, we will ensure further development of our mutually beneficial bilateral cooperation in all areas, as well as

coordination of our efforts in regional and international affairs and counter-acting global security threats and challenges. This, without doubt, meets the interests of our friendly nations.'

As part of his working visit to Egypt in 2017, Vladimir Putin met with President of the Arab Republic of Egypt Abdel Fattah el-Sisi to discuss the future of Russian-Egyptian relations in the political, trade, economic, energy and cultural spheres. Following the talks, the presidents attended the signing of contracts for the construction of the Dabaa Nuclear Power Plant in Egypt and for the delivery of nuclear fuel to the plant. Vladimir Putin and Abdel Fattah el-Sisi also made statements for the press.

President of the Arab Republic of Egypt Abdel Fattah el-Sisi said: 'Russia has supported Egypt since the 50's and 60's, and continues to support our country to this day. This includes the construction of metallurgical plants and the Aswan Dam. Today, we will sign a contract for the construction of a nuclear power plant. Your visit to Egypt today shows that relations between Egypt and the Russian Federation are very strong. We are interested in building and strengthening this cooperation. Once again, welcome. We also welcome the accompanying members of your delegation. All of Egypt and the Egyptian people welcome you as well.'

President of Russia Vladimir Putin said: 'I am pleased to note that our

'Russia and Egypt have always shown and continue to show interest in the cultural and spiritual heritage of our peoples. Therefore, President el-Sisi and I have approved an initiative to declare 2020 a cross year of humanitarian cooperation. We also considered the full-scale restoration of tourism and comprehensive air service. In April, regular direct flights resumed between Moscow and Cairo.'

Vladimir Putin



economic ties are developing at a fairly fast pace. Indeed, we have many good projects coming up, including the nuclear power plant project, the construction of a technological platform, and agriculture.'

In this year (October 17, 2018) in Sochi Vladimir Putin held talks with President of the Arab Republic of Egypt Abdel Fattah el-Sisi, who is in Russia on an official visit.

Following the consultations, Vladimir Putin and Abdel Fattah el-Sisi signed the Agreement on Comprehensive Partnership and Strategic Cooperation between the Russian Federation and the Arab Republic of Egypt. In addition, the two countries' foreign ministers Sergei Lavrov and Sameh Shoukry signed the Memorandum of Understanding between the Russian

Foreign Ministry and the Egyptian Foreign Ministry on Strategic Political Consultations in the presence of the two presidents.

President of Russia Vladimir Putin said: 'Yesterday evening we had a chance to talk informally and touch base regarding our bilateral relations as well as regional and international political issues. Today we have an opportunity to discuss all these matters with our colleagues as well. At the beginning of our talks I would like to note that relations between our countries are developing very successfully. In August we marked the 75th anniversary of diplomatic ties between Egypt and the Soviet Union, and with Russia as its successor.'

Our economic ties are also developing successfully. Last year we saw

trade upsurge of 62 percent, and a 28 percent rise in the first six months of this year. It is also good to note that we do everything to diversify our ties and we do this successfully: our ties are very diverse and include agriculture, industry, equipment and machines.

We have large projects, such as the construction of a nuclear power plant and a techno park. We have established good cooperation mechanisms, including the two plus two format: our defence ministers and foreign ministers. We are very pleased to welcome our friends in Russia and have an opportunity to discuss the development of bilateral relations and regional problems with you here in Sochi.'

President of Egypt Abdel Fattah el-Sisi said: 'First, let me thank you





'In addition to Egypt-Russia cooperation that is aimed at ensuring a better future for our nations, we are coordinating our activities on important regional issues based on our belief in the paramount importance of restoring security and stability in the Middle East so that the interests of the peoples in that region are met and guarantees of a better future for its youth after a long period of suffering caused by war and destruction are provided.'

Abdel Fattah el-Sisi

for a warm cordial reception and the hospitality that we are feeling here in the Russian Federation, where we are visiting our friends. Certainly, all meetings I had yesterday after my arrival in Russia are a graphic illustration of the positive atmosphere that helps promote our ties in all areas, including in trade and the economy.

Of course, Mr President, as you said, we have very many important issues to discuss, including the construction of a nuclear power plant at El Dabaa, the creation of a Russian industrial zone in Egypt and

other projects, as well as the issue of bringing Russian tourists back to Egypt and resuming direct air flights between Russian and Egyptian cities in addition to the air flights between the capitals of our countries.

We are certainly coordinating our efforts in the fight against terrorism. Our cooperation in all areas is based on relations that we have been maintaining for 75 years now.

In frame of the statements for press following talks with President of Egypt Abdel Fatah el-Sisi President of Russia Vladimir Putin said: 'Talks

with the President of Egypt who is in Russia on an official visit were held in a business-like and constructive atmosphere. I also had an in-depth discussion with the President on a number of issues yesterday, in an informal setting. Today, we discussed bilateral cooperation and reviewed key international and regional issues.

To reiterate, the relations between our states have a rich history, and are friendly and mutually beneficial. They are based on respect and recognition of our respective interests. As you have seen, President el-Sisi and I just signed an Agreement on Comprehensive Partnership and Strategic Cooperation, which outlines major and responsible goals seeking to further deepen Russian-Egyptian ties in different areas.

Of course, we focused a lot on trade and economic issues. In 2017, Russia-Egypt trade grew 62 percent to \$6.7 billion. It rose by another 28 percent in January-August. Russia is a major supplier of grain to Egypt. Our country supports Egypt's desire to conclude a free trade area agreement with the Eurasian Economic Union. We are confident that this will open up additional opportunities for boosting economic cooperation and trade.

The President of Egypt and I discussed in detail bilateral cooperation in the energy sector. The construction of a Russian-designed nuclear power plant in Egypt by Rosatom is a major joint project in this industry. Preparatory work at the site is under-

way. Contracts will be signed with Egyptian companies before the end of the year, and these companies will be the contractors.

Positive cooperation experience has been gained in the production of hydrocarbon resources. Russian oil products and LNG are regularly transported to the Egyptian market. In the context of developing industrial cooperation, I would like, first, to mention a large contract worth 1 billion euros for the delivery to Egypt of new passenger carriages in conjunction with our Hungarian partners.

A modern industrial and logistics centre will be created near the Suez Canal in Egypt, with the participation of Russia, that will include instrument production, a wood processing plant, and pharmaceutical enterprises. We plan to invest about \$7 billion in this area, and create over 35,000 new jobs. As planned, the manufactured output in this area will go not only to the Egyptian, but also the Middle Eastern and African markets.

We have also thoroughly discussed prospects for military-technical cooperation. Military interaction is equally important. Russia and Egypt have been successfully interacting in this area for decades now. Joint tactical airborne troop exercises are being held in Egypt now.

Russia and Egypt have always shown and continue to show interest in the cultural and spiritual heritage of our peoples. Therefore, President el-Sisi and I have approved an initiative to declare 2020 a cross year of humanitarian cooperation.

We also considered the full-scale restoration of tourism and comprehensive air service. In April, regular direct flights resumed between Moscow and Cairo.

We have also discussed charter flights to tourist destinations popular with Russians – to Hurgada and Sharm el-Sheikh. We noted that our Egyptian friends are doing everything necessary to increase the security level. We will work to restore charter flights in the near future.

These talks have confirmed the unanimity and proximity of our positions on important international and regional issues. Our cooperation has always been and remains an effective

security factor in the Middle East and North Africa.

We have informed our colleagues about the steps taken by Russia to resolve the Syria conflict. We compared notes on this issue and agreed to work together. We agreed that the situation in the Idlib Province, where a significant number of militants has accumulated in the de-escalation zone, requires special attention. There is the risk of infiltration into neighbouring states. We informed our Egyptian friends of the underlying concepts of our agreements with Turkey on this problem.

We agreed to continue coordination to intensify the Syrian political

make collective efforts to rebuild Syria's economy and create favourable conditions for the return of the refugees.

Russia and Egypt will continue to jointly search for ways to overcome the internal political split in Libya, to restore its sovereignty and territorial integrity.

Russia and Egypt both support strict observance of the principles of a Palestinian-Israeli settlement as stipulated in the resolutions of the UN Security Council and the Arab Peace Initiative, and the earliest possible restoration of direct dialogue between the parties on all controversial issues, including the status of Jerusalem.



'Of course, we focused a lot on trade and economic issues. In 2017, Russia-Egypt trade grew 62 percent to \$6.7 billion. It rose by another 28 percent in January-August. Russia is a major supplier of grain to Egypt. Our country supports Egypt's desire to conclude a free trade area agreement with the Eurasian Economic Union. We are confident that this will open up additional opportunities for boosting economic cooperation and trade.'

Vladimir Putin

process. Allow me to remind you that Egypt secured the so-called Cairo Platform opposition group participation in the Syrian National Dialogue Congress in Sochi.

The next step is to set up and launch a constitutional committee in Geneva. It is also important to

In 2019, Egypt will chair the African Union. We wish all our Egyptian friends and President el-Sisi success in this high-responsibility mission. We expect that the Egyptian presidency will promote stronger cooperation between Russia and all African states.



In conclusion, I would like to thank Mr President and all our Egyptian friends for these substantive and productive talks. The results achieved today will certainly contribute to further strengthening of our interstate relations.'

President of the Arab Republic of Egypt Abdel Fattah el-Sisi said: 'I would like to once again thank my dear friend President Putin for the warm welcome during this important visit that emphasises the strength of the close historical relations between Egypt and Russia. While being here, let me note that I am pleased with the great successes in Russian-Egyptian relations over the last four years as well as the achievements we made

in all areas, above all the agreement to build the El-Dabaa nuclear power plant. I believe that this project will without a doubt become a breakthrough in the relations between our countries, like the project to create a Russian industrial zone in the eastern city of Port Said. I think this project will bring the cooperation between our countries to the stage of joint production instead of just trade. And I am confident that this project's implementation will make a real breakthrough in the volume and quality of Russia's direct investment in Egypt.

Our joint efforts to promote friendship between our countries have resulted today in the signing of the Agreement on



'While being here, let me note that I am pleased with the great successes in Russian-Egyptian relations over the last four years as well as the achievements we made in all areas, above all the agreement to build the El-Dabaa nuclear power plant. I believe that this project will without a doubt become a breakthrough in the relations between our countries, like the project to create a Russian industrial zone in the eastern city of Port Said. I think this project will bring the cooperation between our countries to the stage of joint production instead of just trade. And I am confident that this project's implementation will make a real breakthrough in the volume and quality of Russia's direct investment in Egypt.'

Abdel Fattah el-Sisi

Comprehensive Partnership and Strategic Cooperation. I believe this Agreement will begin a new chapter in the history of our cooperation and provide us with long-term opportunities and new horizons that will promote our bilateral cooperation and relations to a new level entirely.

I would also like to note that President Putin and I have agreed today to declare 2020 the Russia-Egypt Year of Culture. I hope that this year will see various events that can testify to the depth of the cultural, civilizational and artistic ties between our countries and peoples.

In addition to Egypt-Russia cooperation that is aimed at ensuring a better future for our nations, we are coordinating our activities on important regional issues based on our belief in the paramount importance of restoring security and stability in the Middle East so that the interests of the peoples in that region are met and guarantees of a better future for its youth after a long period of suffering caused by war and destruction are provided.

In this context, President Putin and I discussed today the Palestine issue and stated that the positions of Egypt and Russia on the Palestinian-Israeli peace process have become much closer. We also reaffirmed our unshakable positions regarding the need to achieve a comprehensive and just solution to the Palestine issue based on the two-state solution for two nations within the 1967 bor-

der in pursuance of international resolutions and the Arab Peace Initiative.

We paid special attention to the developments in Syria during the talks. We agreed on the need to continue consultations and coordination between Egypt and Russia on this important issue. We agreed that it is necessary to work to prevent further escalation of the situation in Syria.

In this context, we agreed to call on UN special envoys to Syria to speed up the process of forming a constitutional commission as an important step to create the necessary conditions to resume political talks and reach a comprehensive political solution to meet the legitimate hopes of the brotherly people of Syria and maintain the territorial integrity of the Syrian state.

Regarding the situation in Libya. We discussed the latest events through the political and security prism and exchanged views and assessments on the actions of the various parties involved in the events in Libya. In this context, I shared with President Putin Egypt's vision on a

political solution in Libya, and also Cairo's efforts to unite the Libyan National Army for it to perform effectively.

We have also discussed the aftermath of recent clashes in Tripoli that showed how dangerous and reckless it is to rely on armed groups in order to provide security. We believe that only the regular army as well as security and law enforcement agencies should be given such a task. We have also reaffirmed that all the members of the international community must strictly follow UN Special Envoy in Libya Ghassan Salamé's initiative, such as to avoid other decisions.

We believe that searching for parallel solutions would only prolong the crisis and deepen differences between the Libyan parties. We believe such actions are not based on a consensus. During our talks, President Putin and I agreed it was necessary to improve the information exchange process between our countries' special services as part of counterterrorism efforts, especially regarding terrorists' movements

from unstable regions to other states where they carry out new attacks.

We have also reaffirmed that it is necessary to prevent these terrorists from crossing state borders. We have agreed to exchange information on such people with other countries and international organisations. In this context, I have reaffirmed Egypt's readiness to cooperate with Russia in this area more closely, considering that our countries are partners by tradition and share a perspective on this serious challenge that threatens the stability in the region. I have also provided President Putin with a short review of the results of the Sinai 2018 operation. The success of this operation proves the success of Egypt's efforts in countering terrorism.

Let me once again thank President Putin for this amiable invitation to visit Russia, on my own behalf and on behalf of the Egyptian people. I would like to stress our firm historical and strategic relations, which we hope to further develop in the future in order to fulfil our peoples' wish for stability and development.' /RA&MG/



RUSSIAN DEFENSE INNOVATIONS

Rosoboronexport advances cooperation with Egypt and Africa's states

Rosoboronexport, a member of the Rostec Corporation, is to set up a joint Russian exposition at EDEX-2018 – Egypt's first tri-service defence exhibition under the patronage of His Excellency, president Abdel Fattah El Sisi, the president of Arab Republic of Egypt, the supreme commander of the Egyptian Armed Forces.

With over 1.3 million military personnel, as the largest military power in Africa and one of the leading forces worldwide, Egypt is the ideal setting for a large-scale event for the sector. In addition, Egypt has historically maintained continuous investment in the latest weaponry as a defence strategy and has strengthened national production lines across a range of military complexes.

The Russian military-industrial complex takes the most active

part in the supply of the latest and most effective weapons both to Egypt and to the world market. 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 defence industrial complex and approved to be exported. Rosoboronexport accounts for more than 85% of Russia's arms exports. Rosoboronexport is among the major operators in the world market for arms and military equipment. This

year JSC Rosoboronexport will mark its 18th anniversary.

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

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 cus-

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



Rosoboronexport 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.

tomers every year. Over the period of its operation in the international market, Rosoboronexport has delivered hundreds of thousands of units of military equipment and weapons worth more than US\$ 120 billion to 115 countries.

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cial exporter cooperates with more than 700 Russian defense-industrial enterprises and organizations, which enables it to offer partner countries the comprehensive and cost-effective solutions for strengthening their defense capability and national security.

By concluding export contracts, Rosoboronexport supports the Russian defense industry, which is especially important under difficult conditions in the global market. High-tech products are in increased

demand in the world arms market today and thus the company is interested in developing smart manufacturing in Russia. In addition, Rosoboronexport is actively involved in a number of charitable and sponsorship projects. The company provides assistance to military hospitals, military historical museums, and children's educational institutions. Rosoboronexport supports major sporting events and various



sports federations, acts as sponsor and partner of the largest industrial exhibitions and cultural events held in Russia and abroad.

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

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

/RA&MG/

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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.





BRAHMOS: Ultimate Weapon for Modern Warfare

As the designer, developer and producer of world's best and most sophisticated precision strike missile BRAHMOS, the Indo-Russian JV company BrahMos Aerospace has positioned itself among globally-reckoned missile manufacturer today.

The BRAHMOS supersonic cruise missile, having the finest attributes of speed, precision, operational manoeuvrability, firepower, versatility and flexibility, has validated its deployability across land, sea and air warfare platforms. The powerful weapon's invincible capability to neutralise high-value ground and sea-based enemy targets has been established in over 60 flight tests conducted so far.

Successful induction of the tactical missile in the Indian Armed Forces has greatly transformed India's warfight-



ing capability in the 21st century. With future wars likely to be swift, short and intense, BRAHMOS promises to decisively influence and determine the outcome of such wars.

The highly manoeuvrable BRAHMOS flies at supersonic speed all throughout the flight and carries a powerful warhead of up to 300 kg. The missile's break-neck speed at Mach 2.8 and its lethal firepower coupled with the combined hi-lo trajectory makes it 'indefensible and uninterceptable'. The 3-ton heavy missile straightaway bangs on its target with very high precision without giving any time or scope to the enemy's air defence systems to react.

The Indian Army has raised several BRAHMOS Regiments since 2007. The missile's land-attack configuration developed in Block I, II and III variants for divergent land warfare missions, have been deployed across India's strategic frontier positions.

For naval warfare operations, BRAHMOS has been deployed with

Indian Navy's frontline surface warfare ships since 2005. The missile has displayed its impeccable anti-ship and land strike capability from the warships. It has also proved its flexibility to be deployed in both inclined and vertical launchers from moving or static naval platforms. BRAHMOS has also been successfully test fired in single and salvo mode against a single or multiple targets located in different directions, thus adding an unprecedented fillip to modern maritime warfare tactics.

BrahMos Aerospace has also conducted a successful test firing of the weapon in its underwater configuration in 2013, proving BRAHMOS's suitability for deployment onboard conventional attack submarines.

On 22nd November 2017, the Indo-Russian JV programme achieved a historic milestone and created world record when the advanced BRAHMOS air-launched cruise missile (ALCM) was successfully tested by the Indian Air Force's Sukhoi-30 combat aircraft for the first time against a ship target. The landmark feat made India become the first country in the world to complete supersonic cruise missile triad. Today, BRAHMOS ALCM

leads the race among conventional airborne weapons in terms of range, firepower and lethality.

With several countries across continents strongly expressing their willingness to acquire the formidable supersonic cruise missile for their armed forces, India and Russia – the two partner nations in the BrahMos JV project – have decided to export the world-class weapon to friendly nations.

BrahMos Aerospace will be displaying the world-class BRAHMOS Weapon System in its land, sea, sub-sea and air configurations at the EDEX 2018 exhibition from 3-5 December, 2018.

/RA&MG/





PJSC 'NITEL'

PJSC 'NITEL' – is one of the largest enterprises of the radio – electronic industry in Russia possessing modern technologies – and the only official manufacturer of the most mass Radar P-18-2 of VHF band.



PJSC NITEL serially produces P-18-2 radar of medium and high altitudes that, thanks to its reliability, convenience of operation and a possibility of detection 'Stealth' air objects is operated in dozens of the countries around the world.

PJSC 'NITEL' jointly with PJSC 'NPO 'ALMAZ' TOP 'LEMZ' has carried out deep modernization of P-18-2 radar by now.

The main advantages of the upgraded P-18-2 radar are:

- Performance at the level of modern radar, including the possibility of autocompensation of active noise interference;
- Improved operational characteristics;
- fully solid-state technology, including the transmitter device;
- digital processing of radar data and signals shaping;
- modern operator workstation interface with high resolution monitor;
- documentation of radar data.

PJSC 'NITEL' produces P-18-2 radar and mounting kits for modernization of previously manufactured radars at the Customer's position. When upgrading the radar with mounting kit the useful life of equipment cabin is fully restored and the total resource of the radar comes to not less than 80%. We provide warranty and post-warranty service of P-18-2 radar throughout the life cycle of the product.

www.nitel-oao.ru
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ОПК РФ

СПЕЦИАЛЬНЫЙ ИНФОРМАЦИОННО-АНАЛИТИЧЕСКИЙ ПРОЕКТ

ОБОРОННО-ПРОМЫШЛЕННЫЙ КОМПЛЕКС РФ



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MAIN PHOTO

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 practi-

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 9Φ6021 (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.

cal 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.

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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.



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.'

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 hov-

ering and 'bouncing', at distances up to 10 km away from the launch site.

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/RA&MG/

HIGH-PRECISION WEAPONS

Russian holding makes the best weapons for land forces and airborne troops

Currently a huge fleet of such combat vehicles is in service both with the Russian army, as well as abroad. These vehicles have been produced for several decades and presently their weapon systems do not meet modern requirements. However, their life cycle is quite long and reaches 30-40 years. The light-weight category combat vehicles (IFV, airborne assault vehicles, APC) are able to determine the combat potential of a country's armed forces due to their application versatility. Infantry fighting vehicles (BMP-1, BMP-2, BMP-3) and airborne as-sault vehicles (BMD-3, BMD-4) are the most common hardware of land forces and airborne troops.

Many countries keep on upgrading the main fleet of their combat vehicles. In Russia, a BMP-2 mechanical module was selected as a basis for designing a uniform combat module weighing below 3 tons for upgrading Russian combat vehicles. Russian infantry fighting vehicle BMP-2, being the main combat vehicle of multiple countries' land forces, was adopted for service in 1980 and used to exceed most of its foreign counterparts in terms of combat capabilities. Nowadays BMP-2 still basically meets the modern requirements.

The analysis of current state and development tendencies of weapons and fire control systems shows that BMP-2 weapon system is falling behind the modern level a number of parameters:

- guided weapon firing is possible from stationary position only due to wire command link of 'Konkurs' anti-tank guided missile (ATGM);
- 'Konkurs' ATGM has low penetration capability and is not effective against modern tanks like M1A2 'Abrams';
- 'Konkurs' ATGM has low firing rate due to manual reloading of the launcher. Such reloading requires

long time and besides that the loader may be injured by splinters or small arms fire;

- at night the system may fire only automatic cannon or PKT machine-gun at range not exceeding 800 m;
- the BMP-2 fire control system is not automated, i.e. it is lacking in onboard computer, modern sights, target autotracker, and does not allow for accurate firing, limiting the effective range of 30 mm cannon to 1100-1400 m. when firing on the move the system does not provide for required accuracy of line of sight stabilization due to BPK-2-42 sight rigidly bound to the weapon;

- 30 mm projectiles flat trajectory firing is not efficient against prone or entrenched manpower;

- firing at aerial targets carried out using center rings of 1PZ-3 sight, actually delivers only a psychological effect, since the typical aerial target hit probability is hardly one percent.

The firepower of a combat vehicle is determined by its weapon system, thus, the increase of combat efficiency may be achieved by weapon system modernization. BMP-2 has a high weapon system upgrade potential. The challenge of increasing the firepower of existing BMPs providing their superiority over other modern vehicles has been successfully met by KBP Instrument Design Bureau.

The upgrade was implemented on a serially produced BMP-2 turret with 2A42 automatic cannon (without changing the mechanical module and turret internal layout). The design concept implies the following:

- mounting two 'Kornet-E' ATGM launchers on the turret sides, each launcher equipped with independent electromechanical vertical drive and carrying two ready for fire missiles;
- replacement of standard BPK-2-42 sight with combined gunner's sight equipped with independent LOS stabilization system and incorporating optical, IR and laser range-finding channels, as well as missile guidance channel;
- installation of onboard digital computer with sensors system;
- installation of TV-IR target auto-tracker;
- installation of 30 mm grenade launcher with independent electromechanical vertical laying drive and 300rds feed magazine;
- installation of commander's panoramic sight with independent LOS stabilization system and incorporating optical and laser rangefinding channels;
- installation of high-precision digital weapon stabilizer.

The weight of add-on equipment installed does not exceed 500 kg, including around 260 kg of extra ammunition: 30 mm grenades and ATGM.

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The specifications of upgraded BMP-2 with new B05Ya01 combat module are given in Table:

– due to introduction of day/night FCS the system provides accurate firing with all types of weapons, including guided, at moving and stationary targets, round-the-clock engagement of all types of targets from stationary position, on the move and afloat at the range up to 4000 m with automatic cannon, up to 2100 m with automatic grenade launcher, up to 5500 m with 9M133-1 ATGM. Besides, 9M133M-2 ATGM with tandem shaped-charge warhead and 9M133FM ATGM with HE warhead and 9M133FM-3 ATGM with HE war-



The firepower of a combat vehicle is determined by its weapon system, thus, the increase of combat efficiency may be achieved by weapon system modernization. BMP-2 has a high weapon system upgrade potential. The challenge of in-creasing the firepower of existing BMPs providing their superiority over other modern vehicles has been successfully met by KBP Instrument Design Bureau.

head and proximity fuse, recently designed by KBP, allow firing at range up to 8 km.
– ‘Kornet-E’ ATGM penetration capability, increased up to 1100–1300 mm, allows reliable engagement of modern advanced tanks

fitted with add-on ERA (‘Leclerc’, ‘Abrams’, ‘Leopard’). Besides, HEF warhead of the missile is able to destroy concrete fortifications and strongpoints. Due to stand-off range targets engagement capability the upgraded BMP-2 are sure to prevail

in combat with enemy tanks and IFVs.

The improvements implemented in ‘Kornet’ ATGM (9M133M-2, 9M133FM-3) provide for considerable enhancement of its performance without increasing weight and dimensions. These improvements ensure:

– destruction of modern and advanced tanks taking into account their armour protection growth tendency;

– engagement of any armoured vehicle at stand-off range;
– engagement of low altitude assault and reconnaissance aircrafts (including drones);

• installation on two stabilized launchers of BMP-2 ICV of four ready-to-launch guided missiles significantly increase fire rate when firing ATGMs. This rules out the necessity to reload the guided missile launcher during the combat, which increases the survival potential of the crew and of the entire combat vehicle, since stopping of a CV for ATGM reloading during a combat makes it a perfect target;

• implementation of TV-IR-auto target tracker enables to increase the accuracy of target tracking 3–6 fold in comparison with manual tracking. The human is excluded from aiming circuit, the results of aiming become independent on psycho-physical state of the gunner, which is dramatic in stressful battlefield environment. Accurate target tracking becomes a granted technical specification, which enable to decrease the

requirements towards the gunner training level and reduces the training period of the gunners. Automatic target tracker adds the FCS a qualitatively new feature, putting to life the ‘fire-and-forget’ principle when firing a guided missile. At the same time the missile cost is significantly lower than that of a missile with a seeker which fulfils the function of the auto-tracker;

• the possibility of KORNET ATGM launch in an elevated mode (above bore sighting line) almost excludes the possibility of detecting the missile by the enemy;

• laser guidance mode of the ATGM with orientation of the missile within the laser beam provides for high jamming-immunity against all types of active jamming, since the jammer cannot be behind the ICV and send the same encoded messages;

• to overcome systems of targets’ active protection and to provide for guaranteed engagement of crucial targets salvo launch of 2 ATGMs riding on one laser beam is provided;

• significant increase of automated gun and grenade launcher firing accuracy with all types of ammunition is provided due to the development of original firing algorithm, which most fully takes into consideration all the factors: range to the target (measured by laser rangefinder or input manually) speeds and movement directions of the CV and the target, wind velocity, air pressure and temperature, charge temperature, muzzle velocity deviation from normal value, target elevation, pitch and roll angles, angle of jump. During this automatic generation of firing settings is carried out due to the fact, that ballistic computer is included into the firing circuit.

Effective firing range of a 30-mm projectile increases from 1100–1400 m up to 1800–2000 m.

• air defense firing effectiveness increases significantly: kill probability by automatic gun when firing against ‘helicopter’ and ‘low-flying attacking aircraft’-type target increases dramatically and its value approaches that of specialized gun and missile air defense systems of closed ranges with much lesser expenditure of ammunition. Thus, the principle of



Basic technical and performance characteristics of B05Ya01 CM

Specification	B05Ya01 CM
Armament includes	guided weapon 30-mm 2A42 automatic cannon 30-mm AG-30M automatic grenade launcher 7,62-mm PKTM machine-gun
Guided weapon	9M133-1 (9M133F-1), 9M133M-2(9M133FM-2), 9M133FM-3 KORNET ATGM
Firing range, m	
9M133-1 (9M133F-1)	100–5500
9M133M-2(9M133FM-2)	150–8000
9M133FM-3	150–8000
Maximal firing range at night, m	8000
Guidance system	semi-auto laser beam riding.
Salvo launch of two missiles	available
Armor piercing behind ERA, mm	1000–1300
Ammo load, ATGMs	8 (4 of them on the launcher)
30-mm automatic grenade launcher	AG-30M
Type of ammunition	30-mm VOG-17M grenades, VOG-30, GPD-30
Maximal firing range	2100
Rate of fire rounds/min.	at least 400
Ammo load, rounds	300
Automatic cannon	30-mm 2A42
Type of ammunition	30-mm cartridges with AP and HEIP (HE-T) projectiles
Maximal firing range	4000
Rate of fire rounds/min.	200–300 or 500
Ammo load, rounds	500
Fire control system	automated precision all-weather round the clock with full backup of gunner’s functions by the commander.
Laser rangefinder	available
Automatic target tracker	available
Ballistic computer with sensors	available

'Kornet-E' ATGM penetration capability, increased up to 1100–1300 mm, allows reliable engagement of modern advanced tanks fitted with add-on ERA ('Leclerc', 'Abrams', 'Leopard'). Besides, HEF warhead of the missile is able to destroy concrete fortifications and strongpoints. Due to stand-off range targets engagement capability the upgraded BMP-2 are sure to prevail in combat with enemy tanks and IFVs.

ICV versatility is fulfilled by adding air defense capacities without additional expenditures;

- effective engaging of enemy's personnel at ranges up to 2100, including that behind the accidents of ground and in trenches due to the implementation of low ballistics armaments (AG-30M automatic grenade launcher) with new GPD-30 rounds;

- the opportunities of CV commander increase due to installation of night vision panoramic sight with technical view, implemented on ICVs for the first time. The commander has all-around field of view

in horizon and in vertical plane the field of view is increased up to 60 degrees, maximal angular velocity of the bore sighting line increases from 6 to 20 deg/sec. This allows to increase the stream of targets detected by the CV by 2.5 times, increase TD accuracy for the gunner by 10 times and to fully backup his tasks as well as to carry out engagement of aerial targets in automatic mode. BMP-2 upgrade meets the requirements towards future infantry combat vehicle for the nearest 20–30 years and upgraded BMP-3 ICV can be successfully used till year 2030–2040.

The carried out upgrade features a systematic approach and leads not simply to enhancement of separate technical specifications of the system, but has enabled to create a vehicle with qualitatively new features, which can successfully compete with foreign counterparts on the weapon market.

A modular design principle has been implemented in the combat compartment. Under the conditions of harsh upgrade expenditures limitation the customer can choose the set of equipment on his own either full or partial. B05Ya01 CM (combat module) is also meant for BMP-1 upgrade of (after the chassis is upgraded to up to the level of BMP-2), BMP-3, BMD-3 airborne combat vehicle, BTR-90 APC and has passed the trials on their chassis.

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/RA&MG/

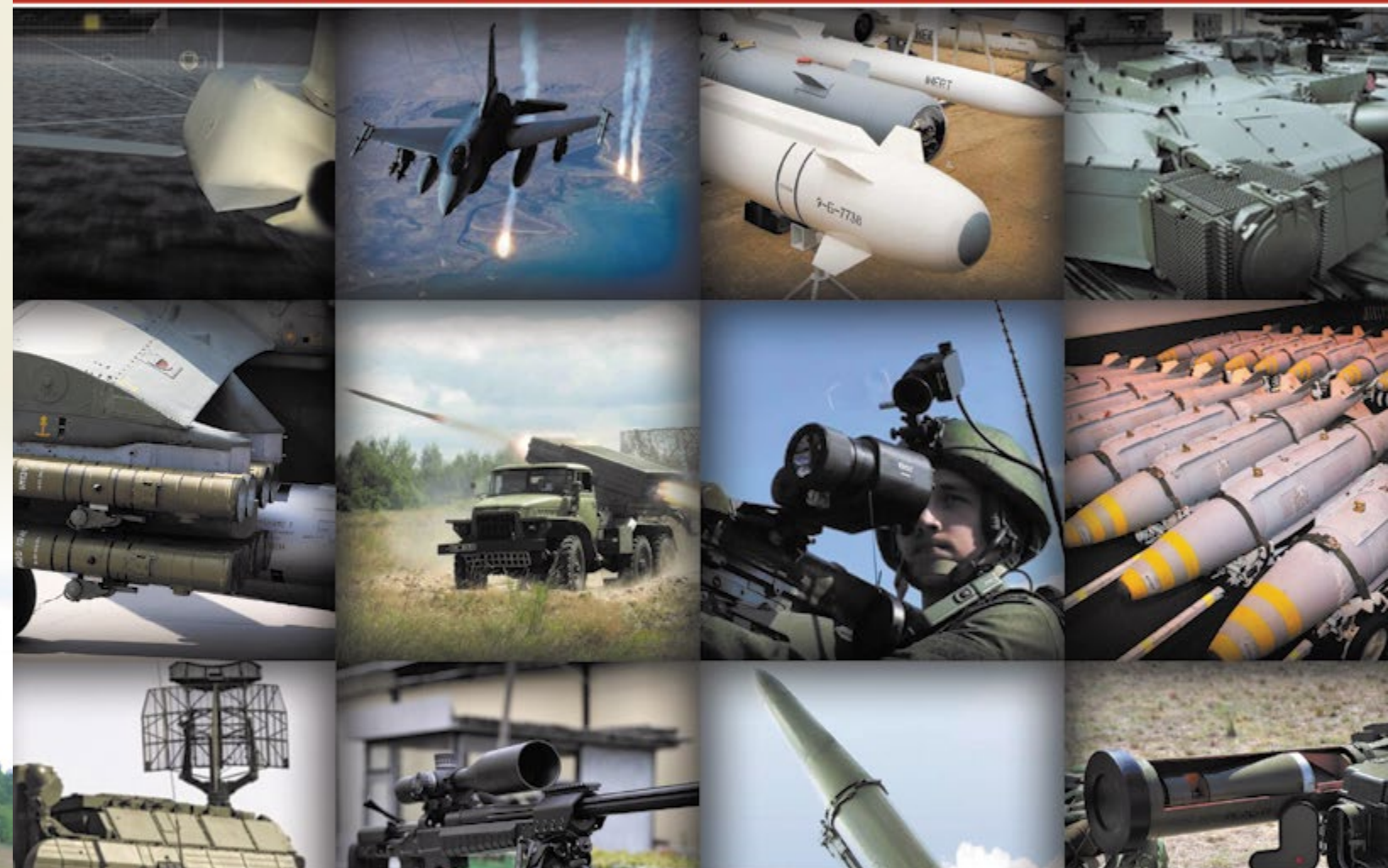


HIGH-PRECISION WEAPONS IN RUSSIA AND IN THE WORLD

ВЫСОКОТОЧНОЕ ОРУЖИЕ в России и в мире

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INDO DEFENCE 2018

Rosoboronexport presented products of seven Russian defense companies

Tatiana Valeeva

INDO DEFENCE 2018 Expo & Forum – The Indonesia's Tri-Service Defence event was held at Jakarta International Expo Kemayoran, Indonesia on November. Hosted by the Ministry of Defence, INDO DEFENCE is recognized as the indispensable place to be, learn, network and do business. Held concurrently with the 5th INDO MARINE 2018 Expo & Forum, the expo was the biggest Indonesian's No.1 Tri-Service Defence Industry Event. For 4 action-packed days, guests and participants had the opportunity to attend the international conference, free technical product presentation, live product demonstration and network with industry experts. Russia presented in Jakarta a sufficiently capacious exposition of its defense solutions for Indonesia and the ASEAN countries as a whole.

Russia and Indonesia are conducting quite active military-technical cooperation on a wide range of weapons and military equipment. It is enough to remember that the Indonesian air force only this year signing a contract

to receive 11 Sukhoi Su-35 fighters from Russia. The air force of this country operates a mixed fleet including Su-27 and Su-30, and the experience that Jakarta had in operating the older Sukhoi designs was touted as one of the reasoning for selecting the Su-35.

The eighth edition of Indo Defence was officially opened by Indonesian vice president Jusuf Kalla, welcoming and inviting domestic and foreign delegations and industry to work together to develop partnerships that will prove fruitful for international defence relations. The deputy premier welcomed Indonesia's partners to the show, which will see 193 official delegations from 33 countries visit Indo Defence.

Official representatives from a number of nations were welcomed to stand by Kalla as the show was opened, namely from Australia, Brazil, Brunei, Czech Republic, Denmark, Fiji, Iran, Russia, Singapore, Thailand, Turkey and Vietnam. In a multi-agency effort, the army, the police and members of parliament are joining forces to represent the show, which has increased in size with the addition of two extra halls at this year's iteration of the exhibition. The show has grown by some 15 per cent this year since 2016, the organisers say, and there is an increase in the number of participants that took part in the show. A total of 867 exhibitors from 60 countries were there, with 30 dedicated pavilions having been set up.

Local and international companies, plus the government, media outlets and academia, are all encouraged worked together during the exhibition, co-operating to

'Arms market in South-East Asia is top on the priority list of Rosoboronexport. Most of the countries in the region are our long-standing partners. They know Russian weapons perfectly well, have trust in them and always keep their eyes open for development of more advanced systems, which we make sure to bring to every exhibition in Indonesia. This year we are going to put on display a number of new but already popular in the world systems catering to the needs of all services: BT-3F armored personnel carrier, IL-78MK-90A tanker aircraft, Pantsir-ME ship-based AD system, Karakurt-E and Sarsar ships, as well as other military equipment.'

Alexander Mikheev

Olga Tyurina,

Project manager at 'IVA Technologies':

'At INDO DEFENCE, our company is representing a few solutions, which, we are sure, will be sought-after on the market of ASEAN countries. Among them is a mobile radio station for underwater communications – 'IVA S/W', which ensures reliable and secure data and voice transmission under water among scuba divers and, most importantly, from under water to the surface.

Expo visitors showed great interest to the video conference system adaptable to the specifics of the local market, which has been represented by us at Indo Defence. In particular, we are already preparing proposals for potential local partners regarding both joint sales of the VCaaS (Video Conferencing as a Service), and personal use within the company.

In Jakarta, we have represented a facial recognition intellectual system equipped with a powerful computational rescue platform, which provides recognition of human faces in the online mode, searching for faces in a group of people, looking for a face in archived video recordings at 20-fold speed. This system is in demand for ensuring safety of the city environment and strategically important facilities.'





**Boris Romanenko,
Head of foreign economic relations department, 'Radiozavod', JSC, Penza:**

'We are participating in INDO DEFENCE expo for the second time. First time we were here in 2014. At INDO DEFENCE-2018 we represented practically all the spectrum of production of our enterprise, which we offer to potential partners at international markets. These are systems and complexes for automated management of armament of the air defense and missile troops and artillery (MT & A). The market of South-East Asia is attractive for us, the production of 'Radiozavod' is just at the start of the road to recognition in this region.

A special attention of potential partners was focused on the new look of the automated air defense system 'Polyana-D4M1' which is the core element of a modern air defense system, as well as a complex of automated management of artillery units – 83t888-1.7, which ensures automation of processes of management by any system of artillery and mortar armament, including foreign-manufactured system. We believe that the work at the expo allowed us to achieve the set goals.

ensure that the most effective technologies and relationships are developed. Over the four days of the show, some 2,500 visitors were, and official delegations from Indonesia are to include the ministry of business and finance, education, foreign relations, research and testing, and communications.

The government claimed that Indo Defence is effectively utilised when it takes place every two years to strengthen product offerings, as well as to bolster the relationships between the Indonesian military and foreign delegations. Indo Defence is now considered the biggest defence show in Asia as a result of this growth, Menurut



Menhan, Indonesia's defence minister says, adding that it is also in the top 10 worldwide.

Rosoboronexport, a member of Rostec, was setting up a joint Russian exposition at Indo Defence 2018. 'Arms market in South-East Asia is top on the priority list of Rosoboronexport. Most of the countries in the region are our long-standing partners. They know Russian weapons perfectly well, have trust in them and always keep their eyes open for development of more advanced systems, which we make sure to bring to every exhibition in Indonesia. This year we are going to put on display a number of new but already popular in the world systems catering to the needs of all services: BT-3F armored personnel carrier, IL-78MK-90A tanker aircraft, Pantsir-ME ship-based AD system, Karakurt-E and Sarsar ships, as well as other military equipment,' says Rosoboronexport's CEO Alexander Mikheev.

Rosoboronexport presented products of seven Russian defense companies, including the United Aircraft Corp., Tecmash, Institute of Applied Physics, and High-Precision Systems. At own Booth Rosoboronexport showed 200-plus pieces of military equipment for all military services.

In the air force sector things look particularly good for the Su-35 multirole super-maneuverable fighter, Yak-130 combat-trainer, MiG-29M/M2 multirole frontline fighter, Be-200



amphibious aircraft, and scores of UAV systems, including the Orion-E recently added to the portfolio of the company. Other platforms facing bright future in the region are the Mi-17 military transport helicopters, Mi-35M attack helicopter with troop-carrying capacity, as well as Mi-28NE and Ka-52 gunships.

Army personnel could see the booth for the T-90MS tanks, BMP-3M and BMP-3F fighting vehicles, BTR-82A and BT-3F personnel carriers, BMPT tank support vehicle, and Kornet-EM and Khirizantema-S AT systems.

There were also equipment suitable for other security agencies contributing to the state security and war on terror and organized crime. Rosoboronexport's display was packed with small arms to include Kalashnikov AK-100 family assault rifles, various machine-guns and close-combat weapons, as well as VPK-233136 Tigr special-purpose vehicle, Ansar light multi-purpose helicopter, and Mi-26T2 heavy transport helicopter.

The location of the South-East Asian nations and numerous sea borders pave the way for soaring demand for naval equipment. Here, Rosoboronexport had a few very special items, some of them com-

bat-proven. Much interest was to go to the Project 11356 guard ship, Project 20382 Tigr small guard ship, Gepard 3.9 frigate equipped with the Club-S integrated missile system, Project 22160 patrol ship, 03160E Raptor patrol craft, and Project 636 submarine.

Navy weapons, as well as defense systems for ships, submarines, and shore-based installations were in high interest. These include the Kalibr-PL (Club-S) and Kalibr-NKE (Club-N) integrated missile systems,

Bastion and Bal-E shore-based systems complete with the Yakhont anti-ship cruise missile and Kh-35E anti-ship missile respectively, as well as underwater weapons, namely UGST torpedoes and bottom mines.

Besides, Rosobornexport was bring Russian AD systems, those which are particularly popular all over the world, South-East Asia included. On the company's bestseller list are the S-400 Triumph and Buk-M2E SAM systems, Pantsir S1 gun and missile AD system, and Verba

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**Denis Kuzmin,
First Deputy Director General – Deputy Director General on Economics & Finance, Shipbuilding & Shiprepair Technology Center6, JSC:**

'At the 8th Tri-Service International Event INDO DEFENCE 2018 'Shipbuilding & Shiprepair Technology Center' (JSC SSTC) presented all its main activities in the area of shipbuilding and ship repair, including designs for shipyard facilities creation and modernization as well as for creation of on-shore infrastructure for ships and vessels stationing-at-base, recent developments in the field of laser and robotic technologies for ship machine-building, designing of vessels, etc.

Abilities of JSC SSTC in establishing and modernization of shipbuilding production facilities aroused the largest interest in the Indonesian market. Taking into account the island location of the state and also rich resources of oil and gas in the shelf sea, the issues of building passenger vessels, ferries and oil tankers are of current importance. The interest in fleet replenishment necessitates creation of new state-of-art production facilities, complex modernization of existing facilities and renovation of metal-processing and assembly-welding equipment and machinery. At present, the issues of expansion and modernization of the existing production facilities are on the agenda of large national and private shipyards and dockyards alike, with representatives of which experts from JSC SSTC had a chance to meet and negotiate during the exhibition. JSC SSTC is highly interested in further development of contacts established during the exhibition.'



Praveen Pathak
General Manager (Mkt. Promotion & Export), BrahMos Aerospace:

'We regularly participate in the INDO DEFENCE expo and are very happy about the efficiency. At the same time, the expo demonstrates a really good growth both in quantitative and qualitative terms. This year at INDO DEFENCE, we have represented various options of the 'BrahMos' missile and the platform with which it is equipped. Represented were ship-based missiles, various options of launching facilities, in which a number of countries of this region are interested in. We are clearly demonstrating that 'BrahMos' can be installed also on ships of virtually any class and configuration – from small-scale to the largest. In Indonesia, we also represented a system for coastal defense using our famous missile, one of the most attractive exhibit at our exposition – Su-30MKI with 'BrahMos'. The aircraft with the missile has already passed a cycle of battle service tests with marine targets; with another cycle to be conducted by the end of the year, after which the weaponization of the Indian Air Forces will start.

Supersonic missile 'BrahMos' offers a great advantage. No other country in the ASEAN region has such systems. And that is the only universal missile which can be deployed both on land, on ships, and on aircraft. This missile is highly attractive in the region, and we are conducting negotiations with a number of countries, and we hope contracts will be signed in the short run. All the more so that this year we succeeded in increasing the service life of 'BrahMos' missiles, and that makes our missile even more compelling.'

In the air force sector things look particularly good for the Su-35 multirole super-maneuverable fighter, Yak-130 combat-trainer, MiG-29M/M2 multirole frontline fighter, Be-200 amphibious aircraft, and scores of UAV systems, including the Orion-E recently added to the portfolio of the company. Other platforms facing bright future in the region are the Mi-17 military transport helicopters, Mi-35M attack helicopter with troop-carrying capacity, as well as Mi-28NE and Ka-52 gunships.



MANPADS. At the INDO DEFENCE 2018 Rosoboronexport had a very rich business program, stipulating meetings with delegations representing most of the countries in the region.

It should be noted that Indonesia is going to actively increase its arms purchases. 'We link to economic growth of about 7 percent ... so by 2019, the national defense budget can increase to around \$20 billion per annum,' Luhut said. Muradi, a defense and military analyst at Padjadjaran University in Bandung, West Java, agreed with the country's plan to set such an impressive target for its defense and security sector, saying that 'our defense sector is already 10 years behind neighbor-

ing countries such as Singapore and Malaysia.'

According to Muradi, Indonesia's defense sector spending – which includes the purchase of primary weaponry defense systems, the cost of security monitoring and also stipends for military personnel – should make up at least 2 percent of the country's GDP to be considered adequate.

This year, Indonesia has allocated Rp 83 trillion (\$6.6 billion), which represents 0.8 percent of the total state

budget, Defense Minister Ryamizard Ryacudu said. 'As of now, I believe there's no other way to modernize our weaponry except for increasing the defense sector budget,' Muradi told. 'We can't let other parties help us with providing weaponry because that way they are likely to dictate to us on how to manage the country's defense and security.'

International relations experts believe Indonesia's move to beef up its security, by setting aside more money for defense in its state budget, is essentially based on its need to improve its defensive capabilities and security systems in order deter any potential aggressors.

'By beefing up security in its territory, Indonesia is sending a warning to other countries that may possibly be planning acts of aggression against it. It shows that they can no longer do whatever they like and think that we wouldn't be able take decisive action against them,' Muradi said. According to Muradi, Indonesia records some 200 violations to its airspace per year. 'For instance, just to challenge the most recent violation by three foreign aircraft, we spent some Rp 150 million, while we only fined them some Rp 60 million,' Muradi said.

'The increase is really needed, not because Indonesia is worried that there would be attacks from other countries, but more due to its inter-

GAZ, Russia's leading manufacturer of commercial vehicles and exporter to more than 40 countries of the world, presented commercial vehicles for civil purposes at the largest regional exhibition in Indonesia. GAZ participated in Indo Defense 2018 together with its local partner, RALIKA. Being not a manufacturer of military vehicles, GAZ took part in the Indo Defense 2018 exhibition with the vehicles for civil purposes, as this exhibition is attended by potential customers from various civil industries.

Leonid Dolgov, GAZ Export Sales Director:

'Indonesia is among the 20 largest economies, and in terms of population it is the 4th largest country in the world. And we see a great potential for our equipment here. Indonesia is a country with left-hand traffic, so at Indo Defense 2018, we exhibit our right-hand drive Sadko NEXT and Ural 6x6 vehicles with impressive off-road characteristics.'



nal interests,' Hikmahanto Juwana, an international relations expert from the University of Indonesia, told the Jakarta Globe. Hikmahanto says that the increase in defense spending is needed: to protect the country from illegal actions by private groups; to be a peace broker in any disputes occurring in the region; and also to boost Indonesia's participation in United Nations peace-keeping efforts.

'Indonesia also requires adequate weapons systems to protect its territory as it has the second-longest coastline in the world, which eventually is in line with Jokowi's agenda to be a Global Maritime Fulcrum,' said Djayadi Hanan, an academic in Paramadina University's department of international relations. /RA&MG/



RUSSIAN WEAPONS at BIAS 2018

Rosoboronexport had set up a joint Russian exposition at Bahrain International Airshow 2018 (BIAS), a fifth iteration of an international exhibition took place at Sakhir AFB in the Kingdom of Bahrain on November.



Rosoboronexport deems Bahrain International Airshow as a perfect opportunity to bring Russia's most advanced systems and equipment to the attention of the Gulf states and let them know their unique features. Lots of the exhibited air force and air defense platforms are either second to none in the world or at least unmatched by their foreign counterparts in key characteristics,' says Director General Alexander Mikheev of Rosoboronexport.

Gulf states are particularly interested in AD systems of various range, aircraft, helicopters and drones. Numbering 250-plus pieces of military equipment, Rosoboronexport's booth had numerous combat proven



systems, which confirmed their characteristics in Syria.

The Su-35 multirole supermaneuverable fighter, MiG-29M/M2 multirole tactical fighter and Yak-130 combat-trainer had everything there was to gather crowds at the event. Rosoboronexport also had on display the IL-78MD-90A tanker plane and IL-76MD-90A(E) transport, both being recent additions to its portfolio.

BIAS's guests and participants were witness outstanding airmanship of the aces of the renowned Russian Knights aerobatic display team demonstrating unsurpassed capabilities of Russian aviation equipment on Su-30SM fighters. Wherever they go, Russian Knights pull standing ovations.

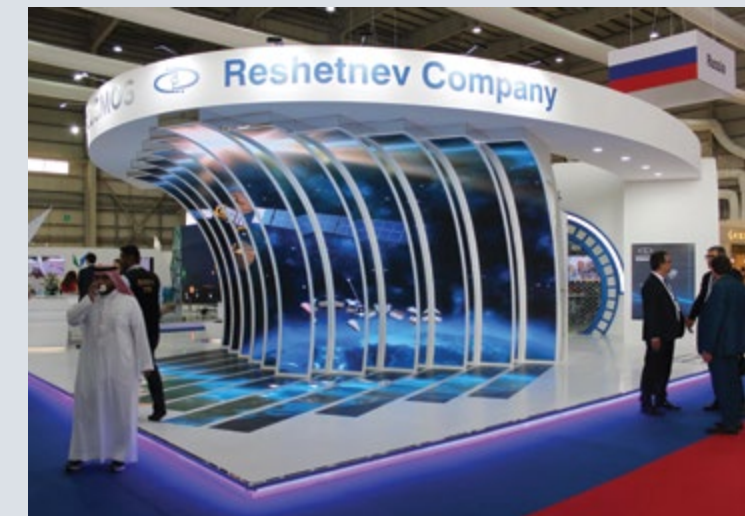
In the RW aircraft segment, the interest of foreign Customers is traditionally piqued by the Mi-28NE attack helicopter, Ka-52 reconnaissance and attack helicopter, Mi-35M gunship with transport carrying capacity, and Ka-226T light multi-purpose helicopter. Other platforms coming to Bahrain's event are the Ansat light multi-purpose and Mi-26T2 heavy transport helicopters, both are very much popular.

For partners the company was make available at its booth information on Russian UAVs to include Takhion and Orlan-10E small short-range drones and Orion-E long endurance reconnaissance platform.

Expectations are also high in the AD sector. Rosoboronexport believes that a rather bright export future faces the S-400 Triumph SAM system, Tor M2E and Buk-M2E SAM systems, Pantsir-S1 gun-missile system, and Verba MANPADS. Besides, the com-

pany made some room in its booth for a variety of EW systems, including the Repellent EW system complete with small drones.

'Lack of stability in the international situation prompts the growth of arms trade worldwide. This has also gone a long way in stoking the Gulf states' interest in getting the most advanced and effective military equipment. Under the circumstances, everything labeled Made in Russia enjoys a keen demand, for Russian equipment has been proven in complex combat and climatic environs at sea, in the air, and on the land. And the trend is on the rise. Recently Rosoboronexport's backlog breached the record \$50 bln barrier. Contributing to the achievement are contracts signed with Arab nations,' notes Alexander Mikheev. **/RA&MG/**





FOR ARMED FORCES AND SPECIAL UNITS



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

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

The exhibition was held in three halls of Pavilion No. 75 and in an open area totaling over 25,000 square meters. Rosoboronexport's exhibit comprised more than 100 models of weapons and military equipment developed and produced by Russian

defense enterprises. At the Company's stand, experts tested skills in shooting the Kalashnikov MMG-AK-101 assault rifle and MP-446 Viking self-loading pistol mockups on the SKAT small arms trainer.

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

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

/RA&MG/



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МЕЖДУНАРОДНЫЕ КОНГРЕССЫ И ВЫСТАВКИ

CONTRACT WITH INDIA FOR S-400

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

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

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

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

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

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

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

Alexander Mikheev

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'RA&MG' №01 (32)	February 12th	IDEX 2019 / NAVDEX 2019 (17-21.02.2019, UAE, Abu Dhabi)
'RA&MG' №02 (33)	February 15th	AERO INDIA 2019 (20-24.02.2019, India, Bangalore)
'RA&MG' №03 (34)	March 24th	LIMA 2019 (26-30.03.2019, Malaysia, Langkawi)
'RA&MG' №04 (35)	April 01th	LAAD 2019 (02-05.04.2019, Brazil, Rio de Janeiro)
'RA&MG' №05 (36)	April 01th	IDEF 2019 (30.04-03.05.2019, Turkey, Istanbul)
'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 (26-30.06.2019, 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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Russian defence technology for Egypt and Africa

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ARMY 2019

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№01. 25 июня 2019 года

ОФИЦИАЛЬНОЕ ЕЖЕДНЕВНОЕ ИЗДАНИЕ ФОРУМА

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-2019». 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.

Основные мероприятия Форума пройдут в Конгрессно-выставочном центре «Патриот». Общая площадь экспозиции в павильонах и на открытых площадках превысит 300 тыс. кв. м. Динамические показы ходовых, летных и огневых возможностей вооружения, военной и специальной техники состоятся на аэродроме Кубинка, полигоне Алабино, а также в военных округах и на Северном флоте.

Научно-деловая программа пройдет в формате пленарных заседаний, конференций, круглых столов и брифингов, что позволит обсудить актуальные вопросы обороны и безопасности, дальнейшие направления совершенствования способов производства продукции военного назначения.

Тысячи посетителей смогут ознакомиться с последними достижениями в области высоких технологий и перспективными разработками, которые реализуются в военной сфере.

Сегодня форум по праву можно считать одним из самых ярких и масштабных мероприятий в области военно-технического сотрудничества России и зарубежных партнеров.



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