

INTERNATIONAL AEROSPACE & TECHNOLOGY GUIDE

Special analytical export project of the United Industrial Publishing

№ 01 (69), February 2023

FSMTC OF RUSSIA

The Russian-Indian military-technical cooperation



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BY UAC BREND

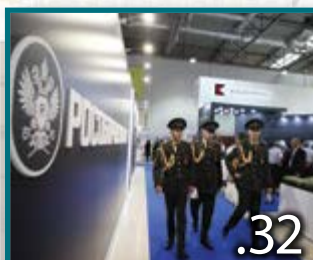
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Registered in the Federal Service for
Supervision of Communications, Information
Technology and Mass Media (Roscomnadzor)
09.12.2015 PI № FS77-63977



The magazine ‘Russian Aviation & Military
Guide’, made by the United Industrial
Publishing, is a winner of National prize
‘Golden Idea 2016’ FSMTC of Russia

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*There are materials from the information
agencies and from the press services
of the federal authorities of the Russian
Federation used in the project.*

Edition is 3 thousand copies

Editorial office:
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The materials marked with published on a commercial basis

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EDITORIAL



The best offers for sky, space and land

It has already become obvious and undeniable that security is becoming increasingly important among 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 issues) 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.

In times like these the market of defense is undoubtedly growing. However, the dependence on the sellers of weapons and defense systems increases along with the defense technologies growth. It becomes extremely important to get products that would not fail you in a complicated situation.

AERO INDIA 2023 presents in Bangalore the best Russian aerospace innovations for global market, which are the undisputed world leaders on price and quality in their segments.

The Indian exhibition shows that the aero quality and capabilities are what really matter and the amount of plane is not as significant, because quality and capabilities of every single one of them are exactly what leads to victory in the sky, in the space 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 India and all countries, which ready for mutual work.

Taking part in AERO INDIA 2023 Russia continues the policy of open partnership with the India and other states. Russia has a wide aerospace product line that meets all the needs of this continent and ready to propose the best technology and the best price offers.

Valeriy Stolnikov

UEC ENGINES SENT ANOTHER CREW TO THE ISS

The RD-107A/RD-108A serial rocket engines manufactured by UEC-Kuznetsov, the Samara-based enterprise of the United Engine Corporation (Rostec), ensured the successful launch of the Soyuz MS-22 manned spacecraft of the 68th long-term expedition to the International Space Station. On September 22 Moscow time Soyuz-2.1a carrier rocket was launched from site No.31 Vostok of the Baikonur cosmodrome. The rocket delivered manned spacecraft Soyuz MS-22. The RD-107A/RD-108A engines installed on the first and second stages, manufactured by UEC-Kuznetsov, operated faultlessly. The spacecraft is named after Konstantin Tsiolkovsky, the Russian scientist, inventor and founder of the theory of space exploration. Honoring the great inventor, the rocket portrays Tsiolkovsky and a commemorative inscription. The crew of Tsiolkovsky included members of the 68th long-term expedition to the International Space Station – Roscosmos cosmonauts Sergei Prokopyev and Dmitry Petelin as well as NASA astronaut Francisco Rubio.

INCREASING THE ELEVATOR ENERGY EFFICIENCY

Ruselectronics holding, Rostec State Corporation, has developed a synchronous motor for elevators. The product is a low-speed permanent magnet motor the use of which will allow to save electric power and ensure high performance of elevators and passenger comfort. The new motor is designed for installation into a direct-drive elevator winch. It has been developed within the elevator main drive motor smart control system program which includes the motor itself and a control unit. The system ensures actuation of the elevator car along the shaft for standard elevators with a capacity up to 1000 kg and speed up to 2 m/s. Thanks to the application of circuit solutions, the equipment allows to avoid unnecessary friction loss and to increase energy efficiency. 'New synchronous motors for elevators expanded the commercial motor range manufactured by the company. Our products are used in automotive and machine tool industries, in pumps, compressors, automatic doors, as well as in oil and gas sector where they are used for pipeline gate valve control. The key benefit of the KEMP motors is that they have high power factor and efficiency, a wider speed control range and improved weight and size parameters, and are robust', said Boris Movtyan, General Director of KEMP.

The First Mi-8MTV-1 under a Non-Profit Leasing Contract

Russian Helicopters Holding has delivered the first Mi-8MTV-1 helicopter to KrasAvia in Krasnoyarsk under a contract with State Transport Leasing Company (GTLK). The contract includes the supply of 26 helicopters within a non-profit leasing program for air fleet modernization in Russian regions.

Mi-8MTV-1s have upgraded lighting equipment which improves spatial orientation and flight safety. The helicopters will deliver passengers and cargo to remote villages in Siberia and Far East.

'For many parts of our country, helicopters have been and still are the only possible means of transport that connects hard-to-reach villages with towns. All 26 new Mi-8MTV-1s will be outfitted with the advanced lighting equipment which is used on Russian helicopters for the first time. GTLK will receive 12 such helicopters before the end of the year and the second part of the batch will be supplied to airlines in 2023,' Rostec's aircraft cluster reported.

New LED-based aircraft navigation lights provided for the helicop-



ter have improved color rendering and reduced power consumption. They will enable pilots to have better orientation during takeoff and landing on noninstrument fields.

The Mi-8MTV-1 features powerful propulsion, improved avionics and

fuselage design. The helicopter cabin includes 22 seats and areas prepared for installation of medical modules. Modifications include provisions for installation of additional fuel tanks and of external sling system for transportation of loads up to 4 tons.

Another Batch of Ansats for Air Medical Service

Russian Helicopters Holding has delivered three Ansat helicopters for the National Air Ambulance Service of Russia. The aircraft made by Kazan Helicopter Plant have been supplied under the contract with PSB-Leasing. A total of 66 Ansats and Mi-8MTV-1s are to be delivered under the NAAS agreement.



Ansats helicopters delivered to NAAS are designed to transport one patient accompanied by two medical professionals. The rotary-wing aircraft have high readiness for takeoff, are capable of landing on non-instrument sites chosen from air, including

building roofs, motor roads and adjacent areas.

'The National Air Ambulance Service of Russia is expanding its helicopter fleet. This will allow to increase flying intensity and expand the geographic reach. During five

years, the NAAS helicopters performed more than 43,000 evacuations with about 60,000 patients rescued. The coverage area was increased up to 49 regions this year. The number of ambulance flights reached 6,000 per year. We are going to expand our ambulance helicopter fleet up to 83 helicopters in the nearest future,' said Oleg Evtushenko, Rostec's Executive Director, in December 2022.

The Ansats are outfitted with electronic display system – a so-called 'glass cockpit' that improves navigation and reduces pilot workload. The advanced control panel displays all key flight details on a single screen. Moreover, the state-of-the-art equipment ensures easy and fast route programming and access to current aeronautical databases.



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VK-1600V ENGINE FOR KA-62



Twenty-five successful starts of the VK-1600V demonstrator engine were performed at the test facility of Rostec United Engine Corporation's ODK-Klimov. The tests continue. An experimental work package was carried out during the tests of VK-1600V demonstrator engine: adjustment of the engine start-up; checking of joint functioning of the units and systems in various modes; assessment of the obtained parameters for compliance with the product specifications.

The engineering tests confirmed the engine's compliance with the characteristics of the first stage of adjustment. Totally, 25 successful starts were made. Stable operation of the compressor, stable ignition of the combustion chamber, compliance of the vibration level with the established standards were registered.

'In the near future, the tests of the demonstrator engine with improved design elements will be continued, and the units' operation within autonomous plants will be checked. In addition, this year we plan to manufacture pilot samples for certification tests', Vsevolod Yeliseev, general designer of JSC ODK-Klimov, said.

VK-1600V engine developed by JSC ODK-Klimov is designed for installation on multi-purpose and special helicopters with a takeoff mass of 5-8 tons. The first object of its application is the modern multi-purpose helicopter Ka-62.

The engine design allows further development of various modifications (including for use in unmanned aircraft and within the power plant of light passenger and regional cargo planes) and expansion of the range of engines of VK-1600 family.

VK-1600V capacity in the takeoff mode is 1400 horse powers, in the mode of 2.5 minute capacity, in case of engine failure, 1750 horse powers. Specific fuel consumption in the takeoff mode is 200 g/HP-hr. The FADEC electronic system of automatic control is used with the engine. The BARK-15V automatic regulation and control unit has dual-channel architecture, compact dimensions, and combines the functions of instrumentation and control of the engine systems, and has the functions of failure diagnostics and troubleshooting. VK-1600V engines have high indicators of reliability and cost effectiveness, the engines will be operated according to their technical condition.

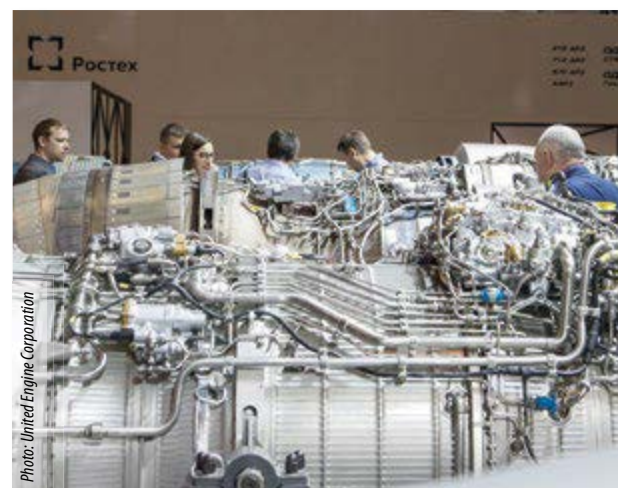
Doubling the Output of Engine Components in Samara

Rostec's United Engine Corporation has launched three new manufacturing buildings outfitted with state-of-the-art equipment at Samara-based UEC-Kuznetsov. More than 4 billion Rubles were invested in their construction. Commissioning of new capacities will double the output of components for a set of propulsion units.

All new manufacturing areas are furnished with high precision control equipment — coordinate measuring machines and magnetic powder and fluorescent penetrant inspection systems to ensure quality control at all manufacturing stages.

The new tool-making facilities with an area of 2,400 square meters will manufacture tooling designed to assemble parts and components for some industrial engines, NK-32 series 02, NK-12MP, NK-25 air propulsion systems and a new advanced heavy-duty product.

A welding building with an area of 3,900 square meters accommodated nine manufacturing areas, including robotic equipment, to enable the operators to perform soldering, welding and to apply protective coatings in automatic mode.



A 3D printer is integrated in the process flow to allow 'growing' of large-size products. The manufacturing facility is able to handle more than 5,500 parts and components per year. The second com-

pressor building phase with an area of 4,600 square meters involves 11 manufacturing areas, including compressor component machining, plasma and detonation spraying, and quality control areas.

Tests of SSJ-NEW Model with PD-8 Engines

The Central Aerohydrodynamic Institute named after N.E. Zhukovsky has completed testing of SSJ-NEW short-haul aircraft with Russian PD-8 engines.



TsAGI researchers have studied aerohydrodynamic behavior of the SSJ-NEW with nacelles of new Russian-made PD-8 engine which is to replace foreign SaM-146s used before. Identification of the optimum angles

of incidence of vortex generators in PD-8 engine nacelles was another goal of the experimental research.

The test was carried out in TsAGI's transonic wind tunnel in cruise mode at Mach 0.75 to 0.82. In addition to

weight studies, oil-flow visualization was performed at the wing, pylon and engine nacelle juncture in order to identify potential unfavourable interference areas. Visualization has shown that there were no unfavourable effects in PD-8 engine nacelle installation area.

'This is an important stage on the way towards the SSJ-NEW flight test that is supposed to be started as early as next year. High aerohydrodynamic properties of the SSJ-NEW with Russian engine were confirmed and, upon completion of the engine prototype test on Il-76 flying laboratory, we will be ready to start integration of the new propulsion into the aircraft together with UEC colleagues,' emphasized Andrey Boginsky, Deputy General Director of Civil Aviation of UAC — General Director of Irkut Corporation.

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AVIAHELP

AVIAHELP has been working at the aviation market since April, 1997. Since then AVIAHELP established its reputation as a trustworthy supplier of spare parts for helicopter operators providing all necessary spares for Russian helicopters maintenance and their ground support. We also provide aircraft spares and maintenance service for repair shops and plants. Our experience in providing helicopter operators around the globe with parts and components makes us a reliable partner.

AVIAHELP, Ltd provides spare parts and service solutions for all modifications of Russian helicopters MI-8/17/171/172, KA-32. The original parts delivery to final customer in any part of the world is our main goal.

AVIAHELP, Ltd has stock of helicopter spare parts and units for hydraulic, electromechanical, pneumatic systems, rotatable spare parts, instruments. We guarantee accurate supplies for our clients.

AVIAHELP BUSINESS AREAS

Spares supply and Maintenance service for Russian-built helicopters and aircrafts, including:

- Spares authenticity verification;
- Urgent maintenance inspection visits to any part of the world;
- Maintenance and overhaul of spare parts at certificated manufacture and repair plants;
- Aircraft and spares lifetime extension.

Upgrade of Russian built civil and transport helicopters and aircraft.

AERO INDIA 2023

Yury Ridzel, Director General of AVIAHELP Ltd., evaluated AERO INDIA 2023 as a significant event of the year for AVIAHELP company: 'We have been witnessing a steady growth of our export deliveries of aircraft and technical equipment in the region. This exhibition is a unique meeting place for experts from all over the world to develop business cooperation. We were glad to meet our partners as well as to establish new contacts with companies from the Asian region.'

Deliveries to India are an important area of AVIAHELP's work. The company cooperates with more than a dozen clients in the region, including aircraft operators, aircraft repair enterprises and training centers. Performance overhaul of main components and upgrade solutions for some vital systems on the helicopter such as radio communication system, dust protection for engines, last generation of navigation equipment.

Company stand at AERO INDIA 2023 – B 5.3.

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LIMA 2023 IS COMING

The Government of Malaysia officially appointed Alpine Integrated Solution Sdn Bhd as the Organiser for LIMA 2023 via a soft launch ceremony held at MINDEF in June.

The Ceremony was attended by both Ministers: Datuk Seri Hishammuddin bin Hussein, Minister of Defence Malaysia and Datuk Seri Ir. Dr. Wee Ka Siong, Minister of Transport as well as the respective Secretary Generals and the Chief of Defence Force.

Defence Minister Datuk Seri Hishammuddin Hussein said that the return of Lima was something that was anticipated as the previous iteration was cancelled due to the Covid-19 pandemic.

'With the success of this year's Defence Services Asia (DSA) there's no reason not to hold Lima next year. The time is right,' he said at the pre-launch event at Wisma Pertahanan.

Transport Minister Datuk Seri Dr Wee Ka Siong, who was also at the ceremony, said that the exhibition would help to spur the economy, especially the maritime and aerospace industries. 'As a maritime country, we have to take advantage of the shipping industry of creating and maintaining ships, which is valued at more than RM15.3 bil,' he said.

The premier event of its kind in the world, LIMA brings together exhibitors, embassy, senior government officials, top military officials, & industry leaders from the commercial and defence sectors around the world. LIMA 2023 is expected to surpass all previous records and will become by far the biggest and most attended LIMA's in its series of 30 years. LIMA is exhibiting 600 of 30 nations compa-



nies from Defence/Security and Commercial sectors. Up to 20 international pavilions from the US, China, UK, France, UAE, Indonesia, Thailand, Italy, Türkiye, Brazil, Germany, Singapore, South Korea, Japan, Pakistan, India, Bangladesh, Saudi Arabia, Belgium, Czech Republic and others. The 20,000 sqm MIEC space venue will be utilised indoor and outdoor with 110 of aircraft and 110 of ships/vessels, expecting 45,000 trade visitors, more than 250,000 public visitors and more than 400 VVIPs comprising Ministers of Defence and Ministers of Transport, Senior Officer and Service Chiefs from 59 countries.

'This LIMA is the largest air and maritime show in the region. We need to continue this LIMA not only for us to see assets from manufacturers, but also to meet industry players,' said the Minister of Defence.

The following participation options will be available to all interested companies who are within the Maritime and Aerospace industry sectors (both for Defence and Commercial):

- Indoor exhibition space or booths
- Outdoor static display
- Chalets
- Aero or Maritime displays/demonstrations
- Branding and sponsorship opportunities

The LIMA 2023 Official Launch happened on the 16th of January 2023 at the Malaysia International Trade and Exhibition Centre (MITEC), Kuala Lumpur.

/IA&T/

The Langkawi International Maritime and Aerospace Exhibition (Lima) 2023 will be held from May 23 to 27. The gates were announced by the Ministers during the press conference on 8th of June 2023.



VLADIMIR PUTIN and NARENDRA MODI

The most important condition for the development of special relations between Russia and India is the friendly relations between the leaders of the two great powers, President of Russia Vladimir Putin and Prime Minister of the Republic of India Narendra Modi. The leaders communicate a great deal and hold frequent meetings, which have become crucial milestones in the development of the partnership between the countries and crucial factors in the strengthening of global stability.

Before the New Year last December, Vladimir Putin had a telephone conversation with Prime Minister of the Republic of India Narendra Modi. While expressing satisfaction with the high level of bilateral cooperation that has been developing on the basis of the Russian-Indian privileged strategic partnership, the two leaders discussed in detail the prospects for practical cooperation in mutual investment, energy, agriculture, transport and logistics.

They also noted the importance of maintaining close coordination within international organisations,

including with regard to India's commenced chairmanship in the G20 and the Shanghai Cooperation Organisation. The two leaders agreed to maintain personal contacts.

Three months earlier in September 2022 Following the SCO summit in Samarkand, Vladimir Putin had a meeting with Prime Minister of India Narendra Modi. During that meeting, Vladimir Putin noted: 'First of all, I want to start our meeting by personally congratulating you and the entire friendly nation of India on the holiday you celebrated last month: I mean the 75th anniversary of independence of the Republic of India. I wish India all the best.

I also know that tomorrow is your birthday, my dear friend. According to Russian tradition, you are not supposed to wish anyone an early happy birthday, therefore I can't do it, but I would like you to know that we remembered, we know about it and wish you all the best anyway, to you as well as to the people of India; we wish prosperity to the friendly country of India that you lead.

Bilateral relations can be characterised as a privileged strategic partnership, and they continue to develop actively. We are actively cooperating on international platforms and discussing all global developments, including unfavourable ones at times.

I know your position on the conflict in Ukraine and the concerns that you constantly express. We will do our best to make it stop as soon as possible. However, unfortunately, the opposing side, the leadership of Ukraine, announced that it was abandoning the negotiation process and declared that it wants to achieve its goals by military means, 'on the battlefield', as they say. Nevertheless, we will always keep you informed of what is happening there.

We are actively working at the SCO, and today's summit of the SCO heads of state, which I believe was very successful, is the best proof of it. It is important that we constantly coordinate our positions despite coronavirus-related restrictions: we had telephone conversations four times, and our staff are always in touch.

I would like to thank you for your video greetings for the participants of the Eastern Economic Forum in Vladivostok.

I fondly recall my own visit to New Delhi last December and my fruitful talks with you. I would like to use this occasion to invite you to visit Russia.

Clearly, constructive relations are developing in the economic sphere. Trade is growing, including due to additional deliveries of Russian fertilisers to the Indian market, as you asked. The volume of fertilisers delivered from Russia to India increased by more than eight times – not by some percentage, but by more than eight times. I hope that this will help Indian farmers to manage the difficult challenge of providing food for the country's population.

Large joint projects in the oil and gas sector and in the nuclear power industry are being consistently implemented. For Russians, the rich history and ancient culture of India are traditionally of great interest, and in this regard, we propose intensifying the talks on an agreement on visa-free tourist travel. We could also think about holding cross years of Russia and India in 2024.'

Prime Minister of the Republic of India Narendra Modi said: 'Your Excellency, I am very glad to have an opportunity to meet with you again today. We had a chance to

talk when we saw each other last time in December, during your visit to New Delhi, where we discussed a wide range of issues. And, as you said, since then we have had several telephone conversations.

Besides bilateral cooperation between Russia and India, we also discussed various global issues. We are meeting again today. Indeed, food security, energy security, and the availability of fertilisers are a major concern, especially for developing countries. Without a doubt, we need to find a solution to all these issues, and in particular, we both need to plan initiatives to this end. These issues have already been discussed today.

Your Excellency, I want to express my gratitude to both Russia and Ukraine, because when the crisis began, at first thousands of Indian students were trapped in Ukraine, but thanks to the support we received from both Russia and Ukraine, we were able to ensure the safe return of Indian students. I am grateful to both countries.

I know that now is not an age of wars. We have spoken about it many times, in particular in our telephone conversations. Democracy, diplomacy, and dialogue are important tools for us to find solutions. It is necessary to achieve peace in the future, and I am sure that we can discuss this. I



welcome the opportunity to better understand your point of view.

Relations between Russia and India have significantly improved. We believe they are extremely important. We are friends, and for decades we have always stood shoulder to shoulder. The whole world is aware of the nature of Russian-Indian relations, and the world also knows the deep friendship, in particular the personal friendly ties that bind us. We first met in 2001 when I was in state government in India, and our friendship has only grown stronger



ever since. In the interests of the well-being of this region, our peoples and citizens, we are once again making efforts today, in particular within the framework of the SCO summit. Thank you for the support you have shown India.'

Vladimir Putin's visit to India at December 2021 has already been called a special historic milestone in the development of special friendly relations between Russia and India, two undoubtedly great countries. In addition, the two countries signed a package of documents before the Russian President's meeting with the Prime Minister of India. They include an intergovernmental agreement on technology protection due to cooperation in space research and the use of outer space for peaceful purposes, and on building and operating launch vehicles and ground-based space infrastructure; an intergovernmental agreement on the Military-Technical Cooperation Programme for 2021-2031; as well as a protocol amending the intergovernmental agreement on cooperation in manufacturing Kalashnikov series small arms of February 18, 2019. The expanded format meeting between the two delegations was followed by a face-to-face conversation over a working lunch. Following the summit, a Joint Statement



Russia – India: Partnership for Peace, Progress and Prosperity was adopted.

The Indian army, the second largest army in the world, is switching to new Kalashnikov assault rifles, and the skies over India will now be protected by Russian S-400 systems. The first shipment of anti-aircraft missile systems to India coincides with Vladimir Putin's visit to New Delhi today, but defense cooperation is not the only element of Russian-Indian relations.

At his meeting with Prime Minister Modi they discussed the training of the second Indian cosmonaut in history, the construction of a nuclear power plant, coopera-

tion in the manufacture of medicines and new ships. All of this will help triple trade turnover in the coming years.

A foreign visit, a meeting of leaders is always an event, and given all the current covidial restrictions, an exceptional event. From the airport, the Russian president's Aurus heads straight to the heart of New Delhi – the government quarter.

Here we see Vladimir Putin's motorcade pulling up to the Hyderabad Palace. Prime Minister Narendra Modi is already waiting for him on the porch. This is the first meeting in two years.

The Indian prime minister is wearing a kurta, the traditional wool vest. The leaders greet each other and walk out together to a specially prepared spot on the palace lawn so that the handshake can be captured by all from the best possible angle.

The focus of the leaders is to further develop a mutually beneficial partnership. The pandemic hit the trade turnover, but now instead of recession, the growth is 38%, and in the first 9 months the figure is almost 9 billion dollars. The goal is to bring the volume of trade to 30 billion in the near future.

The Central Bank of Russia and the Reserve Bank of India signed a cooperation agreement to fight cyber-attacks. Also, relevant agencies signed a number of agreements in the sphere of education and memoranda of cooperation on intellectual property and on geological exploration and prospecting.

The documents signed included a roadmap for cooperation in science, technology and innovation; a programme of cultural exchanges for 2021–2024; a protocol on the organisation of culture festivals between the Russian Federation and the Republic of India in 2022–2023; as well as documents amending the intergovernmental agreement on merchant shipping of December 23, 1994, and concerning Russian oil supplies in 2022.

Vladimir Putin held talks with Prime Minister of India Narendra Modi in New Delhi. At the beginning of Russian-Indian talks Prime Minister of India Narendra Modi said: 'Your Excellency, my dear friend, President of the Russian Federation Vladimir Putin, I would like to welcome you to the annual bilateral summit in New Delhi. I would also like to welcome all members of the Russian Federation delegation.

I know that this is only your second visit abroad for almost two years. This shows your personal commitment to our relations. You are visiting India despite all the pandemic difficulties and this shows your love of India.

Despite the pandemic-related complications, the development of bilateral India-Russia relations has not slowed. We continue strengthening our specially privileged strategic partnership.

We have maintained close cooperation in countering COVID-19, be it during testing vaccine production, providing humanitarian aid or helping people return home in a difficult time.

Your Excellency, 2021 is an important year for bilateral relations for various reasons: this year we celebrate the 50th anniversary of the 1971 Treaty of Peace, Friendship and Cooperation between India and the Soviet Union and two decades of strategic partnership. This is why I am so pleased to meet you in this special year because you have stood behind our strategic partnership over the past 20 years.

Many fundamental changes have taken place in the world in the past few decades. Various geopolitical formations have come into being, but one thing remained

immune to change – the Russia-India friendship. Our countries not only cooperate with each other but also show special care for each other's sensitive issues. This is indeed a unique, trust-based model of interstate friendship.

Your Excellency, 2021 is important for our strategic partnership as well. The first meeting of foreign ministers and defence ministers in the '2+2' format took place today and thus launched one more mechanism to strengthen practical cooperation.

We have maintained regular contact on Afghanistan and on a number of other issues as well. The interregional side of our partnership, which goes back to the Eastern Economic Forum and our summit in Vladivostok, has become a specific part of cooperation between the Russian Far East and various Indian states.

In the economy, we have adopted a long-term vision to reinforce our relationship. Our goal is to increase mutual trade to US\$30 billion by 2025 and to increase mutual investment to US\$50 billion. To do so, we must issue the proper assignments to our respective business communities.

The various agreements that were concluded today will help us expand cooperation as well. Our defence cooperation is being strengthened through joint development and production efforts under the Made in India programme. Cooperation in space and civilian nuclear energy is expanding as well.



I would like to congratulate Russia on obtaining observer status in the Non-Aligned Movement and dialogue partner status in the Indian Ocean Rim Association. We were delighted to support Russia's presence in these associations.

India and Russia have similar positions on many regional and global issues. We will have the opportunity to exchange views on these matters during today's meeting.

Your Excellency, once again, welcome to India. I would also like to welcome all members of the Russian delegation. Despite your busy schedule, you made the time to visit us, and we appreciate this. I am sure that our discussions today will be very productive for our relations.'

President of Russia Vladimir Putin said: 'Prime Minister, my friend. It is an honour and a privilege for me to visit friendly India once again. We regularly hold summits at the highest level, in fact, they take place every year, with India and Russia taking turns in hosting them. Unfortunately, we had to skip last year due to the pandemic. Still, it is our turn to come to India, and I thank you for your invitation.

Russia views India as a major power, whose people have been very friendly to us. Our relations proceed from a very positive foundation. They are developing and forward-looking.

In 2020, trade between our countries decreased by more than 17 percent, but in the first nine months of 2021 it grew by over 38 percent. There is no doubt that we have every



opportunity to reach the trade volumes you have mentioned.

This also applies to investment, which currently stands at US\$38 billion and is more or less equally distributed between the two countries, with Russia having a slightly larger share. That said, we have been working together in very important and promising areas, including energy, high technology, and space. I am certain that the programmes you

have mentioned will be carried out, including the one to train an Indian cosmonaut.

We have been promoting military-technical cooperation like with no other partner of ours. Together, we develop and manufacture high-technology military products, including in India.

There is another essential item on our agenda, which is of interest for both India and Russia. I am refer-

ring to taking care of the environment. Our minds are set on this topic, the green agenda, as well as on the economy and ways of developing it. Of course, we are realistic in our efforts, seeking to fulfil the needs of our economies and improve the standard of living for our citizens on an ongoing basis.

We remain proactively involved on the international stage. Just as you have said, our positions coincide on many issues. Of course, terrorism and efforts to fight it are a matter of grave concern, as are combatting drug trafficking and organised crime.

In this context, the developments in Afghanistan are of course a matter of serious concern for us. The foreign and defence ministers, who are present today, held their first meeting in such format, demonstrating our commitment to developing our relations in international and military affairs.

We hold joint exercises both in India and Russia. We are grateful for the attention you have given to this aspect of our cooperation and intend to keep moving in the same direction. Once again, thank you very much for your invitation.'

Partnership for Peace, Progress and Prosperity. India-Russia Joint Statement following the visit of the President of the Russian Federation (selected excerpts from the document)

1. At the invitation of Prime Minister of India Shri Narendra Modi, President of the Russian Federation H.E. Mr. Vladimir Putin paid working visit to New Delhi on 6 December 2021 for the 21st India-Russia Annual Summit.

2. The completion of 5 decades of the 1971 Treaty of Peace, Friendship and Cooperation and 2 decades of Declaration on Strategic Partnership is symbolic of the long standing and time-tested India-Russia relations characterized by mutual trust, respect for each other's core national interests and similarity of positions on various international and regional issues.

3. The Sides reaffirmed their commitment to the Special and Privileged Strategic Partnership between India and Russia. They underscored that as major powers with common responsibilities, this important relationship continues to be an anchor of global peace and stability.

4. The Sides positively assessed the multi-faceted India-Russia relations that span various areas of cooperation including political and strategic, economy, energy, military and security, science and technology, culture and humanitarian cooperation. They noted that while the traditional areas of cooperation are being further strengthened, new drivers of growth have led to diversification and expansion of bilateral cooperation.

5. The Leaders highly appreciated the sustained momentum in bilateral ties despite the negative impacts of the ongoing Covid-19 pandemic. They acknowledged that the Annual Summit could not be held in 2020 due to the Covid pandemic. The Sides noted with satisfaction the continued intensification of contacts at all levels including 6 telephonic conversations between the two leaders since the last Summit; visits of Foreign Minister,

Raksha Mantri, Minister of Petroleum and Natural Gas and Minister of Steel from Indian side; visit of Russian Foreign Minister and Secretary of Security Council to India; holding of Foreign Office Consultations, India-Russia Strategic Economic Dialogue, consultations on UN issues, Arctic, policy planning etc.

6. The Leaders welcomed the holding of back-to-back meetings of the India-Russia Inter-Governmental Commission on Military and Military-Technical Cooperation and the first 2+2 Dialogue of Foreign and Defence Ministers of India and Russia in New Delhi on 6 December 2021. They underscored the importance of regular annual 2+2 meetings for exchanging views on global and regional political-security developments.

7. The Leaders noted the ongoing interaction between the Parliaments of two countries and underlined the importance

of regular meetings of Inter-Parliamentary Commission as a valuable component of India-Russia relations.

8. The Leaders reiterated the importance of the security dialogue at the level of NSA and NSCS on bilateral and regional issues and welcomed regular interactions between them. This has served to enhance strategic understanding and coordination between the two countries.

Economy

13. The Sides appreciated the resumption of the positive trajectory of bilateral trade, with trade registering an increase of about 38% in the first half of 2021 compared to the same period in 2020 despite the pandemic-related restrictions. They positively assessed the overall increase of bilateral trade in 2019-20 compared to the previous year.

14. The Sides noted that the bilateral trade does not reflect the potential of strength and depth of India-Russia strategic partnership. The leaders stressed on the need for greater efforts to achieve the trade target of USD 30 billion by 2025. In this regard, they placed strong emphasis on new drivers of growth for long-term cooperation.

15. The Sides underscored the need for commencement of negotiations on Trade Agreement between India and The Eurasian Economic Union.

16. The leaders noted the relevance of continued engagement under the India-Russia Inter-Governmental Commission on Trade, Economic, Scientific, Technological and Cultural Cooperation (IRIGC-TEC) for bilateral economic cooperation in various priority areas. They acknowledged the holding of 12 Working Group and Sub-group meetings under the IRIGC-TEC and instructed the concerned officials to expeditiously conclude meetings of pending Working Groups. The sides also welcomed the setting up of the new Working Groups and Sub Groups on Transport, Urban Development and Railways and looked forward to the early holding of their inaugural meetings.

Military and Military-Technical Cooperation

50. Russian side appreciated the participation of Indian Defence Minister Rajnath Singh along with a Tri-Service contingent of the Indian armed forces in the Victory Day Parade at Red Square in Moscow to commemorate the 75th Anniversary of Victory

of the Soviet People in the great Patriotic War of 1941-1945.

51. Military and military-technical cooperation has traditionally been the pillar of Special and Privileged Strategic Partnership between India and Russia. Responding to India's quest for self-sufficiency, the partnership is reorienting presently to joint research and development, co-development and joint production of advanced defence technology and systems.

52. The Sides expressed satisfaction with regular military contacts and joint exercises of the Armed Forces of the two countries which reached unprecedented heights this year with three exercises being held within a span of 60 days besides simultaneous participation of large Indian contingents in the International Army Games. The Russian side deeply appreciated participation of INS Tabar in the 325th Russian Navy Day celebrations. The Sides agreed to continue and expand regular defence dialogue, mutual training and exercises, subject matter expert exchanges and other activities under the aegis of India-Russia Intergovernmental Commission on Military and Military Technical Cooperation.

53. Both sides noted with satisfaction the successful implementation of the 2011-2020 Long-Term Program for Military and Technical Cooperation and welcomed the signing of a new long-term plan for the period 2021-2031.

54. The Sides reiterated their commitment to upgrade the defence cooperation, including facilitating joint development and production of military equipment, components and spare parts, enhancing the after-sales service system, progress towards mutual recognition of quality control and regular joint exercises of the Armed Forces of the two countries. The two leaders agreed that for peace, stability and mutual economic development, there is a need for the two countries to work closely together in the advanced and emerging fields of defence technology and for the Armed Forces of the two countries to work together in niche domains of military capabilities.

55. Both Sides agreed to take forward ongoing engagements to encourage joint manufacturing in India of spare parts, components, aggregates and other products for maintenance of Russian origin Arms and defence equipment under Make-in-India program through transfer of technology and setting up of joint ventures for meeting the needs of the Indian Armed Forces

as well as subsequent export to mutually friendly third countries.

56. The Sides recognized the requirement of an institutional arrangement for reciprocal provision of logistic support and services for the Armed Forces.

Science and Technology

57. Emphasizing the importance of joint research in science, technology and innovation, the two Sides welcome the signing of Roadmap for Science, Technology & Innovation Cooperation and , expressed satisfaction with respect to launching joint calls in priority areas as states in the Roadmap.

58. The Sides expressed satisfaction on launching of India-Russia Technology Assessment and Accelerated Commercialization Program by the Department of Science & Technology, Govt. of India and Russian Foundation for Assistance to Small Industrial Enterprises (FASIE), which provides opportunities to Start-ups and SMES of the two countries to address societal challenges through innovative technologies.

59. The Sides also agreed to facilitate collaboration between government and private sector organizations to find ways of joint development of software products, platforms and services as well as in the area of electronics manufacturing. The Sides confirmed their interest in further developing cooperation in the sphere of digital technologies, including those related to information protection, security of critical infrastructure and law enforcement.

60. The Sides noted the promotion of youth exchanges by bringing together co-innovation programs at School level with the Support of Atal Innovation Mission, Niti Aayog and Talent & Success Fund (SIRIUS Centre, Sochi), Russia. These programs engaged students on both sides to generate hands-on technological solutions for societal problems such as Distance Literacy in remote areas; Rural Health & Well-being and Digital asset monitoring etc.

61. The Indian side congratulated the Russian side for its ongoing successful chairmanship of the Arctic Council from 2021-23 and expressed its readiness to play an active role as an Observer in the Arctic Council. Both sides recalled the bilateral consultations on the Arctic held last year. The Indian side also expressed its interest in collaborating with Russia on the Northern Sea Route.

/IAATO/



Dmitry Shugaev:
'The Russian-Indian military-technical cooperation dates back more than six decades and is the basis of a privileged strategic partnership between Moscow and Delhi'

FSMTC OF RUSSIA

In accordance with the law of the Russian Federation, activities in the field of Military-Technical Cooperation (MTC) with foreign countries shall be controlled and supervised by the Federal Service for Military-Technical Cooperation (FSMTC of Russia) that, among other things, shall ensure implementation of basic principles of the Russian government policy in the field of MTC. Before AERO INDIA 2023 Dmitry Evgenyevich Shugaev, FSMTC of Russia Director discusses main directions and tendencies in development of military-technical cooperation between the Russian Federation and foreign countries, the peculiarities of Russian military purpose product exporters' activities at the present stage in his interview to our magazine.

– Mister Shugaev, what are the main principles of Russia's military-technical cooperation with foreign countries today?

– As you know, military-technical cooperation is one of the components of the foreign policy pursued by our state. The main principles of our foreign policy remain the same for military-technical cooperation. They are: mutual respect and cooperation on the basis of equal rights, non-interference in the internal affairs of other states, compliance with international laws and commitments. Naturally, at the same time we are against the use of threats, blackmail, coercion, use of force and any kind of restrictions in international relations.

All of the above allows us to build cooperation not only with states that share the views and foreign policy of the Russian Federation, but also with countries that are under serious Western influence.

– In your opinion, why does Russia confidently maintain its leading positions in the world market of weapons, security equipment and systems?

– Indeed, over the past several years the Russian Federation has been confidently holding the leading positions in the world arms market. This is due to the fact, that all parts of a well-functioning system professionally work together within the military-technical cooperation between the Russian Federation and foreign countries.

Specifically, when our foreign partners make contracts with Russian suppliers for the purchase of military products, they understand that they will get high end equipment that meets their needs and has the characteristics of the world's best models, tested in real-world combat conditions. Besides, Russian suppliers are always ready to discuss any issues



within the framework of contract performance.

Of course, foreign customers of Russian military products planning to develop military-technical cooperation with Russian Federation, along with other factors, also take into account our historical background, and see us as a reliable supplier capable of providing its partners with top level products.

– Russia has always been and is an extremely reliable partner and supplier, including in such a complex area as the military-technical field. What makes Russia's commitment consistent and reliable? What are Russia's unconditional advantages as a military-technical partner?

– I reiterate that our relations with our foreign partners are built on the basis of mutual respect and equality, not recognizing any use of political or economic pressure or blackmail.

We make no political nor legal demands, except as set forth in recognized international instruments.

Certainly, Russia is willing to honor the wishes of foreign customers to the maximum extent possible, as long as this does not pose a threat to national security.

Furthermore, our commitments to protect the interests of our partners remain strong, especially in the context of the US illegal anti-Russian sanctions policy and Washington's cross-border approach to the Countering America's Adversaries through Sanctions Act.

For the sake of the common interest, we use alternative payment solutions for the products delivered and

increasingly use national currencies for payments. It is imperative that we take into account the requirements of the national legislation of foreign customers.

Traditionally, we offer high-end weapons products on the international market with characteristics comparable to, and in some cases surpassing, those of their foreign peers, including in terms of price-performance ratio.

Needless to say, we are committed to preventing delays in the delivery of purchased equipment. We are actively developing an after-sales service system for previously supplied equipment, arranging licensed production and cooperating in high-tech areas.

Overall, throughout a long period of time, the Soviet and, after that,

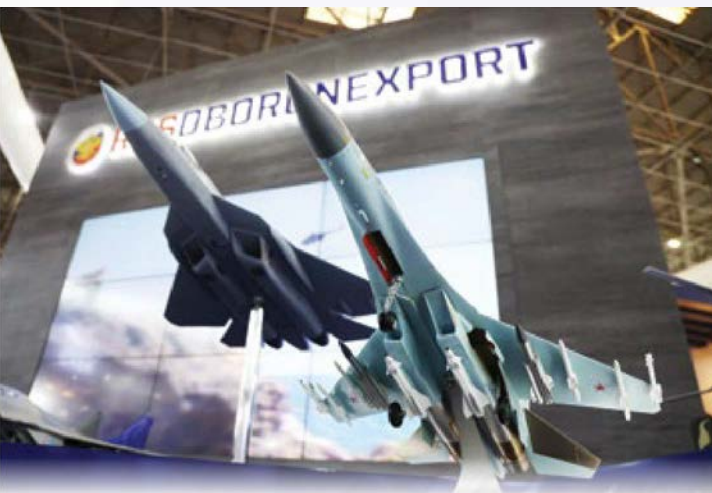


the Russian system of military-technical cooperation has systematically strengthened its global credibility both as a reliable partner and supplier of military products. And now, in the face of unprecedented sanctions pressure, we continue to honestly and efficiently carry out the work entrusted to us – to develop military and technical co-operation with foreign countries.

– In your opinion, what explains the special nature of the partnership between Russia and India in the field of military-technical cooperation?

– The distinctive feature of Russian-Indian military-technical cooperation is that it is planned and long-term in its nature. The Russian-Indian military-technical cooperation dates back more than six decades and is





the basis of a privileged strategic partnership between Moscow and Delhi. Our interaction in the military-technical sphere is free from any political conjuncture.

India is the only country in the world with which Russia is implementing a program of military-technical cooperation covering practically all areas of interaction between the military-industrial complexes of the two countries. Today, there is a solid ground for the development of scientific and industrial cooperation between Russian and Indian military complexes in such priority areas as military aircraft construction, armored vehicles and shipbuilding.

As practice shows, Russia still remains one of the main 'players' in the Indian arms market. For example, over the past five years, the total value of Russian exports to India has exceeded 13 billion US dollars.

Despite significant political and economic changes of both internal and external nature in recent years, military-technical cooperation between our countries remains stable and has good long-term prospects. Suffice it to say that contracts totaling about 10 billion US dollars are currently at various stages of elaboration.

– What traditions of military-technical cooperation between Russia and India can be considered the most principled and immutable?

– First of all, Russian-Indian relations in the military-technical sphere are characterized by trust and openness. We do not link their condition and development to any foreign

policy factors or internal processes taking place in our countries. Russia and India do not have any political requirements for cooperation in the field. This is the principled approach of our two countries.

– What types of weapons from the USSR and Russia have historically been the most important for strengthening India's national security?

– For more than 60 years of cooperation in military-technical sphere, a wide range of weapons and military equipment for all types of armed forces has been supplied from the USSR and then from Russia (produced in India under license).

In the 1960s and 1990s, the Indian Air Force was based on MiG-21 and MiG-23 fighters, MiG-27M fighters and Mi-8 and Mi-17 helicopters. The ground forces were equipped with PT-76 and T-72 tanks, BMP-1 and BMP-2 infantry fighting vehicles, D-30 and M-46 artillery pieces and Grad MLRS. The air defense forces were armed with Pechora, Kvadrat, OSA-AKM, Strela and Shilka surface-to-air missile systems for various purposes. For the Indian Navy were supplied project 61ME destroyers, project 1234E and 159E corvettes, project 1241E, 1241PE and 205ER missile cutters, project 1641IK and 877EKM diesel submarines and minesweepers.

The above equipment has proved itself well in real combat conditions and has been highly praised by the Indian military. Many of these weapons have been modernized with Russian assistance and are still in service.



The core of India's combat aviation is now made up of Su-30MKI and upgraded MiG-29UPG fighters, Il-76MD transport aircraft, Mi-17-1V and Mi-17-V5 helicopters. The air defense forces are receiving S-400 Triumf surface-to-air missile systems. The ground forces are being equipped with the latest T-90S tanks. The Indian Navy received the Project 11430 aircraft carrier Vikramaditya, currently the flagship of the Indian Navy. The latest Project 11356 frigates have been delivered.

It is worth mentioning the BraMos missile systems with cruise missile produced by the Russian-Indian joint venture of the same name. All branches of Indian armed forces are equipped with these modern complexes.

– In your opinion, what is the main feature of the current stage of development of relations in the field of military-technical cooperation between Russia and India?

– The current stage in the development of Russian-Indian relations in the area of military-technical cooperation is characterized primarily by the policy adopted by the Indian leadership to localize production of military products at Indian enterprises based on the 'Produce it in India' and 'Self-Sufficient India' principles.

It should be noted that despite unprecedented pressure on India from Western countries led by the United States in connection with Russia's special operation in Ukraine, it continues to be one of Russia's main partners in the sphere of military-technical cooperation. India's

order portfolio exceeds 10 billion US dollars.

At the same time the Russian side greatly appreciates the efforts of India's political and military leadership to develop the national defense industry, increase exports of Indian-made military products and diversify sources of imported weapons and military hardware.

It should be noted that the 'Produce it in India' principle has long been successfully implemented in the course of bilateral interaction in the military-technical sphere. Over the years of cooperation, India has successfully mastered the production and now produces dozens of high-tech military products.

For our part, we are striving to actively introduce into practice new, more perfect forms of cooperation that can bring the process of our interaction to a qualitatively new level. These include, first and foremost, joint development of high-tech military products, production cooperation through the establishment of joint ventures for the production of military products, the creation of service centers for the maintenance of supplied products, and the performance of joint research and development work in relation to military production.

If you look at the dynamics of Russian-Indian military-technical cooperation in recent years, you can clearly see that our relations have long since shifted to an industrial-technological model of cooperation. The overwhelming majority of projects are joint in their nature. Examples include the BraMos project, the licensed production of T-90S tanks, Su-30MKI aircraft, aircraft engines, Mango tank rounds, and the construction of Project 11356 frigates at Indian shipyards.

We can now say that a project for the joint production of AK203 assault rifles has been successfully started, and early this year the serial production of assault rifles was launched in India.

– What programs of military-technical cooperation between Russia and India, in your opinion, are the most important and promising?

– Currently, the main areas of cooperation are:

- production of AK203 assault rifles in India;
- continuation of licensed production of Su-30MKI aircrafts and T-90S tanks;
- implementation of contracts for the supply of S-400 Triumf surface-to-air missile systems and Project 11356 frigates;
- cooperation in the work of the joint organization BraMos.



Promising projects include joint production of Ka-226T helicopters and licensed production of Igla-S man-portable air defense systems.

– What are the principal features of the development of joint programs for the production of weapons and military equipment in India?

– As I have already said, we support the 'Produce it in India' principle proposed by the Indian side. It should be emphasized that in the field of military-technical cooperation, the Russian Federation has traditionally offered India the latest weapons and military equipment. Russia is the only country that is ready to interact on a large scale with India in the field of military high technologies, transferring its know-how to Indian partners.

This is our fundamental distinguish from the United States, Israel and Western European countries, which in the overwhelming majority of cases offer their Indian partners assembly production of military products without the transfer of sensitive technologies.

For example, the level of localization of armored vehicles production in India (tanks T-72 and T-90S, infantry fighting vehicle BMP-2) is from 80 to 90 percent, Su-30MKI aircrafts – from 50 to 55 percent, missile complexes 'BraMos' – more than 60 percent. Provision is made for 100 percent localization level for the production of AK203 assault rifles and for Ka-226T helicopters – 70 percent.

– What allows Russia to overcome unparalleled pressure by Western countries, as well as sophisticated technologies of unfair competition?

– Now we live in a world that faces a transition from unipolarity to multipolarity. Washington with the desire to maintain its global hegemony is increasingly using illegal methods of coercion in international relations in the form of direct blackmail and various kinds of sanctions, including threats of the use of military force. All this does not make the US any more popular in the international field. The introduction of sanctions against any state always has a more or less negative impact on the global economy. When powerful global players such as China and Russia are involved in the sanctions war, the consequences of the confrontation can be very unforeseeable.

Most of the world community understands this. This is evidenced by the failure of U.S. plans to isolate Russia internationally, as most of the

world does not support the policy of sanctions pressure by the United States and its allies directed against the Russian Federation.

Convinced of the ineffectiveness of economic and political sanctions, Washington and its supporters began to use blatantly terrorist methods.

As propagandistic anti-Russian outbursts, there is a bloat on the issue of 'Russia's readiness to use tactical nuclear weapons' in a special military operation, among other things. Unfortunately, we cannot expect the situation to change any time soon, so our system of military-technical cooperation, which has been under Western sanctions pressure for many years, is systematically improving working methods to successfully counter the restrictions imposed on it.

We have achieved good results in this direction: alternative schemes of mutual settlements are introduced, the system of insurance of international freight transportation is improved, and the interests of our partners are protected.

International economic organizations are being created at the state level, the financial policy of which provides for the rejection of the U.S. dollar. And more and more countries are striving to join them.

Our world is being reshaped; a new world order is being established. In order to strengthen Russia's international standing, its political position and national security, we, the employees of the



Russian Federation's system of military and technical cooperation with foreign states, are also rearranging ourselves.

– How does the FSMTC of Russia assess the AERO INDIA 2023 exhibition site? What are its key advantages and importance for the strengthening of cooperation between our countries and the further development of joint MTC programs?

– The International Aerospace Exhibition AERO INDIA is one of the largest and most authoritative exhibition venues in its class along with similar venues in London, Paris and Moscow. It brings together the world's major companies involved in the development and production of aerospace equipment for both civil and military purposes.

Participation in it allows to demonstrate the achievements of the Russian aviation industry to the global community, in particular, to the fast-growing countries of South and South-East Asia, which have a large market. For Russian aircraft manufacturers, it is an opportunity to establish closer contacts with their Indian colleagues, find new points of contact, which can later result in promising joint projects.

– Speaking about the future prospects for the development of MTC between Russia and India, in what areas and according to what principles does Russia's FSMTC intend to conduct this work and what is the basis for confidence in the constructive prospects of this relationship?

– We are well aware that given the state of affairs in India's defense industrial complex and New Delhi's current approaches to building military-technical cooperation with foreign countries, additional opportunities to strengthen our own position in the Indian arms market are offered to countries that can provide India with financial and credit support, buy equity in Indian defense enterprises and organize production of modern military products in India with a right to their subsequent reexport.

With this in mind, we are trying to build our work in the Indian direction. A striking example of this work is the activities of the joint organization BraMos – in 2022 we signed the first contract for the delivery of missile systems produced by this organization to the Philippines. Negotiations are underway with a number of countries for their delivery.

We expect that the products of the joint venture 'Indian-Russian Rifles' will be no less successful.

Work is underway to start production at the joint venture 'Indian-Russian Helicopters' of Ka-226T helicopters.

Russian companies are ready to participate in Indian programs to develop and produce advanced main battle tank and infantry fighting vehicle.

In addition, joint researches and development in the military-technical field are being carried out in more than 40 areas.

All this allows us to look confidently into the future of Russian-Indian military-technical cooperation. /IA&TG/

INDO-RUSSIAN JOINT VENTURE

Indo-Russian Rifles Private Limited, a joint venture between Russia and India, registered and located in India, whose founders on the Russian side are Rosoboronexport and Kalashnikov Concern (both are subsidiaries of the Rostec State Corporation), has started producing Kalashnikov assault rifles.

'R'ussia and India are linked by strong partnership relations. Military-technical cooperation between the two countries has resulted in the construction of the joint venture Indo-Russian Rifles Private Limited. With the launch of series production of Kalashnikov AK-203 assault rifles, high-quality, convenient and modern small arms will begin to enter service with India's defense and law enforcement agen-

cies. The model combines excellent ergonomics, adaptability to different shooters and high-performance characteristics, it is one of the best assault rifles in the world,' said Sergey Chemezov, General Director of Rostec.

The joint venture plans to ensure 100% localization of the production of AK-203 rifles in India. In future, the company may also increase output and upgrade its production facilities to manufacture advanced rifles based on the Kalashnikov assault rifle platform.

'Korwa Ordnance Factory in Amethi, Uttar Pradesh, has produced the first batch of 7.62 mm Kalashnikov AK-203 assault rifles. The beginning of deliveries to the Indian Army is expected soon. At the same time, the factory's capacity makes it possible to fully equip the personnel of other law enforcement agencies in India with AK-203 assault rifles, which, due to their high adaptability, are suitable for various operators. In addition, the joint venture will be able to export its products to third countries,' said Alexander Mikheev, Director General of Rosoboronexport.

Indo-Russian Rifles Private Limited fully complies with the



Government of India's Made in India initiative and DAP 2020. Today, India is the first country to start producing the AK-200-series assault rifles of the world-famous brand.

The AK-200-series assault rifles have retained all the advantages of the traditional AK scheme: reliability, durability and ease of maintenance. At the same time, they fully meet the latest requirements for firearms in the world in terms of ergonomics and the ability to mount high-tech additional equipment.

Russia and India continue to implement military-technical cooperation projects. Their current and future programs are maximally focused on technological cooperation, including on the basis of joint ventures, in the format of licensed production and joint R&D projects. Rosoboronexport aims to cooperate on terms of transfer of technology put forward by the Indian side and in accordance with the Make in India initiative.



ALMAZ – ANTEY AIR AND SPACE DEFENCE CORPORATION, JSC AT AERO INDIA 2023

Almaz – Antey Air and Space Defence Corporation, JSC will take part in the 14th International Aerospace Exhibition AERO INDIA to be held in the Indian city of Bangalore. During the event, the Corporation will demonstrate a number of products that have positively proven themselves in the global market within a single exposition.

In particular, models of S-400 'Triumf' long-range and S-350E 'Vityaz' medium-range air defense systems will be presented to the public.

The S-400 Triumf SAM system is designed for high-performance defence against air strikes, strategic, cruise, tactical and operational ballistic missiles, as well as medium-range ballistic missiles under conditions of combat and electronic countermeasures.

The S-350E Vityaz SAM system is designed to defend administrative, industrial and military facilities against massive strikes by various

types of modern and advanced air attack weapons, including those operating simultaneously from any direction, from extremely low to high altitudes. S-350E can operate independently or be integrated into the customer's air defense system.

In addition, the guests of the exhibition will be able to see the Tor family of short range air defense missile systems (Tor-M2K, Tor-M2E, Tor-E2, the Tor-M2KM autonomous combat module on the Indian TATA chassis and others) and the Taifun-PVO (E) anti-aircraft artillery fighting vehicle.

For the first time in India the Corporation is presenting the 98R6E Abakan non-strategic ballistic missile

defence system designed to engage modern and advanced tactical and operational-tactical ballistic missiles. The system consists of 98L6E multi-function radar and 51P6E2 launchers (up to four); it is a reliable means of fighting the most dangerous ballistic targets and allows to engage targets both as part of an air defence force and on its own.

Visitors to AERO INDIA will be able to see models of aerial surveillance radars 'Kasta-2E2', 'Gamma-DE' and 'Podlyot-E'. These radars are successfully used for acquisition, coordinate measurement, tracking, identification of air targets and promising air attack weapons, including those made with stealth technology, under intensive active, passive and combined jamming, as well as fire suppression.

The specialists of the Corporation will also tell the exhibition visitors about naval air defense systems. The Corporation's stand will provide information about Shtil-1, Resurs, and Rif-M sea-launched SAMs, Moskit-E and Moskit-MVE shipborne missile weapon systems, and Podzagolovok-24E equipment for ensuring electromagnetic compatibility of shipborne radiotechnical means.

Besides, Almaz – Antey Corp. will present at AERO INDIA 2023 information on the REDIKOM mobile repair and diagnostic equipment set.

In addition to the above products at the Corporation's exposition it will be possible to get acquainted with the characteristics of the universal target training complex 'Adjutant', which features the possibility of multiple use of targets imitating the main modern means of air attack.

'India has one of the largest, strongest and most modernized armies in the world, and Indian partners traditionally show great interest in the developments of our Corporation, which have repeatedly demonstrated and confirmed their high performance, efficiency, reliability and competitiveness,' said Vyacheslav Dzirkaln, Deputy CEO of Almaz – Antey Corp. for Foreign Economic Activities. He emphasized that this was due to the powerful innovative, scientific, technical and production potential of the enterprises and

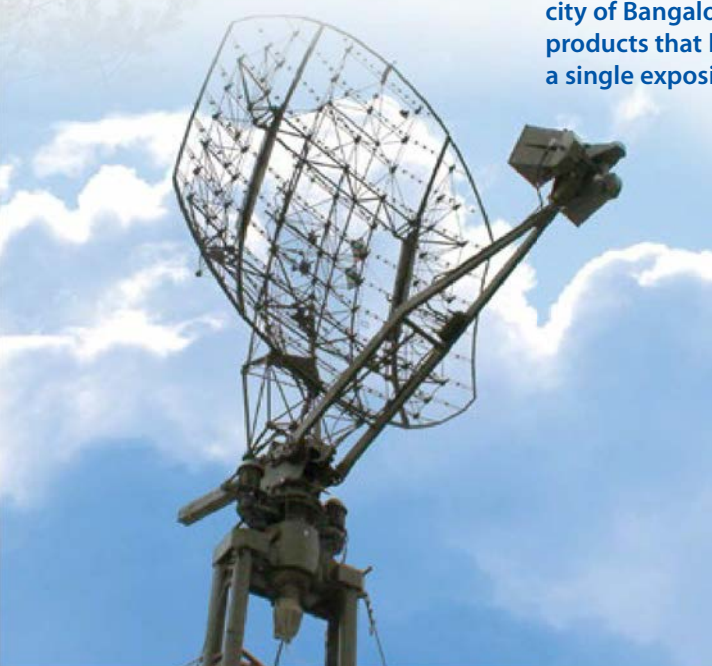
organizations that are part of the Corporation as the leading integrated structure of the Russian defence industry.

According to Vyacheslav Dzirkaln, another focus of the Almaz – Antey Corporation's delegation at AERO INDIA 2023 will be to inform potential partners of the holding about the Corporation's capabilities to develop, manufacture, maintain, extend the service life, as well as modernize and recycle manufactured products.

Almaz – Antey Corporation is one of the largest integrated associations of the Russian military-industrial complex, which includes more than 60 high-tech enterprises. The total number of employees of the Corporation is about 140 thousand people. The products of the Corporation are supplied to more than 50 countries of the world. 'Almaz – Antey Corp. has the right to conduct independent foreign trade activities in relation to military products, including the supply of spare parts, repairs and upgrades of previously supplied equipment.

The Corporation pays special attention to customer training, operation and maintenance of supplied equipment, offers after-sales service, repair, modernization and recycling.

/IA&TG/





Alexander Stolnikov

SAMS TOR-M2KM – AN AD ‘UNIVERSAL SOLDIER’

The Izhevsk Electromechanical Plant Kupol as a member of Almaz – Antey Air and Space Defense Corporation has presented a wide range of its defense products at the Aero India 2023 exhibition in the India, namely the Tor-E2, Tor-M2K, and Tor-M2KM SAM systems in three configurations: stationary, vehicle and semi-trailer mounted, as well as the Typhoon-AD combat vehicle of MANPAD anti-aircraft gunners. Full-fledged mockups of the products are demonstrated at Almaz – Antey's joint exposition.



The SAMS of Tor family are at the top of the best air defense systems in the world, having unparalleled performance characteristics. Combat vehicles boast fast deployment (3 minutes, a world record as of today) which allows to repel a surprise attack; high speed of airspace surveillance (1 antenna revolution per second that also makes it second to none) for prompt reaction in a fluid situation; fast acquisition-to-engagement reaction time standing at 5-10 sec that increases the probability of intercepting low-flying targets always detected after air threats flying at medium and high altitudes. Besides, the Tor-M2E, Tor-M2K, and Tor-E2 are the only short range AD systems in the world capable of firing on the move. Its high performance

characteristics have repeatedly been proven by numerous trials including those conducted by foreign customers, as well as in combat. It should be kept in mind that the Kupol company as a key developer and manufacturer of the Tor family sticks to a responsible marketing policy, always putting down the proven performance characteristics in ads and documents. Thus, record figures can be much higher and Tors have repeatedly demonstrated it in trials and combat.

A state-of-the-art member of the family, the Tor-M2KM, stand-alone combat module lacks chassis whatsoever. Due to this, the Tor-M2KM module is much lighter than the Tor-M2E combat vehicle (15 tones vs 37 tones), cheaper and has many features that are not available to wheeled and tracked versions.

In terms of its reconnaissance and firing capabilities the Tor-M2KM is fully compatible with the Tor-M2E. In one revolution of the antenna it can detect up to 48 targets at a range of 32 km, rank them according to the threat level, pick 10 most dangerous for auto tracking and engage simultaneously four of them. The reaction time from target detection to SAM launch is 5-10 seconds, with 3 sec spanning between launches. The maximum kill range and altitude is 15 km and 10 km respectively. The course parameter is ± 8 km. The system is capable of intercepting small targets with a RCS of below 0.1 m², flying at ultra-low altitudes (10 m and below). The radio-command method of guidance makes it possible to plot different target trajectories including diving, as well as to guide SAMs to the most vulnerable parts of the target. The Tor-M2KM's powerful radars are noted for their high accuracy that excludes firing one target with two SAMs and provides reliable jamming immunity. During trials in Greece Tors were not suppressed by NATO EW. Russian EW did not manage to overcome the SAMS, either.

The lack of chassis makes the Tor-M2KM a point defense asset of choice. One module can cover up to 176 km². When defending stationary assets such as military bases and airfields, the requirements for mobility of air defense facilities are significantly lower, thus the money saved on the chassis can buy more SAMs.

As the module can be airlifted by a helicopter, it can be placed in hard-to-reach places – in the mountains, on the roofs of buildings, etc. – where few SAMs will be able to get. Mounting the Tor-M2KM on rooftops for covering industrial clusters and other assets will enhance the acquisition range, reduce effect of such factors as the terrain and surrounding buildings and ultimately move the interception point to the far end of the envelope, something to consider when it comes to the protection against debris from downed air attack weapons, notorious for casualties and destruction. At the same time, the possibility of engaging low flying airborne threats is retained due to both the curvature of the

earth's surface and the fact that the Tor family SAMs can aim at targets in the lower hemisphere in a narrow, but sufficient sector at a negative elevation angle with the guidance sector provided from -5° to +85°.

Giving up the chassis does not translate into a complete loss of maneuverability. The Tor-M2KM module can be transported on any platform of suitable carrying capacity such as automotive chassis, semi-trailers, trailers, etc. Provided a 25 t crane is available its loading will take 10 min. Due to the shortest time of changing from travel into combat mode all Tors even considering time for loading/unloading have deployment time after position change at the level of modern Western short-range SAMS deployed in 10-15 minutes. That is, by Western standards, the Tor-M2KM remains a highly maneuverable SAMS!

The independent combat module is easily integrated with a suitable load-carrying platform. For example, the Tor-M2KM mounted on a KamAZ chassis is even superior to the base model in speed of movement on the paved road, although inferior in cross-country. Therefore, if necessary, the Tor-M2KM can easily change its role from point AD to troop covering.

Its deployment on the deck of a ship will transform the Tor-M2KM from land-based to ship-based. The feasibility of using the ICM in the maritime capacity has been repeatedly proven. First actual offshore firing the system carried out in 2016, from the frigate Admiral Grigorovich. During the trials the Tor-M2KM suc-



cessfully hit a high-speed and low-flying target. Thus, the module can be used to quickly build up the air defense capabilities of both individual ships and vessels, as well as naval escorts. For littoral countries the Tor-M2KM will prove to be an asset of choice in terms of ensuring the availability of air defense means on land and at sea.

Summing up the capabilities of the Tor-M2KM, it owes its versatility to the decision to abandon standard chassis in the design.

/IAATG/

The Izhevsk Electromechanical Plant Kupol as a member of Almaz – Antey Air and Space Defense Corporation is one of the leading enterprises of the Russian defense industry, a key developer and manufacturer of Tor family SAM systems. The plant also produces onboard equipment for surface-to-air missiles, provides services to the users, repairs and upgrades previously supplied SAMS. SAMS manufactured by Kupol are in service with the Russian Army and shore-based units of the Navy, as well as militaries of two dozen countries on three continents.



TMC: MILITARY-TECHNICAL COOPERATION WITH INDIA IN PRIORITY

Tactical Missiles Corporation (TMC) is one of the leaders in the world market of precision air, sea and coastal based weapons. The Corporation's products have proven their worth in real high intensity combat operations in various climatic conditions. The Corporation's share of the world market of precision aviation armaments is about 10%, and the share of naval armaments is up to 20%.

In 2022, the Corporation celebrated its 20th anniversary. During this time, its composition has expanded to four dozen enterprises, and the range of high-precision weapons produced and research topics have been signifi-

cantly expanded. At present we are developing our own technologies in the field of advanced structural materials, heat shielding, engines, guidance systems, and software. The principles of using artificial intelligence in control and target recognition systems are being improved.

Over the past two decades, the TMC has created more than 20 high-precision weapon systems. Well-proven missile systems have been replaced by new, upgraded models that often have no analogues in the world. In particular, in 2022 the hypersonic Tsirkon missile sys-

tem with anti-ship missile was successfully tested. Multipurpose frigate 'Admiral Gorshkov' equipped with Tsirkon missiles started its combat deployment on January 4, 2023.

Participation in the exhibitions, where the Corporation presents the updated model range of HPW, is given special attention. Among the novelties presented at the recent international air shows, it is worth noting the Grom-E product in variants of the Grom-E1 aircraft guided missile and Grom-E2 gliding munition, an upgraded version of the Kh-59MK anti-ship missile with a double-action warhead, the Kh-69 air-to-surface stealth high-precision aviation missile, the ET-1E electric torpedo.

Work continues on improving correctable aerial bombs, torpedo and mine weapons, coastal missile systems, port and coastal infrastructure protection, and radio-electronic systems.

One of the priority areas of work is the miniaturization of aircraft missiles. At the international forum 'Army-2022' a novelty was presented – the interspecific multipurpose missile of modular construction Kh-MD-E weighing 110 kg.

Military-technical cooperation with foreign partners is one of the key areas of the Corporation's activities. Fruitful and mutually beneficial activities in this area are carried out with more than a dozen countries.

India is among the most important and reliable partners. In the early 2000s, Indian military specialists were the first to evaluate the prospects of the new Uran-E shipborne missile system with the Kh-35E anti-ship missile and concluded a contract to equip Indian combat ships with it.

The joint Russian-Indian project to develop and produce BrahMos tactical missiles for land-, sea-, and air-based weapon systems is being successfully implemented. The participants in the BrahMos Aerospace Private Ltd enterprise, formed in 1998, are the NPO Mashinostroyeniya, which is now part of TMC, and the Defense Research and Development Organization of the Indian Ministry of Defense.

Boris Obnosov, General Director of the Corporation, always notes in his interviews the highest efficiency of this project, which was originally built on mutual respect of the partners for each other.

'I believe that the history of the BrahMos missile and the work of Russian and Indian colleagues within this enterprise is virtually a perfect example of successful cooperation in developing high-precision weapons,' emphasises the TMC head.

BrahMos missiles are in service with the Indian Air Force, Navy and Army, and a submarine variant has been developed. The anti-ship version of the missile has been successfully tested from a surface ship, and the supersonic long-range surface-to-surface missile was launched in November 2022 with a positive assessment.

Last year, the first export contract was signed for the supply of three battalions of BrahMos cruise missile-based coastal defence systems to the Armed Forces of the Philippines.

The company's designers have initiated the development of the new BrahMos-NG (new generation) aircraft missile. This will be a versatile missile for engaging not only mari-



time targets, but land targets as well. It will weigh half as much with the same range. The construction of the plant was started at the same time as the research and development work. In three to four years, the project should be completed and serial production will begin.

The success of this joint enterprise is unquestionable. Many countries have shown interest in BrahMos missiles, both the already proven and promising models. The company's order book currently stands at more than six billion dollars.

In addition to supplying advanced weapons to India, the corporation also implements after-sales service projects, trains Indian specialists and assists in the operation and repair of the products.

The Corporation pays considerable attention to the after-sales service of exported military products, which enables it not only to maintain, but also to strengthen its position in the global arms market.

The importance of this area is confirmed, in particular, by the fact that since 2005, when the parent company of the Corporation was granted the right to conduct independent foreign trade activities in relation to military products, the

volume of export of property and after-sales services has increased significantly. During this time, more than 50 foreign trade contracts have been executed for a total value of \$280 million.

In 2014, TMC started implementing the Long-Term After-Sales Service Programme for exported items until 2025, which provides for more than four dozen contracts with foreign partners, as well as a 25-35% reduction in the number of export product complaints. At the same time, the list of services related to after-sales service of previously exported military products is constantly expanding.

The Corporation aims to become an active partner in the 'Make in India' programme, both in terms of new HPW designs and after-sales services. In particular, a framework contract was signed with Ananth Technologies Private Limited to provide comprehensive after-sales services for the previously supplied products of the Corporation, including manufacturing of spare parts in India.

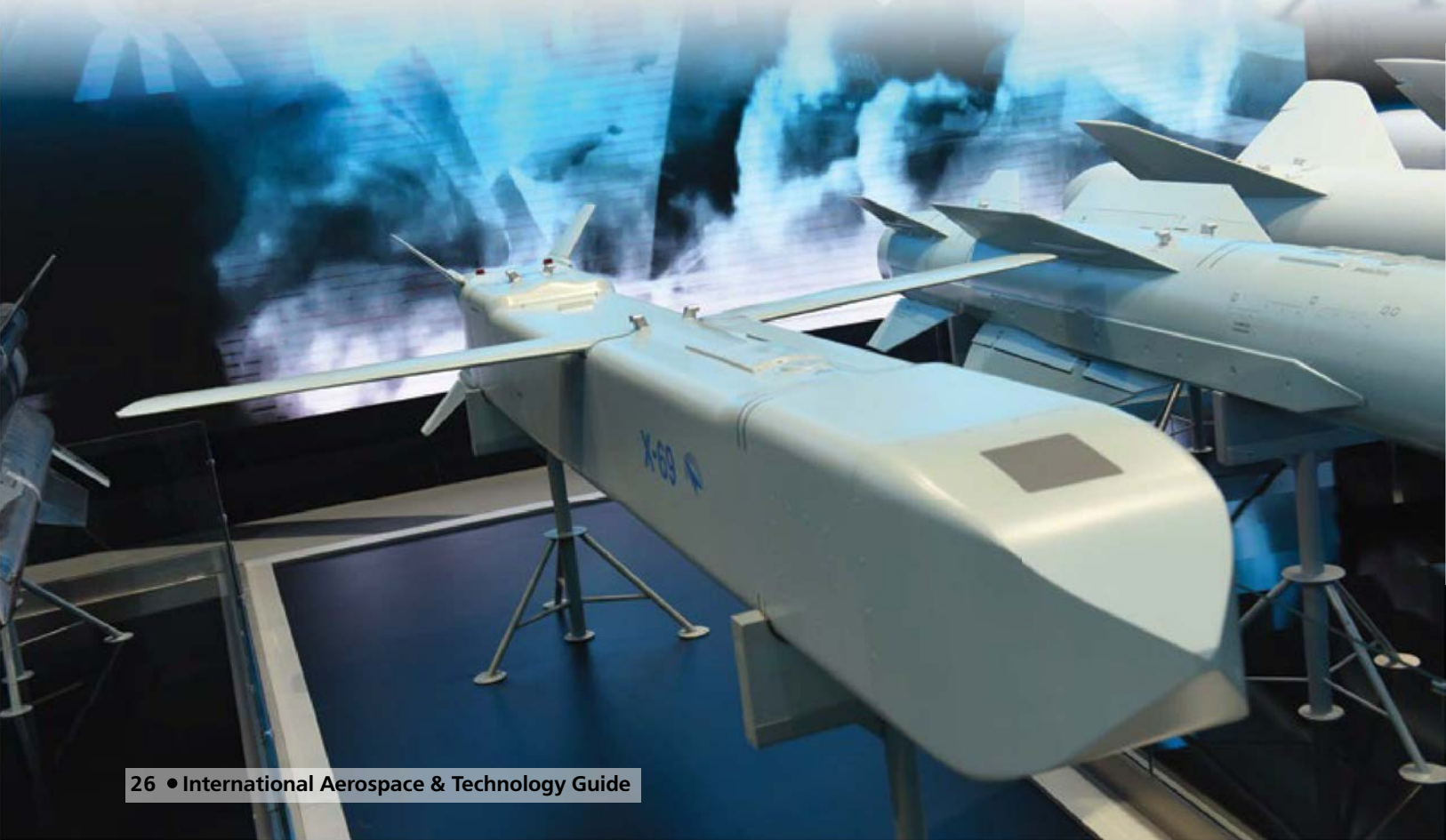
The Corporation appreciates the longstanding, fruitful and mutually beneficial experience of cooperation with India. TMC management intends to continue actively developing joint

promising, mutually beneficial projects with Indian partners.

The successful development of joint projects in the field of precision weapons between India and Russia once again confirms the correctness of the strategy chosen by the Corporation in the global arms market, aimed at mutually beneficial cooperation with foreign partners.

The corporation is implementing a policy to create more advanced high-precision weapons in order to increase range and speed of flight, increase combat load and interference immunity, all-weather and round-the-clock application, introduction of elements of artificial intelligence into the control system.

There is a firm belief that these new directions will form the basis for the further development of foreign economic cooperation and strengthen the security of our partners in military-technical cooperation. /IAATG/



UAC: NEW GENERATION TECHNOLOGIES

Highly intelligent, low-visible, supersonic – these are some of the basic requirements for a fifth-generation fighter

The Sukhoi Design Bureau, part of the UAC, developed dozens and hundreds of advanced solutions during the development of the Su-57 fighter jet. The result is an aircraft that can adjust to a pilot's level of training, has low radio, infrared, optical and sound visibility, more than 50% of its surface area consists of composite materials, and pilot equipment anticipates and parries overloads. However, all these new technologies and solutions have not only shaped the new machine, but also formed the criteria by which an aircraft is now referred to the fifth generation of military aircraft. They will also form the basis for new developments.

The Su-57 is traditionally referred to as a new generation aircraft. But what are the criteria by which a particular fighter could be classified as the fourth, fifth or even sixth generation? Of course, this division into generations is rather arbitrary. Each country has its own criteria for defining a generation of military aircraft. But it is possible to identify common characteristics that would indicate whether an air-

craft belongs to one generation or another.

When it comes to fifth-generation fighters, their distinctive features are the requirements for cruising supersonic flight. The second significant characteristic is the requirement for a lower level of radar, infrared, optical and acoustic signature compared to the previous generation aircraft. The fifth-generation aircraft also has requirements related to a set of onboard equipment. It is designed

according to the open architecture principle and allows the implementation of the principle of modularity in the construction of avionics. In addition, the new generation aircraft also have higher requirements for automation and intelligent crew support. Multi-channel onboard sensors provide the pilot with spherical situational awareness. As a consequence, the fifth-generation complex is becoming an element of a network-centric military command and control structure.

Everything has its own particularities

However, the creation of the new aircraft had its own specific requirements. The first thing that distinguishes the Su-57 from all other members of the family of fifth-generation aircraft in the world is its multi-functionality. The complex was required to meet both air-to-air missions, characteristic of an air superiority fighter, and air-to-surface strike capabilities, characteristic of a fighter-bomber.

If we compare the Su-57 with, for example, the F-22 Raptor, the American one was originally designed only as a fighter to gain air superiority. Its fighter missions dominate, occupying about 90% of the total number of applications. The other American fifth-generation aircraft, the F-35 Lightning II, on the contrary, was designed as a fighter-bomber with an emphasis on strike missions. Of course, each has some degree of versatility. But compared to the Su-57, this versatility is distributed, so to speak, less evenly between different types of tasks. The Su-57 fighter, on the other hand, is capable of performing fighter and attack missions in roughly equal proportions.

The second difference is that the primary focus of the F-22 in fighter missions is on long-range aerial combat. Therefore, it has prioritized low-visibility requirements and the ability to use intra-fuselage compartments to carry aerial weapons. For the Su-57, both are important. The Sukhoi Design Bureau had to find a compromise between all those requirements: ensuring low visibility for the aircraft to gain advantages in long-range aerial combat, but also implementing the principle of high maneuverability for close air-to-air combat. The result was a fighter with maneuverability no worse than the best fourth-generation machines.

Model with cut-outs

The Su-57's appearance alone makes it radically different from the fourth generation. After all, the new fighter was developed with low visibility in mind. The design incorporates the so-called stealth technology. Unlike

previous aircraft, the Su-57 airframe was initially developed to meet these requirements. Therefore, it has a characteristic shape with sloping sides, parallel edges and the like.

In addition, to ensure low visibility on the Su-57, the air-launched attack weaponry is housed in the aircraft's internal compartments. This too required a special approach to the fighter's design. One of the critical technologies that had to be implemented was the creation of the fuselage itself. It contains cut-outs for very large cargo compartments to accommodate air-launched attack weaponry. It was necessary to solve the problem of durability for the fighter's maximum overload. This is a rather unique thing. Neither domestic nor foreign aircraft had ever solved such a problem before.

The aerodynamic design of the Su-57 is unique, too. It features controls that have not previously been used on any aircraft. For example, a deflectable leading edge. 'It ensures stable and controlled flight of the aircraft at high angles of attack. At the same time, it is incorporated into the overall control system, allowing the aerodynamic quality of the aircraft to be improved when maneuvering.'

Metals/non-metals

Special mention should be made of the materials used in the construction of the Su-57. It uses traditional metal alloys, but there were innovations as well. For example, the Su-57's airframe has four times fewer parts than the Su-27's. This was achieved primarily through the machining capabilities of the high-performance machines, as well as through electronic prototyping in the development of the aircraft. As a result, there was a qualitative transition to large milled parts, and the number of fasteners and small parts was reduced. This allowed the design to be greatly simplified. According to production specialists, it has become much easier to assemble the aircraft, as large parts are coming in for assembly. Production of the aircraft is much faster.

As for the exterior surfaces of the Su-57, more than 50% of their area is made up of parts made of composite materials. It was composites that made it possible to make larger cladding elements, while reducing the number of fasteners and the number of conventional parts. New technological methods and ways of working appeared, which required additional technical equipment.





The Sukhoi Design Bureau's close ties with composite manufacturers, established in previous projects, facilitated the wide introduction of composite materials. For the Su-57, it was necessary to master the production of many new specific parts and use new materials. On the other hand, in using composites, the designers at the Design Bureau now have the opportunity to manage the properties of parts by changing the way the filler is stacked. In fact, it is possible to put the whole material in one direction, it is possible to put a part perpendicularly, it is possible to put it under 45 degrees. Combinations of these layouts determine the final properties of a part. So far composite materials have just one drawback: They're more expensive than metal. But as the market volume grows, the cost of composites will drop significantly to quite reasonable levels.



Before composite parts can be put into series production, a large number of full-scale samples have been tested. The suppliers are able to achieve full reproducibility thanks to the production process, strict adherence to technology and stringent oversight.

Discreetness is welcome

In manufacturing the Su-57's cladding panels, it was very important to meet the highest accuracy requirements and for another reason – surface quality has a major impact on visibility characteristics.

In addition, other special measures were also implemented. According to the director of the Sukhoi Design Bureau, these included, for example, the use of special radio-absorbing and radio-reflective materials. Shielding materials were also used, in particular on the antenna compartments. All on-board equipment, such as on the leading edges, was designed to ensure low radar visibility. Certain measures have also been implemented to reduce infrared signature. For example, engine emissions were shielded and purging of heat exchangers of on-board equipment is ensured.

There were also requirements to reduce optical visibility. These were met, among other things, thanks to the special coloring of the airframe. There were also requirements to reduce acoustic characteristics. If you compare the flights of, for exam-

ple, the Su-30SM, the Su-35 and the Su-57, the latter flies much quieter.

One for three

The Su-57 is a multifunctional machine. An increase in the number of tasks would have led to an increase in the pilot's workload. At the very beginning of work on the project, Sukhoi Design Bureau once jokingly calculated that a single-seat fighter of the fifth generation should have at least three people on board: one should be a pilot, the second an equipment operator, the third a flight engineer. But this did not happen. The main task required offloading the pilot from secondary functions. The combination of all the mathematical models enabled us to build the digital system in such a way that the human workload was minimized. But the decision-making is of course left to the pilot.

Digital systems appeared on Russian aircraft quite a long time ago. They were in various subsystems of the onboard complex. But the degree and depth of the tasks they solve have increased and become more complex with each time, with each generation. And when the Sukhoi Design Bureau was tasked with development of a single-seat multifunctional aircraft, this task came to the fore. Some of these solutions were tested on the Su-30MKI and Su-35. But the Su-57 was the pinnacle that was achieved. This aircraft has the entire flight deck digital.

Since the Su-57 is a multifunctional aircraft, it is equipped with a huge number of systems and subsystems operating in different frequency bands. The developers had a big challenge to manage all this complex. It was immediately obvious that with such a wealth of equipment, with such a saturated complex, one person would not be able to cope with it alone. On the one hand, we had multi-tasking, and on the other, multi-mode and multi-systems. A man on the Su-57 must be not so much of a pilot, and not so much of an operator, but a fighter. He has to work at the level of extraordinary decision-making.

Su-57 for each pilot

On the one hand, a fifth-generation fighter is a fairly sophisticated machine. But on the other hand, it should be able to be flown by a medium-trained pilot. This is why the Su-57 has several levels of automation. For the least trained pilots, the aircraft can solve all tasks by itself, but with average quality. For more trained pilots, it is possible to vary the systems with which a particular task is handled. The advanced pilots, however, can delve into the level of system mode control. This way, even an intermediate level pilot can operate this aircraft with a fair degree of efficiency. Over time, however, they will be able to increase their level and start using the Su-57's full capabilities in all situations.

Comfort and safety

The Su-57 is highly maneuverable and has a high cruising speed. But these characteristics also bring problems for the pilot: one has to endure high levels of G-force. Special measures had to be taken to make the pilot's job easier. For example, the chair in the Su-57 cockpit is installed at an angle of 22 degrees. This, too, makes it easier to endure G-force during the flight.

In addition, the logic of the Altitude Compensation Suit, which performs anti-G functions, has changed. Such a suit, when G-force is applied, pinches certain parts of the body, preventing blood from flowing in or out. The previous generation

suit reacted the moment the G-force was applied. The new suit works proactively. When a pilot just starts an action, commands the controls of the aircraft, the Altitude Compensation Suit is immediately activated in advance.

The aircraft's ejection seat has also been redesigned. It provides an escape in all modes: from parking on the ground, to supersonic cruising, as well as in all permissible maneuvers.



Prior to ejection, the seat creates a special pose for the pilot, which is necessary to protect him from the oncoming currents and to enable him to exit the aircraft safely.

The full picture at every point

Digitalization in the fifth-generation fighter program has also manifested itself in another way. The creation of the Su-57 has been significantly accelerated by the development of digital models. Since the start of the project, most of the work has been covered by mathematical modelling. At first, this approach was used to reduce the number of possible errors in the design, and later in the testing process.

Digital models have been used to solve many design tasks. For example, because of the requirement for versatility, the Su-57 had to be designed with an original airframe shape. Mathematical models made it possible to test a whole series of different variants of the aircraft shape.

Moreover, if the blowing in wind tunnels would have taken 1-2 years, the supercomputer modelling was complete in one week to one month. In addition, the mathematical model gave another important advantage: demonstrated a full picture at each point of the studied space or surface. This data proved to be a fertile material for engineers to make decisions.

Thanks to advances in mathematical modelling, it is now possible to

simulate all aircraft systems. This made it possible to apply the concept of digital twins for the Su-57 – to create an integrated digital model of the entire aircraft. Of course, digital twins are needed primarily to make it easier for engineers to understand complex processes. But they can also be used for other applications such as personnel training. After all, the digital twin is able to show what the sequence of operations should be in different situations.

At the basis of present and future is the groundwork

The story of the new technologies and solutions used in the fifth-generation fighter program could go endlessly. All of them did not emerge out of thin air, but were based on the experience and previous developments of both the lead developer, the Sukhoi Design Bureau, and all of its contractors. And all these technologies and developments will also form the basis of future projects.

/IAATG/

15 NEW RUSSIAN-MADE MILITARY PRODUCTS

Rosoboronexport (part of Rostec State Corporation) has added new Russian military products to its export catalog, expanding the range of weapons and military equipment promoted on the global market.

In 2022, Rosoboronexport has launched a global marketing campaign for 15 new military products developed and manufactured in Russia. Its export catalog was replenished with products for the Air Force, Navy, Ground Forces, Air Defense Forces as well as with UAV countermeasures. Market launch of new products significantly increases the competitiveness of Russian arms and strengthens the position of our country on the global market,' said Rosoboronexport Director General Alexander Mikheev.

Among the long-awaited novelties are the Orlan-30 UAV, Ballista remote-controlled weapon station module, Chukavin sniper rifle, UAV countermeasures systems, new underwater weapons, communica-

tions equipment, training simulators, motor and armored vehicles.

New Russian equipment and weapons for which export permits have been issued will be presented by Rosoboronexport at international defense exhibitions, during meetings and negotiations with partners, and on fast-growing digital platforms. The company has agreements with most manufacturers to jointly promote products in foreign markets.

The Orlan-30 unmanned aerial vehicle system developed and manufactured by the Special Technology Center is a further evolution of the Orlan-10 UAV, which is well known in the world market and has proved its capabilities in real combat conditions.

The Orlan-30 is intended for aerial reconnaissance, search, detection and recognition of objects in the

visible or infrared range. In addition, when equipped with a mission payload, it provides target designation for precision-guided weapons for destroying fixed and moving targets day and at night.

The Ballista remote-controlled weapon station is designed for mounting on armored personnel carriers. It is equipped with a 30-mm automatic cannon and a coaxial 7.62-mm machine gun as well as with two ATGMs. The station is fitted with a combined sight with a TV camera, thermal imager and laser rangefinder capable of detecting and identifying targets day and night. In addition, the Ballista is equipped with a backup sight, which significantly increases its combat capabilities.

Besides, the promotion of the BMP-3 infantry fighting vehicle (IFV) with a new remote-controlled



weapon station, developed by High Precision Systems holding company, has begun. The vehicle was unveiled as part of Rostec's exhibit at the Army 2022 International Military and Technical Forum.

The vehicle is equipped with a 100-mm gun/launcher, a 30-mm automatic cannon and a 7.62-mm machine gun. Owing to its powerful armament, the IFV is capable of providing fire support to infantry, including afloat, effectively engaging manpower, lightly armored targets like IFVs and APCs, tanks and other targets with enhanced protection, as well as low-speed air targets, including helicopters.

In 2022, Rosoboronexport added new drone countermeasures to its export catalog. Among others is the RB-504P-E electronic warfare system, which provides highly effective detection, identification, and direction finding of UAVs, as well as jamming of their navigation and control links.

Rosoboronexport has started promoting modern simulators developed by Rostec's subsidiaries for training the crews of the IL-78MK-90A tanker aircraft and the IL-76MD-90A(E) military transport aircraft. In addition, the company got the opportunity to offer foreign partners a new automated artillery fire control system, a radio signal monitoring system, a heliborne ground surveillance radar system, K-5350 motor vehicle with a protected cabin, Podlet-K1KE radar station, communications equipment and small arms.

'In 2022, thanks to comprehensive support of the President and the

Government of the country, as well as the active work of Rosoboronexport within the framework of the Russian Engineering Union's activities to improve legislation, a number of changes were made to the regulatory and legal framework in the field of military-technical cooperation, which have simplified the licensing procedures for launching new products in the world market. Legislative initiatives that optimize working processes, including when executing export documentation, were considered during meetings of the REU's Committee for the Development of Foreign Trade Activities in relation to military products,' added Alexander Mikheev, who holds the position of Deputy Chairman of the Russian Engineering Union.

/IA&TG/





IL-78MK-90A

Tanker aircraft

Versatile platform – inflight and on the ground refuelling or transportation of cargoes

Simultaneous inflight refueling of one heavy or up to 2 tactical aircraft and up to 4 aircraft on the ground. Apart from its main mission it can be converted into a transport aircraft or for execution of other missions.

IL-78MK-90A tanker is intended for in-flight refueling of different types of aircraft by means of three aerial refueling pods and can perform fuel distribution on-ground.

The aircraft may perform the take-off and landing from/on the paved and unpaved airfields.

In operation conditions during few hours the IL-78MK-90A can be converted and be employed as a transport aircraft for transportation and airdropping of vehicles, cargoes and paratroopers.

Main characteristics

- ◆ Max takeoff weight, t..... 210
- ◆ Transferable fuel inflight at a distance of 1000 km, t..... 78
- ◆ Inflight refueling speed, km/h 450-600
- ◆ Refueling pod transfer capacity inflight, l/min..... up to 2.500
- ◆ Maximum payload in transport version, t 60
- ◆ Flight range (with 60 t payload), km 4.000
- ◆ Number of transported troops / in a double deck version (in a transport variant)..... 145/225



Learn more about IL-78MK-90A aircraft
e-mail: roe@roe.ru
www.roe.ru



Su-57E

Perspective multirole fighter

Multifunctional 5th generation aircraft system for execution of a wide range of combat tasks

Unique features of the 5th generation fighter provide covertness of combat operation due to low signature level in the radar field, ensure continued supersonic cruise flight, solve the whole range of fighter and strike tasks that are assigned on tactical aviation.

Su-57E Perspective multirole fighter is designed for execution of a wide range of combat tasks while operating against aerial, ground and surface targets day-and-night with the use of the up-to-date progressive guided and unguided weaponry. The fighter

is equipped with the most advanced avionics suite, armament and self-defense complexes. Advanced intelligent support of the fighter and high level of automation ensure effective piloting of the aircraft and execution of the whole range of combat tasks with one pilot.



Learn more about Su-57E fighter
e-mail: roe@roe.ru
www.roe.ru





Mi-171Sh

Military transport helicopter

Up-to-date configuration of the legendary helicopter

The most modern version of the Mi-17 military helicopter with the improved flight and operational characteristics, high survivability and flight safety as well as powerful unguided and guided armament complex.

Mi-171Sh military transport helicopter is designed to perform delivery of manpower, transportation of cargoes and materials inside the cargo cabin or on the external sling as well as for airdropping of tactical troops, airlanding of reconnaissance and sabotage groups and destruction of ground objects.

The helicopter can be operated for medical evacuation, delivery of the emergency medical healthcare onboard, provision of the search and rescue missions in combat conditions. Mi-171Sh features high transport capabilities, it can be effectively employed in special operations, it is self-sufficient and has an out-of-hangar storage capability.

Main characteristics	
♦ Max takeoff weight, kg	13.500
♦ Max external payload weight, kg	4.000
♦ Max speed, km/h	280
♦ Service ceiling, m	6.000
♦ Range, km:	
with main fuel tanks	610
with two internal additional fuel tanks	1065
♦ Cargo cabin volume, m³	23
♦ Paratroopers carried in cargo cabin	37



Mi-28NE

Combat helicopter

Flying tank

Fulfillment of combat tasks in the interests of army aviation with high efficiency, thanks to powerful armament complex and a combat survivability improvement set of means.

The Mi-28NE is designed for round-the-clock search and engagement of enemy's manpower, armored and non-armored equipment at the frontline and in tactical depth, destruction of enemy's air attack low-speed targets as well as for cover and fire support of tactical landing troops.

The helicopter has high combat survivability in the air due to effective armor protection of critically important systems and aggregates. It shows efficient protection against portable SAM with multi-specter thermal homing warheads owing to helicopter fitting with ECM system.

Mi-28NE can be applied in mountainous, hot and humid climate conditions, moreover, it provides capability of landing on unpaved sites that are located at the altitudes of up to 4000 m.

Main characteristics	
♦ Max takeoff weight, kg	12.100
♦ Maximum payload, kg	2.100
♦ Max speed, km/h	315
♦ Service ceiling, m	5.600
♦ Flight range (internal fuel tanks), km	425
♦ Armor protection weight, kg	300





Ka-52

Combat scout-attack helicopter

Aerial leader

Highly-maneuverable helicopter is armed with powerful armament complex and is capable to execute any combat task with high efficiency.



Ka-52 Combat Scout Attack Helicopter is designed for destruction of tanks, armored and non-armored vehicles, enemy's manpower and adversary helicopters in the front line or in tactical depth. The helicopter provides transfer of target reconnaissance, target distribution and target designation data to interacted helicopters and command posts of Ground Forces.

Ka-52 has a high combat survivability and combat power, it can be operated round-the-clock, it has a wide range of aerial weapons and high It is the only helicopter in the world that is equipped with the Ejection & Shock absorbing System.

Main characteristics

- ◆ Normal takeoff weight, kg 10.400
- ◆ Max speed, km/h..... 300
- ◆ Maximum climb-rate, m/s 16
- ◆ Service ceiling, m 5.500
- ◆ Hovering ceiling, m 3.800
- ◆ Range (with internal fuel tanks), km 460



Ka-226T

Day/night light multipurpose helicopter

Mission and primary tasks

The Ka-226T day/night light multipurpose helicopter is designed to conduct aerial reconnaissance and targeting, patrol, drop small reconnaissance and sabotage groups, transport cargo and passengers, and evacuate the wounded.

The baseline helicopter can accommodate a variety of modules with special equipment.

The helicopter can be converted into one of the following versions: patrol; search & rescue; medical; transport/freight; passenger; corporate.

Airborne equipment

The Ka-226T's airborne equipment provides safe flight control both along air routes and in off-the-airway regulated and unregulated airspace, day and night, and in adverse weather conditions. Lighting equipment of the Ka-226T's cockpit enables the pilot to fly the helicopter at night, including using night vision goggles. The effectiveness of patrol and search missions at night can be enhanced by using TV/thermal imaging equipment. The helicopter can carry various types of special and optional equipment.

Main advantages

- ◆ operability in any geographical and climatic conditions, day and night, and in adverse weather conditions;
- ◆ versatility (module replacement takes two hours);
- ◆ compactness that enables landings on unprepared small-sized sites;
- ◆ high hovering accuracy, including during rescue operations;
- ◆ high hovering ceiling;
- ◆ excellent maneuverability and handling;
- ◆ easy operation and low maintenance;
- ◆ maximum safety and single-engine flight and landing capability.

Main characteristics

- ◆ Max takeoff and landing weight, kg..... 3600
- ◆ Max internal payload, kg 1000
- ◆ Max external payload, kg 1300
- ◆ Max rate of climb at sea level, m/s 9
- ◆ Cruising speed, km/h..... 209
- ◆ Range, sea level, ISA (+15 °C), full main fuel tanks and 20 min fuel reserve, km 430
- ◆ Hovering ceiling with flight weight of 2,800 kg, ISA (+20 °C), m.....6000
- ◆ Rotor diameter, m.....13
- ◆ Fuselage length, m.....8,580
- ◆ Helicopter width, m3,225
- ◆ Helicopter height, m4,185
- ◆ Crew.....1-2
- ◆ Powerplant:
TypeArrius 2G1
number × takeoff power, hp.....2×500





S-350E ‘Vityaz’ Air Defence Missile System

EFFECTIVE. MULTICHANNEL. MULTI-ANGLE

The S-350E ‘Vityaz’ air defense missile system possesses high tactical and technical performance characteristics, allowing it to be used for the defence of administrative, industrial and military facilities from massive strikes of modern and advanced air attack weapons.

The air defence system is capable of simultaneously repelling strikes of various types of air attack weapons from any direction (circular mode) in the entire range of altitudes of their flight – from extremely low to high altitudes.

Types of engaged aerodynamic targets:

- ♦ aircraft of tactical and strategic aviation, including those made using the Stealth technology;
- ♦ cruise missiles;
- ♦ helicopters;
- ♦ unmanned aerial vehicles;
- ♦ aviation weapons.

Types of engaged ballistic targets:

- ♦ tactical ballistic missiles;
- ♦ operational-tactical ballistic missiles.

Main characteristics

Range of engagement (max / min):	
aerodynamic targets:	
SAM 9M96E2	120 / 2.5 km
SAM 9M100E	15 / 1.5 km
ballistic targets with SAM 9M96E2	25/5 km
Altitude of engagement (max / min):	
aerodynamic targets:	
SAM 9M96E2	25 / 0.01 km
SAM 9M100E	8 / 0.01 km
ballistic targets with SAM 9M96E2	20/2 km
Maximum speed of engaged targets	
2000 m / s	
Maximum number of simultaneously:	
engaged aerodynamic targets	16
engaged ballistic targets	12
guided missiles at aerodynamic targets	32
guided missiles at ballistic targets	24



‘Tor-M2E’ ('Tor-M2K', 'Tor-M2KM') Air Defence Missile System *Each missile hits the target*

Short-range mobile multi-channel ADMS with high probability of hitting air targets.

The anti-aircraft missile system has the following modifications:

- ♦ ‘Tor-M2E’ – on the tracked base chassis;
- ♦ ‘Tor-M2K’ – on a wheeled base chassis;
- ♦ ‘Tor-M2KM’ – in a modular design.

ADMS is distinguished by high firepower, noise immunity, short time for putting into combat readiness and the possibility of autonomous use of a combat unit. ‘Tor-M2E’ (‘Tor-M2K’, ‘Tor-M2KM’) air defense missile system is designed to defeat fixed- and rotary-winged aircraft, aerodynamic unmanned aerial vehicles, guided missiles, and other elements of precision munitions at medium, low and extremely low altitudes in contested air and jamming environment.

Main characteristics

- ♦ Firing distance to aerial targets:
 - range 1000-15000 m
 - altitude 10-10000 m
 - course up to 8000 m
- ♦ Number of simultaneously engaged targets4





SPARS® – BRAND NEW CIVIL HIGH-RISE EMERGENCY ESCAPE&RESCUE TECHNOLOGY SOLUTION (by SRS Ltd. Company, RUSSIA) summary



The Russian private engineering Space Rescue System Ltd. (SRS Ltd.) company (www.cosmic-rs.com) has created, tested and validated an unrivaled Civil High-Rise Self-Escape&Rescue Technology Solution (method and devices) based on brand new type of Inflatable Back-Pack Catapult-Chute-Damper capsule – **SPARS®**

SPARS® forefront technology solution could provide for an untrained civil person (weight 45-150 kg; age 18-75) an ability for rapid catapult escape (3-5 min) and secure parachuting descent from nearly any high elevation objects (skyscrapers, high-rise buildings, towers, cranes,

offshore platforms, wind-turbines, high-board ocean ships etc.) starting from 10 till 1000+ m height and injury-free safe landing on any obstacles on the ground or on water in case of emergency when traditional evacuation methods are impossible.

To certain extend it may be considered as an alternative guaranteed ‘last resort escape & rescue mean’ – a ‘must have’ commodity product for those who are living or working at heights all around the Globe.

SPARS® innovative technology development has been conducted based on modern aerospace concepts started from a very idea up-to the level of pilot batch of validated and fully operational real scale MVP-



General Specifications

- 1. Total Assembly Mass – 25 kg (55.1 lbs)
- 2. Rescue Payload Mass – 45÷150 kg (100-330 lbs)
- 3. Descent Elevations – 5÷1000+ m (16.4-3280 ft)
- 4. Landing Velocity – 5,2÷7.1 m/s (17.0-23.3 ft/s)
- 5. Landing Angle – < 30°
- 6. Footboard Barrier Elevation - 1,5 m (7.38 ft)
- 7. Descent Time – 3÷200 s
- 8. Launch Initialization Time – 10÷12 s
- 9. Gas Filling System – air-injection type, 2 cascade, autonomous
- 9. Inflated Gas – Air, 3000 Psi, 4 Lt (1.2 gal)
- 10. General Dimensions:
 - a. In Assembly Mode - 900x450x350 mm
 - b. In Descent Mode - 6500x2700 mm (without canopy)

Descent Actual Personal Affecting External g-Loads

- Actual Launch g-Loads:**
Acceleration directions -
«back-chest» – up to 2÷3 g
- Actual Landing Impact g-Loads:**
Acceleration directions -
«chest-back» – up to 4÷8 g
«side-side», «head-pelvis» - up to ± 4g
- Acceleration Exposition Time** – less than 0,5 s
Acceleration Growth Velocity – less than 500 1/s

Potential Users
Untrained Civilian Personnel age 18-75

devices (technology demonstrators) certified by the Russian State Ministry – EMERCOM.

Eventually one can say that new class of civil back-pack inflatable catapult-parachuting-damper escape-rescue capsule was created. It hasn't got world direct analogues yet and could resolve one of acute problems of the live-saving industry.

SPARS® Intellectual Property rights were protected by 5 TMs and 28 PCT international patents of invention in 20 countries.

Now the SRS Ltd. is looking forward for a Strategic Investor or a Specialized Industrial Partner to industrialize the **SPARS®** technology solution in order to enter with brand new patented **SPARS®** products/services into global market with estimated capacity in commercial B2B, B2C and B2B2C segments of \$3.7-4.3 Billions.

/IAATO/

RUSSIA-INDIA MILITARY COOPERATION THROUGH THE EYES OF THE INDIAN MEDIA

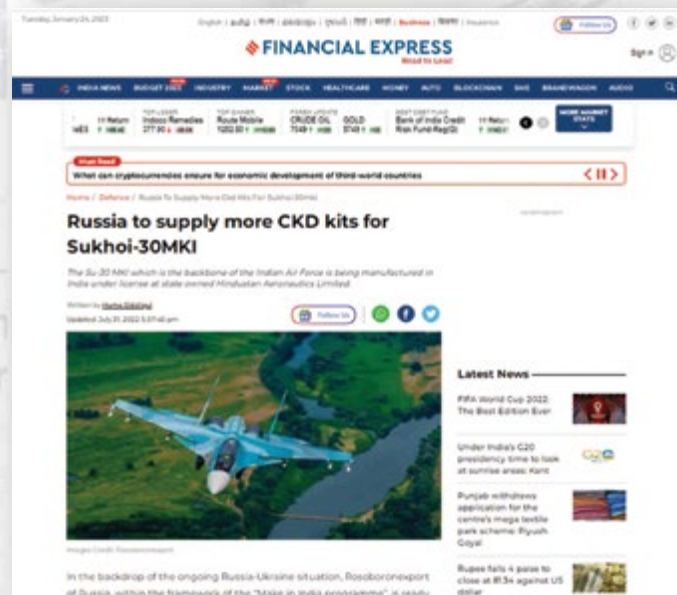
Aero India expo traditionally is a major ground for demonstrating Russia's aerospace industry's latest developments. Russia is the major defense partner of India with large-scale projects (unequalled by other countries) implemented by Moscow and Delhi. For Moscow and Delhi, the Bangalore airshow has always been a perfect ground for discussion of the on-going and future programs.

Rosoboronexport: 'Russia and India continue to implement military-technical cooperation projects. Their current and future programs are maximally focused on technological cooperation, including on the basis of joint ventures, in the format of licensed production and joint R&D projects. Rosoboronexport aims to cooperate on terms of transfer of technology put forward by the Indian side and in accordance with the Make in India initiative.'

The prospects and developments in Russia-India military cooperation are being constantly analyzed by both mainstream and specialized military media and expert community of India. Here is an overview of this coverage since Aero India 2021.

Aero India 2021

At the Aero India 2021 Russian Rosoboronexport exhibited over 200 military products, including the models of 5th generation multi-role fighter Su-57E, multi-role supermaneuverable fighter Su-35, two-seat multi-role frontline fighter MiG-35D, military transport Il-76MD-90A(E), aerial refueling tanker Il-78MK-90A, light multi-purpose helicopter Ka-226T and anti-aircraft missile and gun system Pantsir-S1, reported the **Aeromag**. Besides, Rosoboronexport also demonstrated vehicles Typhoon K-63968, Typhoon K-53949 and protected field ambulance Linza.



'Russia and India have been maintaining and building up mutually beneficial strategic partnership. Military and technical cooperation between our countries is expanding every year. It is very important for us to have such a strong and reliable partner on the global stage as India. Rosoboronexport is ready to cooperate with India in all areas,' said Rosoboronexport's Director General Alexander Mikheev during Aero India 2021.

'Increased attention is expected towards Radar P-18-2 Prima, which is a newly-designed product of Russian defence industry, exhibited abroad for the first time ever. The radar is capable of effectively detecting present-day and future low-signature aerial targets, including the ones, produced with the use of stealth technologies. Traditionally, Russian air defence and electronic warfare systems are in high demand in the region. They include anti-aircraft missile systems Viking, Buk-M2E, Tor-M2E in various configurations, man-portable air defence system Igla-S, as well as assets to counter unmanned aerial vehicles, including the Repellent electronic warfare system against small-size UAVs,' added the Aeromag.

Milestone for Sukhoi Combat Aircraft

The 2022 year marked the 45th anniversary of the maiden flight of the Su-27 fighter prototype which has been developed by the Sukhoi Experimental Design Bureau. The milestone was actively covered by the media in India.



'Rosoboronexport of Russia, within the framework of the Make in India programme, is ready to supply additional completely knocked down kits for the assembly of the Su-30MKI. The Russian export agency is also ready to carry out joint work on the modernization, including the integration of the latest air weapons, avionics, etc., on the Su-30 MKI. The Su-30 MKI which is the backbone of the Indian Air Force is being manufactured in India under license at state owned Hindustan Aeronautics Limited (HAL). And under the existing portfolio of aviation projects, the Russian company is also involved in developing technological cooperation in a broad range of areas,' wrote **Financial Express** in Russia to supply more CKD kits for Sukhoi-30MKI article.

The article emphasized, that because of an open architecture of avionics and weapons systems, the foreign customers are able to integrate locally made air-launched weapons and also systems to customize the Sukhoi fighters as per their requirement.

Key advantages of Su fighter jets: super-maneuverability that gives a clear edge in close air combat, enabling the Su aircraft, inter alia, to disrupt retaliatory missile attacks; powerful missiles and rockets plus a 30 mm autocannon; autonomous basing and in-flight refueling capability; open architecture of the avionics and weapons systems.

The **DefenseMirror.com** also celebrated the first flight of the Su-30MKI which took place on July 1 1997.

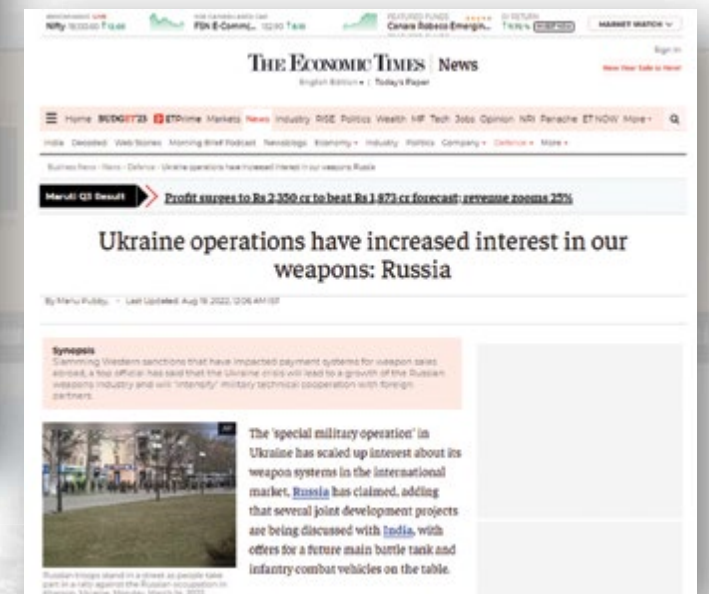
'On July 1, 1997, the first flight of a prototype of the Su-30MKI fighter took place under the guidance of test pilot V.Yu. Averyanov. The Su-30MKI program, which includes the phases of development, delivery and organization of licensed production of aircraft, has become one of the most successful programs of the Russian military-technical cooperation. In the course of numerous international exercises, pilots of the Indian Air Force (IAF) flying Su-30MKI fighters repeatedly achieved victory in training battles with modern combat aircraft of other types, UAC claims,' wrote DefenseMirror.com.

ARMY-2022

The Army-2022 International Military and Technical Forum expo in Russia also found significant coverage in the Indian media.

'The special military operation in Ukraine has significantly increased the interest of foreign partners in Russian weap-

ons. Many of them evaluated their effectiveness in combat use. They were once again convinced of the high quality, reliability, durability and maintainability of Russian military products,' the **Economic Times** quoted Dmitry Shugaev, head of Russian Federal Service for Military-Technical Cooperation (FSMTC).



'Shugaev said that cooperation with India could include jointly producing 'various types of equipment and weapons' for sale in third countries as well. The emphasis is on setting up the production of weapons and military equipment of Russian design in India and conducting joint R&D,' wrote the Economic Times.

The **Print**: 'Underlining it is the only country in the world which can actually do a complete Transfer of Technology (TOT) in hi-tech defence equipment, Russia has said it wants to build the next generation armoured vehicles and submarines in joint collaboration with India.'



The **Aviation & Defense Universe** reported during the expo, that Rosoboronexport was hosting more than 70 delegations from 50 countries representing various regions of the world during the 8th ARMY 2022 International Military-Technical Forum.

Aviation & Defense Universe: 'In 2022, for the first time, the most advanced weapons will be concentrated in Rosoboronexport's demo zone, a specialized outdoor display area near the company's pavilion. Participants and guests of the Forum will be able to get acquainted with the T-14 Armata MBT, Sprut-SDM1 light amphibious tank, K-17 Boomerang wheeled infantry fighting vehicle, Medved and Tigr wheeled armored vehicles in various versions, as well as the Tor-E2 SAM system and the RB-504P-E Silok EW system which have proved effective against unmanned aerial vehicles. Of great interest will be Russia's Orlan-10E multifunctional unmanned aircraft system (UAS), which has proved its high effectiveness in practice, new generation Orlan-30 UAS with a multifunctional EO mission payload, as well as the Kub-E loitering munitions, exhibited in Rosoboronexport's outdoor display area.'



'The company offers its partners a broad range of products, systems and solutions for establishing armament systems for state law enforcement agencies, many of which have a real combat track record. In addition, Rosoboronexport is ready to implement joint projects on the development and production of promising types of weapons, technology transfer. Russia remains a reliable business partner open for technology cooperation with foreign customers,' quoted the Aviation & Defense Universe Alexander Mikheev.

The **Indiandefenceindustries.in** reported, that Rosoboronexport conducted a live demonstration of Russian armored vehicles and



air defense systems at the Alabino Training Ground according to a scenario developed by the company jointly with the Ministry of Defense of the Russian Federation.

'Nineteen pieces of equipment, including the BMD-4M airborne assault vehicle, K-17 Boomerang IFV and the BTR-82AT APC, demonstrated their running and firing capabilities in nine tactical episodes.'

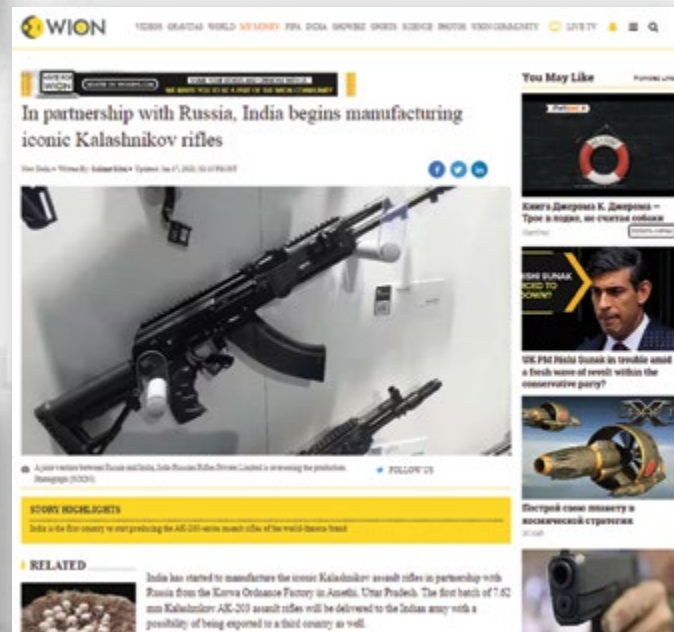
During the ARMY-2022 expo Rosoboronexport and Uralvagonzavod signed a joint action program to promote products and services abroad.

Indiandefenceindustries.in: 'The program is aimed at coordinating the marketing efforts by both companies in external markets to promote modern Russian armored vehicles, missile, rocket and artillery weapons and interact with foreign customers on modernization and maintenance of the earlier supplied weaponry and military equipment.'

Kalashnikov rifles for India

January 2023 Rosoboronexport announced, that production of AK203 Kalashnikov assault rifles had started in India.

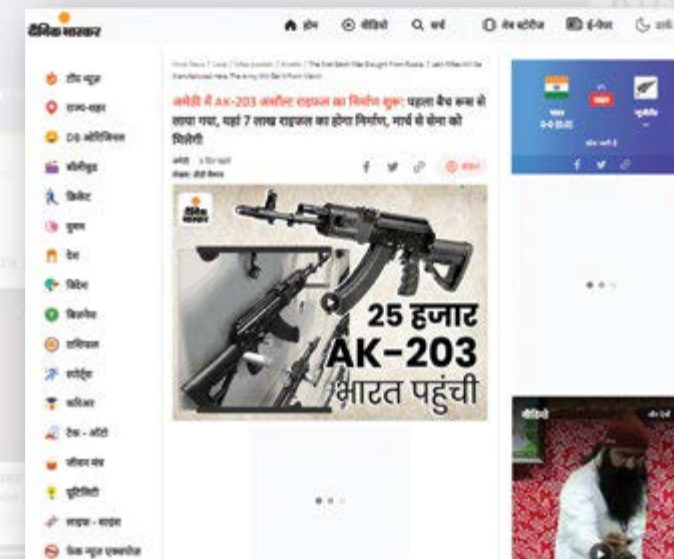
'A joint venture between Russia and India, Indo-Russian Rifles Private Limited is overseeing the production. The company registered and located in India is a joint venture between Rosoboronexport, Kalashnikov (both are subsidiaries of the Rostec) & Ordnance Factory Board (OFB). The joint venture plans to focus on 100 per cent localization of AK-203 rifles in India as part of New Delhi's 'Make in India' policy. India is the first country to start producing the AK-200-series assault rifles of the world-famous brand,' reported WION.



The Hindi-language **Dainik Bhaskar** newspaper reminded, that the foundation stone of the factory in Korwa was laid by Prime Minister of India Narendra Modi in 2019.

Dainik Bhaskar: 'Apart from the army, enforcement agencies in India will be equipped with AK-203 assault rifles. Aside from that, this joint venture will be able to export this rifle to other countries. India will become the first country to produce the AK-203 series assault rifle.'

The **Hindu** stressed, that the joint venture plans to ensure 100% localization of the production of AK-203 rifles in India and in future



may also increase output and upgrade its production facilities to manufacture advanced rifles.

'With the launch of series production of Kalashnikov AK-203 assault rifles, high-quality, convenient and modern small arms will begin to enter service in India's defence and law enforcement agencies,' quoted the **Print** Sergey Chemezov, Rostec Corporation CEO.

The AK-200-series assault rifles have retained all the advantages of the traditional AK scheme: reliability, durability and ease of maintenance. At the same time, they fully meet the latest requirements for firearms in the world in terms of ergonomics and the ability to mount high-tech additional equipment.

Light tank for India

The Hindu in its October 2022 Russia joins race to supply light battle tanks to Indian Army article analyzed the advantages of the Sprut-SDM1 light amphibious tank. The Sprut-SDM1 is the only light amphibious combat vehicle in its class having the firepower of the main battle tank and equipped with a 125 mm tank gun. The ammunition produced in India for T-72 and T-90 tanks can be used by the Sprut-SDM1. The Sprut can cross water obstacles and fire its gun while afloat, disembark from a ship, and operate day and night on terrain – in the high mountains in conditions of thin air, at very high and low temperatures. The tank is equipped with a guided missile system designed to defeat armoured targets.



The **Indiandefenceindustries.in** in its 2022 analysis piece also underlined the unique capabilities of the Sprut-SDM1.

'The much required light tanks tender for the high mountains is getting juicy offers. The front runner Russia has offered its air-droppable, amphibious, sea swimming, Sprut SDM1 light tank to India. It is relevant to mention that the Sprut shares commonality of firepower with Russian Tanks T-90 and T-72 operational with the Indian Army. All three tanks are armed with 125mm guns. The commonality in ammunition reduces the logistic burden as the same ammunition can be used by all three tanks and no requirement for separate stock management which adds a significant burden in terms of manpower, budget and storage space.'



The Sprut-SDM1 light tank is intended for fire support of units fighting against heavily armoured materiel, destruction of enemy strongholds and fortifications, battle reconnaissance and combat security.



'Armed with the automated digital fire control system, Sprut can recognise and destruct targets both on the move and at the halt, in low visibility conditions, day or night. Without refueling Sprut-SDM1 can cover a distance of 500 km, be transported by military transport aircraft and landing ships, parachuted with a crew inside the vehicle. It is capable of disembarking from a ship. Given all these capabilities, it is near to a perfect armoured gun system for all those areas and terrain which are not suitable for main battle tanks,' concluded the Indiandefenceindustries.in.

/IA&TG/

INTERNATIONAL AEROSPACE, MILITARY, NAVY AND TECHNOLOGY GUIDES

In 2023		
ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
'GUIDE' №01 (73)	January 20th	AERO INDIA 2023 (February 2023, India, Bangalore)
'GUIDE' №02 (74)	February 05th	IDEX 2023 / NAVDEX 2023 (20-24.02.2023, UAE, Abu Dhabi) <small>Special analytical export project of the United Industrial Publishing № 01 (69), February 2023</small>
'GUIDE' №03 (75)	March 25th	LAAD 2023 (11-14.04.2023, Brazil, Rio de Janeiro)
'GUIDE' №04 (76)	April 10th	IDEF 2023 (09-12.05.2023, Turkey, Istanbul) <small>Special analytical export project of the United Industrial Publishing № 01 (69), February 2023</small>
'GUIDE' №05 (77)	May 05th	LIMA 2023 (23-27.05.2023, Malaysia, Langkawi)
'GUIDE' №06 (78)	May 12th	IMDS-2023 (21-25.06.2023, Russia, Saint Petersburg)
'GUIDE' №07 (79)	June 10th	PARTNER 2023 (27-30.06.2023, Serbia, Belgrade)
'GUIDE' №08 (80)	July 10th	MAKS-2023 (18-23.07.2023, Russia, Moscow)
'GUIDE' №09 (81)	August 08th	ARMY 2023 (14-20.08.2023, Russia, Moscow)
'GUIDE' №10 (82)	August 20th	Securex Uzbekistan 2023 (06-08.09.2023, Uzbekistan, Tashkent)
'GUIDE' №11 (83)	October 20th	Defense & Security 2023 (06-09.11.2023, Thailand, Bangkok)
'GUIDE' №12 (84)	October 25th	Dubai Airshow 2023 (12-16.11.2023, UAE, Dubai)
'GUIDE' №13 (85)	November 20th	EDEX 2023 (04-07.12.2023, Egypt, New Cairo)

The 'Russian Aviation & Military Guide' is English-language international magazine distributed all over the world.

The 'Russian Aviation & Military Guide' magazine subscription can be ordered after any issue of the magazine with the delivery anywhere in the world. The price of any one issue of the magazine is \$8,88 plus the cost of postal delivery.

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