# RUSSIAN AVIATION & MILITARY GUIDE

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**The best defense innovation for Europe and Asia**

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## EDITORIAL

## Russia is a reliable partner

Political situation in the world 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 non-ending crisis — all of this leads to an unstable and dangerous situation. One can predict raise of defense means market in times like this. But together with developing of defense technologies in order to secure people's safety, rivalry among sellers of weapons and defense systems increases in order to achieve such goals as increasing profits and market share.

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

Valeriy STOLNIKOV

## DELIVERY TO SWITZERLAND

Shvabe completed its first delivery to Switzerland. The holding company delivered its new customer fixed and variable magnification collimator sights and brackets to mount them. Cooperation with their Swiss partner is carried out under the contract signed in June 2016. The first batch of hunting and target shooting instruments was shipped to Switzerland in early August 2016.

'The Swiss market of sight devices is quite large and of great interest for the holding company's enterprises. I am certain that products from Shvabe, which fully comply with international standards, can make a space for themselves in this market,' Deputy Director of Shvabe Dmitry Zhidkov reported.

Currently, Shvabe produces sights delivered to 21 countries of the world. As the holding company's press report states, cooperation is most active with companies in Italy, Canada, Poland, Finland and France.

We remind readers that this year at the Innoprom 2016 fair Shvabe representatives held more than 200 meetings on future cooperation. Following the talks, the holding company can now increase its medical equipment, sights and others export volumes to India, China and Uganda as early as in 2016, and also bring its partnership with Korea and Switzerland to a new level.

Shvabe unites Russia's top companies in the optical and electronic industry — a total of 64 companies. The holding company is a designer and manufacturer of hi-tech optical and electronic systems and complexes, optical materials, medical equipment, energy-saving light engineering and other products.

## FIRST OVERSEAS OFFICE IN CHINA

JSC Sukhoi Civil Aircraft (SCAC) announces the company's plans to open its first overseas client liaison office. Beijing office is the first step taken to implement the business strategy focused on the brand's global marketing and setting up corporate offices in other key markets.

Beijing office, scheduled to be opened by the end of 2016, will specialize in marketing, promotion, certification and arrangements for financial support of Sukhoi Superjet 100, Sukhoi BusinessJet and SportJet by Sukhoi aircraft sales.

Objectives set for the liaison office will also include the creation of maintenance depot, as well as the projects related to industrial cooperation with Chinese companies. The client liaison office will be building up relationships with local leasing air companies and carriers.

SCAC's first overseas office will be headed by Mr Lee Li who has more than 15 years of professional experience in the aviation industry and has held executive positions in such companies as Embraer, General Electric Aircraft Engine, Sparkle Roll Aviation Group, etc. The Chinese office will report to SCAC's headquarters in Moscow.

Launch of SCAC's first overseas office is the first step taken to implement the brand's global marketing strategy. In the years to come SCAC plans to open a number of new client liaison offices in other key markets.

Ilya Tarasenko, President of JSC Sukhoi Civil Aircraft: 'We're opening our corporate office in China as a part of SCAC's commercial strategy, in particular aimed at international key markets. China is a highly promising commercial aviation market and its potential grows year by year. Today Sukhoi Superjet can lay claims to becoming one of the most sought-after regional jets in China.'

## NEW WIDE-BODY AIRCRAFT

This summer during the official visit of Vladimir Putin, the President of Russia, to China a number of documents on the program of new wide-body long-haul passenger aircraft were signed. In particular, an agreement on cooperation in the joint development, manufacturing, commercialization and after-sales support of the wide-body long-haul passenger aircraft was signed between the Russian Federation and the Government of the People's Republic of China.

Also during the visit a contract on the establishment of a joint venture to implement the program was signed. On behalf of the United Aircraft Corporation (UAC) the contract was signed by its President Mr. Yury Slyusar and on behalf of the Commercial Aircraft Corporation of China (COMAC) by the Chairman Mr. Jin Zhuanglong. The joint venture will be registered in the People's Republic of China on principles of parity.

The scope of activity of the joint venture implementing the wide-body long-haul passenger aircraft program envisages, inter alia, development, sales, after-sales support and consulting; investment and financing through the project. The project of the wide-body long-haul aircraft being implemented by Russia and China can be developed as a family of the aircraft.

'The signature of these documents highlights further development and strengthening of relations between Russian and Chinese aircraft manufacturers. This event opens up new opportunities for creation of the wide-body aircraft — competitive and commercially successful in the global market,' said Yury Slyusar.

# Unmanned aircraft systems market

***Rosoboronexport will strengthen Russia's position in the international market for unmanned aircraft systems (UAS) by promoting new models. Among them are Takhion and Granat-4E.***

'For many years, we have been trying to catch up with the world's leading manufacturers of unmanned aircraft systems. However, Russian developers have managed to reverse the situation, and today more and more models that are quite competitive with their best foreign counterparts are becoming available. We are currently in substantive negotiations with a number of countries on the possible supply of Russian UAS, and there is a growing interest,' said Sergey Goreslavsky, Rosoboronexport's Deputy Director General.

Along with marketing the Takhion and Granat-4E UAS, Rosoboronexport is promoting the Orlan-10E, Granat-1ZH, Skat Superkam S-100, Skat Superkam S-640, Eleron-3, Eleron-10, as well as the mBPV-37 and BPV-500 helicopter-type UAS suitable for law enforcement applications. In particular, Rosoboronexport offers the delivery of advanced Russian UAS in the framework of its new Integrated Security Systems marketing project.

'We note the keen interest of foreign partners in the Orlan-10E, which has excellently proved itself during Russian Air Force operations against ISIS in Syria. We expect that the new unmanned aircraft systems Takhion and Granat-4E, which are actively used by Russia's Armed Forces, will also attract the attention of our partners,' said Sergey Goreslavsky.

# Export to Africa

***Dr. Moses Ebuk, Extraordinary and Plenipotentiary Ambassador of the Republic of Uganda to Russia, visited the enterprise of the Shvabe Holding — Zagorsk Optical and Mechanical Plant (ZOMP) in the city of Sergiev Posad. During the visit, the Ambassador expressed his interest in organizing the export of medical and laboratory equipment to Uganda.***

'Today, we are actively increasing product presence in foreign markets. Revenue increases by 15% every year, including 10% from exports. In 2015, ZOMP entered the markets of China, Venezuela and Angola. The African market is of particular economic interest to us. The Ugandan Ambassador's visit has allowed us to more thoroughly discuss the prospects of possible cooperation,' said Dmitry Zhidkov, Deputy CEO of Shvabe.

During the meeting, the ambassador saw a demonstration of the ophthalmologic equipment line consisting of slit lamp, binocular ophthalmoscope, dioptrimeter, visual field analyzer and other products. Ambassador Ebuk also learned about ZOMP's laboratory technology, such as the flour color control unit and photo colorimeter for measuring the concentration of substances in solution.

In addition, the guest of honor took in the company's rich history in the plant museum and employees' regard for their company. At the end of the visit, the Ambassador was presented with a commemorative gift: wide-angle binoculars.

Additionally, the first meeting between the ZOMP's representatives and Uganda's Ambassador took place at the Innoprom 2016 exhibition, where he saw the tumor ablation device Metatom. In the future, one of the fields of parties' cooperation may be the placement of Shvabe series medical equipment in Uganda's clinics.

The Shvabe Holding combines Russia's main enterprises of the optoelectronic industry. It comprises 64 organizations, including research and production units, design bureaus, optical institutions, as well as service and sales companies. Shvabe develops and produces high-tech optical-electronic systems and complexes, optical materials, medical equipment, energy-saving lighting equipment, and other product types. The Holding is part of the Rostec Corporation; Shvabe's largest enterprises are a part of the Russian Engineering Union.

# First flight of Mi-38

***The Russian Mi-38 medium multirole helicopter, fully assembled using Russian components, made its first flight as part of additional tests aimed at widening its range of applicability. This will increase the helicopter's range of tasks and make it possible to use it for transporting passengers, among other missions.***

Additional certification tests of the Mi-38 helicopters aimed at widening its range of applicability started at Mil Moscow Helicopter Plant, a Russian Helicopters company, part of State Corporation Rostec. The operational life of helicopters is expected to progressively improve, a number of additional programs to be executed and major modifications to the type certificate to be approved. They include takeoff weight and flying speed increase, flights in icing conditions, at extremely low and extremely high temperatures.

Russian Helicopters further plans to perform additional certification tests aimed to widen the range of applicability and obtain the Supplemental Type Certification, which prove, among other things, the airworthiness of the specialized helicopter modifications.

The next stage will be the development of passenger and offshore modifications of the Mi-38 and its certification to category A, which provides for the implementation of the most stringent requirements of Aviation Regulations 29 with regards to passenger transportation.

The first helicopter body produced at Mil Moscow Helicopter Plant was redeployed for tests for the Russian Ministry of Defense. In May 2016, the military together with Russian Helicopters decided on the procedure and delivery deadlines for Mi-38 to the Russian Aerospace Forces. At the present time, the working design documentation is being developed for the new helicopter version and all necessary components, entirely Russian-made, are being purchased.

The Mi-38 helicopter boasts high-performance flight characteristics, advanced and reliable helicopter systems, and integrated on-board equipment. The primary structural elements of the helicopter body are made from aluminum alloys, separate components and details - from steel, titanium and composite materials. Energy-efficient engines, advanced carrying system and high power-to-weight ratio ensure efficient operation of the helicopter under a wide range of conditions, while the on-board equipment makes it possible to perform flights in a variety of climatic conditions around the clock.

The passenger modification of Mi-38 is designed to transport 29 passengers accompanied by one flight attendant. The system of passenger and on-board equipment ensures the economy-class comfort level of transportation. The key requirement incorporated in the design of Mi-38 is the guarantee of the maximum flight safety. The helicopter layout, the size and number of emergency exits, emergency exits through large windows, energy-attenuating seats and landing gear, the main rotor transmission's ability to work for half an hour without oil, triplication of the pilot hydraulic system and impact-indestructible fuel system enforce the most stringent requirements of international aircraft safety standards.

## ANSAT TAKE-OFF 3600KG

Russian Helicopters specialists have finished work on increasing the take-off weight of the Ansat light multirole helicopter from 3,300 to 3,600 kg. The change will increase the helicopter's commercial load by 300 kg, thus improving its technical and operational characteristics. At the same time, Kazan engineers will continue to increase the Ansat's flight range and resource potential. To increase the flight range, an upgrade of the fuel system and installation of larger additional fuel tanks will be performed in 2017.

'The increase in payload of Ansat without doubts will affect the helicopter's attractiveness and increase its competitiveness. We are looking forward to a rapid growth of new orders from our foreign partners,' — said Russian Helicopters' deputy CEO for marketing and international business development Alexander Shcherbinin.

In December 2014, the Ansats with hydro-mechanical control system were approved to allow carrying passengers. In May 2015, the medevac versions of Ansats received an approval. In December 2015, the helicopter's version with a VIP-cabin was certified. The new light helicopter Ansat has been already introduced by Russian Helicopters at its traditional markets including the CIS, South-East Asia, Africa and Latin America.

## SU-34 FRONTLINE BOMBERS

This year the Sukhoi Company handed over the first batch of Su-34 frontline bombers to the Ministry of Defense of the Russian Federation according to the 2016 State Defense Order. The aircraft took off from the V.P.Chkalov Novosibirsk Aircraft Plant's airfield and headed to the place of their deployment. At the present time the aircraft plant operates with maximum efficiency. The State Contract with the Ministry of Defense of the Russian Federation for supplies of the Su-34s to the Russian Air and Space Forces up to the year 2020 guarantees a stable work load of the Sukhoi Company for the coming years and identifies long-term development prospects. Currently, Su-34s operate successfully in the military and demonstrate high performance.

## For static tests to confirm

***Irkut Corporation delivered to Central AeroHydrodynamic Institute named after professor N.E.Zhukovsky (TsAGI) the MC-21 fuselage designated for static tests to confirm the strength characteristics of the new aircraft and to provide certification of the type for static strength.***

The MC-21 fuselage was delivered to Zhukovsky from Irkutsk by An-124 freighter. In the near future other parts of the airframe will arrive to TsAGI. In particular, Irkutsk Aviation Plant, a branch of Irkut Corporation where MC-21 fuselage was assembled, will hand over auxiliary power unit compartment.

Irkut Corporation's specialists, together with the employees of TsAGI and cooperation companies, will perform airframe assembly. The first stage of the airframe test includes leaks inspection. Then TsAGI specialists will initiate static tests which include simulation of structural loads in all flight modes with registration of stress-strain state of the aircraft structure.

The purpose of tests comprises experimental verification of static strength, checks of correctness of calculation methods of strength, and fine-tuning of the finite element models based on experimental data.

TsAGI has already conducted tests of a large number of elementary and structurally-similar patterns, including several types of panels, cross and longitudinal joints.

Tests of fuselage compartment, structurally-similar patterns of tail and fin box are being held. The preparation for the isolated testing of composite-made wing box, stabilising fin and high-lift device is being performed.

Ongoing and planned tests are performed to verify the ability of the new MC-21 aircraft structure to perceive design loads without breaking and without receiving unacceptable permanent deformations. This is an important part of a comprehensive test plan, implemented to perform the first flight of MC-21 and its subsequent certification.

## Portfolio of 500 Units

***Currently, Russian Helicopters boasts a firm order portfolio of over 500 units. The company says that it will seek to strengthen its global positions via light and off-shore helicopters. According to Alexander Mikheev, the Holding's CEO, notwithstanding the sanctions and unstable markets, Russian Helicopters is still among the top players on the worldwide helicopters market.***

'We are certain that the fact that we have managed to obtain so many orders in this harsh environment is a testament to our top-notch performance,' he said to Interfax. Alexander Mikheev shares that the Holding has actively completed a number of high-potential R&D initiatives, while also testing new equipment and upgrading production capacities.

'We are sure that the fact that we have managed to obtain so many orders in this harsh environment is a testament to our top-notch performance,' Alexander Mikheev, CEO of Russian Helicopters Holding, stated. 'These steps will help our Holding not only maintain its current positions, but also significantly contribute to our efforts in breaking into new market niches. Among others types, these include light and off-shore helicopters,' the Holding's CEO added.

The annual report of Rostec shows that Russian Helicopters delivered 212 helicopters in 2015. The Holding enjoys a 15% share of the market for civil and military helicopters. The company also has a 35% share of the worldwide military helicopter fleet and 50% of medium military transportation helicopters. In the worldwide civil market, the Holding's units enjoy a 71% share in the segment with +20t gross weight and a 69% share in the segment with 7–20t gross weight. The document shows that Russian Helicopters earned annual consolidated revenues of 197.7 billion rubles and a net profit of 29.2 billion rubles.





## The world's largest Arktika

***Russia owns the world's only nuclear icebreaker fleet and has a long track record in construction and operation of nuclear icebreakers. Icebreakers equipped with a nuclear power unit enable the use of the Northern Sea Route and help Russia maintain a presence in the Arctic Region. In 2015, nuclear icebreakers conducted 195 vessels with a total gross tonnage of 2.04 million tonnes along the Northern Sea Route. Enterprises of the United Shipbuilding Corporation (Russia) engaged in the development and production of unique icebreakers.***

On the 16th of June 2016 the Baltijskiy Zavod — Sudostroenie (shipbuilding) (part of the United Shipbuilding Corporation) has launched the pilot nuclear icebreaker Arktika (Project 22220), which is built to the order of ROSATOM. The ceremony was attended by Chairwoman of the Council of Federation of the Federal Assembly of the Russian Federation Valentina Matvienko; Plenipotentiary Representative of the President of Russia in North-West District Vladimir Bulavin; Governor of Murmansk Region Marina Kovtun; CEO of ROSATOM Sergey Kirienko; General Director of FSUE Atomflot Vyacheslav Ruksha; and others.

In the presence of several thousands of spectators, Valentina Matvienko smashed the traditional bottle of champagne on the board, launching the largest and most powerful nuclear icebreaker in the world. 'Today, the nuclear industry of Russia has the important day. The world's largest and most powerful nuclear icebreaker Arktika has left the slipway. For many polar explorers, it is the meaning of life to develop the Arctic. I am certain the icebreaker Arktika will give the new impetus to the development of the Arctic,' she said in her welcoming speech.

In his welcoming speech, Sergey Kirienko noted: 'The today's event is an enormous victory in all senses! Large work has been done; there are no analogues of the icebreaker such as the Arktika in the world. Thanks to the team of the Baltijskiy Zavod, everything has been done on schedule and the Arktika will come on-stream. This icebreaker is most up-to-date by its parameters; all technical capabilities which have never been used on other vessels are implemented here. The icebreaker Arktika means real new opportunities for our country!'

'The first series-made icebreaker is already on the slipway and in September this year the keel of the second series icebreaker will be laid,' General Director of FSUE Atomflot Vyacheslav Ruksha said. 'We are facing the task of commissioning the pilot nuclear icebreaker Arktika by the end of December 2017. This is due date laid down in the contract terms. We hope our partners will be reliable and fulfill their obligations,' he said.

The universal nuclear icebreaker of Project 22220 is on, FSUE Atomflot's major task will be the support of all-year-round navigation along the entire Northern Sea Route: delivery of hydrocarbons to the Pacific Asia markets.

The pilot nuclear icebreaker of Project 22220 is built to the class of the Russian Marine Register of Shipping (RS) at the Baltijskiy Zavod — Sudostroenie by order of ROSATOM (the keel was laid on November 5, 2013). It will be the largest and most powerful nuclear icebreaker in the world. The icebreaker is designed for independent steering of ships (including large tonnage ones) and leading caravans in the West Arctic all-year-round. The double-draft design of the ship makes possible to use her both in the Arctic and in estuaries of the Polar rivers (in particular, in shallow water of the Yenissei River (Dudinka) and the Gulf of Ob). The icebreaker can be also used for towing ships and other vessels in the ice and open water, rendering assistance to ships, and carrying out rescue operations in the ice and open water. The maximum thickness of solid even fast ice the icebreaker can overcome is 2.9 meters.

Contracts have been concluded with Russian shipbuilders for the construction of five port vessels for the port of Sabetta as part of the Yamal LNG strategic gas production project. This will help diversify the operations of the nuclear icebreaker fleet and create new jobs. In addition, as part of the Yamal LNG project, a contract for conducting liquefied natural gas tankers has been signed; the contract is valid until 2040. The world's only nuclear LASH carrier, Sevmorput, has been restored; its service life has been extended by 15 years at the least.


# TRILATERAL MEETING

## *The presidents of Azerbaijan, Iran and Russia concluded a declaration for cooperation*

**In August the presidents of Azerbaijan, Iran and Russia during trilateral meeting in Baku concluded a declaration affirming their intent to develop trilateral cooperation. The declaration covers cooperation areas such as joint efforts to fight terrorism, settle regional conflicts, work together on the Caspian Sea, and develop ties in the energy sector, transport and other areas. Vladimir Putin, Ilham Aliyev and Hassan Rouhani agreed to establish working groups in the cooperation areas of mutual interest.**

President of Russia Vladimir Putin at the trilateral meeting of the leaders of Azerbaijan, Iran and Russia sad, that 'Azerbaijan and Iran are good neighbours and important partners for Russia. We have amassed a rich history of productive cooperation. No doubt, today we are opening a new chapter in our relations by embarking on cooperation in a trilateral format. We believe the need for this format is clear: the three countries have a shared interest in coordinating approaches on a broad range of regional and global issues, and in continuing to promote multifaceted practical cooperation on trade and the economy.

I would also like to note that all countries, or at any rate many countries, are facing similar problems. I am referring to the continued global economic crisis and persisting tensions. For our nations this is especially relevant because the tensions I have just mentioned exist on our borders both in Afghanistan and the Middle East. The area of instability and ongoing conflicts, the mounting terrorist threat, primarily from ISIS, Jabhat al-Nusra and other terrorist organisations, pose a real danger to us.

In order to search for ways to resolve these problems we need to develop closer cooperation between our countries. The main areas of trilateral cooperation are mapped out in the declaration that we will adopt following today's summit.

I would like to emphasize some issues that Russia considers important. For example, we consider it expedient to step up the exchange of information on the activities of international terrorist organizations. This is needed in order to more effectively curb the transit of militants, weapons and drugs via our territories.

We hope that trilateral dialogue on Caspian issues will help us complete work on the convention on the legal status of the Caspian Sea ahead of schedule. I am convinced that signing and implementing this convention is in the interests of the five Caspian states.

The prospects of cooperation on transport infrastructure are promising. I am referring to the plans to create a Western wing of the North-South international corridor. In the energy industry priority should be given to the implementation of projects for the exploration and development of oil and gas deposits, first of all in the Caspian region. We are ready to discuss mutually beneficial projects on the joint use of pipeline infrastructure for the transit of raw materials.

Naturally, more attention should be paid to cooperation in the areas





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***Vladimir Putin***

of culture, tourism, youth exchanges and education. We need to promote direct ties between the regions of our three states. I am convinced that in the future cooperation between neighbours — Russia, Azerbaijan and Iran — will be pragmatic and mutually advantageous. It will meet the vital interests of our nations and create fresh opportunities for the dynamic development of the entire Caspian region. Needless to say, we still have a lot to do, and Russia — let me assure you of this, colleagues — is prepared to work together. Thank you for your time'.

The same day Vladimir Putin and President of Azerbaijan Ilham Aliyev met. At this meeting Ilham Aliyev sad: 'We work together actively at international venues, strengthen our political dialogue, develop our economic, transport and energy ties, and we have good results in developing our humanitarian cooperation too.

I would particularly like to stress Russia's role in settling the Armenia-Azerbaijan conflict in Nagorno-Karabakh. We value this role, and your personal involvement plays a very important part in the settlement process. We had a meeting in St Petersburg in June devoted specifically to this issue, and I thank you for your active participation in this process.'

President of Russia Vladimir Putin noted: 'I fully agree with your description of our relations, which have indeed become a strategic partnership not just on paper but in reality. It is very good to see that our ties are greatly diversified now, developing in different areas. In the humanitarian area — and you put forward the proposal to develop this dimension of our relations — we now hold a regular top-level Humanitarian Forum. This is a top-level event taking place under our patronage. Thus, Speaker of the Russian Parliament's upper house Valentina Matviyenko took part in the latest forum.





***'I would particularly like to stress Russia's role in settling the Armenia-Azerbaijan conflict in Nagorno-Karabakh. We value this role, and your personal involvement plays a very important part in the settlement process. We had a meeting in St Petersburg in June devoted specifically to this issue, and I thank you for your active participation in this process.'***

***Ilham Aliyev***

Close to 600 Russian companies work in Azerbaijan and direct investment comes to $1.4 billion. There are some points I would like to note now. As we all know, for various reasons such as the crisis affecting both the global economy and our own, the drop in the prices of our traditional export goods and the related problems with exchange rate differences, our trade turnover has dropped in value terms.

It is therefore very timely that we have this chance to discuss these matters today and find solutions to these issues. We have built an excellent base in this area, and overall, we are maintaining the physical volumes of trade. I fully agree with you here.

We also have promising new projects, not only in the energy sector, of course, but in other sectors such as machine-building and high technology. I think this is very important. We continue our cooperation on the Caspian Sea, including our military cooperation.

Thank you very much for organizing this trilateral meeting. This was also your initiative and we do indeed have matters to discuss in this format, new projects in the Caspian Sea, and on the broader plane, transport, the energy sector, and the development and diversification of our trilateral trade and economic ties.'

# INFORMAL MEETING OF BRICS LEADERS

**An informal meeting of the heads of state and government of BRICS member states (Brazil, Russia, India, China, and South Africa) took place in Hangzhou before the G20 summit on September 4, 2016. BRICS leaders discussed the cooperation within the association and the agenda of the upcoming G20 summit.**

President of Russia Vladimir Putin sad: 'We know that on the basis of the Strategy for BRICS Economic Partnership adopted at the last year's BRICS summit in Ufa, Russia, new large-scale joint projects are being prepared for launch, primarily in technology, industrial cooperation, energy, and agribusiness. We intend to expand contacts in other areas as well — in science, education, culture, on issues of social policy, healthcare and sport. We support cooperation between our parliaments, regions, trade unions, youth organizations and civil societies.

Colleagues, we can see that contradictions in the world are indeed escalating. The rise of inequality between rich and poor nations is growing, the struggle for resources, for access to consumer markets, for control of transport arteries is becoming more intense. This is the backgrounds for the growing potential for conflict, as hotbeds of tension continue to multiply.

My Brazilian colleague has just mentioned the long crisis that has engulfed the Middle East and North Africa. Civil wars instigated from abroad, the disintegration of government structures in Iraq, Libya (which President Zuma spoke about with concern) and Yemen, have turned this region into a place of chaos and a foothold for international terrorism which troubles all of us, causing an uncontrollable wave of migration.

The expansion of ISIS and extremists of all stripes united under its banners has become a real security challenge for our countries as well, including Russia and its southern borders.

The most dangerous situation is in Syria, which has already been discussed here. This is why we responded to the request of the legitimate, let me stress, the legitimate government of that country for assistance in the fight against terrorist groups.

The Russian Aerospace Forces have dealt a heavy blow to the terrorists and their infrastructure, and have preserved Syrian statehood, which I think is absolutely vital.

Together with other partners we managed to enforce a ceasefire in some regions of Syria and to launch inter-Syrian talks, because ultimately this sort of conflict can only be resolved by political means. We are confident that terrorist threats can only be countered by uniting the efforts of all interested nations.

In general, the international community needs to work together to solve other complex problems, including those facing the global economy, as Mr Modi said, and Mr Xi Jinping as well.

Unfortunately, the world economy has still not overcome the effects of 2008–2009 financial crisis, and global growth is still uneven and very fragile. According to forecasts, growth is unlikely to reach the pre-crisis level before 2019. Among the limiting factors is the volatility on foreign exchange and commodity markets, the lack of coordination of monetary policies, and the high debt levels in developed economies.

In this regard, we support the priorities of China's G20 presidency, aimed at stimulating the global economy — especially through the introduction of modern technologies.

We welcome Chinese President Xi Jinping's intensive work to prepare this G20 Summit and its substantive package of final documents. It is encouraging that many of them build upon the G20 agreements made in the course of our joint work in St Petersburg, Russia.

It is important to strengthen our countries' positions in the global financial system. I would like to congratulate our Chinese partners on the Special Drawing Right basket being expanded to include the Chinese yuan from October 1, 2016.

The BRICS states have already increased their total share in the IMF capital to 14.89 percent, very close to the blocking threshold of 15 percent. And they certainly need to continue in this direction, advancing the reform of the IMF.

We need to make the BRICS Pool contingent of foreign exchange reserves and the New Development Bank fully operational (here I totally agree with my colleagues), to adopt the bank's strategy, to provide loans in local currencies, and to begin financing specific projects.

We are greatly concerned about the WTO situation, which was also mentioned here. That organization is losing credibility, losing its status as the only universal negotiating platform for the development of global trade rules due to the stagnation of the Doha Round. As a result, various private associations, such as the Trans-Pacific Partnership and Transatlantic Trade and Investment Partnership, are gaining momentum; they seek to replace the WTO rather than complement it.

We see this as a response by some of our partners to difficulties they

encountered in the course of WTO negotiations. But this is not the best way to solve problems. The best way is to negotiate and reach a compromise.

Russia calls for the harmonization of regional economic formats, based on the WTO rules and principles, the principles of transparency and respect for each other's interests.

It is in this spirit that we are shaping the Eurasian Economic Union's activities and negotiating the linkage of the Eurasian Economic Union (EAEU) and China's Silk Road Economic Belt.

I am certain that in the future, all of the above will create a grand Eurasian partnership that is open to cooperation with all interested states and integration alliances. We hope to discuss in more detail the prospects for our group's development at the upcoming October 15–16 summit in Goa, India. On that note, we wish Mr Modi and all our Indian friends success in preparing that event.'


# Including export projects

**RT-Business Development (the State Corporation Rostec investment holding company) and the Federal Project Finance Center (Vnesheconombank Group) have signed a cooperation agreement on joint participation in infrastructure projects in Russia and abroad. The document was signed August 18 by RT-Business Development General Director Andrei Korobov and FPFC General Director Alexander Bazhenov.**

The cooperation agreement will boost development of projects offering the highest promise in terms of growth potential, primarily high-tech projects in the field of social infrastructure.

The FPFC will use its own funds to finance the initial project stages. Under the partnership, the FPFC will also put together cost effective and replicable projects, including all the requisite technical, economic, and legal research and creation of proposals in the form of a private initiative.

Pursuant to its direct investment development strategy, the signing of the agreement will allow RT-Business Development to join the infrastructure projects during their early stages to provide support for their commercial application and enlarge the company's infrastructure assets.

RT-Business Development General Director Andrey Korobov stated that 'the signing of the agreement constitutes an important step for the company in the field of infrastructure project financing and opens up new areas for us to collaborate with the revamped Vnesheconombank Group. The substantial growth opportunities offered by the infrastructure projects, combined with the strong potential of new financial instruments in the hands of our partners in the FPFC, will propel the development of existing projects under today's challenging economic climate'.

Under the terms of the partnership agreement, RT-Business Development will liaise with government authorities and authorized government institutions concerned with implementation of the appropriate projects with a view to creating favorable economic, legal, and tax regimes. Specifically, it will assist in obtaining authorizations and approvals and resolving land and property issues. The parties will work together to seek out investors and long-term financing. Among the first projects to be reviewed will be those in which services and products offered by State Corporation Rostec companies and holding companies can constitute a significant cost component at the investment stage of project implementation.

The Federal Project Finance Center (FPFC) is a wholly owned subsidiary of the state corporation Bank for Development and Foreign Economic Affairs (Vnesheconombank). The FPFC's role in the Vnesheconombank Group is to provide financial and expert support for preparing regional and urban development projects whose implementation involves non-government funded investment, including investment under government-private partnership agreements.

RT-Business Development is a wholly owned subsidiary of the State Corporation Rostec that specializes in professional asset management and financial and industrial project implementation. Under its three-year strategy and initial operating program, the company will move over to a direct investment fund model of operation by 2017-2018. Its strategic objectives are to increase the capitalization of the assets it manages and to implement large-scale financial and industrial projects in various economic sectors. The company's principal goal during its current stage of development is to maximize the investment attractiveness of its existing projects and partially monetize them in order to seek out new investment partners and reap the financial rewards of its operations.






# Rosoboronexport and UAC

## *Sales promotion program for the global military aircraft market*

**State special exporter Rosoboronexport (part of the Rostec State Corporation) and the United Aircraft Corporation (UAC) have signed a Program to promote military aircraft on the external market for the period 2016-2019. The document was signed by Rosoboronexport Director General Anatoly Isaykin and UAC President Yury Slyusar.**

The Program will enhance the efficiency of our cooperation in promoting Russian aircraft on the international market. This will help us expand our sales geography and increase exports of combat, military transport, combat trainer and special aircraft. Among them are Su and MiG fighters, Yak-130 combat trainers, Il-76MD-90A military transports and Be-200 amphibious aircraft,' said Rosoboronexport Director General Anatoly Isaykin.

Yury Slyusar, President of UAC, said: 'We appreciate our joint work with Rosoboronexport, and we are really interested in high effectiveness of our cooperation. Export is an important part of UAC sales and we are proud that Russian military aircraft have a good reputation abroad, and we'll do our best to strengthen it.'

Under the Program, the parties plan to jointly analyze foreign markets, coordinate their marketing activities in accordance with the overall strategy for promotion of aviation equipment on the international market, and conduct multimedia presentations to potential customers.

The Program will make it possible to implement Rosoboronexport's strategy aimed at improving the marketing efficiency of Russian weapons and military equipment on the arms market. Earlier, Rosoboronexport signed a similar document with the Russian Helicopters Holding Company.

# Master class from AIRBUS

**A three-day tutorial for forging and shape mill production specialists was held by representatives of Airbus in VSMPO AVISMA. The European aviation company is one of the main customers of the Russian titanium giant. As the corporation press office reports, the tutorial aims to reduce the number of defects and mismatches in the elements that make up the critical parts of aircrafts to zero. Particularly, the partners verified their defect analysis methods.**

VSMPO-AVISMA is the world largest manufacturer of titanium, bullions and all types of intermediate titanium alloy products, as well as stamped oversize aluminum items and intermediate products of alloy steel and refractory alloys with a nickel base. About 19 thousand employees work in the company. VSMPO-AVISMA's majority stock holding belongs to the management of largest Russian titanium manufacturer, Rostec State Corporation.

'We've learned a lot through this process. For example, to see the full picture a number of documents which were partially disjointed needed to be considered as a whole. We studied the risks related to the geometrical characteristics and the probability of equipment failure. Now we know how to correctly handle ourselves in different situations,' Uralinformbureau quotes the words of the Head of VSMPO Flat-Rolled Products Design Bureau Elizaveta Plaksina.

'I'm not just in Verkhnyaya Salda for the first time ever, but in Russia as well. I saw the forging center and was surprised by the capacities there, the largest press. And the top-notch specialists want to go even beyond their already expansive technical knowledge,' the Manager of Airbus Supplier Affairs Service Francisco Naranjo stated.

VSMPO-AVISMA is the largest supplier of titanium for Airbus. The corporation provides more than 60% of the European aviation company's needs. Russian titanium is used to produce airplane parts exposed to the largest loads in flight, such as landing gear legs and components of the engine and wing pylons.

The companies started to cooperate in the 90s when the first agreements on the delivery of raw materials were signed. In 2009 we entered into a long-term contract on the delivery of titanium alloy round bars and stamped items for Airbus through 2020.

# STATE CORPORATION ROSTEC

## *Achievements Portrait in the New Global Economic Environment*

**At the beginning of August in The Kremlin, Moscow, the The CEO of Rostec Sergey Chemezov presented to Vladimir Putin a detailed report on the latest progress of Rostec and announced the development plans for the next ten years until 2025, according to a new Development Strategy.**





In 2015, the consolidated revenues of Rostec increased by 18%, amounting to 1 trillion and 140 billion rubles. The consolidated net income of the State Corporation was 99 billion rubles, and that of EBITDA — 253 billion rubles. The net profit margin was 8.68%, having increased by 6 basis points. EBITDA margin was increased by 5.58 points (up to 22.19%). The corporation average wage in 2015 increased up to 41,000 rubles (in 2014, Rostec average wage was 37,000 rubles, and Russia average wage was 32,600 rubles as per FSSS data). The corporation tax payments to budgets of all levels exceeded 160 billion rubles.

The new Development Strategy of Rostec adopted at the end of 2015, will allow neutralizing the impact of sanctions and reaching the level of the most high-tech corporations in the world in the next 10 years. The priority is to enter the rapidly growing 'smart' markets: electronics, IT, automation, control systems, robotics, new materials, etc. The successful competition with world leaders will enable Rostec to ensure Russia's economic growth. It's not just a matter of competitiveness, it is the goal to maintain Russia as a global technology leader. The main targets include an annual revenue growth by 17%, increase of civil production share up to 50% and growth of operational efficiency to the best quarter's level of the global players.

At the meeting with the President Sergey Chemezov also said: 'We have established Yota Devices Company; I showed you the mobile handsets we make. This is a startup. We built this company in three years, and over those three years, the company's value has grown to nearly $130 million. We sold 30% to a Chinese company for 46.2 million.

In 2015, the Kalashnikov concern showed a profit for the first time in many years. We have a public-private partnership there. When three years ago you gave us permission to attract private investors to that company, Kalashnikov was practically on the verge of bankruptcy. Now for the first time since then, the company received a net profit of 2.1 billion roubles. It is now a modern, forward-looking facility, with all sorts of new models added to its product line.

The most significant innovation-related results were the successful completion of state testing of innovative electronic warfare systems, and the certification testing of the Mi-38 mid-range helicopter; the PD-14 engine is being tested now, with the first phase close to an end. I hope that if it is successful, we will be able to complete all the tests in 2016-2017, and begin production in 2018.

Furthermore, we launched the production of two fundamentally new Russian car makes, the Lada Vesta and the Lada Xray. They are very popular, and sell very well. They

In the long run, Rostec should become the core of the industrial and, therefore, the economic development of the country, providing a leading place for Russia in the new technological paradigm.

The sanctions regime imposed against Russia and Rostec by some states did not have a significant impact on the State Corporation development. Rostec emphasized the development of internal resources and competencies, which, based on the results of 2015, allowed demonstrating a steady progress in terms of financial, economic and industrial parameters.


are in great demand because they meet the modern market requirements.

We have developed a highly mobile automated control, navigation, landing and communication system for airplanes and helicopters to be deployed on temporary sites. This greatly increases the mobility of our armed forces. Another innovation is a universal model of on-board electronic systems for unmanned aerial vehicles.

One of the key features of 2015 and the highlight of the annual report was the corporation's new development strategy until 2025 approved by the Supervisory Board. A major component of the new strategy is an ambitious revenue growth rate of 17% per year. In 2015, we already grew by 18%.


Although this is a very serious challenge, this ambitious growth rate is the only way we can match the development level of our global competitors. I hope that by 2025, we will become one of the world's top ten companies.

Another priority should be to increase the share of civilian products by 2025 to exceed 50 percent of total revenue.

The first step towards the implementation of the renewed strategy in 2015 was the holding companies' consolidation by industry clusters: the aviation cluster, the electronics cluster, the automotive cluster, the weapons cluster and the bio-cluster. The steps taken in 2015-2016 helped improve the quality of management and raise interaction between the holding companies to a new modern level.

The report also presents around 30 innovative products of the state corporation, those that we have already put into production.

With regard to social responsibility, in 2015, we developed and approved the corporation's housing programme with funding of over a billion rubles in 2015.

A programme of cooperation with universities is also underway. We have been cooperating with 312 major universities across Russia and have established 294 special departments in these schools to train professionals who would later work for our company. The graduates have received their degree certificates and will soon begin working at Rostec. They have obtained their master's degrees from our department at the Moscow Institute of Physics and Technology (MIPT).

Against the sanctions pressure, the general decline of the Russian economy and fall of industrial production index by more than 3%, we managed to increase the revenue of the State Corporation to 1 trillion 140 billion rubles, demonstrating a growth by 18% compared to 2014. The volume of military exports grew by 39% in 2015 (up to $4.6 billion). Therefore, the production of civilian goods increased by 6% (up to 336 billion rubles). The steady growth in all financial indicators enables us to develop also the civil industries. According to the new strategy of Rostec, our main task is to ensure Russia's technological advantage in the highly competitive global markets. The planned investment volume for the development up to 2025 is 3,086 billion rubles.'




According to Minister of Industry and Trade of Russia Denis Manturov, despite the negative trends in the economy, following the results of 2015 Rostec Corporation demonstrated a progress in the performance and steady financial results. The Corporation has made the best use of the ruble devaluation impact, strengthening its position both in internal, and foreign markets. 'The Corporation's enterprises participated in the stable implementation of the state defense procurement, the volume of which has increased by 11 % in comparison with 2014,' said Denis Manturov.

The history of creation and development of the Corporation Rostec — now it comprises near 700 organizations in 60 regions of the country that are currently part of 14 holding companies, nine of which operate in the military-industrial complex, and five in civilian sectors; the group also includes 22 direct management organizations — is a very interesting and revealing.

By the end of the 20th century, Russian industry was in a state of deep crisis, where a simple influx of capital was no longer able to deliver any fundamental change to the strength of the manufacturing sector. As of 2009, of the assets that had been transferred to 'Russian

Corporation Rostec is a Russian industrial company consisting of 700 organizations, which also includes 22 direct management companies and 14 holding companies, five of which specialise in the manufacture of civilian products, and nine, in the manufacture of products for the military and industrial sectors. Rostec organizations are located in 60 regions of the Russian Federation. Company products are delivered to markets in more than 70 countries.

Having brought together and developed many unique production operations and technologies within its structure, along with a significant share of the nation's research potential, Rostec has become a reliable government partner for innovative industrial development. The corporation operates in the following areas:

- automotive manufacturing;
- aircraft manufacturing;
- engine manufacturing;
- metallurgy;
- construction;
- optics;
- composite and other modern structural materials;
- medical equipment;
- pharmaceuticals;
- industrial biotechnologies;
- radio electronics;
- instrumentation technology;
- information technologies, and telecommunications;
- machine tool technology and the manufacture of equipment to revitalize industry;
- manufacturing of arms and military equipment.

KEY TOPICS


## Principal functions of the Corporation Rostec:

- To support Russian developers and manufacturers of high-tech industrial| products in both domestic and foreign markets;
- To participate in the implementation of state policy in the area of military and technical cooperation between the Russian Federation and foreign governments and the state arms programme.
- To attract investment to create competitive examples of high-tech industrial products.
- To engage in promotional exhibits and marketing activities and to participate in demonstrating examples of civilian, military, and dual-use products within and outside of Russia.
- To promote applied research in promising areas of scientific and technical development.
- To bring advanced technologies to fruition, so as to improve the level of home-grown technologies and to reduce the time and cost required to create products.
- To facilitate foreign trade activity with respect to core strategic industries.

Technologies,' 148 companies were in a crisis or pre-crisis state, 28 were in bankruptcy, 17 were not engaged in economic activity, and 27 had partially lost or were at significant risk of losing their assets.

The overall liabilities of these companies was 630 billion rubles. Enterprise production chains had been disrupted, physical assets and equipment had deteriorated, and there was a definite requirement for strong and effective management teams with the necessary skills and expertise to manage these businesses. Additionally, the state of these companies was further impacted by adverse market conditions.

The rationale for creating 'Russian Technologies' was driven by a dedication to maintaining the country's industrial capabilities during a complex time and to make the sector globally competitive. The company was faced with some very demanding challenges. Just carrying out an audit and obtaining asset management rights took the company two years. In 2009, the company began to construct a management system, develop a general development strategy, optimize manufacturing processes, and establish relationships with leading Russian and foreign partners.

In 2009, the Company's revenue was 511 billion rubles, and it paid 62 billion rubles in taxes. Per-worker productivity did not exceed 1 million rubles. Over a two-year period, Rostec's revenue grew by 60%, to 817 billion rubles, compared to a 15% increase in industrial production in Russia as a whole. In 2012, the company's revenue topped 963 billion rubles.

One of the company's priorities is its social programme, and single-industry towns are part of a special area of its responsibility. Currently, Rostec's portfolio includes 21 companies that are the principal employers in certain towns, with many of these having been on the edge of survival only several years ago. An individual anti-recession programme was tailored for each such company.

And as a result, Verkhnyaya Salda — a town whose principal employer is VSMPO-AVISMA—enjoys one of the lowest unemployment rates in the world: 0.6%. Thanks to Rostec, VSMPO-AVISMA has significantly broadened its relationships with international partners. The corporation provides 40% of what Boeing, 60% of what Airbus, and 100% of what Embraer requires. VSMPO-AVISM net profit has increased from 173 million rubles in 2009 to 7.1 billion rubles in 2012, which is an increase of more than 40 times. Seventy percent of VSMPO-AVISM's products are produced for export.

In December 2012, the company's supervisory board made the decision to optimise Rostec's structure and reduce the number of holding companies to 13. Specifically, the shares of Aviapriborostroenie were transferred to Radioelectronic Technologies; those of the Machine Engineering Design Bureau were transferred to Vysokotochnye Kompleksy, while Roselektronika received the assets of both Sirius and Orion. This objective is expected to be achieved during 2013.

## Corporation Rostec objectives:

- to further the development, manufacture, and export of high-tech industrial products;
- to support Russian developers and manufacturers of high-tech industrial products in both domestic and foreign markets;
- to retool production;
- to develop the country's research and human resources potential;
- to develop relationships with large international and Russian industrial companies.

Over the six years since its inception, the company has achieved significant results, which are a testament to strength of the strategy for development that the management team have implemented and of the company's ability to achieve its goals and objectives. Today, the Rostec brand is inextricably connected with science-driven industry and technological innovation in Russia.

According to the 2025 Corporation Development Strategy the main goal of 'Rostec' is to increase the standard of living in various regions of Russia, which is being achieved through productive cooperation with regional state bodies and municipal units.

'Rostec' and Government Authorities work together to solve problems through various cooperation agreements including the projects aimed to develop high technology industry production for civil, military and joint purposes of design, production and delivery.

The Corporation has concluded agreements with 31 regions including the Republics of Bashkortostan, Mordovia, Tatarstan and Udmurtia; the Perm and Khabarovsk Territories; Arkhangelsk, Bryansk, Vladimir, Volgograd, Voronezh, Irkutsk, Kaluga, Kirov, Moscow, Nizhniy Novgorod, Novosibirsk, Omsk, Pskov, Rostov, Ryazan, Samara, Saratov, Sakhalin. Sverdlovsk, Smolensk, Tver, Ulyanovsk and Yaroslavl regions; Moscow and Saint-Petersburg. The Supervisory Board has founded 26 representative organizations in different regions of Russia.

The International Military-Industrial Cooperation development is one of the Corporation's priorities. The volume of 'Rosoboronexport' military-purpose goods exports amounted more than 11 billion dollars. Constant delivery volume increase allows Russia to fit the second leading position in the world market, with the USA in first place.


Andrey Tarabrin

# MILITARY AND TECHNICAL COOPERATION

## *Russia remains one of the world's top defense products suppliers*

**Since 2000, the Russian Federation has established a sufficiently effective system to manage military-technical cooperation between the Russian Federation and foreign states, incorporating the Federal Service for Military-Technical Cooperation ('FSMTC of Russia') as its critical enabler. The Federal Service for Military-Technical Cooperation is empowered with control and supervision functions in the MTC area. FSMTC of Russia shall be a decision making authority on import to and export from the Russian Federation of military purpose products as decreed by the President of the Russian Federation, also in the established manner and as authorized by the Russian Federation President, issue of licenses to military-technical cooperation-affiliated entities for import to and export from the Russian Federation of military purpose products.**





FSMTC of Russia' granting inthe established manner foreign trade licenses to (from) corporate developers and manufacturers of military-purpose products and arranging exhibitions and shows of specimens of military purpose products in the Russian Federation and foreign states as required by the Government of the Russian Federation; and in the established manner and as required by competent authorities of foreign states, issue of end user's certificates for import military purpose products to corporate developers and manufactures of military purpose products.

For example, on the conference on summarizing of the results of advertising and exhibition activity in the area of military-technical cooperation of the Russian Federation with foreign countries in 2015 and activity planning for 2016 with participation of representatives of the interested federal executive authorities, military-technical cooperation affiliated entities and other Russian organizations was held on December FSMTC of Russia presented the departmental awards to the most active participants of the advertising and exhibition activity in the area of military-technical cooperation. Among the award recipients were the representatives of the Ministry of Defence of the Russian Federation, the Ministry of Internal Affairs of the Russian Federation, the Federal Service for Technical and Export Control, State Corporation 'Rostec', JSC 'Rosoboronexport', JSC 'UAC', 'Almaz-Antey' Corp., JSC 'Russian Helicopters', JSC 'RPC 'Uralvagonzavod', JSC 'SPA 'Bazalt', JSC 'KBP', FSUE 'Gamma Scientific and Production Enterprise', JSC 'Exhibition Companies Group 'Bizon', company 'International Congresses and Expositions'.

Military and technical cooperation between Russia and pacific region states is on the rise now. Pacific region nations account for considerable part of Russian defense products delivery. This number may quite possibly rise significantly. Besides, seeing the growing interest toward aviation and air defense equipment, we hope for stepping up of cooperation in this

regard. Russian planes and helicopters have proven themselves highly efficient during large-scale counter-terrorism operations worldwide. Their air superiority and anti-ground high-precision strikes capabilities are also well known to our partners in other states. Among others, in this region large export potential belongs to gunships and transport helicopters, various air defense systems, antiaircraft gun and missile system.

From recent examples of successful participation российско the equipment in the international exhibitions can remember a little. So, Russia takes part in the arms exhibition in Gulf Defence & Aerospace 2015, an international exhibition of arms and military equipment to be held from 8 to 10 December in Kuwait

EXPORT REGULATIONS



City (Kuwait). 'Rosoboronexport seeks to intensify cooperation with the Gulf countries, which are interested in strengthening their armed forces. Russia has deservedly earned recognition as a reliable and independent partner while Russian weapons have proven their effectiveness and reliability in challenging combat and climatic conditions. The participation in the exhibition in Kuwait is another step to strengthen our position in the region,' said Rosoboronexport Deputy Director General Sergey Goreslavsky, who heads the Company's delegation at the exhibition.

The Gulf states are showing interest in Russia's army, air force and air defense weaponry. In addition, Rosoboronexport promotes naval equipment here such as patrol boats, frigates, and coastal missile systems. The foreign delegations are expected to pay more attention to the T-90MS MBT, TOS-1A heavy flamethrower system, Typhoon-K MRAP vehicle, Kornet-EM ATGM system, Su-35 and MiG-29M/M2 fighters, Ka-52, Mi-28NE and Mi-35M attack helicopters, Mi-17 and Mi-26T2 transport helicopters, Yak-130 combat training aircraft, Il-76MD-90A military transport aircraft, as well as air defense weapons of various classes, including the Antey-2500 and S-400 long-range air defense missile systems, Buk-M2E medium-range SAM system, Pantsir-S1 air defense missile/gun system and Igla-S MANPADS.

At Gulf Defence & Aerospace 2015, Rosoboronexport will hold talks with the representatives of the armed forces of the countries from the Middle East and other regions over the prospects for expanding military-technical cooperation.

The Russian delegation will also include JSC NPO Splav (part of JSC NPO Tehmash) and JSC High-Precision Systems (Vysokotochnye Kompleksy) represented by JSC Shipunov KBP Instrument Design Bureau, JSC Tula Arms Plant, JSC Kovrov Electromechanical Plant, JSC VNII Signal Research Institute and JSC Nudelman Precision Engineering Design Bureau (KBtochmash)

Military and technical cooperation with the region's nations tends to increase both in terms of quality and quantity. Thus, recently FSMTC of Russia experts have participated in 'DUBAI AIRSHOW-2015' international airspace exhibition held on November 8-12, 2015 in Dubai (United Arab Emirates). Russia has been an exhibitor at 'DUBAI AIRSHOW' since 1993. The Russian display area this year has been 678 square meters. The exposition involved 23 Russian enterprises including the largest ones like 'Rostech' State Corporation, 'Rosoboronexport', 'Almaz Antei', Russian aircraft Corporation MiG, 'Sukhoi', 'Vertoley Rossii' (Russian Helicopters). Altogether about 200 samples of Russian advanced defense products have been shown in Dubai.

During the exhibition Russia has held negotiations with delegations of UAE, Kuwait, India, RSA, Malaysia, Bahrain, Egypt, Iraq, Indonesia, Jordan, Oman and other countries. They discussed prospects for Russian armament supply including aircraft, air weapons and air defense equipment as well as issues of creating maintenance facilities and establishing after-sale service.

Russia considers Kuwait to be among the most signficant partners as to military and technical cooperation in this region and in whole Asia. Military and technical cooperation between our two countries goes deep. It began in 1978 and advanced in a rather active manner. Thus, back then our country provided Kuwait with about 700 'Strela' portable anti-aircraft missile systems and twenty 'Osa' air defense missile systems.

Extending cooperation between Russia and Kuwait is spoken by the Memorandum of military and technical cooperation between 'Rosoboronexport' and Defense Ministry of Kuwait undersigned in November this year, which shows Kuwaiti military's profound interest towards purchasing Russian military equipment. In particular, Kuwait is interested in Russian battle aircraft and air defense systems. More details of types and purchases will go public later. So far only growing interest can be observed. Besides, much attention has been paid to creation of heavy infantry fighting vehicle (IFV) based on Enigma IFV developed by UAE and Russian AU-220M weapon station equipped with 57mm gun.

In this year at the Bahrain International Airshow 2016 (January 21-23) many countries displayed an interest in buying Russian aircraft, helicopters and air weapons. The Su-35 and MiG-29M/M2 multirole fighters, Yak-130 combat trainer, Il-76MD-90A military transport, Ka-52 and Mi-28NE attack helicopters, Mi-35M transport/attack helicopter, and Mi-17 type military transport helicopters have great export potential in the region.

'Rosoboronexport's order portfolio for aviation equipment exceeds currently $22 billion. Interest from foreign customers, including in the

Middle East and North Africa, is growing. This stems from both launching new aircraft models to the international market and high operational effectiveness of modern Russian military aircraft, including its capabilities for delivering surgical strikes on ground targets. Demand is supported by an excellent cost-effectiveness ratio and Russia's reputation as a reliable and responsible partner in military-technical cooperation,' said Sergey Kornev, Head of Air Force Equipment Export Department, who leads the Rosoboronexport's delegation at the exhibition. At the exhibi-

## Major areas of FSMTC of Russia activities shall be:

- To perform control and supervision functions in the area of military-technical cooperation in compliance with laws of the Russian Federation;
- To participate jointly with other federal government authorities in elaboration of state policy in the area of military-technical cooperation and submit in the established manner relevant proposals to the President of the Russian Federation, the Government of the Russian Federation, and Defense Ministry of the Russian Federation;
- To ensure jointly with other federal government authorities implementation of key state policy guidelines in the area of military-technical cooperation as set by the President of the Russian Federation; and Within its competence and jointly with other federal government authorities, to implement state regulations in the area of military-technical cooperation.

## In conformity with laws of the Russian Federation, FSMTC of Russia shall perform control and supervision functions relating to:

- Compliance, of activities in the field of military-technical cooperation of federal government authorities, government authorities of the Russian Federation constituencies, and Russian organizations empowered in the established manner to carry out foreign trade activities regarding military purpose products, corporate developers and manufacturers of military purpose products, other legal entities, officials and individuals, with legal acts and regulations of the Russian Federation and key state policy guidelines in the field of military-technical cooperation, requirements of the Russian Federation laws on export control over procurement of military purpose products;
- Implementation of underlying state policy principles in the field of military-technical cooperation including state monopoly;
- Efficient functioning of state regulatory system in the field of military-technical cooperation;
- Fulfillment of international treaties of the Russian Federation in the field of military-technical cooperation;
- Activities in the field of military-technical cooperation of representative offices of military-technical cooperation–affiliated entities in the Russian Federation and foreign states, as well as those of other organizations;
- Marketing, advertising, and exhibition activities in the field of military-technical cooperation;
- Efficient application of funds allocated from the federal budget to finance activities in the field of military-technical cooperation, as well as efficient use of federal property by military-technical cooperation–affiliated entities;
- Level of foreign trade prices for export and import military purpose products with due regard to protection of economic interests of the Russian Federation;
- Level of local prices for military purpose products to be funded out of the federal budget, and supplied to foreign customers under international treaties of the Russian Federation.


tion, Rosoboronexport showed the open presentation 'Russian Military Aircraft Fighting against Terrorism,' which analyzes the Russian aircraft's capabilities for use in counter-terrorist operations.

The Bahrain International Airshow has been held since 2010. This year, along with Rosoboronexport, it was attended by Russia's Federal Service for Military-Technical Cooperation, Russian Helicopters and United Aircraft Corporation delegations.

The special story is demanded by a subject of the Russian-Indian relations. The Russian-Indian scientific and technical conference 'Effective after sale service — assurance of high operability of arms and military equipment' was held within the International Aviation and Space Salon 'MAKS-2015' in Zhukovsky at the House of Scientists TSAGI under the aegis of FSMTC of Russia on August 25, 2015.

A.V.Fomin, Director of FSMTC of Russia, A.V.Potapov, Deputy Minister of Industry and Trade of the Russian Federation, representatives of JSC 'Rosoboronexport' and leading military-industrial complex enterprises, whose production is in demand at Indian arms market, took part in the conference work from the Russian side.

A.K.Gupta, Secretary (Defence Production) of the Ministry of Defence of the Republic of India, S.Garg, Joint Secretary (Defence Industry Development) of the Indian Ministry of Defence, representatives of Armed Forces Headquarters (Air Force, Navy, Army), Indian enterprises concerned with operating, maintenance and repair of Russian origin military equipment.

During the Conference, its participants discussed the existing issues in area of after sale service of





Russian origin military equipment in India and exchanged opinions about its effectiveness increase. It was proposed to Indian partners a comprehensive approach for maintenance of arms and military equipment during the whole life cycle from delivery to utilization. During the Conference, held in close friendly atmosphere, the representatives of Russian and Indian military-industrial complex established direct contacts and achieved a number of arrangements on improving of maintenance quality of Russian origin arms and military equipment.

In his interview for Russian Industrial Weekly newspaper Alexander Fomin, Director of FSMTC of Russia has described the extent to which the current stage of military and technical cooperation with other countries is significant. Among other things he said the following.

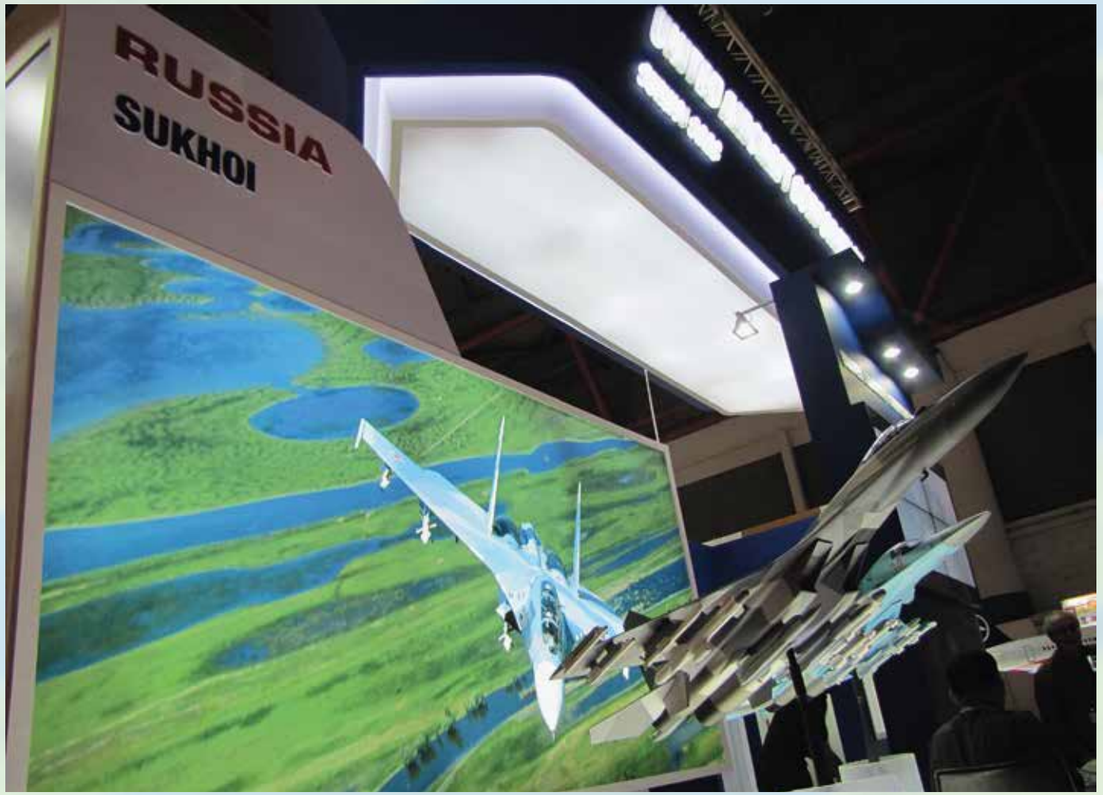
'Today the situation of world armament and military equipment market depends on many factors. These are ongoing global economic crisis, complex military and political situation in Middle East and North Africa, stepping up of military production competitors which include first of all the USA, Germany and France.

We should recognize stepping up of such armament exporters as China, Republic of Korea, Israel and Turkey as well as entry of new ambitious players like Japan and Republic of South Africa. It is needless to say that development of military and technical cooperation between Russia and other countries is to some extent influenced by so-called 'anti-Russian sanctions'. Nevertheless, Russia is still one of the largest global defense suppliers and it is keeping intensive military and technical cooperation underway.

Indian Air Force and Navy are armed with many Russian (Soviet) aviation equipment such as Su-30MKI, MiG-21, MiG-23, MiG-29 ground and ship-based fighters, Il-76 transport aircraft and Il-78 tankers, naval Tu-142M and Il-38, Mi-17, Mi-26, Ka-28 and Ka-31 helicopters. The mentioned aircraft are going to be used by Air Force and Navy of India for next decades and should be constantly maintained by Russia.

**FSMTC of Russia shall:**

- Submit in the established manner draft decisions of the President of the Russian Federation and the Government of the Russian Federation on deliveries of military purpose products to foreign customers, as well as on other foreign trade issues relating to military purpose products;
- Develop jointly with federal government stakeholders conceptual approaches for higher MTC efficiency, as well as review trends in the development of the world's market of military purpose products;
- elaborate jointly with federal government stakeholders draft international treaties of the Russian Federation in the field of MTC and submit in the established manner proposals for concluding and implementation of any such treaties;
- Elaborate and submit in the established manner proposals for working out a state defense order regarding export and import military materiel under international treaties of the Russian Federation;
- make analysis of effective long-term international treaties of the Russian Federation providing for export military materiel adjusted for mutual debts, ability to settle them through goods exchange, and, if necessary, submit in the established manner relevant proposals;
- participate jointly with federal government stakeholders in drafting proposals for establishment, suspension, termination and resumption of MTC;
- submit in the established manner proposals for creating, composition and arranging activities of bilateral and multilateral intergovernmental commissions relating to MTC;
- set up relationships in the established manner with international organizations relating to MTC;
- be in charge of Russian sections of intergovernmental commissions relating to MTC as instructed by the President of the Russian Federation and the Government of the Russian Federation;
- review orders of foreign customers for supplies of military purpose products, record them, appoint contractors among MTC-affiliated entities, agree with federal government authorities on contractors among corporate developers and manufacturers of military purpose products contracted for supplies of the said products, inform foreign customers on accepting their orders for consideration, and supervise preparation and approval of relevant draft decisions, monitor progress of implementation of orders of foreign customers for supplies of military purpose products by MTC-affiliated entities;
- maintain record of orders of foreign customers for supplies of military purpose products placed directly with MTC-affiliated entities, and monitor progress of their implementation;
- streamline and supervise activities of MTC-affiliated entities, review and summarize results of their activities;




Nowadays India is much interested in establishing production of Ka-226T helicopters in India. There are negotiations underway as to cooperation conditions under this project. There is a possibility of additional lots of Mi-17V-5 helicopters to be delivered and increasing the number of Su-30MKI planes being produced under license in India. All this makes us enthusiastic in Russian and Indian cooperation in terms of battle aircraft.

Main areas of cooperation with Malaysia in this regard include after-sale service of Su-30MKM aircraft. In 2012 a maintenance facility was established under the delivery contract. Besides, there are efforts to promote additional lot of Su-30MKM's to Malaysian market. Currently Malaysia is considering proposals for upgrading MiG-29 planes delivered before.

Military and technical cooperation between Russia and China as to battle aircraft is also promising'.

Answering the question of joint defense production to be established by Russia in partner countries, Director of FSVTS emphasized as follows:



'Decisions to establish joint defense-oriented enterprises are made by the President of the Russian Federation and the Government of the Russian Federation. Our Federal Service is responsible for implementing the mentioned decisions and monitoring.

In this regard I would like to state that while the decision to establish a joint enterprise is being prepared, the issue is to be addressed comprehensively in all departments and agencies including FSMTC of Russia, Russian Defense Ministry, and Ministry of Foreign Affairs, Ministry of Industry and Trade and other agencies in order to avoid losses for the Russian Federation. Besides, all factors like political, economic, military and technological ones should be taken into account. Targeted decisions are made as to each separate joint enterprise. Joint development and production are cross-pollinating and allow consolidating and developing technological potential of Russia as well as facilitate future innovation-driven growth'.

Nowadays, promotional and exhibition activity is becoming one of the most important mechanisms of strengthening political and economic positions of states-exporters of arms to different regions of the world and also a set of actions efficiently assisting in innovative development of economy, primarily, of all the military-industrial complex, manufacturing of competitive goods through attracting investments and new technologies.

From 2000 till 2010 FSMTC of Russia in association with the concerned federal bodies of the executive branch created a harmonic and effective system of exhibitions regarding military purpose products (further — MPP) in the Russian Federation. This system is based on 3 nationwide exhibitions, held in the Central Region of Russia and covering principal areas in the field of production of arms and military equipment:

The International Aviation and Space Salon MAKS held starting from 1992 in odd-numbered years at the grounds of FSUE Flight Research Institute named after M.M.Gromov in Zhukovsky, Moscow Oblast;

The International Maritime Defense Show IMDS held starting from 2003 at Lenexpo Exhibition Complex in St.-Petersburg;

The International Show of Weapons and Military Equipment MVSV organized since 2004 in Moscow, which in 2010 has become the core exhibition within the International Forum 'Engineering Technologies' held at the grounds of JSC 'TVK 'Russia' in Zhukovsky, Moscow Oblast.

The International Exhibition of Arms, Military Equipment and Ammunition 'Russian exhibition of arms. Nizhny Tagil' at the grounds of the State Exhibition Centre of FSE Nizhny Tagil Institute of Metal Testing held in odd-numbered years is an attractive show and a salon of significant interest for foreign customers and partners. The pivotal and obvious advantage of this event is a unique test range which makes it possible to showcase in action a great deal of arms and large-sized samples of military hardware of the Land Forces.

The exhibitions organized in the Russian Federation proactively assist in promoting military-technical cooperation of the Russian Federation with foreign states and strengthening political and economic stands of Russia in various regions of the world.

- maintain the register of MTC-affiliated entities and issue to them appropriate certificates;
- maintain record and registration, approve contracts for foreign trade activities relating to military purpose products, as well as maintain control of implementation of those contracts;
- if necessary, participate in talks conducted by MTC-affiliated entities with foreign customers for supplies of military purpose products;
- submit in the established manner proposals for implementation of key objectives and performance of functions of representative offices of the Russian Federation in foreign states regarding MTC;
- make proposals in the established manner for empowering corporate developers and manufacturers of military purpose products to carry out foreign trade activities and revoke the same from them;
- arrange exhibitions and shows of specimens of military purpose products in the Russian Federation and foreign countries as required by the Government of the Russian Federation;
- participate in working out proposals for MTC development with CIS-member states, and draft international treaties with those states on MTC issues;
- maintain relationships with authorized authorities of CIS-member states relating to export of military purpose products to third countries;
- take interdepartmental joint efforts relating to supplies and control over intended use of military purpose products under the Agreement of MTC Fundamental Principles dated 15 May 1992 between member states of the Organization of the Collective Security Treaty;
- maintain record of man-portable air defense systems sold and acquired by CIS-member states and promptly notify stakeholder states and international organizations of man-portable air defense systems sold and acquired by the Russian Federation;
- elaborate a consolidated volume of export military purpose products for the next year and control its performance;
- sponsor research and development of MTC-related works including its information coverage;
- streamline specialty retraining and skill enhancement system for staff involved in MTC;
- communicate to foreign customers scheduled phase-out of spare parts, plants, units, devices, and completing articles, specialty, training, and support materiel required for operability of earlier supplied military purpose products, as well as report about results of such communications to MTC-affiliated entities; and perform as state customer for export and import operations in the field of MTC to be carried out under international treaties of the Russian Federation, as well as customer for research and development works on MTC information coverage.

by S. Vittenberg
'STANKOMASH', Director

# FROM DEVELOPMENT TO PRODUCTION

## *Modern minefield crossing aids by 'STANKOMASH'*

**On May 16, 2015 'STANKOMASH' enterprise celebrated its 80th anniversary. One of its primary activities is performed by SKB-600 Special design office established in December 1956 according to USSR Cabinet Decree 553-782 as a leading agency to develop antipersonnel and antitank minefield reconnaissance and crossing aids for tanks and other tracked combat vehicles.**

Minefield crossing and mine sweeping are among the modern topical issues. The armies of the leading countries keep on improving mine systems, develop and adopt brand new engineer explosives including those designed to destroy armored vehicles. Traditional antitank mines are still available. Significant areas mined during armed conflicts are still dangerous.

The enterprise has unique capabilities to research, develop, test, produce and deliver (to Russian armed forces and abroad) multipurpose engineer equipment such as individual mine sweepers for modern and advanced tanks as well as infantry fighting vehicles; magnetic sweepers, mine-sweeping gears for combat mobility vehicles, BMR-3 armored route clearance vehicle, area mine clearance aids and humanitarian demining aids among others.

The enterprise-made minefield crossing aids such as KMT-4, KMT-5, KMT-6, KMT-7, KMT-8, KMT-10 track-wide sweeps are operational in Russian armed forces and CIS armies. They have been also exported to over 20 countries. These aids were successfully used in Afghanistan and Chechnya combat activities, during peacekeeping missions in Trans-Dniester, Abkhazia, Bosnia and other areas.

Traditional action sweepers like KMT-7 track-width roller and blade sweep, KMT-8 blade sweep, EMT magnetic attachment are popular and up-to-date. A number of export contracts have been concluded in this regard. 'STANKOMASH'-made products outperform many foreign developments; some aids are second to none.

Within the framework of federal programs for development and consolidation of defense industry in terms of creation and production of engineer aids the enterprise has created in the recent years new generation demining equipment to be mounted on modern and advanced tanks.

The company has performed research and development; phased in TMT-S tank sweep designed to make fully swept lanes and TMT-K track-width tank sweep capable of efficient demining, breaching mine barriers, escorting columns by sweeping all main antitank mines including antitrack, magnetic contact and proximity fuze-armed bottom attack, proximity seismo-optical side-hitting mines as well as breaking mine control wires.

'STANKOMASH' is a leading Russian enterprise engaged in developing, manufacturing and supplying inside Russia the following equipment:

- individual mine sweepers for modern and advanced tanks;
- individual mine sweepers for infantry fighting vehicles and armored personnel carriers;
- magnetic sweepers;
- sweeping gears for IMR-2, IMR-3 mine clearance vehicles and BMR-3, BMR-3M, BMR-3MA armored clearance vehicles.

The company-made products outperform many foreign developments. A number of them is unrivalled throughout the world. The technological solutions are protected with over 300 copyright certificates and patents, dozens of publications and research papers.

So far 'STANKOMASH'-made mine crossing aids have been mounted on Russian and CIS armored vehicles. These aids being exported to over 15 other countries were successfully used in Afghanistan and Chechnya combat activities, during peacekeeping missions in Trans-Dniester, Abkhazia, Bosnia and other areas.

Over 22 different action type engineering products have been developed and made operational.

The enterprise's priority activity is engineering aids-related research and development works within the frameworks of State defense order. In the recent years the company has carried out significant volume of research and development works dedicated to engineer equipment.

The quality control system complying with international standards ISO 9000 gained 'Military Registry' certificate.

The enterprise business units are fitted with modern computers and office appliances. In addition to special design offices 'STANKOMASH' includes engineering services, a production facility, laboratories and a test facility equipped with necessary research test aids.

# Combat-like training

**The fact that the leading world countries are appearingly seeking ways of continuous shaping and maintenance of combat skills of combat vehicle crews leads to increased demand for training aids. Equipment which enables realistic training without ammunition and vehicles service life spent is of a particular interest at international arms market.**

Due to great importance of training simulators being involved in modern military equipment training and interest shown by Russian army and foreign customers, IEMZ 'Kupol' (Izhevsk Electromechanical plant) has independently developed and set up a production of 'Tor-M2U' antiaircraft missile vehicle training simulator. The similar simulators dedicated to the previous 'Tor-M1' family had been developed too. The works were carried out in cooperation with programmers of NTTsKT 'TOR' (Saint Petersburg).

For the first time the training simulator was shown to public in 2015 at International Maritime Defense Show in Saint Petersburg. The unique character of the training simulator owes to the capability of the whole unit training but not only a separate crew.

Independent commander and operator training simulator, which ensures vehicle crew training, involving all combat operations in all modes of air surveillance, airborne target detection and tracking as well as firing, enables the following actions to be made:

• simulating any type of assault, individual and multiple targets (bomber, fighter, ground support plane, helicopter, UFV, cruise missile etc.) within radar and vehicle-mounted telescopic TV camera detection envelope as well as the targets movement according to their performance and tactics;

• simulating jamming and clutter effecting the vehicle-mounted electronic equipment;

• simulating surface-to-air missile firing within the range of 9A331MU vehicle capabilities and killing airborne targets with a probability suitable for a certain target and engagement conditions;

• simulating visual environment suitable for firing conditions, which are displayed at vehicle's crew workstations as well as simulating the crew operating results.

The position and external view of trainees' workstations match fighting vehicle workstations. Instructor's interface allows using ready assault scenarios and creating new scenarios.





***'Tor-M2U' air defense missile system (versions: export 'Tor-M2E', wheeled 'Tor-M2K', modular 'Tor-M2KM') is the best-in-class AD missile systems in the world. The system is capable of repelling attack by air weapons at a speed of up to 700m/s, altitude of 10-8,000m and range 1.5-15km. 'Tor-M2U' has high firing capabilities and can simultaneously engage 4 targets with 4 missiles (one-for-one principle operation). The system is capable of fighting UFVs, hovering helicopters, stealth targets with 0.1m2 or higher scattering cross-section. In autumn 2015 'Tor-M2U' for the first time ever in the world locked on and killed a target on the move.***

Thus, the simulator-based training most closely resembles combat and training environment. The training simulator can ensure vehicle crews efficient training both in air defense colleges and operating units, as well as in firing ranges and training facilities. It can operate in any weather and climate at temperature of -5ºC +50°C, relative humidity up to 98% (+ 35°C); in heavy dust, precipitations, wind and other meteorological conditions. The following operation conditioned training simulator versions have been developed: container and truck-mounted container (field), class room (training facilities). The product is assembled using the modern hardware components and computers. Thanks to such technology the cost and range of purchased components as well as labor hours are significantly decreased.

The product can be transported by rail, air, car and water (both river and sea). Setup and removal time do not exceed 30 minutes.

When shown at various armament and military technologies exhibitions and fora, training simulators were of a keen interest to Russian military and foreign experts. In 2016 IEMZ 'Kupol' is to produce several training simulators requested by Russian Ministry of Defense. During International Military and Technical Forum 'Army-2015' chief of Russian Air Defense lieutenant general A. Leonov highly appreciated 'Tor' family antiaircraft missile systems and emphasized the necessity of thorough training, and outfitting training facilities with modern equipment.

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# ‘URALVAGONZAVOD’ TO SHOW ITS BEST DEVELOPMENTS AT ‘ARMY 2016’

**At the second International Military-Technical Forum ‘Army 2016’ ‘Uralvagonzavod’ (UVZ) research and production corporation is showing a wide range of advanced military developments. The UVZ exhibition stand involves products by 8 enterprises being parts of UVZ integrated structure: Nizhny Tagil ‘Uralvagonzavod’, Yekaterinburg ‘Uraltransmash’ and Plant 9, Chelyabinsk NPO ‘Elektromashina’ and ‘ChTZ-Uraltrak’ as well as ‘Omsktransmash’ (Omsk), ‘TsNII ‘Burevestnik’ (Nizhny Novgorod) and ‘Vityaz’ engineering company (Ishimbay).**





At an open display UVZ is to show over 50 military products which include both full-scale items and mockups.

The open display involves T-72B3 tank (made by Uralvagonzavod), the central figure of the ‘Tank Biathlon’. This vehicle has significant advantages of modern foreign tanks in terms of some main characteristics, among which are less weight and size, high endurance, capability of crossing 5m-deep water obstacles and many others. Thanks to two-stage air filtration system and high-performance power package cooling, the tank may be used in heavy dust and high temperatures (above +50°C). It is simple and reliable.

In 2015 brigadier general Solis Martinez Hames, the head of Venezuelan tank biathlon team, described T-72-B3 as follows: ‘This tank is in possession of the best performance attributed to main battle tank, which include high fire power and high mobility. All this makes T-72B3 a lethal weapon against any other tank’.

‘Uralvagonzavod’ Corporation is introducing T-90MS tank. The vehicle is equipped with a new turret weapon station armed with improved precision gun, new highly-augmented digital fire control system, new digital communication, navigation and interaction aids, new remotely controlled machinegun mount. The tank features better positioned commander’s and gunner’s data displays, improved workstations ergonomics, and a turret-mounted air conditioner for more comfort in hot climate. The combination of combat and technical characteristics enables successful operations in any region, weather and climate as well as during day and night.

Another development by Nizhny Tagil tank-builders is BMPT-72 fighting fire support vehicle, also known as 'Terminator-2'. For the first time it was introduced in September 2013 at the 9th International Exhibition of Arms, Equipment and Ammunition Russia Arms EXPO 2013 (Nizhny Tagil).

The vehicle has high fire power, protection, command controllability. It can provide efficient fire support for tanks and infantry in any type of combat activities, in complicated climatic and geographic areas, during day and night, against any enemy. BMPT-72 has improved fire control system and turret weapon station protection, which ensure a unique opportunity to increase life cycle and improve fighting capabilities of armies equipped with this vehicle in a quick manner with little costs spent.

Besides, the exhibition area includes 1I37E checkout vehicle made by TsNII ‘Burevestnik’. This vehicle is designed for servicing and current repairs of cannon, fire control system, guided weapon system of T-72, T-80 and T-90 tanks, 2S25 self-propelled antitank cannon. It is also used for preparation of guns for firing etc.

# NATIONAL PRECEDENT

## *PAO 'Morion': development and production of high-technology general purpose communications equipment*

**Today PAO 'Morion' (Perm) with nearly 60-year-long history is a bright example of consistent experience, latest technologies, national innovations and strategic outlook both in military and civil terms. A wide range of production and design capabilities as well as consistent development work ensure confidence in the future not only for 'Morion' itself but also for the important industry involved in production of high-technology general purpose communications equipment. In the context of International Military-Technical Forum 'Army 2016' the enterprise is to introduce such latest developments as switchboards, multiplexors, special communication network systems etc.**

Thanks to engineering capacities and technological capabilities of own production and testing facilities PAO 'Morion' can develop, test, certify and set up a mass production of high technology communications equipment as well as unique customized products within short timeframes.

Meanwhile, high quality and reliability are indispensable for every product be it fiber optic and copper cable PDH and SDH digital communication systems, or TDM and IP data switching and network gateways, digital individual line equipment, engineering communication systems, control equipment, power plants etc.

A reference list of adapted products includes telecommunication solutions dedicated to special networks, public communication operators, Russian Railways, energy companies as well as oil and gas enterprises. The latest products adapted by Russian armed forces include National Defense Control Center equipment, communication aids for Aviadarts-2016 (Ryazan). Currently PAO 'Morion' is developing Ethernet switchboards to be employed in automated communications systems of Russian Navy surface ships. Within the frameworks of developing Navy coastal broadband wireless communication systems the company has successfully tested multiplexing equipment included in 'Voentelecom'-made 'Dina' hardware system.

'Morion' displays an experience of versatile engineering policy. Its achievements make the company a leader in performing full-cycle works, from development to maintenance service. The unique expertise in making innovative equipment is based on a balance of engineering and production capabilities.

There is no doubt 'PAO 'Morion' is a bright example of Russian innovative industry successfully producing high-technology general purpose communications equipment including defense-oriented. In other words, this is a direct response to a question of national science and industry being capable of creating modern telecommunication equipment.

Another important point is that PAO 'Morion' shows the example of combined defense and civil-dedicated works. Such defense industry task was described by Vladimir Putin this spring during the annual television call-in show when answering a question from the city of Tula. The question said that state defense order would be objectively reduced and defense production capacities could be used for civil purposes. In this regard PAO 'Morion' has a unique experience which is worth both studying and adapting, if necessary.

According to experts PAO 'Morion' is among innovative enterprises, which may and must be relied on for further development, involved in daring programs, used as basis for developing strategic technologies.

**PAO 'Morion' invites everybody to see its exhibition stand at International Military-Technical forum 'Army-2016' (showroom 3, stand 3E2-1), where telecommunication solutions will be described in details and equipment will be shown. The following equipment is to be displayed:**

- OTN main multiservice platform for generating high speed DWDM networks (up to 800Gb/s), NG-SDH optical transport systems;
- Ethernet switchboards L2/L3, including secure switchboards using Russian hardware components, sea-based switchboards;
- Multifunctional flexible multiplexors for making E1 streams out of analog speech waveforms and digital signals;
- Systems dedicated to special communications networks including mobile communications centers;
- Passive equipment: distribution frames, cabinets, power supply units.

# AGAINST ANY TANKS

## *The best in the world Kornet-EM multipurpose missile system*

**As of today the IIIrd generation Kornet-E portable/transportable laser beam-rider system developed by KBP and adopted in 1998 is the weapon de-finitively complying with the concept of advanced ATGW, being state-of-the-art specimen of multipurpose tactical short range weapon system allowing en-gagement of virtually any small-size target within the system's line of sight. Aiming for further enhancement of Kornet-E ATGW combat capabilities, KBP Instrument Design Bureau developed a new multipurpose missile system — Kornet-EM.**

Antitank guided missile systems (ATGM) have been developed and pro-duced globally for already half a century. Since then they became the most popu-lar and wanted type of high precision weapons (HPW) thanks to their usability and relatively low cost. A future ATGM system must be a versatile defensive-offensive guided weapon, whose portable and combat vehicle transportable mod-ifications ensure a wide range of applications in close range tactical zone in vari-ous combat environments.

The weapon is designed as an automatic combat system, incorporating, be-sides the firing unit itself, both reconnaissance and control assets, and ensuring full automation of all combat operation constituents — target detection and distri-bution, issuing and processing of target designation, missiles' guidance. The operator's task within such system is limited to supervision of its proper function-ing and launch of missiles.

The open architecture of the system in terms of data exchange with higher-rank and peer units along with its combat capabilities makes it a vital element of Army network-centric system.

Kornet-EM multipurpose missile system provides for engagement of mod-ern and future tanks, various fortifications (pillboxes, bunkers) and low-velocity aerial targets (helicopters, assault aircrafts and UAVs) in day&night and adverse weather conditions under enemy ECM and optical jamming at ranges up to 8-10 km.

The Kornet-EM system comprises:

• combat vehicle with two automatic launchers and operator's panel with a display;

• battery commander's reconnaissance and control vehicle, equipped with combined surveillance system including TV, IR and radar reconnaissance aids, navigation, communication and data exchange systems, automated control suite and weapon system (Kornet-EM ATGM and PKTM machine-gun),

• guided missile with HE warhead with impact and proximity fuses and firing range of up to 10 km;

• an antitank guided missile with a maximum firing range of 8000 m and shaped charge warhead armour penetration of 1100-1300 mm which enables the Kornet-EM system to engage modern and future tanks bearing in mind the ten-dency to growth of their armour protection.

Due to implementation of state-of-the-art but, however, low cost technical solutions, Kornet-EM acquired a number of new features, allowing significant broadening of its combat capabilities to counter both conventional ground tar-gets, as well as non inherent to this class of systems ability to engage lowe-velocity aerial targets:

• the use of computer vision along with automatic target tracker makes it possible to exclude an operator from missile guidance process and in fact imple-ments the 'fire-and-forget' principle, thus giving a 5-times increase in accuracy of target tracking during real combat.

• engagement of targets in automatic mode reduces psychophysical stress to operators, requirements to their skills and duration of their training.

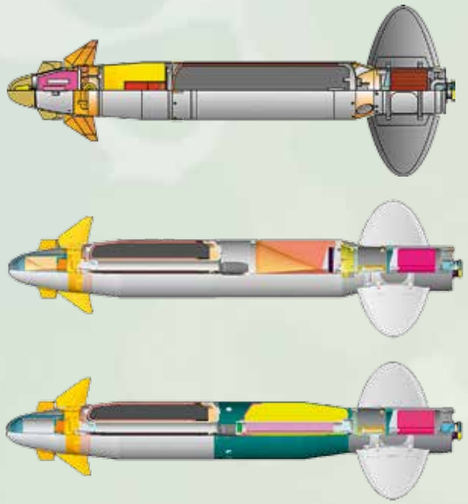
• automation of guidance process along with automated target detection and distribution, target designation commands generation and processing result in virtually fully automatic combat system, limiting the operator's task to super-vision of its proper functioning and launch of missiles.

• combat vehicle with twin-launcher ensures simultaneous salvo firing at two targets, thus significantly increasing the system's firing rate and number of targets handled and at the same time allowing two-fold reduction of combat as-sets required to complete a mission. Such performance specifications endow Kornet-EM with the highest target handling capability among similar existing and future systems — min. 3-4 targets per minute at ranges up to 5 km. Thus, in case the weapon systems are positioned at a stand-off range from enemy tanks (more than 4 km) a single Kornet-EM battery of 9 combat vehicles is able to repulse an attack (i.e. destroy min. 50% of targets) of enemy tank (M1A2 class) battalion (58 tanks). Actually, such mission may be accomplished by two battery salvos, destroying 32-34 tanks, i.e. 55-60% of the battalion. The time required to accom-plish the mission will not exceed 1 minute, allowing to avoid casualties, since the enemy tanks will not be able to to reach their effective firing distance.

• new capability for ATGW — effective engagement of small-size aerial tar-gets — reconnaissance and reconnaissance-attack unmanned aerial vehicles being the enemy's crucial and mass combat support tool,

### Main Performance Specifications

| | |
|---|---|
| Flight range | 150 – 8000 |
| Armour penetration, mm | 1100 – 1300 |
| Maximum flight speed, m/s | 300 |
| Weight with launch-tube, kg | 31 |
| Length of launch-tube, mm | 1210 |



as well as helicopters and as-sault aircrafts.

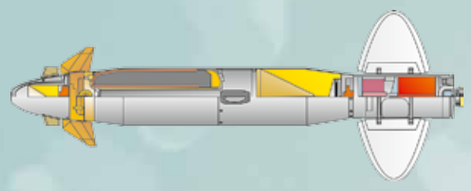
UAV on a reconnaissance mission lets enemy well in advance disclose de-fence, give accurate target designation for firing over-the-horizon munitions, rec-ord and transmit information on army relocations both during operations near the line of contact with enemy and in the rear. This results in significant increase in casualties and possible failures of combat mission performance. From the point of view of engagement, UAVs are difficult targets due to low altitude of flight. Moreover, in case of mass application they are a teaser for the air defence assets, causing high consumption of expensive surface-to-air missiles.

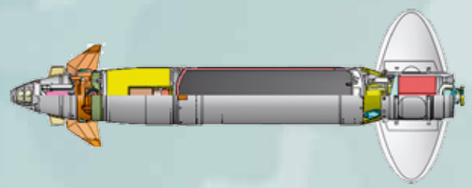
Attack helicopters and tactical aircrafts are by now the highest threat for land forces, as they can inflict maximum damage in minimum time. For example, a helicopter is able to destroy a company of armoured vehicles (10-14 armoured vehicles) with one ATGM load.

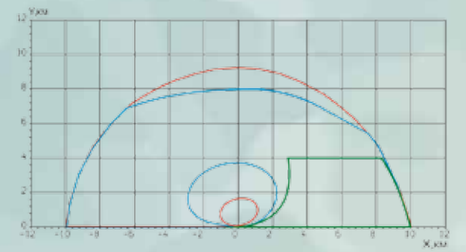
To efficiently counter the UAVs, attack helicopters and tactical aircrafts the air defence assets should be available right in the combat formations, because at-tack or reconnaissance flights are performed at low altitudes, impeding due-time detection with medium and short range air defence systems which are usually sta-tioned deep in the home front. Kornet-EM is the system able to efficiently ac-complish low-velocity aerial threats repulsion tasks.

Another distinctive feature of modern combat operations is deployment of sophisticated surveillance and networking technologies in the tactical units. Wide application of integrated surveillance aids (various combinations of optical, radar, TV and IR systems), sophisticated automatic assets of tactical units opera-tion control, communication and navigation allows continuous monitoring of the battlefield, real-time reception of reconnaissance data (both from peer and higher level units) overlaid on the digital maps and automatic or semiautomatic genera-tion and transmission of target&firing data to the fire units, thus, determining the efficiency of high-precision tactical weapons and ATGW employment.

Availability of surveillance systems providing detection of wide range of targets and automatic bat-








## Main Performance Specifications of the System

| | |
|---|---|
| Firing range, m: | |
| • minimum | 150 |
| • maximum | 10 000 |
| Guidance system | automatic, beam riding guid-ance |
| Jamming immunity | high |
| Number of targets engaged simultane-ously by a salvo | 2 |
| Armour penetration by shaped charge warhead, mm | 1100-1300 |
| TNT equivalent of high explosive war-head | 7 |
| Ammunition load, pcs | 16 |
| including ready-to-fire missiles | 8 |
| Change-over from traveling to combat configuration, seconds | 7 |





***Kornet-EM multipurpose missile system provides for engagement of modern and future tanks , various fortifications (pillboxes, bunkers) and low-velocity aerial targets (helicopters, assault aircrafts and UAVs) in day&night and adverse weather conditions under enemy ECM and optical jamming at ranges up to 8-10 km.***

tery operation control aids is a vital need for Kornet-EM with its versatility of combat applications and ability to effectively counter aerial targets. Timely submission of aerial targets data to the fire units (Line Kor-net-EM combat vehicles) directly influences both the efficiency of ATGW counteraction to aerial threats, as well as casualties in the units under air raid.

To provide operational surveillance/data exchange and control of Kornet-EM battery combat operation, a battery commander's surveillance&control vehi-cle is designed based on standard line Kornet-EM CV.

The Surveillance&Control vehicle is special-purpose unit combining both reconnaissance/control and fire unit functions.

The control vehicle comprises:

• Integrated surveillance system featuring TV, IR and radar aids;

• navigation aids;

• communication and data exchange system;

• automated control suite;

• weapon system.

Employment of radar in the control vehicle allows target detection at rabges significantly exceeding the firing range of line combat vehicles weapon systems. This provides efficient control of Kornet-EM battery combat operation along with wide sector surveillance by Kornet-EM control vehicle.

Provided with such surveillance capabilities the task of the control vehicle limits to target detection, friend-or-foe identification and target distribution among the line vehicles in order to avoid multiple firing at a single target.

The battery commander's control vehicle capabilities by day/night time and under any weather conditions are the following:

• detection, identification and tracking of moving or stationary air and ground targets, automatic measurement, generation and processing of the detect-ed targets' coordinates;

• friend-or-foe identification;

• generation and transmission of target designation data from the anti-tank battery commander to line combat vehicles;

• maintaining radio communication within the battery, as well as with higher-rank and peer unit commander's;

• real-time control of battery fire, relocation and firing pattern planning in case of changing deployment area with data overlaying on the digital map.

These capabilities allow:

• reduction of ground targets detection time for line combat vehicles — by 2-3 times at daytime and by 6-10 times at night (if compared to target search using IR sight), aerial targets — more than 10 times;

• automatic determination and firing primarily at the most threatening tar-get;

• maintaining balanced target load on the combat vehicles to avoid multiple firing at a single targets by several vehicles;

• timely readjustment of battery firing pattern in case of casualties.

As a result, the Surveillance& Control Vehicle is able to double the combat effectiveness of Kornet-EM battery while countering enemy tanks attack in properly arranged defence formations, or increase it by 2.5 times in case of enter-ing the combat (from march) without prior area survey and missing information about enemy forces.

In case of countering aerial threats (UAV, helicopters) the combat efficiency of ATGW battery will increase by 2.5-5.0 times due to reduction of target detec-tion time and increase of detection probability.

# AEROSILA:

## one of the most experienced companies in the world

**AEROSILA is a public multi profile company with high intensive R&D and own production plant. Being established in 1939 as Design Bureau for automatic air propellers developing since 1957 the Company has been designing and developing auxiliary gas turbine engines (APU) too.**

Now AEROSILA specializes in designing and manufacturing:
- APU for aircraft and helicopters
- air propellers and propfans for aircraft
- lifting and propulsion mechanisms for hovercraft
- power converters for supersonic aircraft
- inflowing and exhaust fans, jet axial fans for tunnels and underground premises.

Being the high-level integrator AEROSILA coordinates creative efforts of developers for control systems, fuel devices, starting and ignition systems, heat exchangers, sensors, other aggregates and materials, organizes the formation of perspective requirements and sets long-term objectives.

QUALITY and RELIABILITY of our products have been proven by their users worldwide. The EFFICIENT USE of AEROSILA's products even at highly demanding parameters is guaranteed by our LONG EXPERIENCE in DESIGNING such products, MODERN TECHNOLOGICAL FACILITIES for manufacturing and testing, rigorous quality management system (on ISO 9001:2008, EN 9100:2009 standards) and a well organized technical support network.

AIR PROPELLERS, PROPFANS and HYDROMECHANICAL GOVERNORS

Air propellers and propfans ranging from 15 to 30,000 h.p. feature aerodynamic efficiency up to 0.9. The following characteristics have been achieved by virtue of implementing multi-blade conception and using light composite blades:
- Dimension & weight reducing
- Noise level reducing
- Design service life increasing & reliability improving
- Overhaul ability of composite blades with durability of repaired blade at a level of new one.

The electronic control loop in propellers' automatic control system allows to implement the following:
- expanded set of control functions
- diagnostics
- propellers' phase-synchronization with additional noise level reducing.

APUs

On the basis of the series of New Gen gas turbine engines their modifications are operatively created for APU of new, advanced and modernized aircraft and helicopters.

APUs are equipped with the electronic system of control and adjustment (FADEC) and meet up-to-date requirements in dimension, weight and specific performances, noise level, emissions release, launch and operation altitude, fuel economy and maintainability.

Now the following improvements are being performed:
- advanced small size gas turbine engines.
- board power units with increased electric power bleed including implementation of 'electric aircraft' conception
- base gas generator for small size propulsion engine.

AEROSILA FEATURES
- Full cycle of new product creating from scientific investigation to pilot production, tests and technical support
- Modern technology of full-scale production and wide production cooperation
- Mutually-beneficial kinds of cooperation and personnel approach to partners and customers
- Cooperation with the leading industrial institutes and design bureaus
- High professionalism of collaborators
- Continuous quality improvement, products/services developing and modernizing. Meeting customers' requirements is our main concern.

On CUSTOMERS' DEMAND AEROSILA provides:
- Adaption of serial products to the customer's requirements
- Design and development of new products
- Localization of manufacture under license agreement.

LIFTING & PROPULSION MECHANISMS for HOVERCRAFT and WIG AIRCRAFT

AEROSILA has developed providing serial supply of air propellers and lift fans designed for creating an air cushion under ship body, direct and reverse thrust for high speed, maneuverability, landing and ship moving on the land.

Blades of propellers and fans with variable pitch are made from polymer composite materials.

INFLOWING / EXHAUST FANS, JET AXIAL FANS

AEROSILA has developed the series of high effective variable pitch fans for ventilation of tunnels and underground premises.

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# 'ZAVOD 'PLASTMASS', JSC

**'Zavod 'Plastmass' (Plastics Factory) founded in 1939 is now a part of NPK 'Tekhmash', 'Rostec' State Corporation. Currently the enterprise is producing a wide range of 76-152mm tube-launched ammunitions including those dedicated to tanks, mortars and naval guns.**

***Oleg Lisitsin, General Director***

Besides, 'Zavod 'Plastmass' is engaged in manufacturing and disposal of S-5 and S-8 unguided aircraft rockets. The factory-made products include such ammunitions as HE fragmentation, armor-piercing, concrete piercing, shaped-charge, sub-caliber etc. 'Zavod 'Plastmass' of NPK 'Tekhmash' is among the industry's largest companies in the Southern Urals with over one thousand employees involved.

Since 2013 the enterprise has been undergoing a full-scale restructuring process with production uninterrupted. Today the factory is engaged in two large-scale federal target programs: investment project 'Restructuring and Re-equipment of special production with security steps taken' (under federal target program 'Development of Russian defense industry in 2011-2020'), and 'Restructuring of Production Capacities' of 'Zavod 'Plastmass', JSC. The project is to be implemented in 2013-2016.

The projects are funded with federal budget and enterprise's own resources. These programs are focused on refitting the company with modern equipment and testing instruments. Such procedure is a primary component of mastering new technologies, new ammunitions, increasing their efficiency to be equal to dedicated high-precision weapons.

# China receives 24 SU-35 FIGHTERS

**In 2015, 24 Su-35 fighters were sold to China under the first export contract, the CEO of Rostec, Sergey Chemezov, stated at a meeting with the President of the Russian Federation Vladimir Putin. 'The main business event that occurred last year in 2015 was the first export contract for Su-35 fighters signed by Rosoboronexport. We sold 24 fighters to China,' Sergey Chemezov's statement. Thus, China has officially become the first foreign customer for Su-35s.**

The Su-35 is a multifunctional 4++ generation fighter. The Su-35 is made based on Su-27/Su-30 fighters, and the 'thirty fifth' is a conceptually new fighter employing fifth-generation combat avionics.

KRET enterprises developed the Su-35 ' glass cockpit' indicators and a number of other avionics. In addition, the Concern's specialists created the platformless INS capable of autonomously determining a fighter location without satellite navigation or communication with ground services.

It should also be mentioned that this latest navigation system was designed for use in the fifth-generation fighter PAK-FA. This points once again to the fact that the Su-35 comes close to the fifth-generation fighter in all of its features. It meets most of the requirements for fifth-generation aircrafts, except for the stealth technology and the active phased antenna array (APAA).

Despite the lack of the APAA, the Su-35 radar system can detect targets at ranges of up to 400 km. These capabilities are provided by a new fighter radar control system with the phased array antenna Irbis, which is produced by the Ryazan State Instrument Enterprise, which is a part of KRET.

The important difference of the Su-35 over the Su-27 is the use of new high-power engines in the propulsion system. They were designed at NPO Saturn, a part of UEC, and are known as '117S'.

Presently, in service of the Russian VKS there are 48 Su-35 fighters. Under the current state arms program, Aerospace Forces shall receive 96 Su-35s before 2020. Interest is being shown in the Russian fighter from abroad as well: some potential customers are Algeria, Egypt, Venezuela, and Vietnam. According to some expert opinions, the Su-35 is able to be a serious opponent to the F-15, the Eurofighter and the Rafale.





# SUKHOI Business Jet


**JSC Sukhoi Civil Aircraft (SCAC) held a roll-out ceremony of two Sukhoi Business Jet (SBJ) aircraft built for Royal Thai Air Force (RTAF). The aircraft will be providing VIP transportation services for Thai top officials and government leaders as well as to the High Command of Thailand. The two SBJs are the company's first business jets acquired by an overseas customer.**

Air Chief Marshal Treetod Sonjance, Commander-in-Chief of The Royal Thai Air Force, Ilya Tarasenko, President of SCAC, Nazario Cauceglia, CEO of SuperJet International and Marc Sorel, CEO and Chairman of PowerJet, took part in the official ceremony celebrating the aircraft roll-out and acquisition.

The version of the SBJ designed for RTAF has three sections differing in comfort level: a 4-seat VIP area, a 6-seat business class area, and a passenger compartment for 50 people. The aircraft ensure maximum passenger comfort, including communication and Inflight-Entertainment systems.

The SBJ's flight range is over 4500 km. The aircraft, including the interior, were assembled in Russia. In-service maintenance support for the RTAF jets will be provided in Thailand. The aircraft are delivered to RTAF as part of the bidding and procurement process for which SCAC was awarded a contract in 2014.

President of JSC Sukhoi Civil Aircraft Ilya Tarasenko said:'The delivery of the SBJs to The Royal Thai Air Force is our debut on the global business aviation market. The SBJ provides premium level air service and demonstrates SCAC's flexible approach to our customers' preferences. It is a great honour for SCAC to have produced the VIP version of our aircraft for Thai leaders and we are confident that our SBJ will be a success.'

ACM Treetod Sonjance, Commander-in-Chief of Royal Thai Air Force: 'From the day the Royal Thai Air Force signed the contract to purchase the Sukhoi Superjet 100 aircraft on September 15, 2014, Sukhoi Civil Aircraft personnel have been at their best to provide the Royal Thai Air Force with a top product in accordance with its specification as well as to supply the ground support equipment, materials, and training programs. All steps have been completed on schedule and only some training is still in process. The newly manufactured Sukhoi Superjet 100 aircraft is now ready to be stationed in the Royal Thai Air Force to support VIP operations of Royal Thai Air Force.'

# The Indian Visit to ROSTVERTOL

**A delegation headed by the Indian Ambassador to the Russian Federation Pankaj Saran visited Rostvertol, a part of Russian Helicopters Group. The factory's production facilities and the line of helicopters manufactured by the company were presented in the course of the visit.**

Pankaj Saran, accompanied by Rostvertol's directors, visited the factory's main shop, where he was shown the procedure for assembling Mi-35M, Mi-28NE, and Mi-26T helicopters and saw how parts were machined using state-of-the-art equipment.

The delegation inspected the commercial helicopters produced at the plant. This includes the dual control Mi-28NE attack helicopter, the multirole Mi-35M attack helicopter, and the Mi-26T2 helicopter, the best in the world in terms of load capacity. A special aerobatic performance of the Mi-28NE was put on for the guests, after which India's Air Attaché Air Commodore Dhananjai Vishnu Wani, executives from Russian Helicopters and Rostvertol discussed the opportunities and prospects for bilateral cooperation.

'India is a key strategic partner for Russian Helicopters Group and a major operator of Russian-made helicopters. Russian Helicopters is planning to sign a contract with the Indian Ministry of Defense before the end of 2016 to overhaul three Mi-26 helicopters. The repairs performed by the holding will be high-quality and completed on time,' said Igor Chechikov, Russian Helicopters' Deputy CEO for Aftersales.

The Ambassador expressed his gratitude for the warm reception and was keen to state how impressed he was with the plant's technical equipment in general and the high-tech equipment in the machine-assembling factory in particular. The guest also highly praised the flight demonstration of the Mi-28NE helicopter and its unequaled maneuverability.

In late July this year, the Indian Ministry of Defense and Rosoboronexport signed a contract for the repair and upgrade of ten Indian Navy Ka-28 anti-submarine helicopters. The repairs will be carried out at Kumertau Aviation Production Enterprise.

Russian Helicopters Group (part of Rostec State Corporation) is a leading player in the global helicopter industry and the only Russian helicopter designer and manufacturer. Russian Helicopters was established in 2007 and is headquartered in Moscow. The group includes five helicopter plants, two design bureaus, components production, maintenance and repair plants, aircraft repair plants, and a helicopter service company providing after-sales support in Russia and abroad. Customers include the Russian Ministry of Defense, Russian Ministry of Interior, Russian Ministry of Emergencies, other state customers, Gazprom Avia and UTair airlines, and major Russian and foreign companies. In 2015, Russian Helicopters' IFRS revenue increased by 29.5% to RUB 220.0 billion. Deliveries reached 212 helicopters.





# EVA vision system

**Under order from RSC Energia, Roselectronics has designed a single CCTV system used to monitor astronaut activity in space. The system will be tested in 2017. It was developed on the basis of the Orlan-MKS spacesuit currently used by Russian astronauts and designed for eight hours of continuous operation.**

A single TV camera block attached to the helmet forms a digital and TV color picture signal. Then the CCTV system codes the signal and transmits it through the radiochannel to the service module of the Russian segment of the International Space Station, after which the signal reaches the Mission Control Center (MCC). Stable TV signal receipt and transmission between the spacesuit equipment and ISS antennas is functional at a maximum distance of 200 m.

The system helps two astronauts cooperate in open space and transmits the most complete picture of what is occurring to MMC. An automatically actuated illumination unit is also featured for operation in low-light conditions. Thermal insulation is used to protect the system's power supply unit. TVC visual angles: acceptance — 57˚ ± 2.5˚; vertical — 47˚ ± 2.5˚; diagonally — 70˚ ± 2.5˚.

Currently, the CCTV system has passed basic tests, including acceptance control at RSC Energia and tests on the system stand. Equipment flight tests are scheduled for 2017.

Roselectronics is the largest Russian manufacturer of radioelectronic components and technologies and is a part of Rostec. The holding company brings together 108 companies in the electronic industry specialized in the development and manufacture of electronic technology products, electronic materials and equipment for their production, microwave technology and semiconductor devices, subsystems, complexes and communication technology, as well as automated and information systems. The holding consolidates about 60% of the domestic production sector of electronic components (for microwave technology — up to 80%). According to Rostec Corporation's development strategy, the share of civilian products in the total revenues of Roselectronics will increase twofold, 20 to 40%, by 2025.

# Service center in Iran

**Russian Helicopters specialists conducted technical examination of the Iranian state-owned company, Iranian Helicopter Support and Renewal Company (IHSRC). Based on the results of the company audit, a certificate of provisional authorization as the sole repair base for the Mi family helicopters in Iran was issued.**

Technical examination of the Iranian enterprise was conducted In July this year. In the course of the talks between the Russian Helicopters delegation and the Iranian side, a project plan was also agreed upon for refitting the IHSRC company and its further authorization as the full-value sole maintenance and overhaul center for repairing civilian-type helicopters of the Mi-17/171 family in Iran.

The seminar for Iranian operators and customers of Russian rotorwing machines Initiated by IHSRC was also organized in Tehran on August 23 through 25. Specialists of the Russian Helicopters holding company also took part in it. In the framework of the event, participants visited the IHSRC repair base and saw its capacities.

In terms of its production capacity, the Iranian IHSRC plant is among the largest centers of maintenance, overhaul and upgrading of helicopters in the Middle East.

'Iran is one of our key partners in the Middle East. Authorization of the IHSRC repair plant offers the Russian machine operators an opportunity to perform repairs in their region, thus enabling them to ensure timely operability of the machines,' says Igor Chechikov, Deputy Director General of the Russian Helicopters holding company.

Note that the fleet of Russian and Soviet made helicopters in the Middle East countries includes more than 500 civilian-type and military helicopters. Depending on the helicopter modification, the overhaul is to be performed every 1,500 or 2,000 hours. The machines are overhauled at the enterprises that have passed the procedures of authorization and certification with the participation of the designers and manufacturers of the helicopters.

# HIGH-PRECISION WEAPONS

- Russian holding ‘High-Precision Weapons’ is the world’s largest developer and a producer of high-precision types of arms for the land forces, the navy and the aviation.
- The holding unites 19 leading Russian enterprises that create new generation of high-precision arms.
- Being one of the largest suppliers of the latest arms, ‘High-Precision Weapons’ provides to Russian Army and to the armies of other countries high-precision arms according to their requirements.
- ‘High-Precision Weapons’ is a founder and a producer of the most effective samples of precision weapons in the world, such as Pantsir-S1, Kornet-EM, Palma, Sosna, Igla-S, Kapustnik-B and others.


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