

RUSSIAN AVIATION & MILITARY GUIDE

Special analytical export project of Industrial Weekly

№ 09 (27) September, 2018

FIFTH SUMMIT

*Convention the Legal
Status of the Caspian*



.20

ROSOBORONEXPORT

*Russian's only state
special arms exporter*



.26

THE BEST FROM THE BEST

*Technology and victory from
Military-Industrial Company*



.32

WORLD EXCLUSIVE

*Unique system for rescue
from any height*



.44



The best defense innovations for Europe and Asia



SPECIAL
PARTNERSHIP

NEW RUSSIAN AIRCRAFT

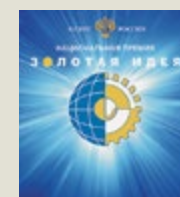


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EDITORIAL



The best partnership at ADEX-2018

It has become already obvious and undeniable that security is becoming increasingly important among the various values of civilization. Today, for any state, the ability to reliably and securely protect the territory, residents and values is a priority.

Political situation in the world (conflicts, sanctions, threats of war and other) makes nations once again reconsider their defense possibilities. Threat of local conflicts to be evolved into global ones, failure of worldwide system of safety and nonending crisis – all of this leads to an unstable and dangerous situation.

One can predict raise of defense means market in times like this. But together with developing of defense technologies in order to 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. ADEX2018 presents the best weapons and innovations for global security, which are the undisputed world leaders on price and quality in their segments.

These exhibition shows that it is not serious about how many weapons you have, but quality and possibilities of every single one of them is fact 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 hitech products, solid aftersales service and proven reliability, Russia is honest and friendly partner for all countries, ready for mutual work.

Taking part in Azerbaijan Defence Exhibition – ADEX-2018 Russia continues the policy of open partnership with the other countries, we have a wide product line that meets all the needs of defense on this region and ready propose the best technology and the best price offers.

Valeriy Stolnikov

MODERNIZED NIGHT HUNTER HELICOPTER

Russian Helicopters (part of Rostec State Corporation) has presented a new version of the Mi-28NE attack helicopter at the International Military-Technical Forum ARMY-2018 which is being held from August 21 through August 26 in Kubinka in the Moscow Region. The attack helicopter can interact with drones and operate them remotely. The modernized Mi-28NE helicopter is presented at the static exposition of the forum. Improvements were primarily related to armaments. The 'Night Hunter' has the new Khryzantema-M anti-tank missile with a dual guidance system. Using this missile will increase the tank-type target engagement range to 10 km. The helicopter is also fitted with the modernized Ataka guided missiles with laser guidance. It can also use aerial bombs weighing up to 500 kg.

'Modernization involved engine power and blades, which improved aircraft performance in highland regions and in hot climates, increased the cruising speed of the machine and its capabilities in terms of advanced aerobatics. A larger tailplane improved the controllability of the helicopter. New armaments installed on the machine will increase its fire power, and the fact that the aircraft can be used in more fields will mean that it will be in greater demand on the market,' said Anatoly Serdyukov, Industrial Director, Aviation Cluster of Rostec State Corporation.

In addition, the new Mi-28NE helicopter can interact with drones and operate them remotely, as it has special means of communication.

'We are constantly improving military helicopters because the requirements of our customers change, and we always aim to meet them. Due to the experience of using Mi-28 machines during military operations we knew how to further develop this project. The modernization considerably increased the capabilities of Mi-28NE helicopters and offered us new prospects in terms of exports,' noted Andrey Boginsky, CEO of Russian Helicopters. The Mi-28N attack helicopter (the export version is Mi-28NE) is designed for fire support of forward ground troops, motorized infantry and tanks. The 'Night Hunter' helicopter has enhanced armor and greater combat survivability. It also has a complex of modern high-precision guided and unguided weapons. The advantages of the helicopter include resistance to battle damage due to the use of the most modern materials and design solutions. The blades of the Mi-28N main rotor are made of composite materials, which means that a flight can still be completed safely if they are hit by shells of 20 to 30 mm. The fuel system is designed in such a way that fuel can neither explode nor burn. The Mi-28N helicopter is one of the first Russian helicopters to be fitted with modern means of communication and digital avionics.

'City of the Future'

The Rostec State Corporation presented a wide range of advanced developments for the 'city of the future' at the 9th international industrial fair, Innoprom 2018. The State Corporation's exhibition stand demonstrated technologically advanced samples of urban transport, digital systems of the 'smart' urban infrastructure, the newest solutions in the field of healthcare and medical equipment.

At a 429 square metres' stand Rostec showcased its developments designed for transformation of the urban environment and creation of the 'smart' infrastructure in such fields as security, transport, housing and public utilities, healthcare, etc. It included smart traffic lights developed by the Shvabe holding company that can be automatically adjusted depending on the road traffic load. The Ruselectronics holding company presented electronic components for the Angara high-speed communication network for supercomputer computations, a new system for photo- and



video-recording of traffic violations, and a non-contact system for microprocessor-based synchronisation of switches and traffic lights for the subway.

The Mechanical Engineering Concern demonstrated an automated diagnostics and therapeutic sys-

tem for human life support to be used in intensive care units and during transportation of patients. The Shvabe holding company's developments also include the AND A15 automatic external defibrillator to be installed at airports, subway stations, shopping malls and stadiums.

Avia Solutions Group

In June 2018, the Zhukovsky international airport's passenger flow grew by 390% as compared to the similar period of the previous year and exceeded 100 thousand passengers per month for the first time ever. The airport complex is being developed by Ramport Aero, a joint venture of Rostec State Corporation and an international aviation holding Avia Solutions Group.

While commenting upon this result, Tomas Vaisvila, CEO of Ramport Aero noted: 'One hundred thousand passengers is an important psychological landmark for us. To a large extent it means that we have reached a brand new level that allows us to state with assurance that the airport is being developed in the right direction. To some extent, the current growth was caused by an increasing passenger flow during the FIFA World Cup. Nevertheless, this result was expected even despite the football championship. To a greater degree it was caused by the extending route network and growing flight rate of the current regular flights. We have been steadily moving towards this goal, and our short-term plans are to consolidate and improve this result.'

The current year is quite successful for Zhukovsky – 472,877 passengers have been carried during the



first six months which is more than during the entire 2017. The growth of the passenger flow is ensured by the activity of partner airline carriers and the growing flight rate along the regular routes. The most popular are flights to Minsk, Tel Aviv and Simferopol. Significant progress has also been achieved in developing the flight services between Russia and China: today, Zhukovsky has regular flights to Guangzhou, Xian, Fuzhou, Haikou and Jinan.

The Zhukovsky Airport is still busy developing the international and domestic route network and attracting new airline carriers.

The Zhukovsky Airport that was opened in spring 2016 is located on the Ramenskoe Airfield 23 km from the capital and has the longest (5,500 m) runway in Europe that allows to operate passenger-carrying and cargo aircraft of any type. The Zhukovsky Airport supports airline operations with the airports of Tajikistan, Kyrgyzstan, Belarus, Turkey, Israel, China, Georgia and Italy. At the end of 2017, Zhukovsky won the Russia's Air Gate award in the 'International airport with a passenger flow of up to 0.5 million people' category.

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UNIQUE CAMOUFLAGE COATING

Ruselectronics and TSNIITOCHEMASH have presented a unique camouflage coating for military vehicles and soldiers' equipment able to mimic the color of the environment at the Army 2018 forum. The company illustrated the possibilities of the material with a soldier's helmet made for the advanced, third generation equipment Ratnik. The specialized electrically-operated material covering the helmet prototype is able to change color depending on the camouflaged surface and environment. The material can display dynamic changes of color intensity and simulate complex images, for example, the motion of leaves in the wind. 'Existing types of camouflage do not change their masking properties depending on changes in the background. For example, soldiers will not be seen in a forest against greenery, but they will be visible against sand or snow. An innovative coating created by Ruselectronics provides unique opportunities for masking. We are demonstrating how it works using one element of equipment, i.e., a helmet. However, its application is much broader. It can be used in clothing, weapons, and military equipment,' said Industrial Director of the Armament Cluster of Rostec Sergey Abramov.

T-500A AIRCRAFT

Rostec has presented T-500A aircraft with flotation landing gear for water deployment at the Hydroaviation-2018 exhibition. This modification can be used to carry out patrol and search and rescue operations in coastal areas, as well as for cargo delivery. With the flotation landing gear, the T-500A has significantly increased the area and geography of its use. No runways are required in order to operate the new modification of the lightweight all-composite aircraft which can be based on water aerodromes, river and sea ports. 'It is a modern multi-functional glider, which can be used for performing a wide range of tasks, such as search and rescue operations for detecting casualties and delivering rescue equipment and medications, delivering various cargoes from mail to urgent cargo, and patrolling coastal and remote areas. At the same time it's a universal aircraft – its flotation landing gear can be quickly replaced with wheel or ski gear if needed,' said Industrial Director of Rostec Sergey Abramov. The T-500A is a modification of the T-500 specialized aircraft for aerial chemical works. The project is implemented by ORPE Tekhnologiya named after A.G. Romashin (part of RT-Chemcomposite Holding Company of Rostec State Corporation) together with MVEN Company (Republic of Tatarstan).

Re-equipping of the Be-200 amphibious aircraft

Rostec's United Engine Corporation has presented the project to re-equip the Be-200 amphibious aircraft with the Russian-French SaM146 engine unit. The presentation took place at the ongoing Hydroaviation-2018 exhibition in the Russian city of Gelendzhik. The modernization will make it possible to introduce the aircraft on the European and American markets, and also to begin the validation of the aircraft in the transport and passenger configurations.

The re-equipment project provides for modernization of SaM146 engine, including improvement of the software for the digital automatic control system. The next stage is the integration of the engine into the Be-200 aircraft and further certification of the re-equipped version.

The key advantages of the SaM146 engine unit are its simple and reliable construction, competitive price and life cycle cost. The engine meets high standards of environmental friendliness and fuel economy. The SaM146 engine unit has also passed international certi-

fication and complied with prospective ICAO requirements.

'The implementation of this project will essentially make it possible to create a new aircraft based on the legendary Be-200, which is known to the world as a fire-fighting amphibious aircraft. The new engine opens up the possibility of the aircraft undergoing the certification and validation procedures necessary to enter the world market. I am sure that, thanks to improved technical characteristics and a well-deserved reputation, this plane will be in demand abroad,' said industrial director of the aviation cluster



at State Corporation Rostec Anatoly Serdyukov.

The SaM146 is an integrated engine unit, including a turbofan engine and a nacelle with a reversing device. The SaM146 is produced by UEC-Saturn in an equal partnership with Safran Aircraft Engines to equip Sukhoi Superjet 100 passenger planes.

Military Aviation Service Centre in India

The Radio-Electronic Technologies Concern (KRET), part of the Russian State Corporation Rostec, and the Indian company Space Era Materials and Processes have concluded an agreement on the participation of the Russian side in establishing a service centre for military aviation in India. A service facility with an area of 30,000 square meters is already under construction in Hyderabad. The agreement will allow the Russian side to participate in competitions held by the Indian government to provide after-sales service of military hardware supplied by Russia, and also to take part in creating a service center for Russian-made aircraft and helicopters.

'KRET has been working with Space Era since 2015,' said KRET's first Deputy General Director Vladimir Zverev during the signing. 'The signed agreement will create an official centre in Hyderabad for the maintenance and repair of on-board electronic equipment and radar equipment installed in Russian-made aircraft. Currently the Indian side is building a facility with an area of about 30,000 square meters, including, among others, helipads. In light of the gained rights to carry out foreign trade activities, the task of KRET will be to organize the servicing of aviation equipment for the full range of products we produce. This work will be carried out in coordination with the Indian Air Force. We had to have this agreement to pro-

ceed to work with the Indian Defense Ministry' – Zverev added.

Under the agreement, KRET and Space Era will develop a joint work plan for the next five years, as well as build the necessary logistics and exchange of specialists and information to create the necessary material base for the project.

'India is one of our main partners in the region. Rostec is ready to provide advanced technology and contribute to the development of the nation's industry. We are confident that our joint projects will allow us to attract 'smart' capital to the economies of India and Russia and help Russian and Indian companies enter new markets,' Rostec's Director for International Cooperation and Regional Policy Viktor Klodov said.



Space Era develops, manufactures, stores, supplies, assembles, maintains, repairs and renovates parts, subsystems, components and equipment, including electronic warfare systems and equipment, which are used in the production of aircraft, radar installations and other electromechanical components, complexes and equipment in India.

The Radio-Electronic Technologies Concern (KRET) is the largest Russian holding in the radio-electronic industry.

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UNIQUE NAVAL UNDERWATER WEAPONS AND SHIPS



JSC Rosoboronexport (part of the Rostec State Corporation), in conjunction with JSC Sea Underwater Weapons – Gidropribor Concern, has launched a program to promote naval materiel and special equipment to the external market.

'A wide range of missions carried out by the navies of maritime powers necessitates equipping them with various types of naval hardware and special equipment. The foreign navies include 225 Russian-built ships. Of them, more than 100 surface ships and submarines are the carriers of naval underwater weapons. Rosoboronexport is offering its partners unique solutions to equip and upgrade the armament of these ships,' said Alexander Mikheev, Director General of Rosoboronexport.

Naval underwater weapons are in service with the world's major navies. However, as few as 5 to 7 countries, including Russia, are capable of designing and manufacturing these weapons independently, due to the high complexity and cost of these efforts. A number of weapons produced by JSC Sea Underwater Weapons – Gidropribor Concern, offered by Rosoboronexport, are unrivalled in the world.

Foreign customers are offered a wide range of naval hardware and special equipment. Among them are torpedoes, mines, antimine and underwater anti-sabotage weapons, as well as means of ship's self-defense against underwater weapons. In the segment of torpedo weapons, the TE-2 universal electric remote-control homing torpedo is offered. It is designed to destroy submarines, surface ships and fixed targets. In addition, a number of newly developed torpedoes, including 533 mm torpedoes and 324 mm small torpedoes, are promising for promotion on the world market.

The MDM-1 and MDM-2 bottom mines are designed to create a mine threat and destroy surface ships and submarines in surface and submerged conditions when used in minefields. The Shelf naval mine offered has no counterparts in the world. It can be placed from delivery aircraft, submarines, and surface ships. The Shelf mine has a hydroacoustic passive/active detection and targeting system protected from triggering when exposed to natural disturbances and influence sweeps that can detect any submarines and surface ships regardless of the level of their noise and speed. Its unique design makes it difficult for the target to use countermeasures and conduct an evasive action.

For Eurasia Largest Telescope

Shvabe Holding affiliated to Rostec State Corporation, has completed installation of a mirror on the Large Altazimuth Telescope (BTA) in the Special Astrophysical Observatory belonging to the Russian Academy of Sciences in Karachay-Cherkessia. Operation of the telescope with the new astronomy-dedicated optics will commence this autumn. The observation distance will increase by 1.5 times. The 6-meters diameter mirror installed by Rostec experts is a key component of BTA.

'Our technologies allow us to build a mirror with a weight of up to several dozens of tons and carry out its nanometric machining. The combination of the large size of the mirror and the unique light-reflecting optical properties will allow Russian scientists to work with the one of the most advanced telescopes in the world in the nearest decades to come. The new optics will augment the observation distance by 1.5 times, so the research horizon will be significantly increased,' commented Oleg Evtushenko, Rostec State Corporation Executive Director.

The telescope's history began with the production of two mirrors in 1970s. The first one was used during the first four years of work, and then it was replaced with an improved one. For more than 40 years of operation the surface quality materially deteriorated, and it was decided to deliver the first mirror to Lytkarino Optical Glass Factory for an upgrade. Today, adjusted in accordance with the new weight, it has been successfully installed on BTA, A regular surface shape evaluation has been carried out. The Russian Academy of Sciences has already received the first test images. The next task is to improve the mirror surface



and further adjustment to complete the preparatory stage. The upgrade procedures will guarantee 40-50 years of further telescope's uninterrupted operation,' said Alexey Patrikeev, Shvabe CEO. Until 1993, BTA was the world's largest telescope. Today, it is the largest telescope in Eurasia.

Mi-35M and Mi-35P at ARMY 2018

At the International Military-Technical Forum ARMY 2018 Russian Helicopters has presented modernized Mi-35M and Mi-35P attack helicopters for the first time.

Guests and participants of the forum will be able to see the machines at the static exposition of the forum. The helicopters have avionics which have undergone a considerable upgrade, and new military equipment.

'The multi-purpose Mi-24 military-transport helicopter (Mi-35 is its version for export) is the first Russian helicopter designed especially for military operations. Its design is so good that now it is one of the most sought-after machines on the international market, and it has proved its high performance during military operations many times. We expect that the demand for new versions of the helicopter with increased combat capability will be high in many countries,' said Anatoly Serdyukov, Industrial Director, Aviation Cluster of Rostec State Corporation.

The modernized Mi-35P helicopter has the OPS-24N-1L observation-sight system with a third

generation matrix long wavelength thermal imager, a TV camera and a laser rangefinder. The new digital flight simulator based on the PKV-8 automatic flight control system will increase the helicopter's steadiness, and automate piloting to assist a pilot. In addition, a modernized sight and computing system will increase the accuracy of target engagement.

The new Mi-35M helicopter has much more options in terms of equipment. The helicopter can be further upgraded for using Igla-S air-to-air guided missiles and the President-S onboard defense system with a laser station for suppression of infra-red homing heads of man-portable air-defense system missiles. Additional equipment may include VOR/ILS systems and a radio rangefinder for measuring the distance between a helicopter and ground-based beacons.

'The Mi-24/35 helicopters are among the machines most frequently used in military operations

all over the world. They have been used during more than 30 wars and military conflicts. With such wide experience, we have managed to perfect this platform, and now we are consistently equipping it with state-of-the-art armaments and avionics. Serial production of the upgraded machines will commence when all the modifications have been tested,' said Andrey Boginsky, CEO, Russian Helicopters.

The Mi-35 military-transport helicopter is designed for destroying armored fighting vehicles and providing fire support for ground troops. It is equipped with modern high-precision weapons and can perform combat missions at any time of day and in all weather conditions. The most important features of the Mi-35 helicopter include its ability to carry personnel with armaments and transport up to three wounded persons from the battlefield, as well as cargo inside the cabin or on an external sling.



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CITY OF THE FUTURE

The Rostec State Corporation presented a wide range of advanced developments for the 'city of the future' at the 9th international industrial fair, INNOPROM 2018. The State Corporation's exhibition stand demonstrated technologically advanced samples of urban transport, digital systems of the 'smart' urban infrastructure, the newest solutions in the field of healthcare and medical equipment. Rostec showcased its developments designed for transformation of the urban environment and creation of the 'smart' infrastructure in such fields as security, transport, housing and public utilities, healthcare, etc. It also includes smart traffic lights developed by the Shvabe holding company that can be automatically adjusted depending on the road traffic load. The Ruselectronics holding company presented electronic components for the Angara high-speed communication network for supercomputer computations, a new system for photo- and video-recording of traffic violations.

RUSSIAN DELEGATION IN THE USA

In the United States of America, on the Day of Military Glory of Russia – Victory at Cape Gangut – the Russian Defence Ministry delegation joined by Russian representatives of the U.S.–Russia Joint Commission on POW/MIAs laid wreaths to graves of seamen of the Imperial Russian Navy in the USA. Sailors Nikolay Pavlov and Timothy Cheparinov, members of the crews of the cruiser Varyag and the battleship Retvizan, were buried in the cemetery Glenwood Memorial Gardens, near Philadelphia, where these ships were built by the order of the Russian government. The graves are dated 1900 and 1901. In late May 2018, memorial stones were installed at the graves. These are the first memorials erected by the Russian Federation for its servicemen on the Atlantic coast line of the USA.

SYSTEM NAMED CHANCE

Rostec premiered a unique design for people evacuation from high-rise buildings – an individual special-purpose parachute system called Chance. The novel solution was unveiled at the Kirzhach airfield when opening a new production complex of the Scientific Research Institute of Parachute Construction, part of Technodinamika Holding affiliated to the State Corporation. Unlike conventional parachute systems, Chance makes it possible to land a person from extremely low altitudes – as low as 30 meters (the height of a nine-storey building) and higher. Its structure includes an anchor line used to close side valves and pull canopies, three parachutes maintaining a specified landing speed, as well as a pack with harness. At the same time, the parachute opens at a required height by itself, and no special training is required for its operation.

NtechLab Face Recognition System

The FindFace Security solution created by NtechLab and implemented by Rostec in several cities during the FIFA World Cup made it possible to detain more than 180 persons included in the database of offenders. Some of them were on the federal wanted list. In the capital, the system introduction project was implemented in conjunction with the Department of Information Technology of Moscow. The system introduced in all regions of the Russian Federation will significantly improve the safety of citizens and reduce the crime rate.

About 500 cameras monitoring the city, metro, stadiums and fan zones as well as mobile biometric complexes for the mass events were connected to the face recognition system in several regions just for the World Cup period. Even within such a short timeframe, the system has shown its high efficiency. It could not be deceived by any tricks. For instance, one of the fans who was banned from sports events by the court decision tried to penetrate the fan zone five times using his glasses, hood and finally the cap for masking, but it did not help! Another striking example is a theft of the sponsor's trophy (one to be awarded to the best player of each match) from the fan zone. Video cameras were used to restore the events: it was possible to identify the persons involved and find their profiles in social media. Thanks to the face recognition system, one of the thieves was located in the fan zone the next day, and the trophy was returned,' said Sergey Chemezov, CEO of Rostec State Corporation.

In 2018, Rostec State Corporation signed a deal for the acquisition of a minority stake in NtechLab, the Russian developer of a unique face



detection algorithm based on artificial neural networks and machine learning. NDF became the third party to the deal.

As for now, the NtechLab algorithm is considered the fastest and most accurate face recognition technology in the world. This is proved by numerous victories in the international competitions held by the US Intelligence Advanced Research Projects Activity, US National Institute of Standards and Technology, as well as Ohio and Washington State Universities.



The algorithm recognizes faces with an accuracy up to 99%. Finding a specific person among 1 billion people takes less than half a second. The NtechLab algorithm can also determine the emotional state, sex and age of a person.

The technology can be used in monitoring and security systems operating on the streets, in yards, house entrances, public spaces, offices, metro, stadiums and other facilities.

The high efficiency of the algorithm was confirmed during the 2018 FIFA World Cup: FindFace Security helped to detain over 180 offenders, some of which were on the federal wanted list.

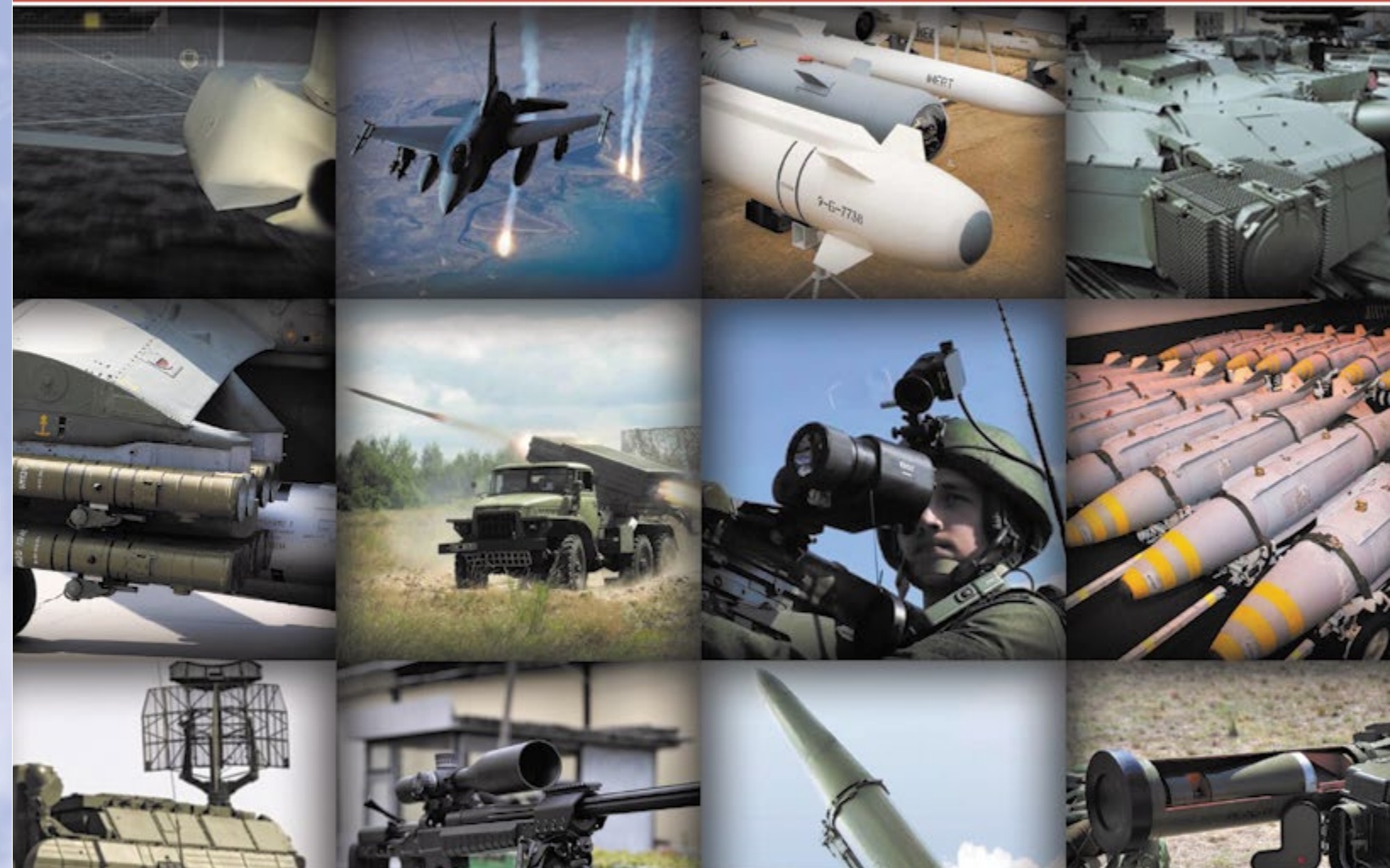
Rostec was responsible for the implementation and operation of a wide range of digital solutions in the field of security and civil IT services during the 2018 World Cup. In particular, it ensured the smooth operation of the information and telecommunications infrastructure in 30 Russian cities. This infrastructure provided 2.8 million phone calls for fans, 262 TB of Internet data transmitted and Ultra HD game broadcasts for 220 countries during the World Cup.

HIGH-PRECISION WEAPONS IN RUSSIA AND IN THE WORLD

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"United Industrial Edition" preparing to publish a new quarterly international research project dedicated to the development, creation, production, delivery, maintenance and use in the armed forces of various types of precision weapons. The publication of the bilingual (Russian and English), addressed to professionals, creators and operators of high-precision weapons. Distribution is by subscription.

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01 (01) 2019 – February 2019

02 (02) – May 2019

03 (03) – August 2019

04 (04) – November 2019

The volume of each room – from 120 p.

HOUSE OF FRIENDSHIP

Before the Tank Biathlon finals, Minister of Defence General of the Army Sergei Shoigu visited the House of Friendship at the Alabino training ground showcasing national expositions about history and culture of the participating countries. Sergei Shoigu played some music instruments of Myanmar, Uganda and Jordan. He was also treated with Chinese tea, Kyrgyz mineral water and oriental sweets. An Uzbek foldable wooden bookholder, Syrian folk craftwork items and copperware attracted Sergei Shoigu at most. Participants of the Games made national expositions about their culture and history at the House on the opening day of the Games. Concerts of national ensembles, lectures, expositions and other events took place in the House of Friendship on a daily basis.

FIRST VISIT TO ERA TECHNOPOLEIS

Specialists from more than 40 leading industry enterprises, scientific and educational organisations visited the Era military innovative technopolis to learn about its capabilities. They saw options for housing joint laboratories for researches in the interests of the Defence Ministry. During the meeting, the Main Department of the Research Activities and Technological Support of Advanced Technologies (innovative research) of the Defence Ministry with the Office of Advanced Research and Special Projects held a working meeting to discuss main vectors of scientific research, relations with enterprises and organizations, as well as logistical base. The Era shall start functioning in September 2018 to house 18 specialized laboratories at the first stage equipped with over 800 pieces of experimental and test hardware.

EUROSATORY-2018

The international Land and Air-Land Defence and Security Exhibition EUROSATORY is one of the world's largest exhibitions of land and air defence weaponry. It has been held biennially under the patronage of the Ministry of Defence of France since 1992. The year of 2018 marked the 12th time Russia has participated in EUROSATORY. FSMTC of Russia has decreed that responsibility for the organization of the Russia's joint display at the exhibition should be vested in Rosoboronexport. The exhibition's main focus is the land and air defence weaponry, as well as communications assets, computer technologies, simulators and logistics support. It has also placed special emphasis on the upgraded versions of current military equipment. Manufacturers of dual-purpose, crisis management, humanitarian aid, peacekeeping, security and counterterrorist products have enjoyed an increasingly broader representation at the exhibition in recent years.

Run Tests in Mountainous Areas

Helicopters of Russia specialists have started the trials of Mi-171A2 and Ansar helicopters. Mi-171A2 will perform a series of flights in the Astrakhan region, and their results will be used to prove this model's operability at ambient temperatures up to +50°C.

The next step will be trials in Nalchik: onboard equipment will be tested in mountainous terrain. Meanwhile Ansar will be tested on Elbrus. Trial results are supposed to confirm the helicopter's operability in mountainous areas at altitudes up to 2,500 meters.

'As the Holding plans to certify Ansar and Mi-171A2 in a number of countries, at the moment it is important for us to check and document the maximum capacity of these helicopters,' said Andrey Boginsky, CEO of Helicopters of Russia.

He also noted that the results of helicopter trials will be used in presentations for potential customers. In particular, they will be demonstrated at Airshow China, an international aerospace salon to be held in Zhuhai in November 2018.



The multifunctional helicopter Mi-171A2 is the result of an in-depth overhaul of the Mi-8/17 family. More than 80 modifications were introduced to the Mi-171A2 design. The helicopter is equipped with VK-2500PS-03 engines (civilian version of engines installed on MI-28 combat

helicopters) with a digital control system. Ansar is a light twin-engine multifunctional helicopter. According to the certificate, the helicopter design allows for its quick transformation into both cargo and passenger versions with the transportation capacity up to seven persons.

Product Range for SSJ-100 and MC-21

Technodinamika (a Rostec State Corporation affiliate) extends the product range for SSJ-100 and MC-21 advanced Russian aircraft. The statement was made by Igor Nasenkov, the Holding CEO, during the new production line opening ceremony.

Science-cum-Production company Respirator, affiliated to Technodinamika Holding, is developing smart units and fire protection systems designed for SSJ-100 aircraft. Besides, affiliated to the holding UAP Gidravlika Publ.Corp is carrying out R&D aimed at components production for MC-21 aircraft. It has already worked out relevant detailed and engineering designs, as well as the working design documentation for fire resistant flexible piping with a protective coating and for hydraulic filter modules.

Nowadays, company specialists are busy preparing for the production of prototypes to be subjected to preliminary and interdepartmental trials. According to the holding company's media relations service, commercial supplies of components are expected



to start in 2019. Most likely, the holding company will become a supplier of the fire suppression system not only for SSJ-100, but for MC-21, too.

Acting in conformity to the MC-21-dedicated programme, Technodinamika Holding has already

been chosen as the supplier of electrically-driven devices for the aircraft's fuselage cargo doors and certain parts for the advanced PD-14 engine, as well as equipment for installing and dismantling batteries found in the fuselage section.

ОПК РФ

СПЕЦИАЛЬНЫЙ ИНФОРМАЦИОННО-АНАЛИТИЧЕСКИЙ ПРОЕКТ

ОБОРОННО-ПРОМЫШЛЕННЫЙ КОМПЛЕКС РФ



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KUZNETSOV ENGINES

Serially-built RD-107A/RD-108A engines by Kuznetsov PJSC, Samara-based enterprise of the United Engine Corporation, were used to perform the seventh launch of the Soyuz-type space launch vehicle this year. The Soyuz-2.1a medium-lift space launch vehicle with the Progress MS-09 Cargo Spacecraft was launched at 12:51 Moscow time on 10 July from the launching site No. 31 of the Baikonur Cosmodrome. Launch of RD-107A/RD-108A rocket engines installed on the first and second stages was conducted normally.

As expected, the cargo spacecraft will approach the station and the Pirs docking compartment of the Russian segment of the International Space Station in the automatic mode under control of the ISS Russian segment's Chief Operational Crew located in MCC, and Russian cosmonauts Oleg Artemyev and Sergey Prokopyev. This will be the second cargo spacecraft to be placed into orbit by serially-built Kuznetsov engines this year. In total, this year saw seven launches of Soyuz-type space launch vehicles with RD-107A/RD-108A engines from four cosmodromes – Baikonur, Vostochny, Plesetsk and Guiana Space Centre. The spacecraft will deliver to ISS about 2.5 tons of various cargoes, including fuel, compressed gases, water, scientific equipment and components.

SELF-LOADING RIFLE TG1

Kalashnikov Concern, affiliated to Rostec State Corporation, launched a new smooth-bore self-loading shotgun TG1. The weapon is meant for training and live practicing, law enforcement and personal property protection. The product can be purchased under a usual license for smooth-bore weapons, making an online order on the official website of the concern or through a proprietary network of brand-zones.

The 12 m gun is constructed on the basis of the popular MR-155 model and features a modern gas venting system, chrome plated chamber and bore. The 12/70 and 12/76 caliber cartridges are fed out from a detachable box magazine, the design provides an automatic shutter delay. The handle with a pistol grip and fore-end are made of impact-resistant plastic. The rifle is furnished with a Picatinny rail, on which a detachable carrying handle with a fully integrated iron sight is mounted. The length of the gun is 1040 mm, while the of barrel length is 510 mm. The weight of the weapon with an empty magazine does not exceed 3.5 kg. the of the magazine case capacity is 5 cartridges.

Support from the Russian Foreign Ministry

At the conference of Russian ambassadors and permanent representatives which took place on the premises of the Russian Foreign Ministry, the Director General of JSC Rosoboronexport (part of the Rostec State Corporation) Alexander Mikheev said about military-technical cooperation and about help from Russian diplomats.

The conference was attended by representatives of the Russian Presidential Executive Office and the Government, the heads of the two houses of the Federal Assembly (Parliament), ministries and agencies involved in the implementation of Russia's foreign policy, subordinate and voluntary organizations of the Ministry of Foreign Affairs, as well as veteran diplomats.

'Today, Rosoboronexport carries out military-technical cooperation with more than 100 foreign countries, and the role of the Russian Foreign Ministry in establishing and strengthening our relations with partners cannot be overestimated. Thanks largely to support from diplomats, we have made a breakthrough to the markets in Latin America and the Middle East in the past decade, and now we are successfully returning to sub-Saharan Africa,' said Alexander Mikheev, Director General of Rosoboronexport.

Rosoboronexport is working closely with dedicated units of the Russian Foreign Ministry in the implementation of Russia's state policy in the field of military-technical cooperation in virtually all re-

gions of the world. In addition, Russian diplomats provide support to Rosoboronexport employees at more than 50 Rostec's representative offices abroad. Russia's ambassadors are involved in the promotion of military products in regional markets, marketing efforts and assist in fulfilling contracts with foreign customers.

The official status of exclusive state-controlled special exporter provides Rosoboronexport with unique opportunities to expand long-term mutually beneficial cooperation with foreign partners, strengthen Russia's leading positions in the world arms market. Rosoboronexport always receives the necessary diplomatic support from the Russian Foreign Ministry in implementing large-scale projects aimed to enhance the defense capabilities of partner countries. This contributes to creating a climate of cooperation and good neighbourly relations with other countries.

'In a dynamic and changing industrial and political landscape, our joint task set by the nation's leadership is to enhance the impact of economic diplomacy efforts, actually help domestic businesses promote advanced



Russian developments abroad, and bring high-tech products to regional and global markets. I am sure that together we are able to accomplish it,' added Alexander Mikheev.

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

Engineering Machines to Vietnam

ChTZ-URALTRAC, a member of Uralvagonzavod Group of Rostec State Corporation, and a Vietnamese company NGA PHAT have signed a B10M.0100E bulldozer supply contract. The tractor manufacturer's dealer has won the state tender for supply of the bulldozer designed for repair and recovery of roads in mountainous villages of South Vietnam.

Tu Hong Hung, CEO of NGA PHAT, explained that local budgets do not allow the territories to independently procure the machinery, so the government helps the highland regions and covers a portion of the infrastructure investments, including the purchase of B10M.0100E. The Vietnamese party shall consider buying two more bulldozers of the same type should the operating experience of

the Chelyabinsk-manufactured earth mover be successful.

The machine will be assembled, tested, painted and prepared for dispatch to the customer as early as this August. The vehicle will be delivered non-assembled to Vietnam in a 40' shipping container. The dealer possesses the required production facilities and qualified mechanical engineers to independently assemble the bulldoz-



er on-site. It will then transfer the machine for operation and carry out its after-sales service and maintenance.

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VLADIMIR PUTIN AND ILHAM ALIYEV

Relations between Russia and Azerbaijan are developing positively and fruitfully. Friendship and cooperation define both political and economic partnership. Frequent meetings of the leaders of the two countries serve as the best visual confirmation of the excellent relations between countries and peoples. September 1 President of Russian Federation Vladimir Putin and President of the Republic of Azerbaijan Ilham Aliyev took place meeting in Sochi and sign the Joint Statement on the Priority Areas of Economic Cooperation between Russia and Azerbaijan.

Talks between two Presidents focused on different issues on the bilateral agenda, as well as prospects for developing trade and economic cooperation. Opinions were exchanged on current international and regional issues.

Following the talks Vladimir Putin and Ilham Aliyev signed the Joint Statement on Priority Areas of Economic Cooperation between Russia and Azerbaijan. A package of intergovernmental and commercial documents was also signed as part of the visit.

Among them is a programme of intergovernmental coopera-

tion through to 2024 and an action plan on developing key areas of the Russia-Azerbaijan cooperation (5 roadmaps). In particular, agreements were signed on developing economic cooperation, on enhancing cooperation in industry, on cooperation in tourism, sport and digital transport systems. The documents signed also concern customs control, developing assembly manufacturing of GAZ vehicles in Azerbaijan, joint surveying of the oil and gas potential in Azerbaijan's section of the Caspian Sea bed, and developing small and medium-sized business.

Beginning of talks with President of Azerbaijan Ilham Aliyev President

of Russia Vladimir Putin said: 'Our relations are also developing along both the political lines and in the economy. Last year trade between our countries grew by 34 percent, even over 34 percent, whereas in the first six months of this year the sales volumes of civilian industry products grew by 20 percent. These are very good indicators.'

President of Azerbaijan Ilham Aliyev said: 'We are satisfied with the level of interaction in all areas. Our relations are developing fully and very effectively. There is active political dialogue. You have noted the growth of trade, which speaks of the positive trends in our coun-

'Our relations are also developing along both the political lines and in the economy. Last year trade between our countries grew by 34 percent, even over 34 percent, whereas in the first six months of this year the sales volumes of civilian industry products grew by 20 percent. These are very good indicators.'

Vladimir Putin

tries' economies and also of a large potential for economic cooperation. I am confident that our trade will continue to grow in the coming years. We cooperate in the energy sector, and in the transport sector. Of course, we are also going to discuss issues related to the settlement of the Nagorno-Karabakh conflict between Armenia and Azerbaijan, and other regional issues. So the agenda is broad enough. I am confident that our meeting today will give an additional impetus to our relations.'

Later the President of Russia and the President of Azerbaijan made statements for the press.

Vladimir Putin said: 'As you may remember, in mid-August President of Azerbaijan Ilham Aliyev and I took part in the Caspian Summit, where an extremely important convention on the legal status of the Caspian Sea was signed. Today I am very glad to have this opportunity to meet

with President of the Republic of Azerbaijan during his visit to our country.

The talks, which were held in a constructive and business-like atmosphere, have just ended. I would like to stress that Russia and Azerbaijan are bound by strong traditions of friendship and cooperation. The relationship between our states is a partnership that is mutually beneficial and is based on the principles of neighbourly relations and respect for each other's interests.

I am convinced that today's talks, in which the heads of our key agencies and business leaders took part, will give an additional impetus to further developing the entire complex of Russian-Azerbaijani relations. This is the aim of the joint statement the President of Azerbaijan and I have signed along with a substantial set of intergovernmental and inter-departmental agreements. First of all

I would like to highlight the Action Plan on Developing Key Areas of Cooperation. This programme document includes roadmaps on such important issues as increasing trade and mutual investments, creating new transport routes and expanding humanitarian cooperation, including cultural and tourism exchanges.

As for bilateral economic ties, they are developing very actively. The Russia-Azerbaijan trade grew by nearly 35 percent in 2017 to reach \$2.5 billion. Russia's direct capital investments in Azerbaijan have amounted to \$1.5 billion. There are around 700 joint enterprises operating on the Azerbaijani market, and around one third of them have 100 percent Russian capital.

Contacts between the business communities are growing, including between small and medium-sized businesses. Only last year the Russia-Azerbaijan business council rendered





'We are satisfied with the level of interaction in all areas. Our relations are developing fully and very effectively. There is active political dialogue. You have noted the growth of trade, which speaks of the positive trends in our countries' economies and also of a large potential for economic cooperation. I am confident that our trade will continue to grow in the coming years. We cooperate in the energy sector, and in the transport sector.'

Ilham Aliyev

support to 42 joint projects worth a total of over \$450 million.

Many Russian energy companies, such as Gazprom, Transneft and LUKOIL, are working successfully in Azerbaijan. In general, the energy systems of both Russia and Azerbaijan are functioning in an integrated mode. Cooperation in the industrial sector is deepening. I would like to mention some successful joint projects that Mr President and I have discussed.

For instance, KAMAZ has set up the production of license trucks and their maintenances at Ganja Auto Plant. The Russian company R-Pharm invested \$74 million in the construction of an enterprise in Azerbaijan

that will produce pharmaceuticals. The enterprise will open in 2019. Gazprombank is taking part in the development of Sumgayit Chemical Industrial Park. Investments amount to around \$750 million.

The North-South transport corridor, which will connect Western European markets with Asian producers, is considered to be one of the most important projects. This will allow substantially increasing the speed of freight transportation from South Asia and the Middle East through Iran to Europe. The total length of this corridor will exceed 7,000 kilometres. It will include railway, ferry and automobile communication. Yet the substantial part of

the North-South corridor will pass through Russia and Azerbaijan. I would like to underline that the work on some sections of the route is already underway. Next year our countries intend to finish the construction of the bridge over Samur, a border river.

We discussed interregional cooperation as well. More than 70 constituent entities of the Russia Federation support economic ties with Azerbaijan, and around 17 entered into framework agreements on trade, economic, scientific and technical cooperation. This October there will be another interregional meeting, a regular interregional forum, and we have just discussed it. We planned to

hold it in Ganja, but our friends may arrange it in Baku.

We were glad to highlight the active bilateral contacts in culture and education. More than 11,000 Azerbaijani students are studying in Russia, around one thousand of them have their tuition fees covered out of the federal budget of the Russian Federation. More than 200 scholarships have been awarded to Azerbaijani students.

Meetings of the Baku International Humanitarian Forum, which was established upon the initiative of the Presidents of Russia and Azerbaijan, are held on a regular

President of Azerbaijan Ilham Aliyev said: 'First of all, Mr President, I would like to thank you for the invitation to visit Russia, for your hospitality and a warm reception. As you said, we meet on a regular basis. We met three times over the last three months. We had a meeting in June in Moscow, ahead of the 2018 FIFA World Cup, then again in August in Kazakhstan, and today in Sochi. I would like to take this opportunity to once again congratulate Russia on the successful holding of a global event and the Russian national team's excellent performance at the World Cup.

has been occupied by Armenia. More than a million of Azerbaijani citizens became refugees and displaced persons as a result of the conflict. The prompt settlement of the conflict will allow our citizens to return to their historic homeland and will bring peace, stability and cooperation to our region.

Russia, as a co-chairman of the OSCE Minsk Group, which deals with the settlement of the conflict, plays an important role in the process. Russia is our neighbour, historical partner and friend. We hope that Russia will continue to make every effort to settle the conflict.



'More than 70 constituent entities of the Russia Federation support economic ties with Azerbaijan, and around 17 entered into framework agreements on trade, economic, scientific and technical cooperation. This October there will be another interregional meeting, a regular interregional forum, and we have just discussed it. We planned to hold it in Ganja, but our friends may arrange it in Baku.'

Vladimir Putin

basis. The sixth session of the forum to be held at the end of the year in Baku is expected to attract more than 500 participants.

Of course, we shared opinions on international and regional matters. In particular we touched upon the Nagorno-Karabakh issue. Russia, as a co-chairman of the Minsk Group, will continue to render all possible assistance to the peaceful settlement of this conflict.

In conclusion, I would like to thank the President of Azerbaijan and all our Azerbaijani friends and colleagues for the substantial and effective talks. I am convinced that the agreements we reached will serve to further consolidate the Russian-Azerbaijani friendship, and promote the development of mutually beneficial cooperation for the benefit of our nations.'

Regular contacts between our countries' heads of state give an impetus to our relations, which are built a very solid foundation.

Relations between Russia and Azerbaijan are a strategic partnership. They cover all spheres of our life. Today, during my visit we discussed in great detail many aspects of our bilateral relations and issues on the international agenda. Mr President spoke about it in detail.

I would like to highlight that especially important among the issues we discussed is the issue of regional security, in particular the settlement of the Armenian-Azerbaijani Nagorno-Karabakh conflict, which has lasted for a very long time and has caused enormous suffering for the people of Azerbaijan.

For many years, the international-ly recognised territory of Azerbaijan

We looked closely at economic issues and were satisfied to note the growth in trade and positive outlook for the future. The matters we discussed and agreed today, in particular, the roadmaps on different areas of economic cooperation, will allow us to further boost trade between our countries, which is already very active. This year, despite last year's rapid growth, trade continued to grow. Russia is Azerbaijan's top partner in terms of imports and is number one recipient of Azerbaijan's non-oil exports. This testifies to the scale and importance of cooperation between our countries.

Many investment projects Mr President mentioned are being implemented and are very promising. In general, we expect an increase in trade and the economy, the consolidation of integration ties





'Military-technical cooperation has very rich traditions. The contracts implemented by Russia and Azerbaijan, to be more specific, the military goods bought by Azerbaijan from Russia, are worth over \$5 billion and continue to grow because Azerbaijan continues to modernise its armed forces and Russia is a very important global producer and supplier of military products to the international markets.'

Ilham Aliyev

and creation of even better conditions for cooperation between our companies.

Of course, transport projects play an important role. Russia and Azerbaijan are neighbours, we are connected by both railways and motorways, as well as very active air transportation, both passenger and cargo. We discussed in detail the future steps to create new transport opportunities for our countries and for our neighbours.

Mr President highlighted the importance of the North-South project. Azerbaijan, for its part, has

already implemented all important infrastructure projects in this area. This year, the North-South route will transport one hundred times more cargos than last year. And this is only the beginning because this large-scale global project will cover many countries and continents. Therefore, transport opportunities of our countries will increase and thousands of new jobs will be created.

Today we signed important documents on cooperation in the oil and gas sector, a traditional sphere of our cooperation that has an excellent potential.

Mr. President mentioned the active participation of Russian banks in the implementation of many important transport, infrastructure and industrial projects in Azerbaijan. We welcome this.

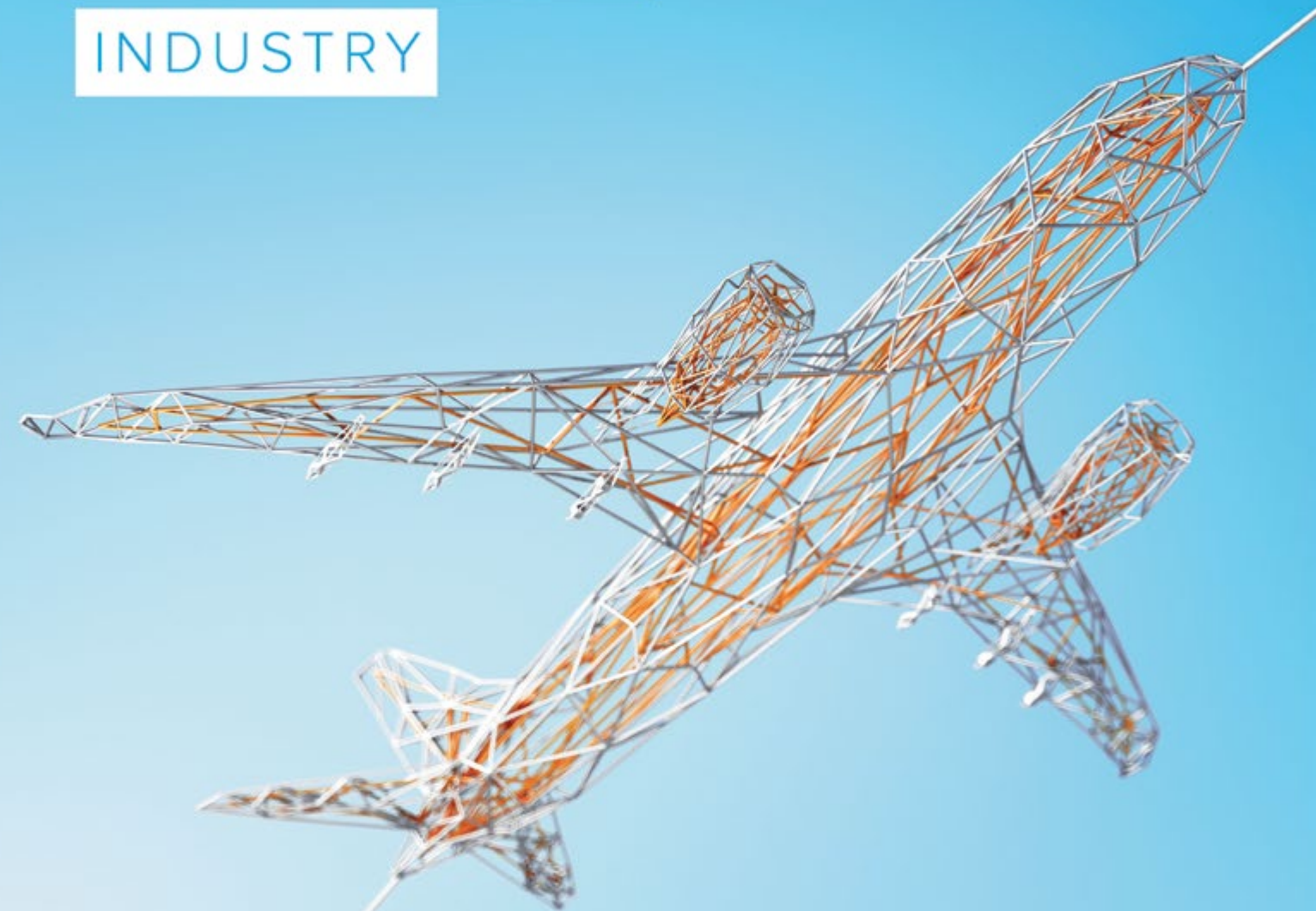
Today we discussed further military-technical cooperation, which has very rich traditions. The contracts implemented by Russia and Azerbaijan, to be more specific, the military goods bought by Azerbaijan from Russia, are worth over \$5 billion and continue to grow because Azerbaijan continues to modernise its armed forces and Russia is a very important global producer and supplier of military products to the international markets.

Cooperation in the humanitarian sphere had a very special place in our discussion. People in Azerbaijan have a caring attitude towards Russian culture, the Russian language, and everything that unites our people and has united them for centuries. There are more than 340 schools in Azerbaijan where the language of instruction is Russian, and there are two branches of leading Russian universities. Today we discussed further steps to consolidate cooperation in the humanitarian sphere, in education and culture, and the documents we signed, including in the sphere of sport, will continue to unite our countries and people more and more.

In other words the relations between our countries are friendly and neighbourly, a full-fledged partnership, as it should be between good friends and neighbours.' /RA&MG/



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FIFTH CASPIAN SUMMIT

Presidents were sign the Convention On the Legal Status of the Sea

In Aktau (Republic of Kazakhstan) the presidents of Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan during Fifth Caspian Summit were discuss key aspects of cooperation in the Caspian region across various areas. They also reviewed the implementation of the decisions taken during previous meetings of the heads of state of the 'Caspian five'. Following this summit, the presidents were sign the Convention On the Legal Status of the Caspian Sea, a document which was been in development since 1996. Additionally, a number of intergovernmental documents was signed during the meeting.

The summit participants have considered key issues of cooperation in various spheres and discussed the implementation of the decisions taken at the previous meetings of the 'Caspian five'. The heads of state have adopted the Convention On the Legal Status of the Caspian Sea and signed a number of intergovernmental documents.

Protocols have been signed on fighting terrorism and combating organised crime as they pertain to the Agreement on Security Cooperation

in the Caspian Sea of November 18, 2010, as well as the Protocol on Cooperation and Interaction of Border Services to the Agreement.

In addition, agreements have been signed between the governments of the Caspian states on trade and economic cooperation, cooperation in transport, as well as the Agreement on Prevention of Incidents in the Caspian Sea. The Communique of the Fifth Caspian Summit has been adopted.

President of Russia Vladimir Putin said at the Fifth Caspian Summit:

'The Convention On the Legal Status of the Caspian Sea, a document that we have been negotiating for over 20 years, at last formalises our exclusive rights and the responsibility each of us carries to protect the future of the Caspian Sea, and it establishes clear guidelines for its collective use. I want to thank everybody involved in this major project, heads of state, negotiators and experts alike.

Based on consensus and consideration for our mutual interests, we have produced a modern and balanced international agreement. The

convention will replace the Soviet-Iranian agreements of 1921 and 1940.

It is important that the Convention regulates the issues of necessary delimitations, regimes of navigation and fishing, establishes the principles of political and military interaction of member states, and ensures the use of the Caspian Sea solely for peaceful purposes and the non-presence of the armed forces of non-regional states in the sea.

Regulating the legal status of the Caspian Sea creates the necessary conditions for taking the level of cooperation between the countries to a brand new level and will serve to develop closer interaction in various areas. The six specialised agreements in the economic, transport and security areas that were signed today, among others, will provide the necessary legal foundation for this. It is Russia's aim to work jointly with all Caspian states on the implementation of these agreements.

In particular, the agreement on economic cooperation in the Caspian region will serve as basis for paying priority attention to boosting regional, trade and economic ties, as well as enhancing close and mutually beneficial cooperation.

I should note that the volume of trade between Russia and the Caspian states constantly grows. In 2017, foreign trade increased by over 20 percent and amounted to \$22 billion, while in January and February this year it grew by over 10 percent.

The decisions being adopted on establishing the Caspian economic forum will allow us to reinforce contacts between our countries' business communities.

Russia suggests that the 'Caspian five' states focus on cooperation in the digital economy, actively introducing information and communication technologies and e-commerce, and engaging in the digitisation of foreign trade operations, cargo transportation and logistics.

We expect that the intergovernmental agreement on cooperation in transport in the Caspian region will serve to develop a common integrated infrastructure. Transport interconnection is one of the key factors for securing sustainable growth and

It is crucially important to note that the Convention confers upon the five states exclusive and sovereign rights to use the Caspian Sea, to pursue its responsible development and to use its assets and other resources, while firmly securing the settlement of all pressing issues based on the principles of consensus and mutual consideration of each other's interests, and bestowing upon the Caspian a peaceful status, and ensuring that armed forces of non-regional countries are not present in the Caspian region.

strengthening our countries' cooperation.

In this regard, I would like to inform you that Russia has adopted and is currently implementing the Strategy for the Development of Marine Ports in the Caspian Sea until 2030. It defines the prospects for comprehensive modernisation of the Caspian sea communications and related railway and motor transport infrastructure.

In particular there are plans to construct a new deep-water port near Kaspiysk that will receive large-capacity ships with actual loads of 15,000–25,000 tons. We are taking strides to integrate Russia's port capabilities into global and Eurasian transport and logistic networks, increase

the competitiveness of cargo and passenger transportations, and multiply the volumes of processed cargo.

We support the project of the International North–South Transport Corridor, which provides for rail, ferry and automobile services, which we intend to develop.

Its launch will allow for a 2.5-fold increase in the speed of transporting cargo, which will amount to 25 million tonnes delivered annually via Iran from European countries to the Middle East and South Asia.

The development of a five-party agreement on cooperation in marine transport could go a long way in developing international transportation and providing equal unified conditions for transit across the Caspian



Sea. Experts from the five countries can now more closely engage in drafting such an agreement.

I should note that tourism is a promising area of cooperation as well. According to available estimates, Caspian Sea resorts could receive over one million vacationers annually. Yet, this requires a modern tourism infrastructure.

Russia is building the cruise ship Pyotr Veliky (preliminary commissioning deadline is 2019), which, once built, can be used for circuit cruises in the Caspian Sea, stopping in all five Caspian states, and also carry out cruises in the Caspian and Black seas as well as in the Sea of Azov.



We also plan to boost the development of tourist clusters in coastal areas, building new hotels and recreation centres. The relevant authorities of the five countries should draw up a programme for such joint projects in tourism.

We deem it equally important for the Caspian states to interact in preserving the environment and



biological resources. The five states already are successfully implementing a number of beneficial agreements, such as the Framework Convention for the Protection of the Marine Environment of the Caspian Sea, Agreement on the Rational Use of the Biological Resources of the Caspian Sea, and the Protocol on Environmental Impact Assessment in a Transboundary Context.

These documents provide for strict environmental control over infrastructure projects that may create potential risks for the Caspian Sea.

Last year, a specialised inter-governmental commission of the 'Caspian five' adopted an important decision on extending a ban on commercial fishing of sturgeon. Russia welcomes the temporary ban on fishing for this valuable species and is ready to support a longer moratorium. It is advisable to quickly complete work on documents that will regulate our joint fight against poaching.

Colleagues, we are well aware of the responsibility of the Caspian

states to provide security in the region. There are spots of instability in close proximity to the Caspian Sea, such as the Middle East and Afghanistan, and therefore our core interests and even life itself require that we cooperate closely.

It is important for the 'Caspian five' states to further boost consistent interaction in fighting terrorism and organised crime and to expand the joint efforts of our special services and border agencies. Corresponding protocols to the agreement on cooperation in security of 2010, to be signed today, are aimed at this.

Russia fully supports these decisions and is ready to actively engage in their implementation. In the future, we should also think about developing a separate document on cooperation to stop drug trafficking in the Caspian region.



We deem it important to develop partner relations in the area of our naval forces, in particular, to implement regular reciprocal visits of our ships, expand the mutual participation of ship crews in various events, such as the Sea Cup international competition as part of the International Army Games in the Caspian region.

The intergovernmental agreement on prevention of incidents in the Caspian Sea is very important, as it will considerably strengthen the system of confidence-building measures in the region.

Regular consultations as regards our countries' navies and regular meetings of our naval commanders could serve as an efficient mechanism of cooperation in this field.

And of course, joint efforts should be continued under the agreement on cooperation in emergency prevention and response.



Our rescue services hold joint exercises, and act out special scenarios of incidents and possible disasters to rehearse joint actions. This practice must undoubtedly be continued.

In conclusion, I would like to thank Mr Nazarbayev for the major efforts Kazakhstan has made to prepare this important meeting.'

Vladimir Putin also said about the Convention: 'Today, a very important and landmark event has taken place – the signing of the Convention On the Legal Status of the Caspian Sea, an international agreement that con-

Russia support the project of the International North–South Transport Corridor, which provides for rail, ferry and automobile services, which we intend to develop. Its launch will allow for a 2.5-fold increase in the speed of transporting cargo, which will amount to 25 million tonnes delivered annually via Iran from European countries to the Middle East and South Asia. The development of a five-party agreement on cooperation in marine transport could go a long way in developing international transportation and providing equal unified conditions for transit across the Caspian Sea. Experts from the five countries can now more closely engage in drafting such an agreement.

tains a detailed and comprehensive set of rules and obligations on the use and preservation of our common treasure – the Caspian Sea. Thus, the multifaceted interaction of the 'Caspian five' states was given a present-day legal foundation that will serve us for years to come.

It is crucially important to note that the Convention confers upon the five states exclusive and sovereign rights to use the Caspian Sea, to pursue its responsible development and to use its assets and other resources, while firmly securing the



It is important for the 'Caspian five' states to further boost consistent interaction in fighting terrorism and organised crime and to expand the joint efforts of our special services and border agencies. Corresponding protocols to the agreement on cooperation in security of 2010, to be signed today, are aimed at this. Russia fully supports these decisions and is ready to actively engage in their implementation. In the future, we should also think about developing a separate document on cooperation to stop drug trafficking in the Caspian region.





settlement of all pressing issues based on the principles of consensus and mutual consideration of each other's interests, and bestowing upon the Caspian a peaceful status, and ensuring that armed forces of non-regional countries are not present in the Caspian region.

We have been striving for many years to develop and approve this strategic and fundamental document. Substantial efforts have been made to hold negotiations with the participation of numerous government agencies of our countries and have involved experts from business communities.

The success achieved – and this is undoubtedly a success – was made possible largely due to the high level of trust and mutual understanding that exists between the leaders of the Caspian states and our readiness

to always follow the logic of respect, partnership and equality. I would like to express appreciation to all heads of state present today.

Such a joint approach actually showed its efficiency and relevance. It showed that joint efforts can result in achieving ambitious goals in any, even the most complicated issues, in finding a compromise and balanced solutions of mutual interest. In today's difficult international conditions, this carries a lot of weight.

The signing of the Convention opens a new stage in the relations of the Caspian states and allows us to secure prosperity and provide for dynamic development of our common region together.

I note with satisfaction that today we have also signed a comprehensive package of agreements that expand and add to the Convention

in the most important and pressing issues of interaction.

The plans of the Caspian states include boosting economic cooperation, expanding trade and investment ties, cooperation in the energy sector, developing the region's transport and logistic potential, and boosting tourist flows. Particular attention will be paid to preserving the rich nature and biodiversity of the Caspian Sea.

Of course, the Caspian countries attach great importance to the issues of security and counteracting today's challenges and threats. We have to take into account the fact that the Caspian Sea is located near hotbeds of tension and areas of international terrorist activity – I am referring to the Middle East and Afghanistan.

That is why our countries are committed to strengthening comprehensive interaction of our special services and border agencies, and to promoting coordination in foreign policy.

All the above-mentioned issues form an actual and positive long-term agenda for Caspian cooperation. We are facing serious and interesting tasks. And we are intent on consistently solving them.

In conclusion, I would like to once again express my appreciation to our Kazakh friends and President Nazarbayev, first of all, for the warm hospitality, and congratulate all of us and all colleagues on the successful holding of this summit! /RA&MG/

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RUSSIAN DEFENSE INNOVATIONS

Rosoboronexport presents in Baku the best military and defence innovations



Rosoboronexport, a member of the Rostec Corporation, is to set up a joint Russian exposition at the 3rd Azerbaijan International Defence Exhibition – ADEX 2018 which will be held at Baku Expo Centre in the capital of Azerbaijan 25-27, September. This large-scale event enjoys the status of a major regional exposition of weapons and military equipment; ADEX 2018 is a grand display of modern weaponry and equipment, where world military-industrial complex shows the best products for defence and safety. Traditionally Rosoboronexport presents the best Russian military innovations.

Recently, Rosoboronexport has distinguished itself by a number of export achievements. For example Rosoboronexport has signed 15 different contract documents with foreign customers of Russian military equipment and weapons at the Army 2018 International Military Technical Forum in Kubinka, Moscow region.

'The sum of the export contracts signed by Rosoboronexport on the margins of the Army forum has

exceeded 20.3 billion rubles. This relates to modern land forces' military equipment, unmanned aerial vehicles, electronic warfare systems, close combat weapons and much more. The Company's portfolio has been replenished with firm orders from Asian and African countries, as well as from member states of the Commonwealth of Independent States,' said Alexander Mikheev, Director General of Rosoboronexport.

Several agreements on cooperation between Rosoboronexport and

The first Soviet state intermediary agency for military-technical cooperation with foreign countries was created on 8th May 1953 after the USSR Council of Ministers had decided on forming the General Engineering Department within the then Ministry of Domestic and Foreign Trade. Other special foreign trade bodies were created later on to provide for further expansion of military-technical cooperation activities. In the late 1990s there were two federal state unitary enterprises in Russia acting as state arms exporters Rosvoorouzhenie State Corporation and Promexport.

In November 2000 the two enterprises were merged into a single one – Rosoboronexport Federal State Unitary Enterprise, the sole state intermediary for export/import of defence products, by the Presidential Decree No. 1834 dated 4th November 2000 aimed at restructuring the system of military and technical cooperation of the Russian Federation with foreign states, and improving its performance. Since September the 1st, 2014 Rosoboronexport has been operating as a joint stock company.

Russian actors in military-technical cooperation were also signed at the forum. The documents signed at the forum seal the accords reached with foreign partners on export deliveries of final Russian military hardware and its after-sales service, repair and modernization.

In total, Rosoboronexport conducted negotiations and consultations with delegations from 45 countries of the Asia-Pacific region, the Middle East, Africa, Latin America and Europe during the first days of the Army 2018 forum. For them, Rosoboronexport specialists carried out presentations and demonstrations of over 150 pieces of modern Russian weaponry and military equipment exported by the Company. Foreign guests particularly noted the excellent organization of the forum, primarily a comprehensive program of events and live demonstrations of the Russian military hardware's capabilities.

Despite ongoing anti-Russian propaganda, Rosoboronexport held a series of successful negotiations with delegations from a number of European countries which visited the Army forum.

'Many in the world, including Europe, are fairly outraged by actions of the US, which is trying to prevent other countries from developing military-technical cooperation with Russia. Rosoboronexport is engaged in dialogue with foreign customers at the level of authorities, and the export deals are approved by either presidents or at a high government level in the G2G format. That is, sanctions have the effect of a boomerang:



'Most of our partners see and understand their benefits from cooperation with Rosoboronexport, which suggests their willingness to defend their own sovereignty. With full support from Russia's political leadership and state financial institutions, we take effective measures to neutralize non-market attempts to influence our business processes. Russia carries out military-technical cooperation with foreign states under interstate agreements, and any sanctions directed against us and our foreign customers, is interference in the internal affairs of states...'

Alexander Mikheev

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

the partners reasonably regard them as interference in the internal affairs of the state. As a result, we are consistently moving away from the US dollar in mutual settlements in favor of national currencies, especially since Rosoboronexport has accumulated a lot of experience of successful cooperation in various foreign economic circumstances,' the head of Rosoboronexport stressed.

At the Army 2018 International Military Technical Forum Rosoboronexport presented the main export novelties and bestsellers of the Russian defense industry. 'Rosoboronexport continued to steadily evolve and strengthen its positions in the world arms market in 2018. We have already exported over \$7 billion of products and increased our order book through signing about 600 contract documents

worth \$9 billion. Now it stands at over \$45 billion and includes 6 new countries, our partners. We hope to significantly increase the Company's capacity during Army 2018, including also through new export products showcased,' said Alexander Mikheev.

The latest developments from the Russian defense industry, including those proposed for export, are unveiled at the Army forum every year. The year 2018 will be no exception: among new weapon systems for land forces are the BT-3F armored personnel carrier and Sprut-SDM1 light amphibious tank.

As for air defense weapons, the new generation Viking and Tor-E2 SAM systems and the Gibka-S MANPADS squad combat vehicle make their debut at the forum. Foreign customers will also be shown new solutions for electronic sensors, in particular the Istra-E mobile all-altitude 3D surveillance radar. Such air defense bestsellers as the S-400 SAM system and the Pantsir-S1 air defense missile/gun system will undoubtedly attract their interest as well.

Naval delegations from Rosoboronexport's partner countries

will surely be interested in the novelties of the Company's catalog: Project 22800E Karakurt-E and Project 21635 Sarsar small missile ships, Project 21980E special purpose boat, and Project 1496M1E Lamantin patrol boat.

The Su-35 and Su-30SM multirole super-maneuverable fighters, Yak-130 combat trainers, Mi-28NE and Ka-52 attack helicopters, Mi-17Sh and Mi-17V-5 military transport helicopters traditionally attract Air Force delegations.

Together with the Russian Ministry of Defense, Rosoboronexport has assisted in organizing demonstration flights of military pilots from 5 countries on Su-30SM, Su-34, MiG-29M2 and Yak-130 aircraft.

Demonstrations of such popular Russian weapons and military equipment as the Kornet family of ATGMs, Kalashnikov assault rifles, Iskander-E theater missile system, BMPT Terminator tank support combat vehicle and many others will be held at the forum.

In 2018, Rosoboronexport will showcase more than 350 pieces of weaponry and military equipment on its stand.

'The Army forum traditionally gives Rosoboronexport the maximum monetization among all the exhibition events in the world and gathers the largest number of foreign delegations in Moscow. These days, we will hold talks with representatives of more than 50 countries. By the way, this year we will witness a real 'African breakthrough' at Army. In addition to our traditional partners from North Africa, we are waiting for representatives of 16 countries of the sub-Saharan Africa at our stand and in the meeting rooms,' added Alexander Mikheev, Director General of Rosoboronexport.

The increasing number of countries cooperating with Rosoboronexport, as well as the Company's financial growth, is taking place against the backdrop of tough competition. The Company has repeatedly noted the obvious presence of unfair competition.

'Most of our partners see and understand their benefits from cooperation with Rosoboronexport, which

suggests their willingness to defend their own sovereignty. With full support from Russia's political leadership and state financial institutions, we take effective measures to neutralize non-market attempts to influence our business processes. Russia carries out military-technical cooperation with foreign states under interstate agreements, and any sanctions directed against us and our foreign customers, is interference in the internal affairs of states,' said Alexander Mikheev.

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

major operators in the world market for arms and military equipment. This year JSC Rosoboronexport will mark its 18th anniversary.

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

The official status of the exclusive state intermediary agency gives Rosoboronexport unique opportunities to expand long-term mutually



Russian export to the region makes emphasis on aviation equipment. Company's specialists believe that the most promising export future faces the Su-30 family of multirole fighters, MiG-29M/M2 multirole tactical fighter, and Yak-130 combat-trainer. African partners also get their attention piqued by the Mi-171Sh military transport helicopter, Mi-35 gunship with troop-caring capacity, and ANSAT.



beneficial cooperation with foreign partners, provide guaranteed state support of all export-import operations, and strengthen Russia's leadership in the world arms market.

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

The special exporter makes painstaking efforts on a daily basis to increase Russian arms exports resulting in more than a thousand contract documents signed with foreign cus-

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

Rosoboronexport pays great attention to both major billion dollars contracts and small deals. The company seeks to operate flexibly and efficiently by using modern and advanced marketing and customer settlement methods. The special exporter cooperates with more than 700 Russian defense-industrial enterprises and organizations, which enables it to offer partner countries the comprehensive and cost-effective solutions for strengthening their defense capability and national security.

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

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

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

/RA&MG/

Core areas of activities of Rosoboronexport

- Export / import of all types of conventional weapons, military and dual-use equipment and services.
- Organization of licensed production of armaments and military equipment abroad, joint R&D efforts with foreign partners.
- Maintenance and repair of earlier supplied weaponry and military equipment.
- Modernization of Russian-made weapons and military equipment.
- Training foreign specialists in Russia and customer countries in the operation and maintenance of supplied military equipment.
- Technical assistance in the construction of military infrastructure facilities: defense plants, airfields, depots, ranges, training centers.

Industrial Daily

№01, 23 июля 2019 года

МЕЖДУНАРОДНЫЙ АВИАЦИОННО-КОСМИЧЕСКИЙ САЛОН «МАКС-2019»

МАКС-2019

Главный праздник и главный смотр российского авиапрома

На этой неделе в подмосковном Жуковском уже в тринадцатый раз будет проходить крупнейший российский авиационный праздник, смотр, шоу, выставка и так далее – Международный авиационно-космический салон МАКС-2019, который заслуженно занимает одно из ведущих мест в ряду крупнейших мировых авиа-мероприятий. Организаторы салона – Министерство промышленности и торговли РФ и Госкорпорация «Ростех». Официальный устроитель салона – ОАО «Авиасалон». По предварительным данным, в МАКС-2019 примут участие около 800 компаний из более 30 стран мира. В мастерство покажут восемь пилотажных групп. На статической стоянке МАКС-2019 будут представлены 116 летательных аппаратов.

«ЦИФРОВАЯ ЗЕМЛЯ»

Сплошное покрытие и сервисы на основе данных ДЗЗ

Холдинг «Российские космические системы» (РКС, входит в Госкорпорацию «РОСКОСМОС») на международном авиационно-космическом салоне МАКС-2019 представит проект «Цифровая Земля», а также новейшие разработки в области космического приборостроения, наземных систем управления и сервисов, основанных на использовании результатов космической деятельности.

Проект «Цифровая Земля» предполагает создание и регулярное обновление сплошного бесшовного покрытия данными дистанционного зондирования Земли (ДЗЗ) территории всего Земного шара. Точность модели Земли составит около 1 м с периодической актуализацией. «Цифровая Земля» ляжет в основу целого семейства новых геоинформационных сервисов. Сплошное покрытие и сервисы на основе данных ДЗЗ ориентированы на всех потребителей, среди которых федеральные и региональные органы исполнительной власти, крупный и средний бизнес и массовый потребитель.

Также в ходе авиакосмического салона РКС представит результаты работы в области создания инфраструктуры Федерального сетевого оператора навигационной деятельности (НСОД). На ее основе будут работать перспективные системы общесистемный и роботизированный мониторинг и управление воздушным движением и другими полетами.

По мнению заместителя министра промышленности и торговли Российской Федерации Олега Бочарова, нынешний год станет важной вехой для отечественного авиастроения: «Мы демонстрируем свои успехи явно, наглядно, безапелляционно». Заместитель министра напоминает, что уже начались летные испытания пассажирского лайнера МС-21, многоцелевого вертолета Ка-62, истребителя МиГ-35. По его словам, в конце текущего года должны приступить к заводским испытаниям военно-транспортного Ил-112В.

Выставочной программой МАКС-2019 Олег Бочаров

достижения предприятий авиационно-космического комплекса России. Именно на выставку и только здесь можно увидеть самые современные образцы техники, которые пока не могут продемонстрировать за рубежом. МАКС привлекает специалистов и бизнесменов со всего мира, поэтому он является уникальной возможностью для налаживания контактов, дальнейшего развитию производственной кооперации и поиску новых партнеров для бизнеса. Роль авиасалона как генератора новых альянсов и плодотворных идей признана во всем мире.

МАКС проводится в городе авиационной науки и техники – Жуковском, на аэродроме центральной испытательной базы страны – Летно-исследовательского института им. М.М. Громова. Значительное место в программе МАКС занимают научные конференции и симпозиумы, проводимые под эгидой государственного научного центра России – ЦАГИ. Они позволяют ученым и специалистам обмениваться мнениями по поводу наиболее острых проблем развития авиации и космонавтики в настоящем и будущем.

МАКС 2019

Industrial daily «МАКС-2019»

Специальные ежедневные (в формате show-daily) новостные выпуски газеты «Промышленный еженедельник», посвященные развитию российской и глобальной авиакосмической индустрии и ежедневной работе Международного авиационно-космического салона МАКС-2019. Распространяется на мероприятиях Салона, отдельные материалы по итогам МАКС-2019 дополнительно будут опубликованы в изданиях и на сайтах «Объединенной промышленной редакции».

Формат – А3; объем – 24 полосы; русский и английский языки.
Тираж каждого выпуска – 10 тыс. экз.

Выход первого номера – 23 июля 2019 года.
Выход второго номера – 24 июля 2019 года.
Выход третьего номера – 25 июля 2019 года.
Выход четвертого номера – 26 июля 2019 года.

1/1
295x420 мм

1/2
130x366 мм

1/1
265x390 мм

1/2
265x183 мм

1/3
86x366 мм

1/6
130x125 мм

1/4
130x183 мм

1/8
130x92 мм

1/3
265x125 мм

1/4
265x92 мм



WHEELED MULTI-TASK ARMoured VEHICLES

Alexander Krasovitskiy,
Director General
of Military Industrial Company

Nowadays Military-Industrial Company is well-known not only in Russia but far beyond its borders. Wheeled armoured vehicles designed and manufactured by the company are operated in more than 40 countries and are by right highly popular there.

Aside from well-known all over the globe wheeled armored vehicles BTR-80/82A, today Military Industrial Company designs, manufactures and delivers a wide range of multi-purpose armoured vehicles of Tigr family.

Presently the list of machines designed, manufactured and supplied by Military-Industrial Company includes wheeled armoured vehicles, multi-purpose armored cars, spe-

cial carriers, mine-resistant ambush protected vehicles being the state-of-the-art models on the global market of combat vehicle arsenal and military equipment. Among them wheeled armored vehicles BTR-80 and the family of machines designed

on their basis, armored vehicles BTR-82A, multi-purpose armored vehicles of Tigr family.

Exposition of Military Industrial Company at the Azerbaijan International Defence Exhibition ADEX-2018 (open area 40-08) presented 6 prototypes of Tigr family of armoured cars. Though the wheeled armoured vehicles BTR-80 and BTR-82A had been already well-known in Azerbaijan Republic, Tigr family vehicles had arrived to the country for the first time.

Multi-purpose Tigr family cars

In more than a decade of massive operation and combat employment in 'hot zones' Tigr family armoured vehicles prove themselves to be reliable hardy machines providing high tactical maneuverability and necessary level of protection.

High speed on both public roads and terrain is ensured by original tor-

sion bars, suspension arm overstroke, new powerful hydraulic dampers. The design of the car makes the crew feel comfortable when moving on public roads and on terrain, besides, the vehicle can move at the speed comparable with that of the passenger cars.

At present there are three basic models of Tigr armored vehicles in series manufacturing: multi-purpose AMN 233114 Tigr-M, special-purpose ASN 233115 Tigr-M SpN and special armoured vehicle SBM VPK-233136 Tigr.

The main peculiarity of these models is the installed multi-fuel turbo diesel engine YaMZ-5347-10 produced in Russia. The engine develop power of 215 h.p. with maximum torque 735 N·m.

Multi-purpose vehicle AMN 233114 Tigr-M was designed as an improved version of special carrier GAZ-233014 with diesel engine manufactured by Yaroslavl motor plant in 2010. The new version of Tigr passed all required tests and is adopted into service in the Armed Forces of the Russian Federation and is being manufactured in series.

Tigr-M is equipped with crossbar locks and improved door sealing system, air conditioning system, fan and filter unit, starting preheater with enhanced heat value (20 kW instead of 12 kW) that can be used as a stand-alone heater. The number of seat is increased from 6 to 9. Rotating platform on the roof was replaced with square hatch.

The flotation has been substantially enhanced on soils with low load bearing capacity due to the new axle design with forced locking differen-

tials. Braking system efficiency is significantly improved due to the new braking mechanisms and installed auxiliary surge brake with pneumatic drive controlled by the driver.

The fuel system comprise additional turbine pump to provide for possibility to operate on blended fuels, among them mixtures with up to 85 % of gasoline. Cooling system efficiency was enhanced for operation in elevated temperatures on account of the new radiator unit.

Multi-purpose vehicle AMN 233114 Tigr-M with remotely operated combat module Arbalet-DM.

The weapon move outside the manned department of the car make it possible to not only protect the gunner, but also to efficiently utilize free interior space in the machine to enhance protection, and accommodate additional ammunition load or fuel. Specialists of Military Industrial Company together with engineers and designers of 'Oruzheinye master-



Exposition of Military Industrial Company at the Azerbaijan International Defence Exhibition ADEX-2018 (open area 40-08) presented 6 prototypes of Tigr family of armoured cars. Though the wheeled armoured vehicles BTR-80 and BTR-82A had been already well-known in Azerbaijan Republic, Tigr family vehicles had arrived to the country for the first time.





In more than a decade of massive operation and combat employment in 'hot zones' Tigr family armoured vehicles prove themselves to be reliable hardy machines providing high tactical maneuverability and necessary level of protection. High speed on both public roads and terrain is ensured by original torsion bars, suspension arm overstroke, new powerful hydraulic dampers. The design of the car makes the crew feel comfortable when moving on public roads and on terrain, besides, the vehicle can move at the speed comparable with that of the passenger cars.

skie' created multi-purpose armoured vehicle AMN 233114 Tigr-M equipped with Arbalet-DM complying with all modern requirements. Armoured vehicle with the said military module passed all tests and is adopted for service in the Russian Army.

The advantages of military module Arbalet-DM also include its versatility. Weapons that can be used with it include 7.62 mm Kalashnikov tank machine gun, 6P49 Kord 12.7 mm heavy machine gun, 40 mm AGS-40 Balkan automatic grenade launcher. Aside from main gun the remotely operated combat module is equipped with 4 launchers of 902 type system for launching the smoke (aerosol) grenades.

In distinction from absolute majority of foreign analogues, that have not protection whatsoever, Arbalet-DM possesses ballistic protection at the level of Tigr armoured vehicle, on which it is installed.

The sighting and observation complex of remotely operated combat module Arbalet-DM comprises survey and aiming TV cameras, thermal temperature sight and laser ranger. The fire control system can operate in automatic target tracking mode which substantially increases the maneuvering target destruction probability when firing on-the-go in the terrain. This decreases dependability of accuracy on the gunner operator qualification. Recently in Russia the tests have been carried out for completion of tasks aimed at UFV mitigation. The crews to perform such tasks were the crews of armoured vehicles Tigr-M with remotely operated combat module Arbalet-DM.

Special-purpose ASN 233115 Tigr-M SpN was designed by experts of Military-Industrial Company on the basis of multi-purpose AMN 233114 Tigr-M. Unlike its predecessor this

machine has a rotating platform with a large hatch on the roof for installation of armament. Two guns can be simultaneously mounted on the platform, including various options: 12.7 mm machine gun, 7.62 mm machine gun and 30 mm automatic grenade launcher. There are places for ammunition load stowage inside the vehicle for the gun installed on it, as well as for storing of the armor-defeating and assault grenades such as RPG-26 or RShG-2. There are four launchers of 902G type Tucha systems for launching the smoke (aerosol) grenades, two on each side of the top-wall.

Tigr-M SpN can carry six soldiers including the driver and can tow trail car up to 2.5 tonnes.

Basic configuration provide for heating and air-conditioning systems, automatic fire fighting system. The vehicle also carries night-vision devices, a net for fastening of road backpacks of the crew members and other equipment. ASN 233115 Tigr-M SpN is adopted for service in the Armed Forces of the Russian Federation

On ADEX-2018 exhibition Military Industrial Company for the first time presented the advanced model of armored car ASN 233115 Tigr-M SpN. The machine was modified by the company at its own initiative in order to enhance its application characteristics.

Apart from changes in the nose part exterior, the combat characteristics of the machine had been also improved. Engine protection was enhanced, now it is protected not only with the armored bonnet on top



The sighting and observation complex of remotely operated combat module Arbalet-DM comprises survey and aiming TV cameras, thermal temperature sight and laser ranger. The fire control system can operate in automatic target tracking mode which substantially increases the maneuvering target destruction probability when firing on-the-go in the terrain. This decreases dependability of accuracy on the gunner operator qualification. Recently in Russia the tests have been carried out for completion of tasks aimed at UFV mitigation. The crews to perform such tasks were the crews of armoured vehicles Tigr-M with remotely operated combat module Arbalet-DM.

and by armored radiator grill on the front, but also from the sides.

The machine cabin contains anti-traumatic seats with five point safety belts. To ensure smooth boarding and unboarding of the crew the machine is equipped with footrests on the sides and a foldable footrest under the tail wing door.

The renewed Tigr is equipped with modern all-round surveillance system which provides high situational awareness of the crew.

The vehicle is furnished with modern illumination equipment, with two remotely operated xenon spot lights.

At the request of the customer all windows and lights may be safeguarded by grating.

New air intake device of engine air supply system makes it possible to lower the dust or water intrusion levels when operating in dust environment or fording.

Air-conditioning system is installed in standard configuration as in the previous model of Tigr.

Special armoured vehicle SBM VPK-233136 Tigr has been designed according to the order of the Ministry of Internal Affairs of the Russian Federation. It is intended for carrying personnel, various cargoes along the public roads and in terrain, for use as a means of transportation and tactical service machine during counter-terrorism operations, mass riots suppression, for protection of the crew and personnel from firing arms and fragments of ammunition or explosive devices. Besides, the vehicle can be used for installation of special-purpose hardware and equipment.

The machine can carry protected single-compartment three-door armoured hull that grant protection of the crew and landing personnel corresponding to the 2 level as per STANAG 4569. All windows of the hull and doors contain armoured glass with gunports for firing the individual weapons. The number of seats in the cabin of SBM Tigr depends on

the type of installed seats and can accommodate 6 to 9 people.

Apart from automatic fire fighting system of the engine compartment SBM VPK-233136 Tigr can carry automated system for wheel fire suppression.

Covering fire in the course of counter-terrorism operations can be provided by infantry assault machine-gun on the roof of the vehicle. For these purposes there are two hatches that are closed with single-leaf armoured covers.

Basic configuration includes air-conditioning system and electric hoist with towing capacity of 4000 kg installed on the front bumper.

At the request of the customer the vehicle can carry all-round surveillance cameras, anti-traumatic seats, anti-mine rugs, protective grating on the external lighting devices, additional footrests, black-out flaps inside the cabin, as well as other options.

Taking the great deal of interest to Tigr armoured vehicles into con-



sideration on the part of prospective customers from the countries with left-hand traffic, there is a model of SBM VPK-233136 Tigr with right-side steering wheel.

Large internal armoured compartment with high hoisting capacity, maneuverability and robustness destined Tigr for usage as a basis for whole range of special vehicles, such as control units, special communication units, electromagnetic warfare units, RCBD division surveillance units, as well as a chassis for mounting of various weapon systems.



Special armoured vehicle SBM VPK-233136 Tigr has been designed according to the order of the Ministry of Internal Affairs of the Russian Federation. It is intended for carrying personnel, various cargoes along the public roads and in terrain, for use as a means of transportation and tactical service machine during counter-terrorism operations, mass riots suppression, for protection of the crew and personnel from firing arms and fragments of ammunition or explosive devices. Besides, the vehicle can be used for installation of special-purpose hardware and equipment.

Tigr BMA armoured casualty evacuation vehicle was designed upon initiative of designers and engineers of Military Industrial Company on the basis of chassis of Tigr armored vehicle.

Armoured casualty evacuation vehicle is intended for search, gathering and evacuation of the wounded from the battlefield, centers of mass contamination or destruction, technogenic catastrophes, including the ones in the territory of military conflicts or places in close proximity

to the burning ammunition or other explosive material storage facilities, for provision of first aid measures in case of indications of immediate medical attention in the course of transportation. The car with a medical crew can be used as a first-aid post or mobile dressing post.

Standard configuration of Tigr BMA can carry up to 4 wounded on litters or seated ones.

The BMA crew can include driver/ medic, doctor or doctor's assistant

and one more medical worker. All necessary medical equipment may be installed in the car according to the customer's request, including special equipment for intensive care unit.

The comfortable environment for the casualties and medical crew is provided by a new armoured hull with internal volume extended up to 10.3 m³, which is mounted on the basic chassis. Useful volume of the armoured compartment is 7.7 m³. The armoured body and bulletproof windows meet the STANAG 4569 Level 2 standard of ballistic protection.

As to the main specifications of BMA Tigr, they remain on the same highest level as befits Tigr armoured wheeled vehicle family.

Due to the expanded internal volume BMA Tigr can also be used as the chassis for control units and other uses that require high maneuverability, crew comfort and, certainly, reliability.

Today hundreds of armoured vehicles of Tigr family are operated in more than ten countries around the globe, having saved many lives of military personnel and by right enjoy popularity in uniformed services.



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FROM ADEX TO ADEX

The major regional exposition of weapons and military equipment

The 3rd Azerbaijan International Defence Exhibition, ADEX 2018 will be held at Baku Expo Centre in the capital of Azerbaijan from the 25th to the 27th of September. This large-scale event enjoys the status of a major regional exposition of weapons and military equipment; ADEX 2018 is a grand display of modern weaponry and equipment, where the force and power of Azerbaijan's military and industrial complex is showcased. President of the Republic of Azerbaijan Mr. Ilham Aliyev is a constant visitor to the ADEX exhibitions which are held on the initiative of the Ministry of Defence Industry of the Republic of Azerbaijan and supported by the Ministry of Defence of Azerbaijan. The exhibition will be organised by Caspian Event Organisers, CEO.

This year's exhibition will bring together more than 209 companies from 32 countries worldwide and will occupy three pavilions and an outdoor area of Baku Expo Centre. The national groups from Azerbaijan, Turkey, Russia, Israel, the

Republic of Belarus, Serbia, Ukraine, Pakistan, France and other countries will participate at the ADEX 2018 exhibition.

This year a number of countries have increased the scale of their national expositions; for example, Turkey's pavilion is 30 percent larger than it was

As is tradition, the business programme of ADEX 2018 will be rich in thematic events with informative and eye-catching content; these events include presentations in the field of innovative research, developments and technology in the field of national defence and security and will create ample opportunities for bilateral meetings with heads of line ministries, foreign military delegations, manufacturing companies and customers.



back in 2016. The leading companies of the defence sector from Italy, Bulgaria, China, the Netherlands, Lithuania and other countries are among participants of ADEX 2018.

The third hall of Baku Expo Centre will host the pavilion of the Ministry of the Defence Industry of the Republic of Azerbaijan, where the most recent armaments and military equipment of local production will be on display. Here, the industry professionals will be able to get acquainted with the new products of Azerbaijan's defence complex and witness both the current and growing capabilities of the Armed



PRODUCT CATEGORIES at ADEX-2018

AEROSPACE DEFENCE SYSTEMS

- Airships and powered balloons
- Artificial satellites
- Assisted eject (escape) systems
- Aviation maintenance equipment
- Avionics systems and equipment
- Ballistic missile defence systems and facilities
- Engines, equipment and components parts for aircrafts
- Military aircrafts and helicopters
- Missile and artillery weapons for aircrafts
- Parachute packs
- Space instrumentation technology

ARMS AND AMMUNITION

- Ammunition
- Artillery weapon
- Cold steel arms
- Missile weaponry
- Non-lethal weapons
- Small arms

ELECTRO-OPTICAL EQUIPMENT AND SYSTEMS

- Component parts for electro-optical, thermal imaging and laser systems
- Electro-optical systems for space control and space surveillance
- Hydro-optic devices and systems
- Laser equipment
- Navigational survey systems and aids
- Night vision devices
- Optical sights
- Surveillance and sighting devices and facilities

ELECTRONIC WARFARE SYSTEMS, C4ISR

- Command Information Centres (CICs)
- Communications systems and means for armed forces
- Electronic warfare systems and facilities
- Intelligence systems and aids
- Jammers for wireless and cellular communications
- Navigation systems and aids for armed forces

EMERGENCY AND RESCUE MEANS

- Chemical, biological, radiological and nuclear defence (CBRN) systems
- Emergency Response and Search & Rescue Equipment
- Fire fighting plants and equipment
- Medical equipment packages
- Military ambulances
- Mobile hospitals
- Water treatment facilities

INTERNAL (DOMESTIC) SECURITY

- Border control and customs inspection facilities
- Emergency population warning systems
- Enforcement and investigation activity aids
- Forensic equipment
- Perimeter security systems
- Personal security of the population
- Police equipment
- Systems and resources to counter terrorism

MILITARY UNIFORMS AND EQUIPMENT

- Bullet resistant vests
- Camouflage clothing
- Helmets
- Holsters
- Military backpacks, map boards, bags
- Military shoes
- Military uniform accessories and insignia (medals, shoulder boards, cap badges, chevrons)
- Personal hygiene among military personnel
- Uniforms

RADAR SYSTEMS

- Air radar systems
- Ground radar systems
- Marine radar systems
- Telescopic masts (antennas)

SHIPS, VESSELS AND NAVAL SYSTEMS

- Air-cushion vessels (ACVs)
- Auxiliary vessels
- Marine vessel design and upgrades
- Radar and navigation systems for ships
- Sonar systems
- Submarines
- Underwater and diving equipment
- Warships
- Weaponry, component parts and engines for ships

Forces of Azerbaijan. Moreover, this year's newcomers from Azerbaijan are the science and technology company Vitta, High Tech Park (ANAS), Service Centre for Armament and Military Equipment of Air Defence.

The media also shows great interest in the exhibition. Information support for the exhibition is provided by over 60 leading international and local specialized media – magazines, websites, and news agencies. The general information partner of the exhibition is IHS Jane's Defence Weekly (UK), and the official online diary of the exhibition is Army Recognition (Belgium), while the official Media partner is the Azeri Defence magazine (Azerbaijan).



There are an increased number of entities and organisations that demonstrate military and dual-use products at ADEX; the number of exhibits also shows an increase. Thus, ADEX 2018 will represent the following sectors: Air Defence (AD) and Missile Defence (MD) Systems; Military Shipbuilding; Development and Upgrade of Weapons Systems; Military Research; UAV Systems; Robotic Systems; Small Arms, Ammunition and Accoutrements; Demilitarization Systems; Missile and Artillery Rounds; MLRS; Electro-optical and Laser Technology; Armoured Vehicles; Submarines; Cyber-security of Naval Forces; EW & C4ISR Systems; Machinery and Equipment of Railway Troops; Technology and Equipment for Manufacture, Maintenance and Disposal of Weapons, and many more. Alongside the other sectors, this year's exhibition will widely feature the military aviation industry sector where famous corporations such as MIG, TUSAS, Leonardo, United Aircraft Corporation (UAC), Motor Sich, Russian Helicopters and Aeronautics Group will participate.

As is tradition, the business programme of ADEX 2018 will be rich in thematic events with informative and eye-catching content; these events include presentations in the field of innovative research, developments and technology in the field of national defence and security and will create ample opportunities for bilateral meetings with heads of line ministries, foreign military delegations, manufacturing companies and customers.

Thus, the ADEX 2018 exhibition will serve as an ideal platform for demonstrating the latest weapons and concluding new agreements in the area of international military and technical cooperation. The exhibition will be held at Baku Expo Centre.

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SIMULATION AND TRAINING SYSTEMS

- Military simulators for naval vessels, ground vehicles and aircrafts
- Modelling
- Shooting-range equipment
- Small arms simulators
- Targeting equipment
- Training aircrafts

UNMANNED SYSTEMS

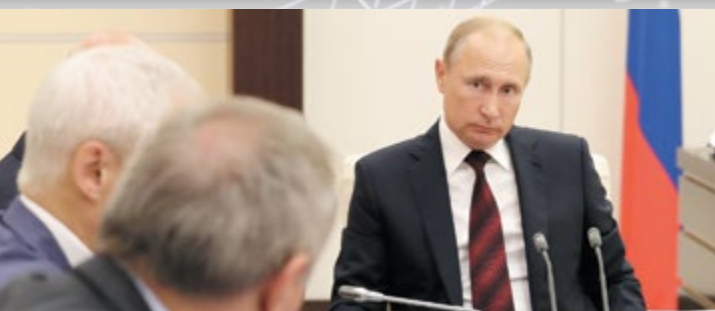
- Air drones
- Robotic systems
- Unmanned ships

WEAPONS AND VEHICLES FOR GROUND TROOPS

- Air and missile defence weapons and equipment
- Armoured vehicles
- Armouring of transport vehicles and defensive armour manufacturing
- Artillery and missile weaponry and systems
- Components and accessories for military ground equipment
- Military mobile points of command (Mobile Headquarters)
- Military transportation resources
- Specifically trained dog (K9) services
- Systems and aids for detecting and clearing landmines
- Upgrade and maintenance of combat materiel and weaponry



MEETING ON SPACE SECTOR DEVELOPMENT



In Novo-Ogaryovo (Moscow Region) Vladimir Putin held a business meeting on space sector development. The meeting participants discussed the implementation of the programmes to develop the space sector and measures to ensure its stable growth. The meeting was attended by First Deputy Prime Minister – Finance Minister Anton Siluanov, Deputy Prime Minister Yuriy Borisov, Presidential Aide Andrei Belousov, Deputy Commander-in-Chief of the Aerospace Forces and Commander of the Russian Space Forces Alexander Golovko, and General Director of the Roscosmos State Corporation for Space Activities Dmitry Rogozin.

President of Russia Vladimir Putin marked: 'As you know, a few weeks ago we met with the new leadership of Roscosmos corporation. Today we will continue analysing the situation in the space sector. This sector is of strategic importance for the country. Its steady and progressive development is essential for building up Russia's defence capability and national security, for enhancing the country's scientific potential and for creating innovative commercial technology.'

Space exploration and making use of the opportunities it offers to serve the interests of the economy and social sphere are major areas for Russia's technological breakthrough. Today I suggest discussing the implementation of the programmes for the development of the rocket and space industry and additional measures to ensure its stable and balanced growth.

Instructions were issued to the Government and Roscosmos in this connection, primarily to increase the orbital group, create a super heavy-lift launch vehicle, implement a manned flight programme and complete the construction of the Vostochny Space Launch Centre. I hope to hear reports on the implementation of these instructions today.

It should be noted that Russia has the necessary design, engineering and technical capabilities to success-

fully implement all of these projects, as well as the experience of designing complex space equipment and unique space exploration competences.

At the same time, our space industry must consistently improve the quality of its products and works, which should come at globally competitive prices. This is the key condition for increasing the industry's commercial potential to ensure its successful operation on the global market, where competition, or even rivalry, continues to increase.

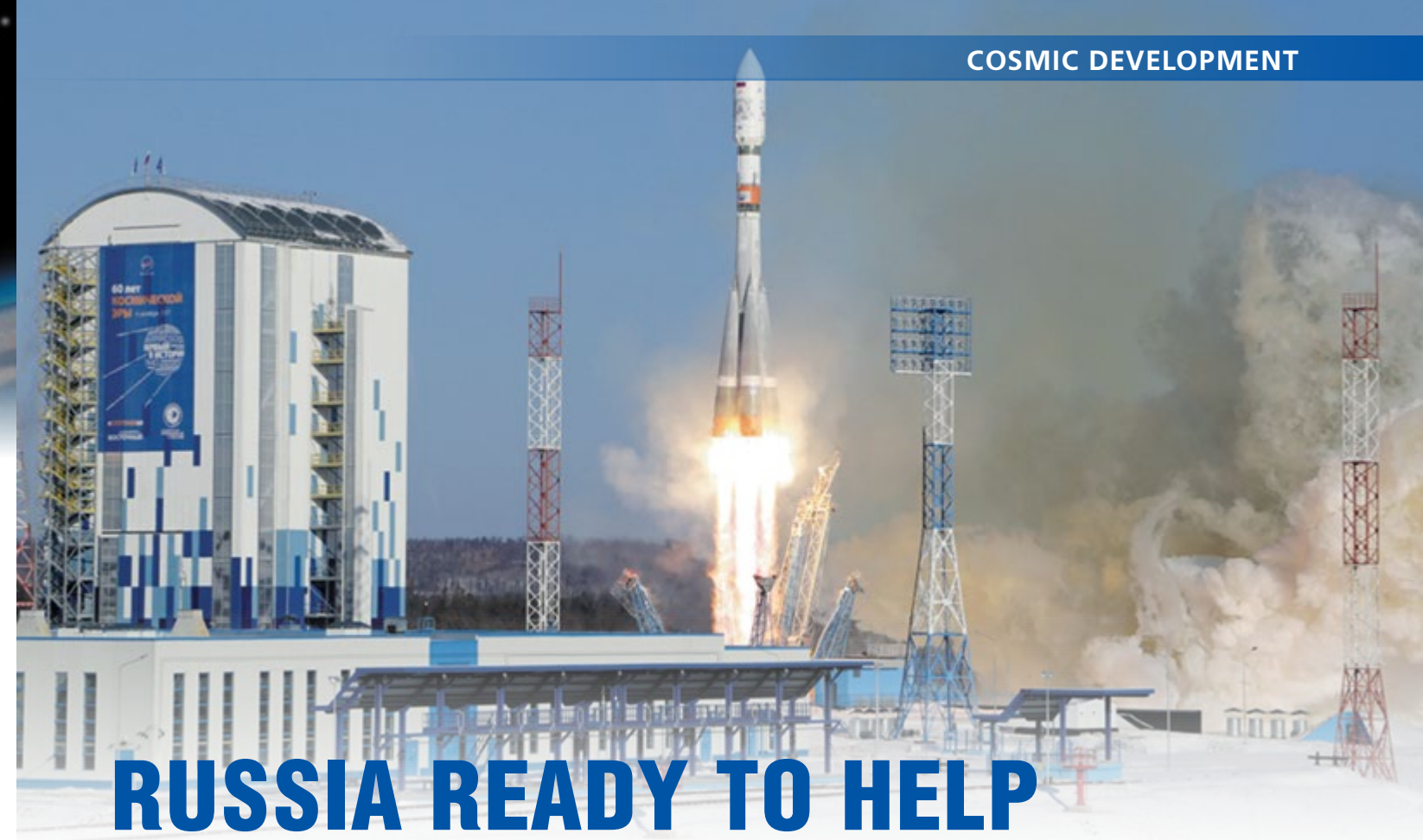
We must create conditions for fruitful and coordinated work of all space industry companies and their personnel, including designers, engineers and workers. We must also enhance the financial stability of these companies and provide additional social guarantees and incentives for improving the professional skills of their personnel and for attracting young talented professionals.'

After President speech General Director of the Roscosmos State Corporation for Space Activities Dmitry Rogozin said: 'Based on your instructions, starting from January 1, 2017, we introduced a new procedure requiring all vehicles produced in Russia or supplied to Russia to be equipped with ERA-GLONASS units. This has already saved hundreds of lives. We are even ahead of European practice here. We propose to introduce a similar practice when Russian airlines buy or lease for-

eign-made aircraft and even more so, aircraft made in Russia. They should all be equipped the same way – and we propose making it a legal requirement – with GLONASS or GLONASS-GPS modules in some cases. This will enable more accurate navigation for the crews. We have airports equipped with this system, but the planes, which are still mostly foreign-made, do not have these units. I would ask you to support my proposal. I have prepared a report and will submit it to you today.

And the second question. I would like to show you an album today after the meeting. Since April 2014, we have been photographing the Crimean Bridge, while it was being built. From the first step on each autoshot path, 240 paths in all, were shot monthly by our satellite-based remote sensing devices. Now we have a group of 10 satellites; in a few years, there will be 23. This is also a very important area for the commercialisation of space activities. At present we can remotely monitor how objects change, observe changes in the landscape, changes in the natural environment, illegal logging and many other things.

Before the end of this month we will be presenting the latest capabilities of Roscosmos and its orbital group to the federal districts and the regional governors. These new capabilities need to be commercialised and promptly introduced into the national economy.'



Rostec is ready to expand its cooperation with Turkey in creating and developing the republic's space agency. Earlier, the Turkish satellite Turksat-4A was launched in cooperation with Rosoboronexport (part of Rostec).

Rostec is actively developing the space industry and introducing advanced technologies in various areas of space exploration. The engines manufactured by UEC put Soyuz carrier rockets into orbit. Technodinamika produces life support systems for pilots and astronauts, including the Orlan-MKS space suit and the latest 'space' parachute system. Optical devices designed by Shvabe sense the earth's surface from satellites and are also used in the largest observatories in the world. RT-Chemcomposite creates unique composite materials that can withstand ultra-high temperatures and heavy loads.

'Rostec and its Turkish partners have had a mutually beneficial relationship in various industries for a long time. We certainly welcome our partners' intent to develop the space industry,' said Viktor Kladoy, Director for International Cooperation and Regional Policy Department of the State Corporation. 'Rostec has a wide range of competences and

extensive expertise in developing the space industry, and we are ready to expand and strengthen cooperation in this sphere.'

In addition, through Rosoboronexport and in the interests of foreign customers, Russian aerospace industry enterprises create and launch spacecraft for various purposes, make ground control complexes, complexes for receiving and processing data from satellites, and provide foreign partners with maps created based on space images. Specialists from partner countries learn how to carry out thematic processing and analysis of data obtained by remote sensing of Earth, with support from Rosoboronexport.

Rosoboronexport may suggest unique comprehensive projects to partners, as in the case when the first Malaysian astronaut Sheikh Muszaphar Shukor was sent to the ISS as part of an offset agreement to the contract for supplying Su-30MKM fighters.

Overall, Rosoboronexport has assisted in putting over 30 space-

craft from 14 countries into relevant orbits, including in the interests of the UK, Germany, Italy, China, Norway, Sweden, and the European Space Agency.

/RA&MG/



Sergey Kulik

SECURE RESCUE AT ANY HEIGHT



Unique autonomous rescue parachuting back-pack system for emergency escape

The innovative Russian private Space Rescue Systems Ltd. (SRS Ltd.) company (www.cosmic-rs.com) proposes a unique and unrivalled emergency rescue vehicle SPARS® – an Autonomous Rescue Pneumo Transformable Chute Back-pack System – a validated forefront rescue solution for guaranteed secure individual emergency escape from nearly any high elevation structure (skyscrapers, offshore platforms etc.). The SPARS® project is resulted in a creation of a brand new pneumo-framed aerodynamic devices technology. There is no doubt in the near future this solution is going to be a must-have in skyscrapers construction all over the world

The SRS Ltd. proposes a SPARS® high rise escape technology that has a global nature. It is uncovered market niche with an obvious but unrealized human requirement to be and to feel safe while living or working in high elevation buildings. In case of emergency than traditional evacuation is impossible or ineffective those people all over the world have practically no means of urgent secure rescue from the height and need an alternative solution.

Actually the technical reviews shows that at present there are practically no means for secure alternative escape starting from 60÷80 m height and higher available on the market. But according to the said firefighter's statistics about 3÷5% of people being caught in alarm situation on the high-rise building used to try escaping from the windows and

usually perished. On the other side homeland security analytics says that in average an every skyscraper in the world is expected to be subjected to a fire case (terroristic attack or other emergency) once in every 47 years.

So the SRS Ltd. has decided to resolve the problem in finding an alternative to traditional evacuation methods technical solution. It takes about eight years of R&D to resolve the task. Finally it is resulted in creation a brand new escape technology – an Autonomous Rescue Pneumo Transformable Chute Back-pack Solution for secure personal rescue from high-elevation structure in case of emergency than traditional evacuation methods are impossible.

The SRS Ltd company in outsourcing cooperation with 18 leading Russian and foreign aerospace companies has fulfilled full-scale research and development activities to devel-

op the project from conceptual proposal stage to releasing operating prototypes unparalleled anywhere in the world.

The SPARS® escape technology is based on a synergy of sophisticated aerospace technologies such as Air-Aspirator Rapid Inflation; Elastic Pneumo-Frame Catapult Ejection; Air-Drag Deceleration; Air-Bag Shock Absorbing and others. Such technologies were invented for space probes deceleration during descent in atmospheres of Solar system planets and its landings on surfaces.

The SPARS® device provides a secure individual escape of untrained person or valuables cargos with weights 45÷120 kg. from about any of existing high-rise (50÷1000m) facilities (skyscrapers; towers; offshore platforms etc.) with guaranteed safe landing on any underlying surface in urban terrain or water in

case of emergencies than traditional evacuation methods are impossible.

The SPARS® solution meets the Russian Ministry of Emergency Situations (EMERCOM) requirements for high-rise emergency escape apparatus (GOST R 22.9.08-2005; GOST R 12.4.206-99) and provides for the following unique capabilities, never implemented before:

1. Alternative of emergency escape (so-called 'last resort rescue')
2. Emergency evacuation of an untrained person having weight of 45÷120 kg, from heights of 50÷1,000 m;
3. Ready-for-use in 45÷60 sec;
4. Self-sustained operation and independently selected escape route;
5. User-friendly operation for untrained persons and fully automated rescue procedure right from start;
6. Personal protection against external hazards during evacuation;
7. Appropriate weight of a back-pack-type carried device;
8. Secure injury-free landing on any underlying surface.

The SPARS® unit for individual use had required a special certificate basis. In this regard the National Standard (GOST) 4240-001-2012 specifying medical and technical requirements for injury-free operation by untrained persons rescued by means of new type SPARS® shock-

absorbing systems entered into force in 2013.

To have certification tests performed a special Hybrid-III (USA) crush test dummy-based anthropomorphic (bionic-like) instrumentation station has been developed and created by the SRS Ltd., which has no equals in Russia.

A full cycle of comprehensive calculations and testing to validate design properties and performance has been performed. Up to now the SPARS® device technical operational reliability is 98.7% but further testing is under way.

New SPARS® escape solution provides the following advantages:

1. Alternative (a 'last resort') escape mean for ordinary person in case of emergency in the high-rise structure;
2. Secure rescue of untrained personnel (18÷70 years old) from high elevations from 5 till 1000m (no practical means available starting from 50 m height);
3. Off-line capability of the system provides mobility that helps to find optimal self-escape way of out from emergency situation;
4. Smooth automated ejection from the emergency object after manual initialization of the system;
5. Guaranteed deploy of the canopy with 3÷5 m loss of height irrespective of air flow speed pressure;
6. Protection from dangerous external factors (fire, hits, smoke) during descent;

The SPARS® General Specifications

1. Total Assembly Weight – 25 kg
2. Rescue Payload Weight – 45÷120 kg
3. Descent Elevations – 5÷1000 m
4. Landing Velocity – 5÷7 m/s
5. Landing Angle – < 30°
6. Footboard Barrier Elevation – 1.5 m
7. Descent Time – 3÷150 s
8. Ready-to-use Time – 45÷60 s
9. Launch Initialization Time – 15÷20 s
10. Inflating Gas – Air;
11. General Dimensions:
 - a. Assembled – 900x450x300 mm
 - b. In Descent mode – 6,500x2,700mm (without canopy)

Actual Landing Impact Loads:

Acceleration directions:

'chest-to-back' – up to 8÷10 g

'side-to-side', 'head-to-pelvis' – up to ± 6 g

Acceleration Exposition Time – less than 0.5 s

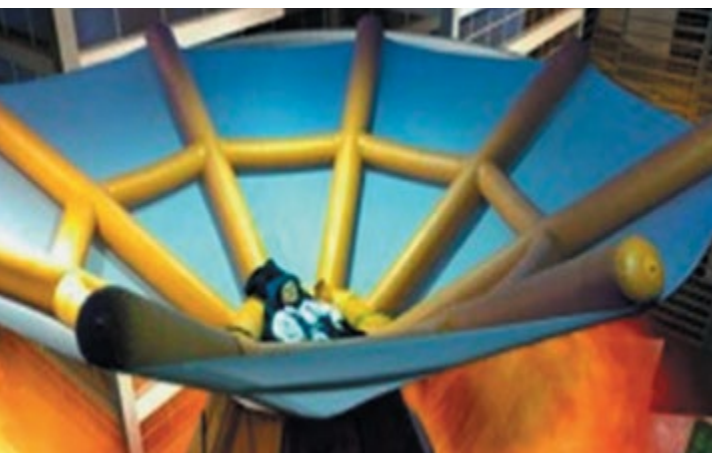
Acceleration Growth Velocity – less than 500 1/s

User's age – 18÷70 years

7. Safe landing on any underlying surface in urban terrain;
8. Reusable and does not sink.

In packed and assembly complete mode the SPARS® system weights 25 kg with back-pack dimensions





850x450x350mm and has easy – to-use suspension system.

The SPARS® has its Technical Data Sheet (TU 801130–5047075064–01–10) and working design documents issued. Under the SRS Ltd requirements Russian gas-filling systems (GFS) manufacturing company has mastered Autonomous Two-Stage GFS for SPARS® (TU 8042–017–45307693–2013).

The SRS Ltd. Intellectual Property Rights on SPARS® and its 'know-hows' have been completely protected within Russia (9 Patens, 3 Trade Marks) and abroad under PCT (Patent Cooperation Treaty) procedures 2 'umbrella' requests for SPARS® have entered national level in 15 countries and covered 78% skyscrapers and



95% potential SPARS® manufacturers. 13 Patents of the US, China, Japan, Canada, South Korea, Singapore, the Ukraine, Indonesia, Malaysia and Australia have been already received.

Three Russian EMERCOM Certificates of Conformity were received for the SPARS®. 'Aerospace medicine and military ergonomics' R&D Institute of the Russian Air Force has granted an official approval for the SPARS® physical adaptability.

The SRS Ltd. company now is looking for cooperation with a strategic Partner and/or investor in order to industrialize the brand new SPARS® product; to make it commercial; to prepare and set up its production and to enter with it into a global commercial market having all nec-

essary intellectual property rights protected.

An accurate assessment of the terms, timeframes and investments required for the SPARS® industrialization it is foreseen that a Partner from the region where product itself (or its production) could be demanded (Middle East, China, US, Europe, Asia-Pacific etc.) could formulate and provide the SRS Ltd. Company with the regional authority technical requirements to upgrade the product specifications and also could determine the necessary level of licensing.

At the same time in order to reduce production costs it is desirable to find and select a local manufacturer taking into account its technical capabilities and possibility to use appropriate production process technologies.

Upon receiving necessary information from a Partner the SRS Ltd. Company could finalize the design documentation, to fabricate a prototype with specifications meeting local needs and to determine expected investments and timeframes necessary to prepare and to run mass production of the product in the region.

Shares and Conditions in the business organization is a matter of further negotiations. The SRS Ltd. Company would be ready to demonstrate its good willing approach and to meet a Partner in negotiations halfway with necessary flexibility in some critical questions aiming to achieve mutually beneficial cooperation.

Such forms of cooperation as Joint Venture, Technical, Manufacturing or License Agreements are feasible.

For a strategic industrial Partner sought who would be interested to

run mass production of the SPARS® in the region and enter an empty market with protected rights it would be necessary to have production technology experience in the fields of:

- thin coated/laminated fabric manufacturing;
- assembly from these fabrics a complex air-beam-frame air-proof inflatable structures;
- parachute canopy manufacturing;
- air-aspirator gas filling manufacturing;
- plastics (carbon) manufacturing and forming
- human field (air-borne) tests plastic forming and others.

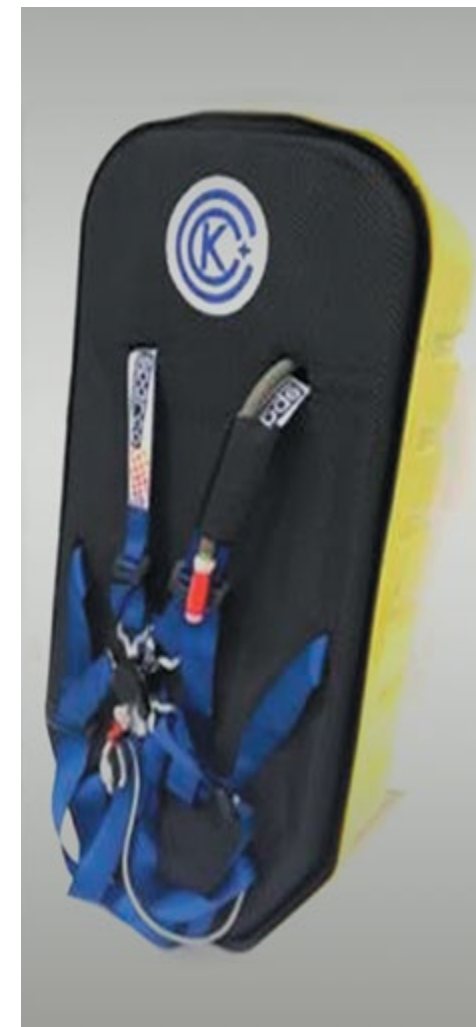
A Partner sought may be expected to undertake part of those activities or provide financing for already SRS Ltd. Company existing outsourcing manufacturing solution in Russia on a mutually beneficial basis.

As for the SPARS® solution operation such a potential entity sought (hotels, profitable houses; skyscraper's management company; offshore platform management; air-borne attractions & entertainment companies etc.) should only require a free window exit sized 1000x500 mm at the appropriate height to use Autonomous Pneumo Transformable Escape Chute and propose to its clients an additional exceptional secure service with limited warranty.

General market estimations shows there are over 7,303 finished and 2,500 under construction skyscrapers worldwide with the heights of 100÷828m, over 100,000 buildings having height of 50÷100m and more than 800 offshore platforms. Taking that analysis into account the SPARS® may have potential market capacity of up to \$700-850 million annually.

Furthermore, the SPARS® estimated potential market capacity is worth over \$3.5 billion in commercial sector alone. The Governments market is bigger but for accepting that new technology implementation it may require some updates of the appropriate local norms and regulations.

/RA&MG/

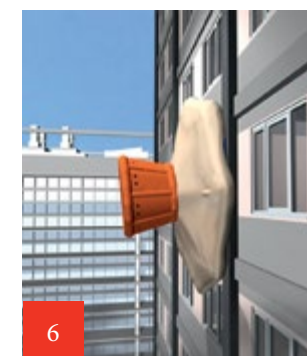
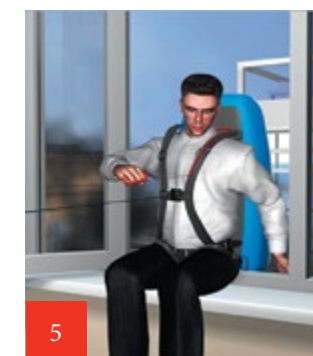
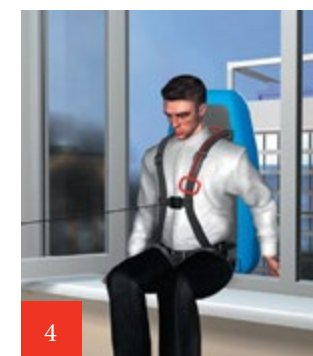
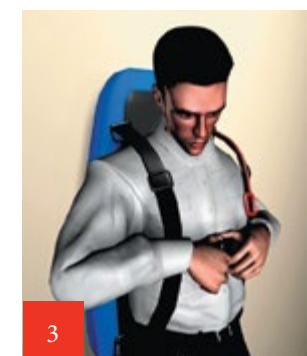
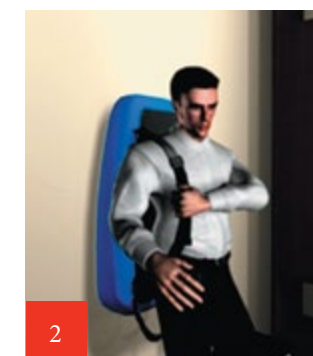


There are following innovations in the proposed SPARS® technology:

1. A brand new free parachuting technology (means and escape method) was created for emergency escape from heights higher than 50 m where practical methods for safe evacuation of a person are not available on the market.
2. Sinergy solution based on specially designed and produced from film-laminated fabric a rapid inflatable air-beam single volume frame structure for:
 - Elastic catapult ejection of a human from a window of an emergency object;
 - Forced deploy of the canopy with only 3÷5 m loss of height and irrespective of air flow speed pressure for deployment (usual parachute requires of 25÷100 m free fall and/or 250÷350 km/h speed of airplane to be deployed);
 - Guaranteed safe landing with 5÷6 m/s vertical velocity on any underlying surface in urban terrain using integrated air-frame shock absorbing pneumo dumper.
3. Fully automatic mode of usage (after manual initialisation of the apparatus) and all the descend envelope accelerations bearable for an ordinary person make the escape solution available for use by untrained people from 18 till 70 years old;
4. New type of light weight air-proof film coated fabric for air-beam inflatable frame structure was created.

The Special National Standard (GOST) for shock acceleration limits for untrained human using new type of lodgment Rescue Parachuting Systems was issued.

The Crash test dummy Hybrid-III 50% percentile was instrumented, calibrated with the help of centrifuge, certified and used as anthropomorphic instrument for human acceleration checking during field tests and validation of the Autonomous Pneumo Transformable Escape Chute.



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INTERNATIONAL AEROSPACE, MILITARY, NAVY AND TECHNOLOGY GUIDES IN 2018-2019

In 2018

ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
'RA&MG'№09 (27)	September 24th	ADEX 2018 (26-29.09.2018, Azerbaijan, Baku)
'RA&MG'№10 (28)	November 05th	Airshow China 2018 (06-11.11.2018, Zhuhai, China)
'RA&MG'№11 (29)	November 07th	INDO DEFENCE 2018 (07-10.11.2018, Indonesia, Jakarta)
'RA&MG'№12 (30)	November 26th	IDEAS 2018 (27-30.11.2018, Pakistan, Karachi)
'RA&MG'№13 (31)	December 01th	EDEX 2018 (03-05.12.2018, Egypt, Cairo)

In 2019

ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
«RA&MG»№01 (32)	February 12th	AERO INDIA 2019 (14-18.02.2019, India, Bangalore)
«RA&MG»№02 (33)	February 15th	IDEX 2019 / NAVDEX 2019 (17-21.02.2019, UAE, Abu Dhabi)
«RA&MG»№03 (34)	March 24th	LIMA 2019 (26-30.03.2019, Malaysia, Langkawi)
«RA&MG»№04 (35)	April 01th	LAAD 2019 (02-05.04.2019, Brazil, Rio de Janeiro)
«RA&MG»№05 (36)	April 28th	IDEF 2019 (30.04-03.05.2019, Turkey, Istanbul)
«RA&MG»№06 (37)	May 12th	IMDEX ASIA 2019 (14-16.05.2019, Singapore)
«RA&MG»№07 (38)	May 26th	Security Week Russia 2019 (28-31.05.2019, Russia, Moscow)
«RA&MG»№08 (39)	May 14th	SITDEF 2019 (16-19.05.2019, Peru, Lima)
«RA&MG»№09 (40)	June 16th	Paris Air Show 2019 Le Bourget (17-23.06.2019, France, Paris)
«RA&MG»№10 (41)	June 24th	IMDS-2019 (26-30.06.2019, Russia, Saint Petersburg)
«RA&MG»№11 (42)	July 20th	MAKS-2019 (23-28.07.2019, Russia, Moscow)
«RA&MG»№12 (43)	August 18th	ARMY 2019 (20-25.08.2019, Russia, Moscow)
«RA&MG»№13 (44)	September 16th	AVIATION EXPO CHINA 2019 (18-20.09.2019, China, Beijing)
«RA&MG»№14 (45)	October 01th	INMEX SMM India 2019 (03-05.10.2019, India, Mumbai)
«RA&MG»№15 (46)	October 13th	SEOUL ADEX 2019 (15-20.10.2019, Korea, Seoul)
«RA&MG»№16 (47)	October 28th	BIDEC 2019 (28-30.10.2019, Bahrain, Manama)
«RA&MG»№17 (48)	November 02th	Defense & Security 2019 (04-07.11.2019, Thailand, Bangkok)
«RA&MG»№18 (49)	November 16th	Dubai Airshow 2019 (17-21.11.2019, UAE, Dubai)
«RA&MG»№19 (50)	December 08th	Gulf Defense & Aerospace 2019 (10-12.12.2019, Kuwait, Al Kuwait)

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«С 20 по 25 августа Министерство обороны Российской Федерации проводит Международный военно-технический форум «АРМИЯ-2019». Это третье по счету масштабное мероприятие, в котором примут участие крупные отечественные и зарубежные предприятия оборонно-промышленного комплекса, ведущие конструкторские бюро и научно-исследовательские институты.

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