«Helicopter Industry» magazine is a publication Helicopter Industry Association of Russia (HIA)

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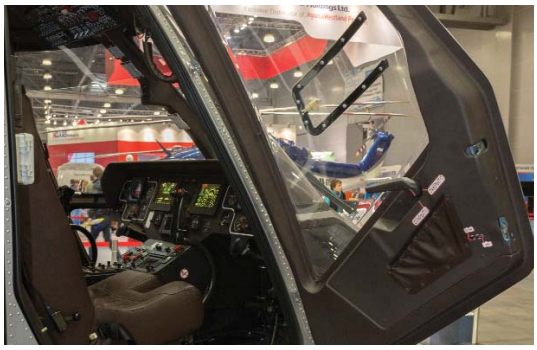
The magazine is published with financial support of JSC Russian Helicopters



According to some experts, the creation of the Ansat helicopter is nothing but a creative impulse of the Kazan helicopter plant. The development of this machine began in 1993 in an initiative manner together with the establishment of the public design bureau. And only one year later, the statement of work was formalized for the development of a light twin-engine multi-purpose helicopter with a carrying capacity of 1,300 kg corresponding to the domestic and international FAR-29 Airworthiness Standards.

Not very long ago Russia got involved in the struggle for Arctic resources, to put it more precisely, it undertook an attempt to regain its rights to that vast water area. There was a time when the arctic boundary of the USSR extended all the way to the limits of the eastern hemisphere, but after Russia ratified the UN Convention on the Law of the Sea (UNCLOS) in 1997, the situation changed.

Depending on configuration, the Ansat can be used for cargo and passenger transport, and also for medevac and emergency missions. However, these are not all the functions the helicopter can boast of having – the Russian military have for a long time been using this helicopter for training and patrol purposes, and they are fully satisfied with its features and functionality.

It is, without exaggeration, the main helicopter event of the year for the majority of participants in the helicopter industry in Russia, the CIS, Baltic states and for the key manufacturers of helicopters from Russia, Europe and the United States.

A helicopter which has extraordinary commercial potential

The Ansat. Considering the market needs

According to some experts, the creation of the Ansat helicopter is nothing but a creative impulse of the Kazan helicopter plant. The development of this machine began in 1993 in an initiative manner together with the establishment of the public design bureau. And only one year later, the statement of work was formalized for the development of a light twin-engine multi-purpose helicopter with a carrying capacity of 1,300 kg corresponding to the domestic and international FAR-29 Airworthiness Standards.

Both military uniform and civilian clothes

The birth to the helicopter was given by the state - through the purchase orders of the Russian Ministry of Defense as a training aircraft for future pilots. Moreover, the training aircraft turned out to be very promising – due to its fly-by-wire system (FBWS). However, in order for this model to enter the market, it was decided to adjust the Ansat program subject to the existing requirements for the hydromechanical system which is conventional in the helicopter industry. In late 2014, the Ansat with the hydromechanical control system received a supplement to the Type Certificate of IAC AR (Aviation Register of Interstate Aviation Committee), making it possible to exercise passenger traffic on the commercial market. The medical version of the helicopter also received the Type Certificate.

Not just the control system has been changed for the civilian market. In order to increase the flight range of the aircraft over 700 kilometers, the place, which had been left vacant after removing the FBWS, was equipped with an additional fuel tank with a capacity of approximately 200 liters. And some other changes were made too.

A balanced machine

The light multi-purpose helicopter Ansat is built based on the classic single-rotor configuration with a tail rotor. The Ansat is designed according to the AP-29 standards (FAR-29), category "A"; it has a high level of structural safety. The helicopter exists in versions with the latest fly-by-wire control system (KSU-A) and conventional hydromechanical control system (GMSU).

The Ansat with GMSU has a Type Certificate of the Aviation Register of the Interstate Aviation Committee (IAC AR). The traditional and innovative solutions have been perfectly balanced in the helicopter.

This model is equipped with two PW 207K turboshaft engines with a capacity of 630 hp manufactured by Pratt & Whitney Canada with a Full Authority Digital Engine Control system (FADEC) ensuring the continuation of the takeoff with one dead engine.

The Ansat flight simulation and navigation system and on-board equipment of the helicopter include an on-board information system, multi-function indicators and a failure warning system. The training version with KSU-A has a comprehensive quadruplex-redundant digital-wire control system.

Monetary funds allocated for engines.

As for the power unit: currently, several Russian companies are actively working on the creation of a domestic engine for the Ansat. Among them, the St. Petersburg Klimov and Rostec's Technodynamics. The latter, during the Helirussia-2016 exhibition, announced the start of work on the family of the main engines for light helicopters, includ-

ing the Ansat. "The project will take four years, during which 12 engines (five of them for flight tests) will be built. The TD-701 will be certified according to the international standards", according to the statement of the Holding. One of the key advantages of the new engine will be the use of a unified gas generator which will help to reduce the development and mastering costs. The price of a series-production engine will be reduced by 15% comparted to the analogues. A unified hardware package of the automatic control system (ACS) will be developed for the engine family .

The VK-800 Klimov power unit announced as a base unit for Russian light helicopters, including the Ansat, successfully passed the bench tests in 2015. Now the engine is at a stage of development work, which may take up to 3-4 years. According to Andrei Boginsky, the Deputy Minister of Industry and Trade of the Russian Federation, the necessary monetary funds have been already allocated to create this engine.

The prospects have been taken into account from the very beginning

By doing so, the creators of the Ansat have been gradually forming an attractive image of a commercial multi-purpose aircraft capable of arousing the interest of potential buyers. In this regard, it is interesting to know that Ansat with a hydromechanical control system has received two approvals for major modifications from the Federal Air Transport Agency (Rosaviatsia) and the Ministry of Transport of Russia for the design variant of the passenger cabin "Salon" (VIP) and the use of the air conditioning system.

One of the advantages of the Ansat, as compared with its foreign counterparts, is the most spacious cabin among the helicopters of this class, which can accommodate up to 7 passenger seats. This makes it possible to build the cabin of the passenger VIP-version as comfortable as possible.

With the configuration of the cabin for 5 seats, the cargo compartment can accommodate a wardrobe and a full-fledged luggage compartment with a built-in mini-bar. The passenger cabin is equipped with ventilation and air-conditioning systems with individual light and airflow features. The cabin is equipped with energy-absorbing seats with armrests damping vibration. In addition, for passengers' convenience, there are special earphones with active noise reduction installed.

"The quality is not worse"

All these factors yield results. In December 2015, Kazan Helicoters, PJSC signed the first contract for the supply of the passenger Ansat in the "Salon" version. The customer of the helicopter was one of the Russian largest manufacturers of household chemical goods and oil and fat products – the Tatarstan group of companies Nefis.

"The quality of the Ansat is every bit as good as the quality of foreign counterparts", said Aigul Mirzayanova, the head of PR-service delivering a message of Nafis management. “But a helicopter of same class, the Bell, would be at least twice as expensive. Surely, the company could have acquired a western-made helicopter, but we purchase it based on a conscious decision since we are convinced that its quality is not worse."

According to BUSINESS Online, the price of the passenger Ansat in its basic configuration is 243 million rubles. A similar Western helicopter costs approximately $ 8 million, i.e. approximately 640 million rubles.

Savings and once again savings plus consideration of the market needs

It is worth noting that during the creation of the helicopter the new methods of design were used, which resulted in reduction of design and tooling production time and labor costs in other areas of production. In order to ensure the competitiveness of the helicopter as to its performance characteristics and price, the designers applied conventional

and modern technical solutions, modern technologies and construction materials in a balanced way. When creating the Ansat, the designers used the concept of the minimum cost of mass production and the maximum adaptability with consideration of market needs to the most possible extent.

Healthcare comes first

The government civilian agencies also paid their attention to the "simple" (if “Ansat” is translated from Tatar) helicopter. The Russian Industry and Trade Ministry has showed its interest in the helicopter. It has been reported that the first customer of the medical Ansat will be the Ministry of Health of the Republic of Tatarstan.

"The light multi-purpose helicopter Ansat equipped with a medical module can be used in large metropolitan areas as a flying ambulance. Medical helicopters are extremely important for the emergency evacuation of victims of road or other accidents. Timely provision of medical care increases the victim's chance to survive by more than twice", said Alexander Shcherbinin, the Deputy General Manager for Marketing from Helicopters of Russia.

Production of helicopters for air ambulance is one of the main priorities of Helicopters of Russia holding company. Ansat can reach a maximum speed of 275 kilometers per hour and fly a distance over 500 kilometers.

A medical module installed on board allows to use the helicopter for the evacuation of injured persons in critical or serious condition on a stretcher. During transportation, the medical team may carry out continuous monitoring of the state of a victim to support the vital functions of the organism and perform intensive therapy to the extent as required by specialized medical aid. The weight of the module together with the medical equipment is 147 kg, it is energized from the aircraft electrical system.

The passenger cabin of the helicopter is, in turn, the most spacious in its class, making it possible to take up two victims on board and the necessary medical equipment, as well as provide space for medical staff. The Ansat set of on-board medical equipment corresponds to modern international standards.

The emergence of medical version was the final step in creating a unified helicopter certified for transportation needs, medical works, as well as for passenger traffic. Operators of the Ansats will be able to transform the interior of the helicopter in accordance with their needs. “Helicopters of Russia”, in its turn, is developing the search and rescue version of the Ansat, which, in addition to the medical unit, will have a winch, searchlight and loudspeaker device installed.

> The Ansat helicopter now finally available for use over a wide range of different applications, as well as being fitted and certified to be used for both regular and charter passenger flights

In whatever configuration

Due to the versatility of the light helicopter manufactured by the Kazan plant, its designers are ready to supply it to their customers in any desired configuration. This was confirmed by the General Manager of the company Vadim Legai who expressed the readiness to develop cooperation with Iran. "Iran has a vast experience in operating the most diverse aircraft. We are willing to diversify the helicopter fleet of the republic with the new Ansat helicopters in any configuration," he said.

Previously, the Kazan plant delivered three Mi-17V-5 helicopters in the search and rescue version to the Red Crescent Society of Iran and two Mi-17V-5 helicopters in transport version to the Ministry of Energy of Iran. Inspite of the fact that great attention is paid by developers to the commercial versions of the Ansat, the military purpose is still kept in mind. An example of this is the Ansat-2RTS. Originally, this helicopter was created for exploration purposes and target designation. However, in the course of its development, other features and functionality of light attack aircraft were added.

and an air bomb. In addition, along the right side of the fuselage, there is a fixed single-barreled machine gun "Kord-12.7", caliber 12.7 mm. The UV-26 units of passive jamming release of 26 mm caliber are mounted into the sides of the fuselage.

The helicopter is built based on the conventional civil Ansat. According to the developers, the two machines have 90 per cent of the units in common. Although the exterior of the two models have serious differences – the cockpit of the military version is designed completely from

ated a solid foundation for future creation of a drone on its base", said the chief designer Alexey Stepanov. The electrical control system provides such an opportunity. Therefore, the computer can replace the pilot there. The foundation has been prepared, the rest is a mere formality."

According to him, in the future, the Ansat helicopter might be in a demand as a scout attack UAV. "In particular, this model would be useful in the event of so-called local conflicts where there is no clearly marked front line, and the enemy could be anywhere. For ex-

Under the fuselage nose of the helicopter, the gyro-stabilized electro-optical target-sight system TOES-521 is installed, and on its sides, there are short wings with four points of weapon carriage with a total weight of up to 1,300 kg. They can carry "air-to-air" missiles such as "Igla" in launch canisters, blocks of the B8V7 free-flight missiles for seven S-8 missiles of 80 mm caliber each

scratch. The pilots do not sit next to each other, but one behind the other. In addition, the helicopter has a spacious cargo compartment that can accommodate landing force or be used for the transportation of various goods. Capacity of the machine – 1,300 kg.

"By developing the Ansat, we basically cre-

ample, a shooter with a hand portable air defense system.

Fully autonomous

In general, the prospects of Ansat platform are based on the functions pre-set in the design - simple and easy to use. Thus, for the first time in the history of the global helicopter construction, it became possible to ac-

commodate ten passengers in a helicopter of this weight category. One of them is located next to the pilot, on the left, and another nine seats are in the cargo-passenger cabin. Loading is carried out through four doors: two in the cockpit and two more – in the cargo-passenger cabin. In the rear part of the fuselage, there is a hatch for loading of luggage or stretchers.

The main rotor hub of the Ansat is hingeless and "maintenance-free". Hingeless suspension system of blades has not only increased the controllability and maneuverability of the helicopter, but it has also reduced the cost and weight of the structure, and has significantly reduced the operating costs. The replacement of the hub parts can be carried out outside the maintenance facilities and can be performed "on condition" and based on indications of objective information collection system. The hingeless torsion hub design has been developed in our country for the first time ever, and it has great prospects for further development.

Among other things, the latest flight-navigation system has been installed on the Ansat providing piloting in automatic and manual control modes in simple and challenging weather conditions, as well as full autonomy in preparation for flight and maintenance of the helicopter.

The key benefits are still there

As it has been already mentioned, the government is considering the possibility of providing a comprehensive support for the promotion of the latest Russian light multipurpose helicopter Ansat both in the domestic and foreign markets.

The President of Russia Vladimir Putin instructed to finalize the product line of the helicopter to avoid any questions about the prospects for its use.

"We need to finalize it [the product line] bringing it to the end to avoid any questions related to the prospects of its [helicopter] use," he said at the events within a single day of acceptance of military products. "It is possible to use the latest developments on individual components. I very much hope that from this starting point you will continue to move forward", noted the President.

And this movement forward will be accompanied by a fierce competition from the Bell-429, EC-135, EC-145 and AW-109. Here, one of the advantages will be the price and better adaptability of domestic vehicles to Russian conditions and operation peculiarities. The Ansat is unpretentious, easy and inexpensive to maintain. In this regard, the helicopter has very good prospects, both in the Russian market and in the airspace all around the world.

Herman Spirin

Without helicopters the struggle to develop new regions for extracting hydrocarbons would be impossible

Helicopters in the Struggle for the Arctic

Not very long ago Russia got involved in the struggle for Arctic resources, to put it more precisely, it undertook an attempt to regain its rights to that vast water area. There was a time when the arctic boundary of the USSR extended all the way to the limits of the eastern hemisphere, but after Russia ratified the UN Convention on the Law of the Sea (UNCLOS) in 1997, the situation changed. Four years later, the UN did not accept the Russia's claim even to 18% of the Arctic. Two international agreements - the Convention on the Continental Shelf (1958) and UNCLOS (1982) - define the economic boundaries of the area within 200 nautical miles, or 370 km from a coastline.

the various northern states. Thus, without helicopters the struggle to develop new regions for extracting hydrocarbons would be impossible.

Of course, modern helicopter technology and even the helicopters of the previous generation allow operations under these conditions. Countries and companies practicing offshore oil recovery have accumulated enormous experience in using helicopter services in extreme climatic regions. However, next in line are the helicopters that are safer and better equipped and enjoy superb flight performance. As proposed by oil companies, helicopters of the

The necessity for a polar evolution of the available transport helicopters in Russia has been timely recognized; the result of that understanding was the new Arctic Mi 8AMTSh VA

Russia decided to insist on its age-old rights to active operations, which other Arctic countries had also asserted. It became clear here that the aviation (especially helicopters) of all five countries possessing polar sectors - Russia, the US, Canada, Norway, and Denmark - will inevitably join the battle for the Arctic zone. Indeed, this pertains to Arctic territories or zones that are more than 200 nautical miles away from the shores of

transport category "A" have to be used for offshore oilfields starting from 2010, with all the resultant certification requirements. It is easy to understand that the requirements for helicopters used in the Arctic should be even more stringent. The necessity for a polar evolution of the available transport helicopters in Russia has been timely recognized; the result of that understanding was the new Arctic Mi 8AMTSh VA. With this

new helicopter, it will be easy for Russia to assert its rights in this region.

Whose ridge?

The overt and apparent struggle for the Arctic has been going on for several decades. On 2 August 2007, the deep-water habitable apparatuses Mir 1 and Mir 2 made a descent to the bottom of the Arctic Ocean to a depth of 4,300 meters. That expedition,

widely covered in the press, was named "Arctic 2007". Under the leadership of the polar explorer Artur Chilingarov, scientists went to the pole on the ship "Academic Fyodorov", with the way opened for them by the nuclear icebreaker "Rossiya".

To signify the victory of domestic high technology, the scientists placed a Russian flag, made of titanium alloy, on the bed of the ocean. Not only a unique descent was made, but soil specimens and water samples were also taken. Then the question arose: Is the underwater Lomonosov Ridge, which extends from Canada to Russia across the North Pole, a structural continuation of the Siberian continental shelf? Today this question has been resolved in Russia's favor.

Of course, that expedition could not have been carried out without air support. Control and further exploitation of this region will be impossible without a full-fledged helicopter presence. And Russia already has operators for such work, operating in Murmansk, Vorkuta, Yakutiya, Tyumen, in Sakhalin and Yamal.

A participant in this expedition, the St. Petersburg company Gazavia (formerly known as Spark+), has been operating since the beginning in the Polar Region. The geography of flights has continuously expanded over the last 17 years. Originally flights were made to the Kola Peninsula; they now go also to Komi, Spitsbergen, the North Pole, and Antarctica. Operations in extreme climatic regions have become a basic specialization of the company.

The "northlands" are traditionally the region where narrowly specialized, niche, and therefore the most advanced operators have been operating, these are operators that can undertake operations of any complexity in a region with an unfavorable climate. This fortifies them and helps to practice methods to enhance their competitiveness.

The honoured Russian pilot Vadim Bazykin once compared the pilots of his company with fighting dogs. Any of them must be ready to take off under the worst of conditions. The weather in the Arctic is often changeable, and good weather is an extremely rare phenomenon. Based in St. Petersburg, the company's pilots use any opportunity for training flights. The company undertook almost free flights to Valaam just to "do some somersaults" in the fog and gain expertise. Now the operator flies year-round to Spitsbergen, "letting" all the pilots come through that polar archipelago, and from May to October through the Kola Peninsula. After that kind of school, a pilot is ready to work at the North Pole.

From hardy machines to special ones

Extreme operating limits have become a standard specialization for Russian helicopters. The utilitarian Mi 8MTV helicopters by default are suitable for the Polar Region: A successful deicing system and a roomy cabin make it possible to accommodate 20 people and 4 tons of cargo. The modern Mi 8/17 transport helicopters are very functional for expedition use. The same machines that completed operations in Africa are sent a week later to Antarctica, dealing excellently with the rapid change of climate and the enormous temperature differential. This is one of the hardiest of machines, as testified not only by the expeditions but also

The Mi-8AMTSh-VA isn't just a transport 'copter, but a battlefield one too. It can rapidly transport troops to an incident location, and also open fire itself, with its onboard cannon and rocketry

by utilization of the helicopter in battle conditions.

However, examples of the technology of the previous generation in many ways have ignored the particulars of the Russian northern economy. The upgraded Arctic helicopter Mi 8AMTSh VA will be better able to compensate for that extreme: It is less labor-intensive in operation, is efficient, safe, can fly long distances and has service life as comparable to its modern counterparts.

A lot of aircraft-type technology was put to use when building the new helicopter. All of the craft sections of the Mi-8AMTSh-VA are welded together – rather than being glued, as in conventional helicopters. Welding improves the aerodynamics of the craft – and welds are easier to repair in the 'field' conditions of the Far North. The Mi-8AMTSh-VA isn't just a transport 'copter, but a battlefield one too. It can rapidly transport troops to an incident location, and also open fire itself, with its onboard cannon and rocketry. The helicopter's flight range at temperatures of -40° C is 1300 kilometres. It also has a system of guided weaponry, just like the Mi-24. The helicopter is fitted with reinforced armour plating made from light-gauge metallo-ceramic armour, and has radio-electronic weapons systems.

“This new Arctic helicopter is specially designed for transport and paratroop use by

the Russian armed forces in the Arctic", said the CEO of the Russian Helicopters corporation, Mr Alexander Mikheyev. "It can provide air support for troops, provide monitoring for defined zones, and offer search-and-rescue for crews, or passengers of vessels in distress on the Northern Sea Route", Mr Mikheyev said of the helicopter.

For flights in featureless terrain and the polar night, the machine is equipped with the latest navigational and radio equipment for pilots

It's planned to release a civilian version of the Arctic helicopter too. "Such a helicopter is a must-buy for the outlying Regions of the Russian Federation, for maintaining transport infrastructure, and also for companies in the petrochemical industry to provide support for their offshore projects", Mr Mikheyev continued.

For flights in featureless terrain and the polar night, the machine is equipped with the latest navigational and radio equipment for pilots, including a digital autopilot and inertial navigation system that operates in the absence of satellite signals.

Long-distance flights between base points are provided with external supplemental fuel tanks increasing the flight range. The safety of crew and passengers is increased by using special marine rescue suits. Pursuant to a placed State Defense Order, the holding company Helicopters of Russia will supply the RF Ministry of Defense with five more Mi 8AMTSh VA helicopters in 2016- 2017 (two helicopters have already been furnished to the client).

The Mi 8/17 helicopters as before make use of the work previously done, giving the machine a superiority for decades to come. The story is well known how a Mi 8 MTV (250 km/h) overtook the Super Puma helicopter (280 km/h) on a route to an Antarctic station (over 1000 km) due to the fact that the French helicopter had to refuel twice during the flight. Indeed, nowadays the company Airbus Helicopters plans to actively promote its upgraded version of the Super Puma—H215 on the Russian and CIS market—and has even started production again in the Romanian city of Braşov, with a view to replace its aging fleet of Mi 8 helicopters. However, thanks to the enormous experience in Arctic operations, Russian technology, even that one which is far from being new, is head and schoulders above the more state-of-the-art and better equipped machines of foreign manufacturers.

Nikolay Korobov

SICHUAN INTERNATIONAL AIRSHOW 2017

In association with Farnborough International

LAUNCHING SEPTEMBER 2017

No doubt that the Ansat will become in the near future one of the sales hits

Ansat Helicopter: light and multi-purpose

A new Russian helicopter claims leadership among the light utility aircraft.

Ansat was designed in the challenging times of the '90s as a light utility helicopter for our civil aviation which had a need for such aircraft. The creators of the Ansat focused on the most successful Russian helicopter Mi-8/17 which some experts aptly described as "PK machine gun" (Kalashnikov) among the helicopters for its ease of use and maintenance. And designers had to develop a mini-version of Mi-8/17 in order to repeat this resounding success of the Mi-8/17 family on the world markets. The younger brother to Mi-8 received the name "Ansat" which is translated from the Tatar as "simple". The Ansat owes this name not only to its simplicity, a quality which Russian- made helicopters are famous for, but also to the place of its "birth". The helicopter is manufactured in the Republic of Tatarstan at the Kazan helicopter plant.

One helicopter but many functions

The Ansat was initially designed with the aim to beat its rivals in terms of flight performance: it had to withstand a severe struggle on the market of light helicopters. If compared to its nearest competitor - helicopter EC-145 by Airbus Helicopters, the Ansat is available at a much lower price, has similar physical and operational characteristics and flight performance, and, besides, a more spacious cabin.

Depending on configuration, the Ansat can be used for cargo and passenger transport, and also for medevac and emergency missions. However, these are not all the functions the helicopter can boast of having – the Russian military have for a long time been using this helicopter for training and patrol purposes, and they are fully satisfied with its features and functionality.

Given the wide range of tasks this helicopter is capable to fulfil, the Ansat may be called a multi-purpose aircraft, as indeed the majority of Russian-made helicopters are.

Ahead of time

Despite a "simple" name, the Ansat's fate was far from simple.

For the first time ever, a fly-by-wire control system (FBWCS) was employed on the helicopter, a system which previously had only been installed on board the modern military planes and civilian airliners. The FBWCS significantly improves the aircraft performance by reducing its weight, saving manufacturing costs and ease of control for the pilot. However, exactly this innovation has become an obstacle to obtaining a type certificate for the Ansat. It was therefore decided to return to the conventional (hydromechanical) control layout to obtain permits necessary for the commercial service of the aircraft. And currently, the Kazan helicopter plant has already mastered the production of Ansats featuring both FBWCS and HMCS (hydromechanical control system) which allows to satisfy various requirements of customers.

Designers had to develop a miniversion of Mi-8/17 in order to repeat this resounding success of the Mi-8/17 family on the world markets

However, despite the issue above mentioned, the Ansat found its first operators, the military, since a certificate of commercial use was not a compulsory condition for them. In 2013, the first 6 Ansat-U helicopters were delivered to the Air Force Academy to train the future pilots. Currently, according to Alexander Shcherbinin, Deputy General Manager for Marketing and Business Development, Russian Aerospace Forces have received up to date 40 Ansats in the Ansat-U configuration for initial flight crew training. And these supplies will continue over the coming years, as the Ansat is gradually replacing Mi-2 helicopters previously used for training purposes.

The "Big Brother" will help the Ansat

Now the manufacturer is considering options for the sale of helicopters to civil operators, including from abroad. A number of foreign countries have already shown interest in the helicopter. Market success and popularity of Russian Mi-8 helicopters worldwide, reputation of the Kazan helicopter plant which has long been a "quality mark" in more than 80 countries globally, will contribute to the promotion of Ansats.

The success of the helicopter will depend on how exactly it will become a mini version of the Mi-8, a cheap and reliable aircraft that is easy in maintenance. Private companies are going to monitor the helicopter performance under real operation conditions. There is no doubt that the Ansat will become in the near future one of the sales hits in the Russian Federation and on the world market.

Press relations service,
Russian Helicopters Holding Company

Ka-32S

ВЕРТОЛЕТНАЯ ИНДУСТРИЯ

Results of the ninth helicopter exhibition in Moscow

HeliRussia 2016: the Exhibition expanded anticipating a soon growth in the sector

From 19 to 21 May, the 9th International Helicopter Industry Exhibition HeliRussia 2016 was successfully held in Moscow. It is, without exaggeration, the main helicopter event of the year for the majority of participants in the helicopter industry in Russia, the CIS, Baltic states and for the key manufacturers of helicopters from Russia, Europe and the United States.

The HeliRussia 2016 exhibition has received support at the highest level: at the official opening ceremony, the Assistant to the President of Russia for Military-Technical Cooperation Vladimir Kozhin read out the greeting of the President of Russia Vladimir Putin addressed to the participants, guests and organizers of the expo.

Today, when some other industries are experiencing a noticeable decline in their business activity, which is associated with the complicated foreign policy and economic situation, HeliRussia 2016 has demonstrated the success of the helicopter industry development both in terms of technology and in the framework of international cooperation. This year, the expo has gathered 224 companies, including 44 foreign ones from 15 countries: Russia, Belarus, Lithuania, the USA, the UK, France, Germany, Italy, Spain, Austria, Belgium, Norway, Canada, South Africa and the Czech Republic. This has left behind the results of last year, when 219 companies were represented at the expo, including 41 foreign ones from 13 countries. The number of visitors – over 11,000 people – remained at the same level.

Helicopters at HeliRussia 2016

Sixteen helicopters were presented at the HeliRussia 2016, which demonstrated the richness and diversity of the Russian helicopter industry; the demonstrated samples included exclusively Russian helicopters, models constructed with the use of foreign components and assemblies, as well as foreign-made helicopters and aircrafts developed overseas, though built in Russia.

Russian Helicopters introduced a new multipurpose helicopter Ansat in two configurations – VIP at the company booth and a medical-evacuation model – at the booth of Russian Helicopter Systems. The Ansat which is developed and produced by the Kazan Helicopters has Pratt & Whitney Canada PW207K engines and was consistently certified at first in a transport version and then in passenger and VIP versions. All-metal fuselage design, composite materials of nonbearing elements, and fiberglass blades – all these have been used for the Ansat production. Hingeless main rotor hub provides a high level of controllability and significantly reduces operating costs.

Another novelty from Russian Helicopters – a multi-purpose helicopter Mi-171A2, which was first shown at HeliRussia 2016 in an offshore version. The Mi-171A2 represents a synthesis of experience and talented engineering solutions of great minds of the Russian helicopter industry, embodied in the Mi-8/17 family made with the use of cutting-edge materials, technologies, achievements and developments available in the XXI century. The engeneers from the Design Bureau of Mil Moscow Helicopter Plant have made more than one hundred major changes to the design of the EASA-certified Mi-171A1 helicopter; they also integrated the new VK-2500PS-03 engines manufactured by Klimov UEC (United Engine Corporation), and the KBO-17 avionics with glass cockpit produced by Ulyanovsk Instrument Manufacturing Design Bureau, which is part of KRET holding. The Ulan-Ude Aviation Plant produces the Mi-171A2 prototypes and will organize well the subsequent commercial production of this model. Certification is planned for 2017.

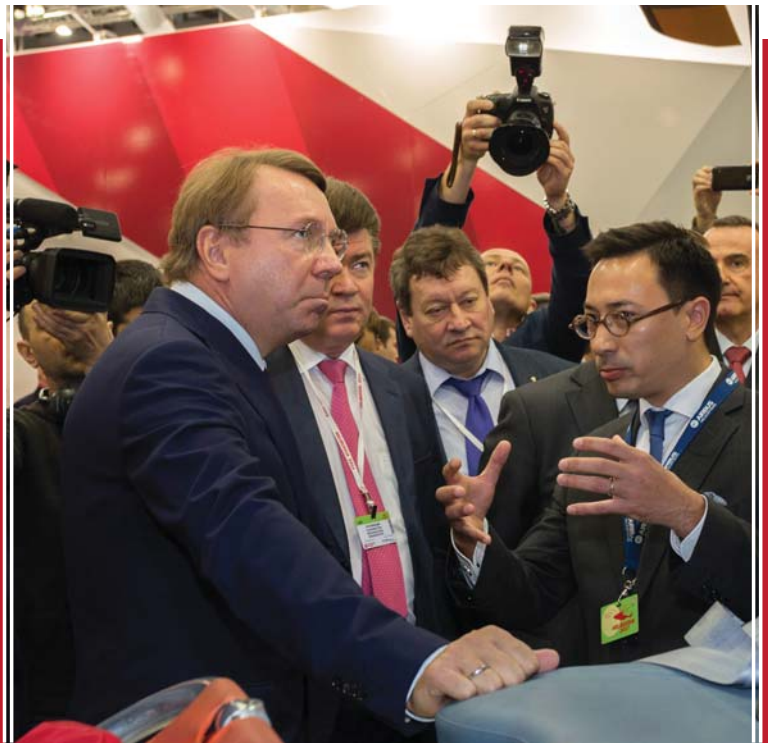
Pall Aerospace deminstrated at their booth new dustproof devices for the Mi-171A2 engines, providing for unprecedented high-level of air filtration for helicopters of the Mi-8/17 family.

Another important Russian helicopter being on display at HeliRussia 2016 is the Mi-38. This medium-heavy aircraft opens up a new weight segment in the range of Russian Helicopters. Designed by the Mil Moscow Helicopter Plant and manufactured at the Kazan Helicopters, this model is equipped with with TV7-117V engines developed by Klimov Company, certified in 2015, and equipped with the IBKO-38 avionics with glass cockpit unit produced by Kronstadt Group (former Transas). The Mi-38, in its transport configuration, has a type certificate, which confirms that its design meets the requirements of Russian and foreign aviation regulations.
One of the most notable news of the HeliRussia 2016 was the decision of the Russian Ministry of Defense to purchase the Mi-38 for the needs of the Russian Aerospace Forces (VKS). The transport version of the Mi-38 helicopter makes it possible to increase the functionality and extend its scope of application by creating specialized versions, including the Arctic option similar to the Mi-8AMTSh-VA helicopter. The Mi-38, in its military-transport modification, will undergo a series of flight tests to meet the requirements of the customer, and upon their results, further purchases of this helicopter will be planned for the needs of the Russian Aerospace Forces. It has been reported that an agreement was reached for the supply of three helicopters with an option for another five aircraft.
Deputy General Director of the Kazan Helicopters Igor Bugakov told at HeliRussia 2016 that deliveries of the military transport version are scheduled to begin in 2018; meanwhile, the commercial version is going to be supplied at the end of 2018 or early 2019. The first civil operator may be Rosneft, which is already considering the possibility of using the Mi-38 for servicing offshore oil platforms. The Mi-38 is distinguished by good capacity as it can take up to 30 people on board.
Avia-Project Company presented its own perspective development – the AP-55 Helicopter. The single-engine helicopter AP-55 features a coaxial rotor scheme. Leading domestic and foreign engineering companies have been actively involved in the development of this model, and polymer composite materials have been widely used in its design. Today, the project is in the final design stage; meanwhile, active work is underway to prepare for the production of units and systems.
AirLane presented its coaxial “air scooter” – the Micron. This is a new Russian ultralight gyrocopter created for nonprofessional pilots and aviation enthusiasts. Its dry weight is 115 kg, and the maximum take-off weight – 250 kg. The cruising speed of the Micron can reach 115 km/h, at the static ceiling – 3 km. It is assumed that the Micron will become a budget model and will be a convenient alternative to entry-level models and will be able to attract new people to the helicopter industry, by making helicopter flight training more accessible.

The exposition of foreign helicopter companies were saturated as well. For example, Airbus Helicopters, for the first time in Russia, showed a new medevac H135 model: its demonstration at the HeliRussia 2016 expo was part of a large-scale Russian demonstration tour. The domestic customers were shown a helicopter from the Austrian operator ÖAMTC (Österreichischer Automobil-, Motorrad- und Touring Club). The model presented in Russia was manufactured in 2016 and is part of the latest generation of machines of this series. The medical unit of the helicopter is equipped to the very latest state

of the art and has the ability to accommodate additional equipment according to customers' requirements.
Models of Airbus Helicopters (formerly – Eurocopter) have been used in the Russian air ambulance for more than 20 years. Among the operators - the EMERCOM of Russia and the Moscow Aviation Center, as well as regional operators. Russia operates medical helicopters of the following models: Bo 105, AS350B3e / H125, EC135 / H135, EC145 / H145. The potential market for the new version of the H135 in Russia has been estimated by the manufacturer at 150 units.
Airbus Helicopters demonstrated its H130 in a commercial multi-functional version. This single-engine helicopter is well suited for corporate transportation and can take on board up to seven passengers. The H135 is an improved version of the Airbus Helicopters' internationally famous Ecureuil EC130 family of helicopters.
Bell Helicopter and its Russian representative Jet Transfer presented the multi-purpose Bell 407GX, which is well known to operators of helicopters around the world working in the field of corporate transporation and offshore transport missions. This model is one of the most successful in the line of the US company: according to the last year results, out of 175 civil helicopters supplied by Bell Helicopter 99 aircraft accrue to the Bell 407GX / GXP. In recent years, 29 of such aircraft have been supplied to Russia; 5 of them were supplied last year.
Due to the high interest of Russian customers in the Bell 407GX / GXP, the production of this type of helicopters was localized in Russia by the Ural Works of Civil Aviation (UWCA), an agreement on which was signed at the previous exhibition, HeliRussia 2015. At the end of December 2015, the first Bell 407GX helicopter assembled in Russia was supplied to the Omsk Flight Technical College of Civil Aviation named after A. V. Lyapidevsky (branch of the Ulyanovsk Higher Civil Aviation School), and the second one - at the end of April this year.

Another model of the US company which turned out to be very interesting for Russian customers was the VIP version of the Bell 429 GlobalRanger. As a sequel to the Bell 427, model 429 was introduced in 2007 and received a certificate in the United States in 2009, and later in 2011 – in country Russia, where the popularity of the Bell 429 helicopters is growing, mainly for corporate purposes and for medical evacuation. Currently, in Russia and the CIS, more than 20 Bell 429 helicopters are being operated.
Licensed production of helicopters developed by foreign designers in Russia in the framework of international cooperation supported by the HeliRussia expo is a common practice. The well-known in Russia AW139 was showcased by the Exclasses Holding at the HeliRussia 2016. This model is manufactured by HeliVert plant near Moscow which is the joint venture of Russian Helicopters and Italian AgustaWestland (which was renamed Leonardo Helicopters). This helicopter is one of the leaders in its class, and has high performance characteristics. In Russia, the AW139 is used for corporate transportation; in particular, four such helicopters are being operated by Special flight group "Russia", which serves the highest government. In addition to passenger traffic, the AW139 is used in other countries to perform search and rescue operations, in the medical aviation and police departments.
Exclasses Holding also showed at their booth the VIP configuration of its light



AW119Ke. This model was originally designed as a vehicle for business aviation and VIP-transport, and these tasks are performed by the AW119Ke with flying colors. The luxurious interior of the single-engine AW119Ke have been designed by the experts of the legendary Italian company Versace. Such helicopter can take up to 6 passengers on board. According to Exclasses Holding's forecast, the AW119Ke should be certified in Russia this summer.

At HeliRussia 2016, Exclasses Holding demonstrated for the first time the VIP-cabin of the AW169 model, which has recently entered the world market: the medium AW169 received the EASA certification in 2015, as for Russia, the certification process is scheduled to begin after the receipt of firm orders from Russian operators. Thanks to HeliRussia 2016, many domestic customers were able to get acquainted with the interior of this helicopter and find out about the progress of its R&D. The AW169 is equipped with two Pratt & Whitney Canada PW210 engines and a glass cockpit with touch screens. Innovative technical solutions are applied in the rotocraft flight structure and transmission design of the helicopter.

The basis of the helicopter fleet among private Russian pilots is made up by the R44 Raven I / II and R66 Turbine helicopters made by the American company Robinson Helicopter. These helicopters are distinguished by affordability and easy operation. Several R44s were presented at the stands of the companies involved in the HeliRussia 2016 and a new R66 with the autopilot was shown at the booth of Heliports of Russia. The R66 with the Genesys Aerosystems HeliSAS autopilot and Garmin G500H flight control and navigation system was certified in Russia in December 2015 and is now available to customers. Helicopters in this configuration are characterized by increased convenience and safety in use.

Among foreign novelties, an electric model of multicopter named Volocopter VC200 should be particularly noted. It can radically change the appearance of small aviation. In addition to the electric power plant, the other features of the Volocopter VC200 are safety and simplicity of design and management, achieved by a high degree of automation.

The Volocopter VC200 is distinguished from other helicopters of a conventional design by the absence of a swash plate and a tail rotor. The rotors of the VC200 are fixedly secured to the motor axes, and the change of the height and direction of movement is provided by changing the thrust. The control of the unit is ensured by special intelligent systems that support the position and direction of flight. They control the speed of rotation of each engine and provide the automatic compensation of changes in air flows. This aircraft made its first manned flight on March 30, 2016.

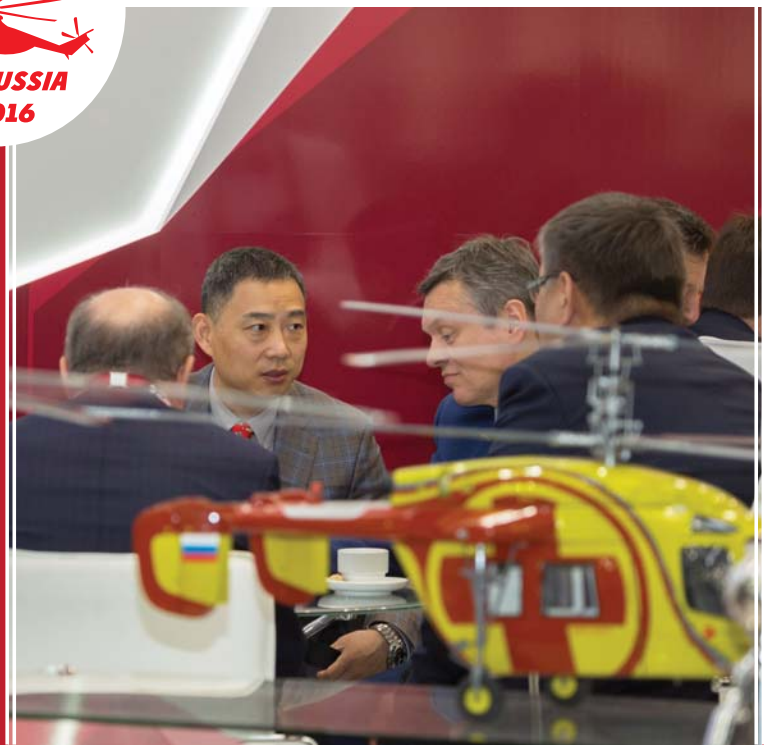
According to the developer, in contrast to conventional helicopters, which require lengthy and costly professional training, it will take incomparably less time to learn how to fly the Volocopter VC200. Like the Micron, the VC200 can be created in a completely unmanned configuration.

Aviation Equipment and Accessories

Each year, the HeliRussia expo gathers a large number of companies from various fields, which are engaged in the development, production and maintenance of helicopters and other aircraft systems. The exhibition of this year was no exception; all major industrial companies presented their innovations and promising developments, in-

cluding: Technodinamika, KRET, UEC, OPK and Schwabe of the Rostec State Corporation as well as Kronstadt Group.
The most welcomed became the news about the start of work on the design of a new generation of engines for Russian-made helicopters: at the HeliRussia 2016, the representatives of Technodinamika told that the company, within the framework of the import substitution program, is developing the main engines of the TD-700 series designed for the light helicopters, Ansat and Ka-226T, which, over the next four years, will be able to replace the currently applied engines manufactured by Pratt & Whitney Canada PW207K and Turbomeca (Safran) Arrius 2G1.
It is assumed that new engines in contrast to Western models will be designed for a greater range of operating temperatures and will get ample opportunities to boost the capacity. The company expects the TD-700 series engines to be 15% cheaper thanks to the unified gas generator used in the entire line.
At the HeliRussia 2016, Technodinamika for the first time presented an accident-proof fuel system for helicopters, which has already undergone performance tests. The system helps to prevent fuel ignition at hard landings of helicopters. Maxim Kuzyuk, the CEO of the company, said that the systems of such high complexity have never been previously developed in Russia. Technodynamika also demonstrated a starter-generator for a new generation of helicopters (e.g. the Ka-62) which is being developed under the state contract with the Russian Ministry of Industry and Trade. Other promising developments by Technodynamika, including the latest auxiliary power units of different dimension and sizes, were presented in the form of interactive 3D-layouts on the video wall.
Technodynamika had a busy agenda. Alexander Litvinov, the Deputy CEO for innovation, development and sales, proposed to establish an institution of independent quality control for aviation technology being created and to introduce a standardized international system of certification and qualification of the aviation authorities, which should help to develop mechanisms for validating certification results of the Federal Air Transport Agency ("Rosaviaciya") by international aviation authorities. This system has been designed to reduce the time of harmonization of the regulatory framework of the Federal Air Transport Agency with the current requirements of the international US and European aviation authorities (FAA and EASA, respectively).

Concern Radio-Electronic Technologies (KRET) presented more than 150 exhibits made by its affiliated companies: samples of helicopter avionics, strapdown inertial navigation systems (SINS) and airborne defensive aids (ADA). The expo was attended by 17 major companies which pare part of KRET.
KRET presented a set of avionics for helicopters and airplanes of general aviation KBO-42T, as well as military products, such as a laser station of optical-electronic suppression of the President-S optical-electronic aircraft and helicopter protection system, the NSTsI-V helmet-mounted target designation and indication system and the N-025E airborne radar system of the Night Hunter Mi-28N(E) attack helicopter.
The actual work of the modern helicopter equipment was shown for the first time by the example of a multifunctional demonstrator, with which every visitor of the expo had a chance to get acquainted, and "fly" in a helicopter. This unified navigation system consists of four screens, a computer, instrument



panel with a trackball on the one side of the pilot and a joystick on the other side. According to the General Manager of the Ramenskoye Instrument Bureau, an affiliate of KRET, Daniel Brenerman, this technical novelty is unique, and the joysticks will be installed on the new Mi-38 helicopters. The bench tests have been already conducted, and the flight tests are scheduled to take place until the end of this year.

During the HeliRussia 2016, the advisor to the First Deputy General Manager of KRET Vladimir Mikheev told that the company would soon complete the tests of the laser suppression station, enhancing the protection of the Night Hunter Mi-28NM modernized attack helicopter, which is currently being tested. It is expected that such a system would be effective against all existing and future missiles with infra-red homing heads. After completing the tests, it is planned to launch the commercial production of the laser-suppression station that will be installed on all Mi-28NM helicopters.

During the HeliRussia 2016, KRET familiarized the visitors and representatives of the professional community with the work on developing the Rychag-AVM complex of electronic warfare for helicopters. The launch of this new complex is scheduled for 2017, and its acceptance by military forces into operation is expected in 2018-2019. In particular, this complex can be installed on the upgraded Mi-8AMTSh-V(A) helicopters.

Deputy General Manager of KRET Igor Nasenkov told that the first production samples of the laser suppression station intended for the protection of the Mi-28NE helicopters (export version of the Mi-28N) have already been tested and delivered to the customer. He reminded that for the first time the system was presented at the HeliRussia 2014. By early 2016, the tests of the system had been completed and the first samples were transferred for production and to be installed on helicopters, which are produced for foreign customers.

In addition, KRET presented new and promising equipment and systems for helicopters, in particular, the President-S complex developed by the Scientific and Research Institute "Ekran" a part of KRET. The complex is de-

signed for the protection of helicopters against anti-aircraft guided missiles and various artillery complexes. The President-S can also provide defense against "air-to-air" missiles. The airborne defensive aids are able to independently detect a threat, determine the extent of its power and activate electronic interference that will prevent from hitting the target.

Klimov Company (affiliate of the United Engine Corporation, UEC) presented, as part of its exposition, the TV7-117V and VK-2500PS helicopter engines in the full-size mock-ups. The TV7-117V was designed based on the TV7-117SM aircraft engine and is intended for the Mi-38 helicopter. The engine has received a type certification in 2015. The VK-2500PS engine in the power class from 2200 - 2500 hp is a deep modification of the VK-2500 with the use of the modern FADEC digital automatic control system. It is intended for use on the new Mi-171A2. Thanks to the new design solutions, the VK-2500PS will provide a more reliable operation of helicopters in areas with high temperatures and at high altitudes. Currently, Klimov Company is carrying out a set of certification work on this engine. Other promising developments of the company were presented at the HeliRussia 2016 in a multimedia presentation format.
United Instrument Manufacturing Corporation (UIMC) presented the samples of advanced avionics for helicopters at the HeliRussia 2016. The company held the first show of the Aist-62 integrated antenna-feeder system, built on the "smart skin" principle, as well as new communications equipment for helicopters, capable of exchanging data with the land without human intervention by making self-tuning and restoring the work.

Equipment from UIMC presented at the HeliRussia 2016 provides voice communication, transmission of video, navigation and radar data. It implemented a packet data exchange in digital form, broadband radio channels and new methods of dealing with interference, which increases the speed, range and performance. The number of external antennas has been minimized, and the Aist-62 antenna system is embedded in the skin of a helicopter. This approach increases the efficiency of antennas and their reliability by 10 times, while reducing power consumption of communication systems.
Schvabe Holding Company at the HeliRussia 2016 was represented by Production Association Ural Optical and Mechanical Plant named after E.S. Yalamov (UOMP), which presented the optical surveillance systems. These systems make it possible to solve a wide range of tasks: around-the-clock search, detection and identification of ground and surface, moving and stationary objects during rescue operations. In addition, this technique is also used for remote detection of forest fires in a smoke and complete darkness as well as for the technical monitoring of oil and gas pipelines and high-voltage power lines.

Kronstadt Group (former Transas) presented a number of new projects for the helicopter industry at the HeliRussia 2016. The glass cockpit for the new Ka-62 helicopter, which combines the most modern avionics, aroused a huge interest of the visitors. Kronstadt's avionics has already been installed on three experimental Ka-62 samples, one of which made its maiden flight in April this year.
Kronstadt Group acquainted the participants of the expo with the program of modernization and service support for the flight simulators produced by the Group. In particular, they can be integrated with the Aurora-3 visualization system – an innovative breakthrough of this year.
In addition, the company presented some new lighting equipment: a spotlight with an integrated high resolution camera as well as microprocessor-controlled portable lights. The company showcased the new TSL-1600 aviation searchlight with the integrated high resolution camera and upgraded operating console at its booth. A camcorder with an 30x optical zoom and 12x digital zoom, equipped with an image stabilization system is installed in a sealed heated box.
Heliatica presented a wide range of auxiliary equipment and accessories for helicopters, for example, the Heli-Utility-Basket easily removable baskets for the Robinson R44 and R66 helicopters produced by DART Aerospace, a company which is represented by

Heliatica as an authorized dealer. One of the interesting new products at Heliatica's stand was an airborne flight data recorder Gesvol for the Robinson R44 with an integrated GPS and GSM module.

Airbus DS Optronics, before joining the EADS known as Carl Zeiss Optronics, presented the systems of optical and electrical methods of processing, storage and transmission of information (optronics) for aviation, transport industry, as well as optronics of special purpose.

This year GIFAS (French Aerospace Industrial Association) organized the exposition of industrial French companies at a united French stand. It included ALKAN, Composite Industrie, MÄDER, Novintec and Permaswage.

The presented companies demonstrated a wide range of materials, systems and equipment for civil and military helicopters. The companies included in GIFAS have unique competence in the aerospace industry, and all the participating companies noticed the high level of interest from their Russian colleagues who were interested in international cooperation.

The French Safran Helicopter Engines (former Turbomeca) presented at its booth some turbine engines for Russian helicopters – the Arrius 2G1 and the Ardiden 3G models, with which the Ka-226T and Ka-62 have been respectively equipped. The Arrius 2G1 became the first engine of foreign origin used for intallation on coaxial helicopters, and the integration of the modern Ardiden 3G into the Ka-62 design helps to obtain potentially high flight performance and makes it possible to cut operating costs.

Zehr Aero Company, which included Cobham and TITEFLEX, presented some engineering solutions and components manufactured by French and Swiss companies. The French Aero Zehr is a commercial representative of a number of European manufacturers of components for the aerospace industry. The partners of ZEHR Aero

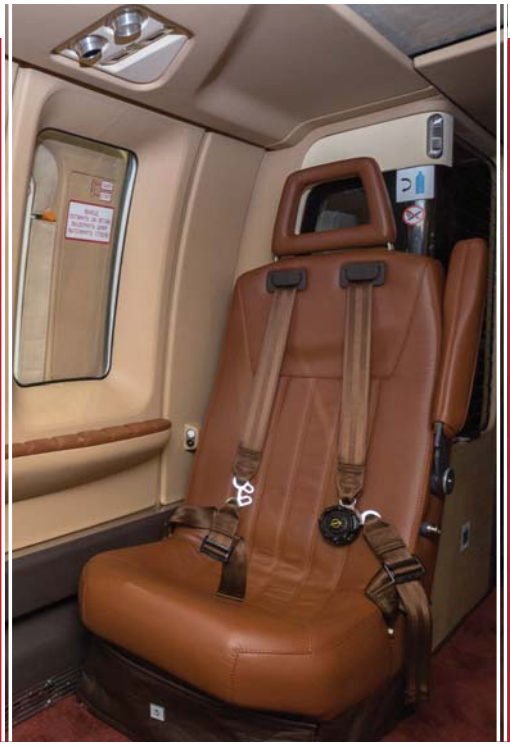
are suppliers of large corporations of the aerospace industry such as Airbus, Boeing, Safran, General Electric, Thales, Sagem, and others. The company also offers services for the selection of aircraft component vendors in Europe.
Trace Worldwide Corporation presented medical modules and equipment for emergency medical services (HEMS, EMI) produced by Air Methods Corporation. Also, there were presented some treatment system for processing of wastewater from washing of aircraft manufactured by Hydro-Engineering; seats for passengers, crew members of helicopters and VIP-cabins manufactured by B/E Aerospace Fischer.

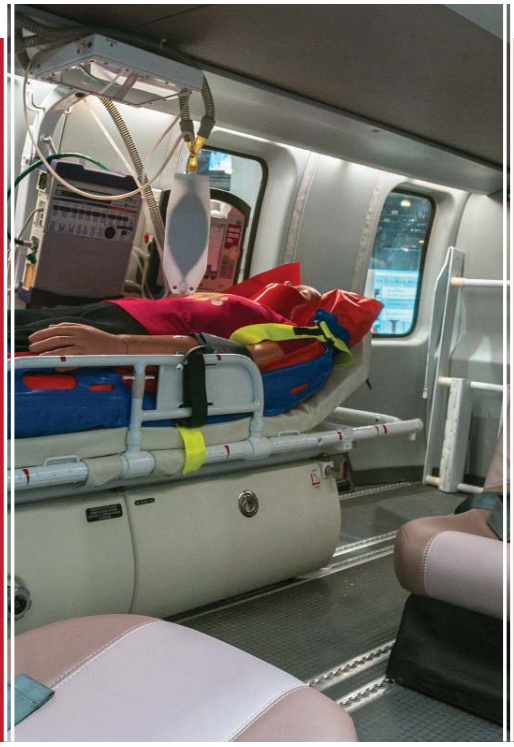
Agreements signed at HeliRussia 2016

During the HeliRussia 2016, a significant number of agreements and contracts was signed. The expo, year after year, serves as an example of an effective business activity venue and contributes to the development of inter-sectoral cooperation.
Thus, Russian Helciopters and United Instrument Manufacturing Corporation (UIMC) signed an agreement on cooperation in the field of development, production, supply of communication and control equipment to be used on Russian-made helicopters. The two companies intend to form a unified scientific and technical policy and to organize interaction of their subsidiaries.
The priorities of the cooperation between the companies in the short term are flight training on effective modes of group activities of the Ka-52 Alligator and the modernized Mi-28NM, as well as the integration of military helicopters in the military automated control systems. This step will increase the combat capabilities of the machines and will make it possible to continuously monitor the state of helicopters and respond quickly to any changes in the environment during the execution of various tasks for the benefit of the Russian Military Space Forces.

Russian Helicopters and Rosoboronexport (ROE), the only Russian state mediator for the export of military products, technologies and services, signed at the HeliRussia 2016 a program of joint activities to promote of military and dual-use products to the external market for the period from 2016 to 2019, which aims to increase the volume of exports of combat and multi-purpose helicopters.

According to Sergei Kornev, the head of the ROE delegation to the HeliRussia 2016, the portfolio of foreign orders for Russian military helicopters is currently around $8 billion. This figure exceeds the previously announced data.
The Russian commercial helicopters received particular attention: Russian Helicopters and UTair – Helicopter Services signed a memorandum on cooperation for promotion of civil helicopters to the Russian market. According to the memorandum, the main areas of cooperation will be the joint promotion and launching to the Russian market of the light multi-purpose helicopter Ansat, including in its medevac version within the framework of the program of medical aviation development. The specialists of Russian Helicopters and UTair – Helicopter services will also improve the technical and operational documentation for the Ansat and will organize the system of its after-sales service.
Helicopter Service Company, an affiliate of Russian Helicopters, announced the beginning of construction of a warehouse complex, which is located 1.5 km from the cargo terminal near Moscow Sheremetyevo Airport. The new warehouse will be the largest complex for the distribution of spare parts for hel-





icopters in Russia and will be put into operation in December 2016. The modern complex located near the major transportation hub will allow Russian Helicopters to expand its presence in the market of helicopters by 25-30% by 2020.

HeliRussia 2016 demonstrated effective development of local service support of domestic helicopters abroad: Russian Helicopters concluded the service contracts to repair helicopters in the Republic of Korea, the Czech Republic and Laos.

Russian Helicopters and the Republic of Korea's RH Focus Corp. signed a memorandum of understanding to establish a service center on the basis of the dealership model performing the aftermarket helicopter service of the "Ka" and "Mi" series in accordance with the standards of Russian Helicopters to ensure proper and continuous aftermarket services of Russian-made rotorcraft in the Republic of Korea by the manufacturer. According to the document signed, RH Focus Corp. might become a dealer offering a full range of services for the aftermarket services of Russian-made helicopters in the country. State and private operators in the Republic of Korea are widely using an extensive fleet of Russian-made helicopters, including the Mi-172 and the Ka-32 helicopters.

Russian Helicopters signed a contract for the repair of units for the military transport helicopters Mi-8/17 with the Czech company Lom Praha. Under the agreement, the Russian specialists will perform repair of components for the Mi-8T used by the Ministry of Defense of the Czech Republic. Repair of these units will be carried out unit the end of 2016.

In addition, during HeliRussia 2016, the parties concluded an additional agreement on the supply of aviation assets for the Mi-24/35 attack helicopters and other aircraft of the Mi-8/17 type being operated in the Czech Republic. Currently, the Czech Republic is operating several dozens of Russian-made helicopters and which need timely service and spare part delivery.

Russian Helicopters, for the first time ever, concluded a contract for the repair of machinery for the Ministry of Defense of Laos.

The agreement signed at HeliRussia 2016 provides that the Russian specialists will overhaul four helicopters – two Mi-17-1V and two Mi-17. The Mi-17 helicopters, during the overhaul, will be upgraded to the Mi-17-1V version. The project will be implemented within one year at the existing maintenance base of the Laos Defense Ministry. In addition, during the expo, the parties held talks on cooperation prospects.
During the HeliRussia 2016, the representatives of KRET held more than 30 talks with potential partners from foreign countries, including France, Italy, India, Switzerland, Canada and others.

Jet Transfer and Heliports of Russia signed an agreement on the organization of the center for the training of pilots to fly the Bell 505 Jet Ranger X. Currently, three prototypes of the Bell 505 are being tested and it is expected that by the end of summer it will receive a certificate type. According to the CEO of Jet Transfer Alexander Evdokimov, after the US certification of the helicopter the certification process of the Bell 505 will begin in Russia and our country will be among the first ones, where this helicopter is certified. The expected time period for the Bell 505 certification in Russia is June 2017.
The Minister of State for Foreign Trade, the Promotion of Tourism and French Nationals Abroad at the Ministry of Foreign Affairs and International Development of France Matthias Fekl took part in the meeting with the representatives of GIFAS which was represented by the Chairman of the Association Emerick D'Arsemol, who is also the President of the company BEAM.

One of the most notable events at the GIFAS stand was the signing of an agreement on the subject: "The prospect of the creation of the Center for prototyping and development of additive technology in Zhukovsky town". The corresponding minutes of the meeting were signed between Scientific and Engineering Company and the French BeAM with the presence of Matthias Fekl, representatives of the Moscow Region Government and the Administration of the Zhukovsky Municipal Urban District.

The French company Safran Helicopter Engines (former Turbomeca) signed a Memorandum of Understanding with the Ural Works of Civil Aviation (UWCA) on the localization of production of turboshaft engines Arrius 2R in Russia. UWCA, that performs licensed production of foreign helicopters in Russia, may thus significantly improve its manufacturability. According to Maxim Faribo, the Executive Vice President for Sales of Safran Helicopter Engines, the parties are currently examining the localization of production, and the final decision on the project can be made by the end of this year.
In general, the HeliRussia 2016 has demonstrated the active growth of cooperation between Russia and France in the field of aerospace.
Other foreign companies can also be proud of their rich agenda: Airbus DS Optronics signed four agreements of intent, H+S – 12 contracts and agreements, ITP – six cooperation agreements to be implemented in the future, Lom Praha signed two contracts, and Hansen – one agreement.

HeliRussia 2016 business program

The International Helicopter Industry Exhibition HeliRussia every year is accompanied by a very varied business agenda – one of the largest in the industry. In 2016, the Exhibition hosted 58 Russian and international conferences, seminars and round table talks devoted to the problems of the helicopter industry and related areas as well as presentations and awarding ceremonies of the aviation competitions awardees and winners. This figure turnes out to be a record for the expo; last year, the business agenda included 46 events.
The business program of HeliRussia 2016 included a series of significant events held which have become the landmark of the expo and attract particular audience: these are conferences on air ambulance, helicopter market, design, service, supply of aircraft components and other important issues of the helicopter industry and inter-sectoral cooperation.
First of all, it is important to underline the increased attention to air ambulance, which was evidenced by the presentation of two

medical evacuation helicopters at the expo – the Russian Ansat and the European H135, as well as the demonstration of specialized equipment. In the conditions of modern cities, and in regions with underdeveloped transport infrastructure, the helicopter makes it possible to urgently evacuate a patient to a medical facility within the "golden hour", to carry out rapid transportation of patients and deliver medical staff quickly to where they are needed. Modern medevac helicopters are equipped with specialized equipment that allows conducting medical and resuscitation operations immediately in the air.

This subject was discussed in the business agenda of the expo at the 5th Interdepartmental scientific and practical conference "Air Ambulance and Medical Evacuation - 2016", within the framework of which a plenary session took place on May 19 named "The experience of air ambulance in the Russian regions", and a round table talk on the same topic was held on May 20. The event was organized by the Helicopter Industry Association, the HeliRussia Directorate, “Mobile Medicine” and “VTSMK Protection”. During the conference, the analysis of the experience of the application of medical helicopters in different regions of the country was given. In particular, it was possible to identify the most obvious problems of medical aviation in Russia, such as: lack of regulatory framework, lack of sufficient number of modern helicopters (123 units in 45 regions of the country), poor infrastructure, lack of adequate number of helipads at hospitals and high costs of a flight hour. During 2015, 133,203 road accident happened in Russia which killed 16,638 people (including 582 children) and injured 168,146 people (including 15,860 children). The proportion of those killed and injured in Russia is 13%, whereas in the United States and Europe, the figure does not exceed 3%. A significant contribution to the reduction of this proportion is made by the use of medevac helicopters. Round table named "Counterfeiting in supplies: is it possible to eliminate the demand for counterfeit products in the helicopter industry?" was organized by the Helicopter Industry Association on May 19 and demonstrated a high interest of the helicopter operating companies to the problem of the presence of counterfeit products on the market.

It was noted that since 2001, The State Research Institute of Civil Aviation, as part of authenticity assessment, has verified more than 62 thousand components of aircrafts, where 5,025 of them have been found inauthentic, including aircraft engines, rotor blades and tail rotors, as well as other key components. Only in 2014, and only on the Mi-8/17 family helicopters, more than 400 inauthentic and questionable components were revealed.

According to the consolidated position of the Federal Air Transport Agency and the State Research Institute of Civil Aviation, in order to improve the situation with the presence of aircraft inauthentic components, it is required to improve the legal and regulatory framework, develop the system of monitoring the informative-analytical airworthiness, develop the methods to identify aircraft components, as well as provide the operational e-documents and interbranch cooperation development, and introduction of criminal responsibility for the supply of counterfeit aviation components.
The experts of the Helicopter Industry Association noted that the majority of consumers

who acquire unauthentic products are bona fide purchasers; thus, they are often not aware of the fact that they acquire counterfeit products. The event showed the importance of the participation of the helicopter community participants in the work process for the optimal implementation of aviation legislation. At the conference, "Helicopter Market: Realities and Prospects" the following participants presented their reports: Paulo Menegusso, a market analyst at Honeywell Aerospace and the Chairman of the Board of the Helicopter Industry Association Michael Kazachkov; the event was moderated by Oleg Panteleyev, the head of the analytical service of industrial agency AviaPort. The conference was held at the HeliRussia expo for the 8th time and was aimed at tracking down the parameters of the Russian helicopter market, and identification of correlations with the parameters of the global market. It is organized by the Helicopter Industry Association and industrial agency AviaPort.

The conference gave an overview of the current state of the Russian fleet of helicopters, including the number of helicopter by their types and models, the analysis of their use by type of aerial work performed, the state of airworthiness, and the intensity of their use. In particular, it was said that the total Russian fleet of helicopters manufactured domestically as of 2015 amounted to 1,828 vehicles, having decreased by 6 units as opposed to 2014. At the same time, the number of helicopters being operated is smaller - 948 units (the decrease amounted to 36 helicopters compared with 2014). According to the the Federal Air Transport Agency, the Russian fleet was replenished with another 70 new helicopters last year, and the total number of flight hours of the helicopter fleet amounted to 360 thousand hours. With the reduction in the number of domestic rotorcrafts, the share of foreign-made helicopters continues to grow.

Paulo Menegusso spoke about development trends and practices of foreign operators of helicopters and gave a report about the prospects of the international helicopter market. Thus, according to the forecast of Honeywell Aerospace in 2016-2020 the world market will be supplied with 4,000-4,500 new commercial helicopters, including 805 new turboshaft-powered helicopters annually. This forecast takes into account the drop in demand for new helicopters in North America, Europe and Asia. Nevertheless, the demand in Latin America is growing, which makes this region a champion as to Air Transport fleet renewal in the upcoming five-year term. Paulo Menegusso particularly underlined the rising demand for helicopters in Brazil and India.

Among the main reasons for the global helicopter fleet rejuvenation, Honeywell Aerospace highlighted the obsolescence of the existing fleet, exhaustion of service life, the increase in operating costs and reduced safety of older models, as well as contractual requirements for fleet renewal. Among the objective technical advantages of new helicopters, the experts underline the increased flight range, increased useful space of the cabin, increased high speed, payload, flying range and altitude of new helicopters.

On May 20 - 21, a new event took place in the business agenda of the HeliRussia 2016 - International Conference "The industry of unmanned aircraft systems". The conference was organized by the HeliRussia Directorate, the Working Group of AeroNet National Technology Initiative (NTI) and AERBAS Association.

The work of the conference was opened by a welcoming speech from Sergey Emelyanov, the Director of the aviation industry Department of the Ministry of Industry and Trade of Russia, who told about the National Technological Initiative as a program designed to provide the leadership of Russian companies on the new high-tech markets, which will determine the structure of the world economy in the next 15-20 years. According to Sergey Yemelyanov, in the last decade, the development and production of unmanned aircraft systems have been the most dynamic segment of the global aviation industry and provide a stable compound annual growth rate of not less than 10%. Even in times of general decline in the industry, the UAS segment shows a positive trend.

Professor Uwe Meinberg, the Head of the German CURPAS Competence Center dedicated to the development of the civil use of remotely piloted aircraft systems, gave a report at the plenary session. He shared his expectations that the total UAS market in Europe may reach $127.3 billion in the near future.

The Working Group of AeroNet National Technology Initiative, which was presented by the co-head Sergei Zhukov presented a vision of the future market, where unmanned systems do not just hold a strong position in traditional aerial works (i.e. transportation, construction and installation work, monitoring, etc.), but also open up new directions; therefore, express delivery, photographing and videorecording will develop. Sales in the field of UAS, according to AeroNet, are expected to skyrocket.

The key projects will be the remote sensing of the earth, the creation of cadastral plans throughout the territory of Russia, monitoring of different types of infrastructures, the use of UAVs in agriculture, as well as the integration of UAS in the search and rescue works.

The business program of the HeliRussia along with the "Helicopter Forum" organized by Helicopter Industry Association each November, are the key activities that form the agenda for the Russian helicopter industry.

Public Events during HeliRussia 2016

The International Helicopter Industry Exhibition HeliRussia is important not only for industrial enterprises; it gathers annually all the representatives of the professional community. The expo's format makes it possible to hold a number of industry events, awards and meetings.

During HeliRussia 2016, the ceremony of the Helicopter Industry Association Awards was held. This is a competition for the annual award of the Helicopter Industry Association, organized for the employees of the enterprises of the helicopter industry, which has been held since 2008. It serves the purpose of promoting professional skills, innovation, advanced technology and unique achievements in the helicopter market.

As before, HeliRussia 2016 held the ceremony awarding the winners of the "XXI Century Helicopters - 2016" contest, which was organized by the Russian Helicopters. 106 people participated in the event - students of technical colleges located in different cities of Russia as well as young workers of manufacturing plants and engineering bureau included in Russian Helicopters.

Direcoor of the RH-Technologies (part of Russian Helicopters) Alexander Ohonko and Director of Human Resources and Organizational Development of Russian Helicopters Yevgeniy Kuzmenkov noted the high importance of the competition to the domestic helicopter industry and awarded the contest finalists.

Traditionally, HeliRussia 2016 became the place for awarding the winners and finalists of the annual photocontest "Beauty of Rotary-Wing Machines" ", which has been held by the Helicopter Industry Association for the 9th time. The competition is open to both professional photographers and amateurs. The submitted photographs vivdly demonstrated the daily work of helicopters in a variety of conditions.

A charity auction was held at the KRET stand. During the trades, three paintings of the contemporary Russian artist Angelina Emelianenko were sold dedicated to the helicopter theme. All the amounts gathered at the event, have been directed to the needs of children in support of Orphanage No. 18 of the city of Moscow.

The following year, the 10th anniversary International HeliRussia Exhibition will be held on May 25-27, 2017. Given the great success of the expo this year, HeliRussia 2017 is definitely expected to expand its exposition and the number of participants. We are expecting the growth of the business agenda and the scale of involvement of UAS companies which appreciated the tremendous opportunities offered by HeliRussia.

Igor Korotkin