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#### Editorial/advertising

#### Editor

Vladimir Orlov  
orlov@rvs-holding.ru

#### English editor

Alan Norris

#### Maker-up

Irina Danenova

#### Advertising manager

Marina Bulat  
bulat@rvs-holding.ru

#### Translator

Moscow Translation Agency MTA,  
Inna Frolova, Translation Agency  
Translink

#### Photographer

Dmitri Kazachkov

#### Photos by

Dmitri Kazachkov, Dmitri Lifanov, Alan Norris, Sergei Alexandrov, Michael Bibichkov, by companies Eurocopter, UTair Aviation, Russian Helicopters, Vertical-T, Ulan-Ude Aviation Plant, Aviamarket

#### Publisher

**Russian Helicopter Systems**  
Moscow Region, Krasnogorsk, 65-66 km Moscow Ring Road, IEC  
“Crocus Expo”. Pavilion № 3, office  
332, 143402

Tel. + 7 (495) 926-60-66  
URL: [www.helisisystems.ru](http://www.helisisystems.ru)

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Marina Bulat

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### What is more relevant than the tenders

Page 2

Until recently, there have been really a lot of talks over the backwardness of Russian civil and military equipment. Currently, thanks to demonstration flights performed by the Russian aviation in Syria, tensions on the background of image-related issues has almost dropped to zero.



### A New Industrial Reality

Page 14

Interview with Sergei Zhukov, CEO of the Technology Transfer Centre, leader of the AeroNet working group on drone aircraft in as part of the National Technology Initiative (NTI). NTI is a state-wide program aimed at the creation of supportive measures for the development of industries of promise, which within the next 20 years could form the foundation of the global economy. It is expected that state financing and investments into the industry will total \$300-350 billion.

### Other articles

#### The Ka-226T – the Indian model

Page 10

#### Vladimir Mikheyev

Page 20

#### Air Ambulance Factors. Helicopters for Children.

Page 30



### Collaboration with China

Page 6

The Russian Helicopters Holding has signed a framework agreement document with Chinese companies AVIC International Holding Corporation and CITIC Offshore Helicopter Corporation, to organise a Technical Servicing and Repair Centre (TSRC) for Russian-produced helicopters in China. Under the terms of the Agreement, Russian Helicopters plans to outfit a TSRC in the PR Chinese city of Shenzhen, which will service and repair Russian-produced helicopters.



### Ways of Overcoming the Crisis

Page 26

Industry and Trade Minister Denis Manturov announced that Russian authorities have made the decision in principle to privatize the Russian Helicopter holding in 2016. The minister explained that discussions are ongoing on the amount of shares to be sold. A strategic investor from Russia may buy 49% of the shares, while a foreign investor could own 25%.

#### Valdai-Avia – from practicalities to the pleasures of life

Page 46

#### The best place never goes empty

Page 36

#### Investment in «Progress»

Page 40

#### The helicopter with the letter A

Page 42

# Combat helicopter – a textbook example worth examining



Until recently, there have been really a lot of talks over the backwardness of Russian civil and military equipment. In this regard, the phrase "aircraft that have been literally dusted off" has deeply stuck in the memory. Currently, thanks to demonstration flights performed by the Russian aviation in Syria, tensions on the background of image-related issues has almost dropped to zero. Although there was another issue coming which had "tactfully" remained on the sidelines all the time before: "What needs to be done for relatively cheap and high-performance Russian technology to become the best one among the larger number of options available on market?" The answer to this question can partly be found in the results of tenders.

#### One has received them – one has calmed down.

Along with that, we had to deal with traditional stereotypes which sometimes have made observers feel stumped and were defied when facing reality. Observers expressed their resentment for sales figures of Russian equipment not reaching the level of American analogues despite the fact that Russian technology was comparable to American one, showed even better performance in some cases and was half as cheap. One example of this was the case with Mi-28NE which lost against the American AH-64D Apache in the Indian tender for the supply of 22 strike helicopters worth \$1.4 billion, with a future option of increase in procurement volume.

What is most interesting that few people believed in the statement delivered at that time by a source at the Indian Ministry of Defence which announced that the decision was allegedly made solely on the basis of performance indicators of the aircraft: "According to our experts, the Mi-28N does not meet the requirements of the tender in 20 points, unlike the Apache helicopter which showed the best performance". The thing is that many people simply couldn't wrap their heads around the fact that Russians entered the tender process with knowingly "push-over" products: training exercise 1995 showed that MI-28A literally wiped the floor with an "American" counterpart.

The mass media, while seizing on the failure of Russian helicopter in this tender, also were there to throw the fat in the fire by publishing different versions of what had happened, one after another. Discussions were held about India's intention to diversify arms purchases, and failure to meet delivery deadlines, about upgrade and repair of equipment by the Russian side which resulted in aircraft accidents. Moreover, according to some opinion, Russia was already participating in several tenders, and it simply would not be given a chance to win everywhere.

#### Image is created through practice

By the way, talking about diversification. This assumption had certain legs to stand on. The point is that until recently, India has been forced to purchase arms mainly in the USSR and later on in Russia as long as sanctions remained in force against it. A lot has changed since the Western companies like Boeing, BAE and Lockheed Martin have entered the Indian market. And it remained almost unexplainable why did customers pay no attention to the price of Western equipment, nearly twice as high as Russian products.



The best advertising for weapons is a war



## Armament manufacturers are now manufacturing equipment not just to put it into store as it was the case just a few years ago but are preparing it for real battlefield engagement

Meanwhile, the explanation for this seemingly paradox phenomenon was quite simple – Russian aircraft were in a state of stagnation. Over the period of Mi-28NE development which lasted almost 30 years, it has never been manufactured in series, unlike AH-64D. Until 2008, only 16 Mi-28N have been in operational service with Russian Air Forces. Physical and operational characteristics and requirements put forward to the creators of Mi-28NE in 1978, needed a clarification after 30 years. But this was not supposed to happen and lead to a situation

in which the helicopter was equipped with the second generation anti-tank guided missile and airborne avionics of yesterday. As a result, obsolete weaponry was not able to defeat targets without entering the action area of short range ADMS of the enemy. Against this context, the Apache has proven its effectiveness in all recent conflicts.

### **The bottom line is that the program must be functional**

We can argue for ages about how the image of the Mi-28NE helicopter is shaped, how the work is being performed on this aircraft. However, if you do this without taking into account the implementation of state armament programs, it would be impossible to form a fair view of the situation. Meanwhile, there have been several such programs, and each of them was in line with the processes related to significant reformatting of the Russian and world economy, and the political framework.

For example, the first program for 1996-2005 was adopted in the context of dramatic lessons learnt from the counter-terrorist operation in Chechnya. The impetus for the adoption of the second program for 2001-

2010 was provided by the NATO operation against Yugoslavia and the obvious failure of the first state armament program. An improvement of the financial and economic situation in Russia and changes in the foreign policy made the country's leadership to revise the state armament program for the years 2007-2015. In 2011, the 2015-programme was replaced by the state armament program 2020 which is currently in force. By the way, attempts were made to cut back this program as far back as in 2013. However, Deputy Defence Minister Yuri Borisov said on that occasion that budget allocations for GPV-2020 (State Armament Development Program) are not subject to sequestering, although he acknowledged the transfer of funding. The main reason behind the transfer was the unwillingness of industry to finish design and development tasks according to deadlines approved and to start batch production.

### **One has started the work - and has gone on with it**

However, even in such circumstances, the industry became to a large degree more active. One example of this could be the same Mi-28, but this time with "NM" index which

was awarded to a new navigation system, optics and control system to ensure an instrumental landing.

Compared to the radar installed in Mi-28N, each module underwent an upgrade. The radar provides for a 360-degree space scanning in several radio frequency ranges. The radar is able to process information from a number of channels simultaneously which improves the measurement accuracy of target data and obstacle parameters. The number of simultaneously tracked targets has

increased. New operation modes were developed. The response speed of aircraft on-board computer system has grown tenfold.

#### **Similar to warfare practice**

Armament manufacturers are now manufacturing equipment not just to put it into store as it was the case just a few years ago but are preparing it for real battlefield engagement, and that is why currently they have serious intentions and mindset towards capacities and parameters thereof. And the practical use of armament integrated into the

battlefield operating system demonstrated by Russia in Syria is just an additional proof of this fact.

Now everyone involved in the promotion of Russian armament on foreign markets will operate similar to warfare practice (obviously there is no other way out). In this connection, I would like to believe that we will leave behind us memories of losing the tenders for the supply of Mi-28 helicopters.

*German Spirin*



Sudden check the readiness of the armed forces is the new passion of Russian President

Over 400 Russian-made helicopters are in use in China's military and civil sectors



## Russian Helicopters corporation is extending its collaboration with PR China

### **A new service and repair centre for Russian-produced equipment**

The Russian Helicopters Holding has signed a framework agreement document with Chinese companies AVIC International Holding Corporation and CITIC Offshore Helicopter Corporation, to organise a Technical Servic-

ing and Repair Centre (TSRC) for Russian-produced helicopters in China.

Under the terms of the Agreement, Russian Helicopters plans to outfit a TSRC in the PR Chinese city of Shenzhen, which will service and repair Russian-produced helicopters.

The initial stage of the project foresees the provision of authorised service support for Ka-32A11BC helicopters. The second stage would create engineering capacity for the service and repair of Russian helicopters in the Mi-8/17 category.

“We are ready to provide all-round support for China in creating a repairs centre, and keep supporting its operations for the entire working life-cycle of Russian-manufactured helicopters provided to China” said the CEO of the Russian Helicopters corporation, Mr Alexander Mikheyev. “The new centre will provide top-quality service from highly-trained personnel, for Russian-made helicopters, for the complete cycle of their operational lives”.

Against the background of a large fleet of Russian-made helicopters operating in China, the Russian Helicopters corporation similarly plans to roll-out a network of authorised service centres for Russian-made helicopters, which will be equipped to provide servicing for both military and civil craft produced in both the Mi- and Ka- families of helicopter. The Chinese partners have voiced their interest in opening TSRCs not only in Shenzhen, but in other Chinese cities too – specifically in Shanghai (at the Hainin aviation repairs centre) and in Chengdu (at the Jingjiang aviation repairs centre).

The People's Republic of China is one of the world's most important operators of Russian-manufactured helicopters. Russian craft such as the Mi-8/17 and the Ka-32A11BC are used with great success all over China – particularly in hilly terrain, and in areas of extreme climatic conditions. They are put to use delivering cargoes, for delivering medical goods, to provide humanitarian aid, for delivering construction parts, as well as providing rescue services, and in providing assistance in emergencies.

The helicopter in greatest use in China is the Mi-8/17. There are over 400 such Russian-made helicopters now operating in China. In 2014 the Russian Helicopters corporation completed a delivery of 84 Mi-171E helicopters to the Chinese company Poly Technologies. This kind of helicopter is irreplaceable for such uses as the delivery of either goods or passengers, for geological survey studies, for patrol use, and for firefighting.

Another popular Russian helicopter in China

is the multi-purpose Ka-32A11BC. This helicopter is particularly well-suited to the high-rise urban environment often found in China, and the climatic and terrain specifics which can be expected. This kind of helicopter is extremely valuable in the construction industry in heavily built-up urban locations, in far-flung mountainous terrain, and in forest zones. Another useful aspect is its capability to land safely in extremely tight spaces on the decks of ships, on oil platforms, and on uneven and unfinished landing surfaces.

#### **The Russian Helicopters corporation has signed contracts to delivery nine helicopters to China**

Russian Helicopters Holdings has signed contract to deliver helicopters to China – seven Ka-32A11BC models, and two Mi-171 helicopters. Two of the Ka-32A11BC helicopters are designated for firefighting use in the Chinese city of Qingdao, while four more of them are to be delivered to the Jiangsu Baoli corporation. The remaining helicopter will be delivered to the Easy Best Group. The recipient of the two Mi-171 helicopters will be China General Aviation Service. The delivery contracts will be completed over the course of the upcoming year.

**Russian craft such as the Mi-8/17 and the Ka-32A11BC are used with great success all over China – particularly in hilly terrain, and in areas of extreme climatic conditions**

“China is one of the largest operators of Russian helicopter technology, and Chinese companies are the traditional and strategic partners of our Holding Company in the Asia-Pacific Rim”, said CEO of the Russian Helicopters corporation, Mr Alexander Mikheyev. “Our multi-purpose helicopters can fulfil all the tasks required of them, in a wide range of climatic and weather conditions”. Earlier, Russian Helicopters delivered eleven Russian Ka-32 helicopters to different Chinese clients. Three craft were delivered during 2015.



Mi-171 helicopter of the Chinese People's Liberation Army



A Chinese Ka-28 anti-submarine helicopter

The overall helicopter fleet in the PRC totals more than 400 craft. In June 2014 the Russian Helicopters corporation completed deliveries of 84 Mi-171E helicopters, fitted with VK-2500 engines, to the Chinese company Poly Technologies.

**Civil organizations operate the already renowned Mi-8/17/171, Mi-26 and Ka-32 helicopters, and China's navy is successfully flying our Ka-28 and Ka-31 ship-based helicopters**

**New Deliveries Planned**

Representatives of Russian Helicopters Holding Company held negotiations with executives of Chinese investment and leasing companies at the 2016 Helicopter Technology Conference.

Potential customers were shown both the well-known Ka-32A11BC and Mi-171, and the new Ansat and Mi-38 models. Furthermore, experts from the two countries discussed the need to extend maintenance services for Russian aircraft and deliveries of components to People's Republic of China. The conference which was devoted to the development of helicopter technology took place in Beijing and was organized by Jiangsu Baoli Aviation Equipment Investment, partner of the Holding company. The purpose of the event was to demonstrate products made by Russian Helicopters to potential buyers in China. The representatives

of Russian holding company noted that China has been for many years the largest operator of Russian helicopter technology.

"Currently, over 400 Russian-made helicopters are in use in China's military and civil sectors. Civil organizations operate the already renowned Mi-8/17/171, Mi-26 and Ka-32 helicopters, and China's navy is successfully flying our Ka-28 and Ka-31 ship-based helicopters", said Alexander Scherbinin, Deputy General Manager for Marketing and Business Development. Russian Helicopters Holding Company offers to its Chinese partners both the proven Mi-26, Mi-171, and Ka-32A11BC and the most recent multi-purpose Ansat and Mi-171A2 models.

A true breakthrough in Russian-Chinese cooperation has been a joint project on the construction of a new heavy-lift helicopter.





To date, Russian Helicopters and AVIC have prepared the preliminary technical specifications and now work is underway to agree on design of this aircraft. The new helicopter will have a take-off weight of up to 38 tonnes, and it will be able to carry 10 tonnes internally, and 15 tonnes on an external sling.

The helicopter will be able to operate round-the-clock in all weather conditions. It can be used to complete a wide variety of tasks: transportation, evacuation, firefighting, and many others. The project participants are planning to enter into the General Contract before the end of this year.

The conference participants supported Russian Helicopters' proposal to hold similar events on a regular basis, including in home bases of Russian helicopters.

*Nikolai Korobov.*



The Mi-8 MTV-1 in the border area of the Chinese People's Republic and the Republic of Kyrgyzstan

HAL is expecting to produce between 30 and 40 Ka-226T helicopters in India



# The Ka-226T – the Indian model

At the end of January 2016 the Russian Helicopters corporation launched a project to build the Ka-226T helicopter in India. This sensational news somehow passed by unnoticed in the Russian business press – whereas in fact this is a genuine breakthrough in the Russian helicopter business. Once fully operational, the project aims to manufacture 200 light Russian multi-purpose helicopters. Sixty of these will be manufactured entirely in Russia, while the rest will be produced in India, with the collaboration of the Russian project partners. Work on the project will be undertaken by the Russian

Helicopters corporation and Hindustan Aeronautics Limited (HAL) of India. The cost of the entire program, according to official Indian sources, is expected to US\$700 million dollars.

It should be mentioned that the localisation of manufacturing involved in the project is promised to be extensive. HAL is expecting to produce between 30 and 40 Ka-226T helicopters in India, with a rising level of localised Indian manufacture in the project cutting in 3-4 years after the project launches, and rising to 30%.

Currently the partners in the project are finalising design details for the helicopters, defining their areas of responsibility, and agreeing final issues on their collaboration. Some media sources are projecting the involvement of private companies in the project, such as Sun Group and Bharat Forge.

### All going ahead according to plan

The agreement to manufacture the Ka-226T in India was inked during the visit to Russian of Indian premier Narendra Modi in December of 2015, and covers not only the manufacture of the helicopters themselves, but

also maintenance, operation, servicing and technical support.

Earlier in February 2015 at the Aero India 2015 international air show held in Bangalore Mr Alexander Mikheyev – the CEO of the Russian Helicopters corporation and Delegation Head for Rostec – gave a personal demonstration of Russian civil and military air equipment for the Indian Prime Minister. Earlier still, Russian President Vladimir Putin had raised the possibility of the production of the Ka-226T model in India during this State Visit to New Delhi in December 2014.

“Russia and India have been strategic partners in the military aviation sphere for more than 55 years. For us, India is a key partner in both the civil and military aviation sectors”, said Mr Mikheyev on behalf of Russian Helicopters. “We have serious plans to expand and broaden our collaboration in the helicop-



ter industry. I'm sure that the Ka-226T helicopter which has been showcased here at the air show has a significant number of extremely worthwhile advantages which our Indian partners will find of great interest". As as those 'extremely worthwhile advantages' are concerned, the Indian team of

The test flights which the Russian-made helicopters made in India's highland mountainous regions, and in the extreme heat of the Indian summer, demonstrated their advantages over competing models which were submitted by western manufacturers for tender





Specifically, the Ka-226T made light work of a high-altitude mountain over-fly at 7500 metres – substantially higher than any of the requirements listed in the official tender.

**Critical reception was less good this time**

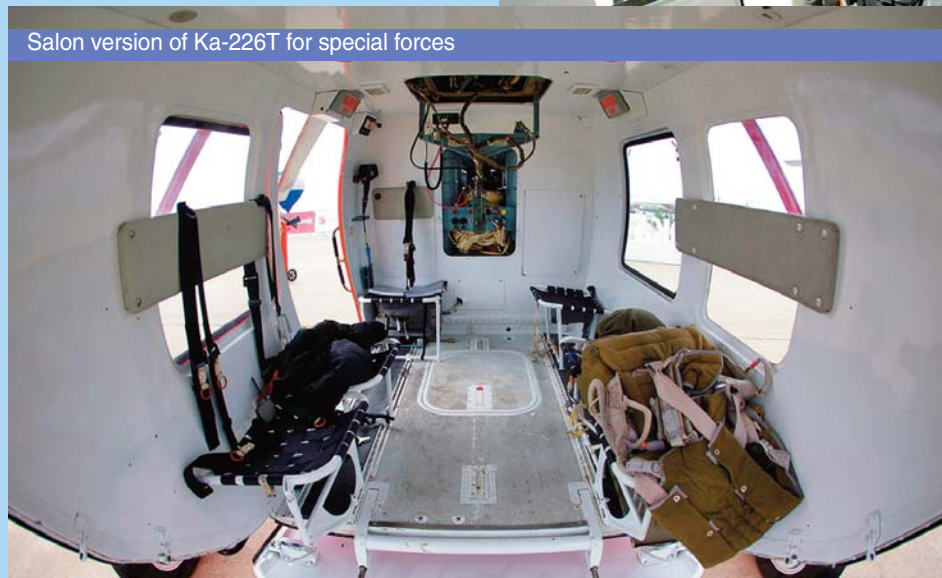
The most intriguing aspect of this cooperation has been that for the first time in the long history of technical collaboration between Russia and India, this very collaboration attracted the negative attention of western authorities – including the contract for the production of Ka-226T helicopters in India. This all fell into a very well-known pattern.

The way this finger-pointing usually works, as a rule, is that some kind of analytical organisation leaks a report, whose results are picked up by the press. This time it came out as “the clunky features of the Russian tech-

specialists would have had the chance to examine these in detail during the period when the Ka-226T was being submitted for supply tenders in India – a process which the Indian authorities terminated in 2014. The test flights which the Russian-made helicopters made in India’s highland mountainous regions, and in the extreme heat of the Indian summer, demonstrated their advantages over competing models which were submitted by western manufacturers for tender.



Medical helicopter Ka-226T module



Salon version of Ka-226T for special forces

nology on offer, and Moscow’s frigid unwillingness to put any concessions on the table when inking the contracts”, which the staff of Stratfor published dead on cue. This set up the opportunity for Stratfor to follow-through with a floor-punch - claiming that this marked the death-throes for Russia on the Indian market, viewed against alleged dissatisfaction from Indian quality experts with particular technical aspects of the Russian hardware in field tests.

*The Ka-226T light multi-purpose helicopter is developed by the Kamov corporation, a division of Russian Helicopters. The helicopter is in mass production at the Kumertau aviation production plant. The craft is built with a coaxial rotor scheme, offering excellent air handling and power optimisation. The Ka-226T comes fitted with modern navigation equipment. This helicopter can manoeuvre easily in both dense modern urban high-rise environments, and in mountainous terrain. The absence of a tail rotor, and its compact dimensions permit deployment at even small airfields. The Ka-226T is a low-noise helicopter which conforms with the latest environmental standards. The helicopter has a quick-change-out transport module, which enables the functionality mode of the helicopter to be changed in very short time.*



Alongside all this, back in May of 2015 Jane's Defence Weekly published an article by Rahul Bedi, titled 'HAL to licence-build Ka-226 for army and air force'. The article hinted at sources in New Delhi which said that Hindustan Aeronautics Limited (HAL) – India's state aerospace corporation – was about to establish a Joint Venture company with the Russian Helicopter corporation - to produce a licensed version of the Ka-226T helicopter, to supply 200 such helicopters to the Indian armed forces.

It then became clear that the Indian Defence Ministry had signed-off the program for manufacturing the Ka-226T in order to replace its ageing Chetak (Aerospatiale Alouette III) and Cheetah (Aerospatiale SA.315B Lama) helicopters, in service with the Indian Army Air Force and the Indian Armed Forces.

#### **The Indian contract – the result of agreements, concessions, and a great helicopter**

A large part of that decision was motivated by the fact that the Ka-226T will be fitted with Turbomeca Arrius 2G1 engines from

the French manufacturers Safran – a supplier with whom HAL has enjoyed long technical collaboration. One of the ideas behind the collaboration is for India to develop and produce the Shakti engine – a modification of the Turbomeca TM333-2B – for use in Indian-made Dhruv helicopter, and the development of its Light Combat Helicopter (LCH) and Light Utility Helicopter (LUH).

Yet as far is known, despite kicking-off the joint production of the Ka-226T, HAL is still intent on rolling out its own light helicopter, the LUH, which it has been working on since 2009. It's expected that 187 of these LUH models will be delivered on a contract for the Indian Ministry of Defence. However, an announcement of 400 Ka-226T helicopters, instead of the originally-specified 200, seems likely to put the kibosh on the LUH project.

The Russian Helicopters corporation has submitted the Ka-226T for supplier contract tenders in India twice. It was up against competitors including the AW119, the Bell-407GT, and the Airbus Helicopters AS350 Fennec. Neither of these tenders came through for Russian Helicopters.

Mr Dmitry Rogozin, the Russian Deputy Prime Minister, said that when India first announced the contract tenders for this kind of helicopter, the main rival to the Russian model had been the German-produced Eurocopter. Despite this, the exceptional technical specifications of the Ka-226T, and the special needs of the purchasing country, the previous tender was scrapped, and reissued in favour of the Russian Helicopters model, to be produced in India. Mr Rogozin added that two different versions of the Ka-226T will be manufactured – one for use in mountain regions, and another for use at sea.

For the implementation of this major project to arrange the Indian production of no fewer than 200 Russian light multi-purpose Ka-226T helicopters, and modifications thereof, the Kumertau Aviation Production Enterprise will enter the contract (Bashkiria, KumAPP, which produces the Kamov family of helicopters – a division of Russian Helicopters). KumAPP will be the primary partner in this project.

**Text author - German Siprin.**

# A New Industrial Reality

Interview with Sergei Zhukov, CEO of the Technology Transfer Centre, leader of the AeroNet working group on drone aircraft in as part of the National Technology Initiative (NTI). NTI is a state-wide program aimed at the creation of supportive measures for the development of industries of promise, which within the next 20 years could form the foundation of the global economy. It is expected that state financing and investments into the industry will total \$300-350 billion.



**The Helicopter Industry:** *You have referred to the AeroNet roadmap as Russia's best program specification document. What about it makes it so praiseworthy?*

**Sergei Zhukov:** "I really meant to say something else: based on feedback from our specialists, it was the only system specification document in existence for drones, and in that sense it was the best. But we are not trying to pretend that the program is superior to other developments in the industry that are included in Russia's strategic planning system. It's not possible and we wouldn't want it to be.

It does have its pros, though. The document has been under development for around a year, and over a hundred experts played a role, based on modest estimates. In the paper, we tried to expound upon how we see the competitive environment, both domestically and internationally, and to track current trends in the development of the drone business; we touched upon military uses. But mostly we discussed civil applications; we looked at the markets, we chose the most relevant from among them, and then on that basis tried to formulate the targets and tasks of our roadmap for the development of Russia's drone industry. In my opinion, it turned out to be quite systemic. Not only were we able to formulate our targets and goals, we brought together more than 300 initiatives relating to different aspects of drone aviation. It's clear that they require expert review, but 300 is a big number, and some of them, without a doubt will be selected. We chose four market segments, facility surveillance, agricultural monitoring, and delivery—no small deal—and last but not least: search and rescue. Moreover, because we're talking about an entire industry that needs to be regulated, there is a large body of questions about its standardization and legislative aspects. And then there is the final question of employment and infrastructure.

These are all immensely multi-faceted tasks. There are practical ones, such as creating infrastructure, that will support drone operation with a virtual 3D space. Further applications will include remote

earth sensing and bioinformation technology, both areas full of many unknowns. Delivery is another type of service all together. Pilots will make up a class of worker themselves that will to a greater or lesser degree compete directly with pilots in conventional aviation.

*V.I.: The drone revolution has been compared with the gadget revolution. At the same time, drone aircraft possess critical parameters required for law enforcement and military structures. They are vulnerable from a security standpoint. Moreover, the explosive growth in Russia's cellular market occurred during a time of peak liberalism, when just about anything could be put into mass consumption, whereas now the state is taking back its control of government. Is a breakthrough possible under the present conditions?*

**Not only were we able to formulate our targets and goals, we brought together more than 300 initiatives relating to different aspects of drone aviation**

**S. Z.:** Of course there will be complications. As far as the mobile world is concerned: it used to be really hard to register a phone. You always needed to have your passport, and more. Then liberalization happened. I believe that even if there were greater restrictions to come in the area of mobile communications, they will be based on technological solutions that already exist. Drone aviation faced the risk head on when Federal Law No. 462 was passed on 30.12.2015 'On the Introduction of Amendments to the Russian Federation Aviation Code in the Area of the Use of Drone Aircraft', which served as a prohibitive measure. To summarize, I'll remind you that all



drones of a mass over 250 g will have to not only be registered with the Air Transport Agency (Rosaviation), but also entered in the FSB database. This affects everything except for toys. Furthermore, each such drone will have to undergo certification based on its type, including scale models. This strongly undercuts the foundations of drone aviation as a sport. Moreover, anyone operating the device, even a child, will have to have a licence. All of this is overly harsh. So of course if these requirements stay in place, the development of a market for AeroNet will be severely limited. On the other hand, everything happened fairly unexpectedly. For the last two years the public has been talking about amendments to the Air Code, when it was agreed that aircraft of a weight under 30 kg or less should remain under the control of self-regulating organizations. Just such an organization is being created in our industry based on the association between insurance for participating companies being a means of holding business accountable and the fact that operator certification will happen in the same place. But all of that has since gone under the knife, and the standard has not

Lawmakers in Norway significantly limited the use of drones by owners



been retained. On the other hand, since we got to the bottom of the situation, we now understand that the power structures that initiated the creation of the organization simply do not yet know how to ensure security and make the regulations as simple as possible

What actions are we taking in that directions? On the one hand, we have grabbed the attention of the public, wrote letters to the President, drawing his attention to the negative consequences of these restric-

**The autopilot component contains a device which allows the police to commandeer it, and if needed, to land it. In other words, shooting down a drone would not be required**

tions. We tell him that we completely understand security, but you have to think about the market and strike a balance. But the compromise must be reached through technological solutions. Every drone has a certain benchmark and it's easy to recognize it. That's the first thing. the second is that the autopilot component contains a device which allows the police to commandeer it, and if needed, to land it. In other words, shooting down a drone would not be required. There are devices which ensure safe crash landings, using parachutes and other means. The registration system itself could be coordinated amongst the different regulating authorities, but drones under 30 kg should be farmed out to self-regulating organizations. They will create a shared database that would go hand in hand with the state database of heavier aircraft, etc. We will think over a number of issues to make their high-powered jobs easier, and we hope to come to reasonable solutions.

*V. I.: These men of power are conservative and will fight to the death...*

**S. Z.:** But in that case, we would lose grasp of this market and we would be brought new

drones by the Chinese. Today, Russia's market is, to put it lightly, already modest, at only 2% of global turnover. AeroNet was imagined as a resource to be used to export products and services, but the law being passed has made that extremely difficult to bring to bear.

*V. I.: The adoption of drones by all kinds of industries, with greater power, versatility and computing capacities in the drone networks seems like a pipe dream. But it is a question of how active customers will be and the actual size of the market. In order for the dream to become a reality, these services will have to become orders of magnitude more commonplace. Does the market have the resources available? Or do you hope that as was the case with smartphones, that the product creates its own market?*

**S. Z.:** Both are true. The Chinese company DJI has grown its sales volumes over the 7-8 years since it was founded from a startup to a billion-dollar business, and then added another half a billion this year. We have observed the rapid pace at which the con-



sumer segment has grown. For instance, I buy a drone so my kid can show it off, then I hook up a camera to it and film my daughter's wedding, then I hook up a rope and I'm skiing, and so forth. There is a market. On the one hand it is still underdeveloped but new figures are coming in every day. The Swiss are sending mail by drone, and some use them for security, use for shipments is underway and China now has an air taxi, which only flies at a height of 50 m and a speed of 40 km/h, but it can carry two people. In short, the market is exploding. To what extent is the market formed by the manufacturers and developers and to which the consume plays a role are difficult for me to say. Everyone is involved in the process. Take for example the Aero Glonass State Information System. How did it work? An accident happens, the customer presses a

panic button, and an operator responds, maybe even from a different region in the country, picks up the signal and within 15 minutes an Emergencies Ministry vehicle and ambulance arrive on the scene. As the system was being rolled out, the consumer, having tested its capabilities began to build demand for additional services. Not long ago a conference was held on commercial applications for space, and the Constructor General at Gazprom Cosmic Systems Nikolai Sevastyanov said the same about his remote sensing and network services. The greater the growth in consumer demand, the more rapidly the market develops. The same will happen here and drone use will grow at an unbelievable pace.

*V. I.: There is word in Russia that drones will be used for a wide range of monitoring*

*activities, in agriculture and for small deliveries, but no one talks about utility services, such as providing Internet to remote communities. It is something Google has put lots of work into. And then there are what we call personal drones. These are multifunctional devices capable of running additional software for various missions: e.g. running coach drones, personal security detail drones or personal camera operator drones. How unlikely are those scenarios?*

**S. Z.:** When we were writing the roadmap, we selected specific priority areas...

*V. I.: There are fast-growing American and Canadian companies that strictly adhere to the same specialization covered by your roadmap, so at least growth is one of those areas.*

**New solution: maximize the efficiency and accuracy of mapping from UAV's using precise position and orientation from GNSS**



**S. Z.:** Most certainly. There are very few companies on the market today that have approached the MTI for aid. Some people have applied, but others say they can manage on their own with commercial investors and will get their money from consumers. In that regard, no one is preventing them from working on other technologies. They are also supported by the MTI and moreover the MTI adjusts its roadmaps once a year, including for AeroNet. It's not a statue cast in bronze, after all. As soon as we see a new market segment come to light, with new prospects, we make corrections to our source code. When I was giving my report before the Modernization Committee, Russia's Prime Minister Dmitry Medvedev drew our attention to the fact that the drone mass production segment has not been articulated, and recommended that we develop that aspect. Everything is possible, and much depends on the market and on the entrepreneur and what they can come up with. It is possible that entrepreneurs will convince us of the fact that development in this area is important, in line with market demands, and so forth.

*V. I.: You have dedicated three years to laying the groundwork for the industry as part of the AeroNet roadmap and we will be ready for the ensuing explosive growth in this market throughout the world. How justified is this prognosis? What indicators lead you to believe this will happen?*

**The Swiss are sending mail by drone, and some use them for security, use for shipments is underway and China now has an air taxi**

**S. Z.:** Someone took my words out of context. The Roadmap covers 20 years, it is just that the first 2-3 years have been better worked out. At the time, I talked about the explosion in growth expected after 2020-2025. By that time, we expect that the laws will relax. Today's aviators and traffic controllers are afraid of drones; not all of them, but the bulk of them have their apprehensions. At the same time, many drones are already actively flying, or in other words, nothing scary has happened yet. We assume that in 5-7 years experience in working with and operating drones will accumulate, infrastructure data and 3D maps of locations will be created, and specific corridors will be defined, and all of it will be built into the software. There is a massive amount of other things that will make it possible to roll out the legislation and kickstart growth. And we believe that the legislation will undergo liberalization section by section: in agricultural lands or along pipeline routes, solutions will be simpler to arrive at than in large cities with high population densities like Moscow and St. Petersburg. Here the process will be more complicated and take more time. Nonetheless, after the laws have been relaxed, growth will explode. That's what I meant.

*V. I.: Based on your evaluations, the industry will really take to wing in terms of the development and manufacture of pilotless aircraft, there will be about 50,000 specialist jobs created, and associated services will employ half a million people. This is a massive number. It's larger than all of aviation today. What kind of time horizon are we looking at here?*

**S. Z.:** The aviation industry employs about 200,000 people, while the space agency in Roscosmos' perimeter provides another 200,000 jobs. We are talking not only about drone building, so it's not just about the aircraft themselves. Our numbers include manufacturers of parts and payloads. We aren't looking at standard optics, but are taking into account the use of aerial infrared cameras developed especially for them, optical electric systems, etc. Based on our forecasts,

such manufacturing chains could employ up to 50,000 people. Drones are not so much an aircraft in the traditional sense, but rather airborne robotic IT systems. We should take a few moments to discuss who may be involved in each area of their application, for instance in surveillance or agriculture. Not only is there are two-man crew that controls the drone in the feel, but there are also the precision farmers that make use of information from the drones in their work. The same applies to other types of monitoring and delivery. Personal use is one thing, but if we are talking about a company delivering chips using drones, then there is already an element of service and maintenance for a number of varied systems, as the experts put it. Just remember that before the fall of the USSR over one million people worked in the space industry.

*V. I.: The USSR had 1.3 million scientific workers with science degrees, and that does not include those who provided regulatory support. how do you think new technology development companies should be aided? Or is it possible that large state-owned and state-affiliated companies will be the driving force behind the industry, while tinkerers will remain in narrow niches where they will survive how they might.*

**S. Z.:** I'm actually a person who believes more in tinkerers than in large state-run companies. The latter build drones including for military applications. These include Sistema JSFC, Vega Concern, and to some extent Russian Helicopters, and the whole of Rostec State Corporation; we could mention medium-sized enterprises, as well. If we're talking about tinkerers, then if take the market into account, small companies can grow into mid-sized ones, and those into major players. Why them? They have a higher rate of growth, more leverage, and a different motivation. Taking Gazprom Cosmic System, the company grew from a startup 20 years ago into a competitor against Information Satellite Systems today. Half of all satellite television broadcasting in Russia and the CIS is on Gazprom Cosmic System.

*V. I.: By the way, was the deal with Gazprom? They bought the company?*

**S. Z.:** No, the story is more interesting than that. The young company, headed up by Nikolai Sevastyanov, who at that time was a manager at Energy SPA, turned to then chairman of the board of Gazprom Concern Remu Vyakhirev. They looked for areas where they could apply their joint efforts and space technologies. They found out that the network engineers in Urengoy, in Eastern Siberia needs a more modern and reliable network. It turned out that satellites were better suited for the job and the young colleagues at Energy started developing a satellite from a transponder and were so successful at their task that they were able to get a loan (Gazprom didn't even give them any money) and they launched production of the Yamal 1 and Yamal 100. They use digital transponders and the channel is divided into 10 bands, at a cost of a million dollars a year. That's expensive, but when they cost a hundred thousand each, now that's savings. The Federal Subjects in Siberia started buying the system and so did Gazprom. After that, they created the Yamal-200 and the Yamal-300. In essence, Gazprom and Energy had raised the company that laid the golden egg. They likewise render services to Gazprom, as well as in Russia and overseas. They work in the satellite and equipment manufacturing segment and receive most of the income from the broadcast and service segment. That's why I'm all for tinkerers. Today, there are close to 40 such companies on the horizon: 44 to be precise.

*V. I. : It's a union of two companies that are already under the same yoke. And if someone comes to you with ideas, how can you support them?*

**S. Z.:** In many ways. We are moving away from the simple toward the complex. We see engineers come to us that have their own company and some who do not. The first type can be offered the most simple of solutions: a platform for discussion. That alone is fantastic, so financial support comes second. There are many non-financial tools, for example shared administration of standardization and legislation, which is third most important. Expert support comes in fourth and PR (promotion at trade shows) is number five. If the Russian Venture committee provides us with financing, we rent our own booth at different exhibitions where we draw exhibitors. For instance, we are taking part in Hydroavisalon 2016 in Gendzhik.

The next issue to solve is infrastructure: engineering centres are being established when you can come with a sketch or fuselage of your drone and have it printed. It is groups like that where you are most likely to find investors.

Flight training on UAV becomes a profitable business



We stand today on the brink of Electronic Warfare



The advisor to First Deputy Director of KRET gave details about the prospects for electronic warfare. [KRET is a division of the Rostec state corporation, manufacturing equipment in the avionics, operational and tactical systems sector.]

# Vladimir Mikheyev – We lead the field in electronic warfare systems

“The poll position in the epoch of electronic warfare is held by EW (Electronic Warfare) systems. Within that sector we lead the field” says Vladimir Mikheyev, advisor to the First Deputy Director of KRET. Mr Mikheyev went on to describe the latest innovations in the world of electronic warfare - in an interview with Helicopter Industry, during the program 'Open Text'.

**Helicopter Industry:** Can you tell us please - what does 'electronic warfare' really mean?

**Vladimir Mikheyev:** Frankly, we stand today on the brink of EW (Electronic Warfare, sometimes called Electronic Warfare & Intelligence Systems, or ELINT). Such warfare is

already ongoing around the world – the world is moving from conventional arms into the sphere of electronic warfare.

ELINT systems are extremely complex. They're primarily intended for protecting your own aircraft, and for blocking the use of weaponry by enemy aircraft. An aircraft becomes completely useless if ELINT systems are deployed against it. These days all equipment is controlled using different kinds of EW electronic systems, which can check out the entire range of equipment installed aboard an enemy aircraft – and complete block it from using its weaponry. Meanwhile the enemy aircraft won't be able to see a

thing, or fire a rocket, or be able to fire his cannons. The enemy pilot is effectively deaf and blind. But his plane remains capable of performing elementary flight functions.

**HI:** But surely, won't the enemy have exactly the same ELINT systems installed?

**VM:** That's what is known as counter-electronic warfare. It means that we engage the enemy, but not with rockets and cannons – but with electronic warfare systems and capabilities, using electronic wavelengths and electronic signals.

**HI:** So you mean it's a question of who blocks first?



Rychag-AV (MI-8MTPR-1 is the most cutting-edge complex of specialised electronic warfare systems available

**VM:** Exactly, it's who is the first to block the other – and who has the optimal signal system.

**HI:** So – who is in front at the moment?

**VM:** We lead the field in the electronic warfare and intelligence equipment field. The reason is that for our whole lives, of course, we've been engaged with the most serious of electronic enemies. Our benchmarks have always been the USA, Israel, and European countries – and we've made sure we had an asymmetrical answer ready for them in electronic warfare. We knew what weapons they were ready to use against us – and we blocked each and every attempt to deploy their weapons.

**HI:** In other words – we can see off the USA in electronic warfare and intelligence equipment

**VM:** I would say so, certainly.

**HI:** There was talk at KRET a few months ago about providing slung-under equipment for the SU-34 bomber – which effectively converted into a EW aircraft.

*Does this offer any promise of deploying such aircraft in Syria against the terrorists? And if so, how would it work?*

**VM:** That all depends on whether the Defence Ministry, and the Russian Air Force will give the go-ahead for it. We have the latest cutting-edge equipment available for deployment in these aircraft – a primary set-up of ELINT equipment, which converts a standard plane for EW with no loss of existing functionality, and not only protects the plane which has been converted, but an entire formation of aircraft.

**HI:** So you mean, that the EW-equipped plane would be the leader? There would be one aircraft equipped with the EW gear in a slung-under format – and the other planes in the same formation would all be protected by it?

**VM:** That's right, the leader would cover all the others, and increasing their 'persistence' at the same time. But the most important thing is that equipped planes would be kitted out to fight in the modern electronic-warfare

environment. Not only against organisations prohibited in Russia like ISIL – but, if it comes to it, against any more well-equipped modern foe who might attack us.

**VI:** But can these systems operate if ground-based? ISIL hardly have a large air capability, but they could easily deploy such systems from the ground.

**VM:** We're talking about an all-purpose system here. It operates for any kind of aircraft, or for any facility based on the ground too. Any types of anti-aircraft battery, radar systems, communications control equipment can be scoped-out and be blocked out in due order. And when I say that, I mean they'll be entirely blocked – radar systems will be completely disabled, not a single anti-aircraft defence system will remain operative.

**HI:** KRET has also announced the launch of a further weapons system, named Rychag-AVM ('Lever-AVM'). Could you tell us, please, what precisely is new in this - and



Rychag-AV is able to blind the enemy within a hundred kilometers

Installation of equipment in the helicopter complex Rychag-AV

*how does it differ from the older Rychag-AV – its very successful predecessor? The Defence Ministry, for example, hold the Rychag-AV in very high regard.*

**VM:** Well, and the Defence Ministry aren't alone in that!

**HI:** *What, you mean all these weapons are intended for the export market?*

**VM:** Hmm, definitely not all – but only the older Rychag-AV is licensed for export. The full export documentation is in place, the export model is in production, and we are promoting sales.

**HI:** *So the export model is inferior to the version produced for the Russian armed forces?*

**VM:** Well, I wouldn't say 'inferior'. It's just a different model, which is optimised for overseas markets.

**VI:** *So where is the export version on sale?*

**VM:** Well, that information is somewhat confidential! (smiles). The equipment under dis-

cussion here is the most cutting-edge complex of specialised electronic warfare systems available. Unlike the SU-34 bomber, this system can provide electronic blocking for not only the plane in which it's deployed, but all of the space around it, and the entire surrounding territory. The coverage is up to one thousand square kilometres. This means that a helicopter becomes the centre of entire designated zone – and for several hundred kilometres the system will scope-out and block any defence- and weapons-related systems in the area, including ship-based systems. The principle of its operation is somewhat similar to the SU-34 idea – but with a vastly wider range of possibilities. It means that this helicopter-operated version is accompanied by a much more serious power source on board, a hugely more powerful antenna system, higher capacity, and a much more powerful computing capability. If in one system we're using a plane's on-board computing system, then here we are installing super-computers optimised specifi-

cally for electronic warfare and intelligence equipment – which are capable of covering huge areas for this type of work.

**HI:** *KRET has ploughed extensive resources into the research for these projects – which are aimed at import substitution.*

**VM:** Of course, it was already two years ago that KRET was put on the sanctions list – it was one of the first firms to be sanctioned.

**HI:** *So that means the new Rychag-AVM is 100% independent of imports in its make-up, yes?*

**VM:** Well, in today's world, there isn't a nation or area which can truly call itself independent – not even the world's largest corporations, such as Airbus, Boeing, or Northrop Grumman. They can never develop every last detail that goes into their planes themselves – because there would be no point in doing so. But what I can say for certain is that not even the tiniest question of imported parts for Rychag-AVM can arise.



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Ка-52

Russian helicopter manufacturers are looking for ways out of the crisis



# Russian Helicopters for Sale and Other Ways of Overcoming the Crisis

Industry and Trade Minister Denis Manturov announced that Russian authorities have made the decision in principle to privatize the Russian Helicopter holding in 2016, RIA Novosti reported on Thursday, March 10th.



The Chinese delegation at the Kazan Helicopter Plant

The minister explained that discussions are ongoing on the amount of shares to be sold. A strategic investor from Russia may buy 49% of the shares, while a foreign investor could own 25%. A combination of investors is also possible. Priority factors include the price and whether the investor will take an active role in process modernization, Manturov stressed.

Russian Helicopters Holding was created in 2007 and is currently considered one of the leading companies worldwide in the pro-

duction of helicopter technology. According to the company's 2015 annual report, the primary stakeholder in the holding is the company Oboronprom, which owns 98.5% of the shares. Russian Helicopters' IPO was cancelled a few years ago due to the impossibility of arriving at an objective price tag for the stock.

On 1 March, the head of Federal Antimonopoly Service of Russia (FAS) Igor Artemyev announced that the percentage of the Russ-

ian economy belonging to the public sector had reached a critical level, and that any further rise would lead to reduced economic efficiency.

At a meeting to discuss the economy with Russian President Vladimir Putin that took place on 1 February, 2016 the partial privatization of publicly held companies was approved. Candidates listed for sale include assets owned by Rostelecom, Transneft, Aeroflot, Rosneft, Sovcomflot and a number of other companies.



The main stage of the Mi-17 helicopter assembly

### Difficult Times for Kazan Helicopter Factory

KHF CEO Vadim Ligai left his parallel job as Deputy CEO of Russian Helicopters. According to statement by the factory, this was due to high workload. So what is happening to one of the flagships of Tatarstan's defense industry "the blades of which turn ever more slowly, while hanging an added load on the chassis" — the Bashkir KumAPP plant (Kumeratu Aviation Production Enterprise) with billions in losses?

**Experts have expressed their opinion that in the near future the focus of helicopter deliveries will gradually shift from export to orders for Russian defense and enforcement agencies**

Vadim Ligai was appointed to the post on 13 November 2013 and headed up some of the holding's key programs: implementing helicopter projects, innovative projects, and the modernization of the current model helicopter line and the creation of new helicopters—Ka-62, Mi-171 A2 and Mi-38, an advanced mid-sized helicopter. He was actually the second in command at Russian Helicopters which likely strengthened the position of KHF.

In addition, KHF announced the Board's plan to raise capital by issuing additional 100 million shares with a nominal value of one ruble per stock. At the same time, according to the announcement, an upper bound of the transaction is 20 billion rubles. It will be a closed subscription sale among the existing shareholders of Rostec, Russian Helicopters Holding Company and Oboronprom.

By the way, the decision to raise additional capital will be discussed at an extraordinary shareholder's meeting on March 16. While at the next extraordinary meeting on May 6, the question will be raised of whether the authority of the acting board of directors be suspended and a new board be elected which

may be reduced from 9 to 7 people.

All of this is happening against a backdrop of a drop in production unprecedented for the recent period in the development of KHF. Based on data from the Ministry of Industry and Trade of Tatarstan that became available after the recent Ministry Collegium, the product output of the factory, the Republic's pride, dropped by an entire 34.8% in 2015. No commentary was provided for this information at the KHF, instead they suggested to wait until the accounting statement is published in March. All the while, rumours were spreading around Kazan that this year the usual 13th paycheck was not issued, labor disputes related to remuneration have become more frequent, and moreover, the plant was supposedly switching over to a three-day work week.

### The Indian Factor

In 2015, KHF has really sold a record-breaking low number of helicopters in recent years: no more than 80. We would like to remind you that in 2014 the enterprise closed deals on 107 aircraft, and as the management announced, in 2015 it was planned that 110 helicopters would be handed over to buyers. Based on information from the source, there were two main causes behind the drop. Partly it was bureaucracy: for a number of reasons the schedule for signing the acceptance papers on the new helicopters was held back, and more than ten of sold helicopters were "shifted" to 2016. The most important part, though, was the lack of large orders.

The reasons behind the lower production at KHF included the collapse in oil prices, the completion of major contracts with the U.S. (for 63 helicopters; completed in late 2014) and India (for 151 helicopters' completion announced in early February) and the international sanctions.

It became clear in March, however, that deliveries from KHF to India would continue. In 2015, it was reported that India's armed forces may procure 48 Mi-17V-5s for \$1.1 billion from Russia.

Experts have expressed their opinion that in the near future the focus of helicopter deliv-

eries will gradually shift from export to orders for Russian defense and enforcement agencies and the armed forces, as well as for civilian consumers.

**Why is KHF taking KumAPP under its wing?**

Considering this fact, what does the follow-on capitalization amounting to 20 billion rubles mean in this case? Perhaps Moscow decided to reach out a helping hand in a trying time? Especially since KHF has paid its shareholders an astronomical 7.8 billion rubles in dividends at the end of 2014. It had already been announced in early November 2015 that control over and 100% of the shares of the Bashkir plant would be handed over to KHF by 2018. The assumption that the decision was taken to complete the fusion as quickly as possible is supported by the coinciding numbers: the upper bound of KHF follow-on capitalization is the same

as the value of the assets of the Kumertau plant: 19.97 billion rubles.

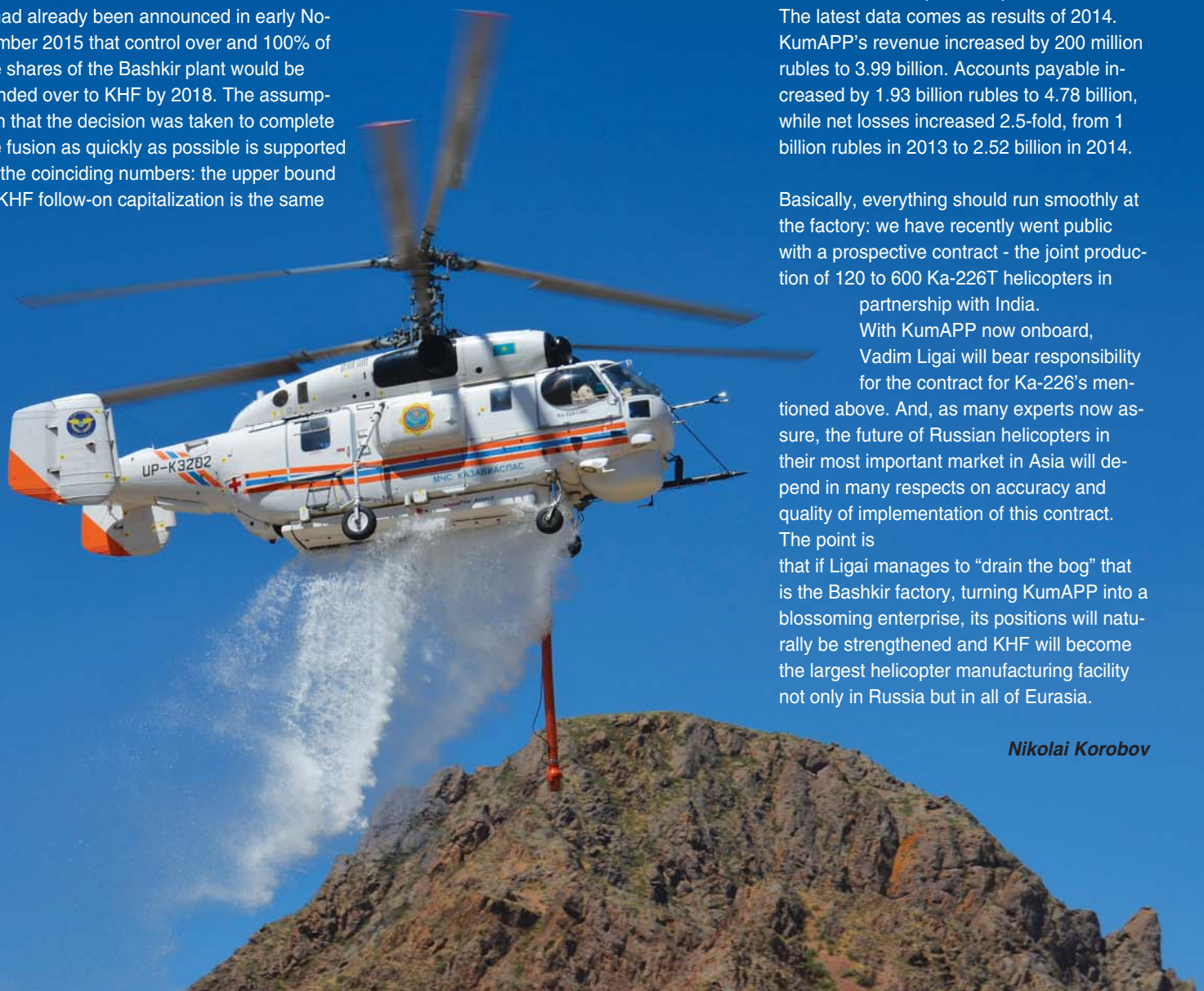
It's assumed that the combined company will manufacture "combined products": Mi-8/17, Mi-38 and Ansat from Kazan plant and Ka-226T, Ka-32A11BC and Ka-31 originating from Kumertau. The restructuring can be explained by the drive to distribute helicopter production and repair volumes in the best possible way, to improve the management system and to increase revenue and profits through the synergetic effects of the compa-

nies working together and to increase revenues going into the budgets of neighbouring Republics of Tatarstan and Bashkortostan. It has been announced that there will be more work for Kumertau: the plant will launch a facility for the production of parts and aggregates for Mi-8, Ansat and Mi-38; the volumes of prefabrication stamping, press-and-forge and aggregate assembly facilities will grow up; a competence centre will be created for manufacturing polymer blades, as well as rotor assemblies for helicopters Ka-52/52K, Ka-62; a facility for the production of ground crew tools is also put into operation. The latest data comes as results of 2014. KumAPP's revenue increased by 200 million rubles to 3.99 billion. Accounts payable increased by 1.93 billion rubles to 4.78 billion, while net losses increased 2.5-fold, from 1 billion rubles in 2013 to 2.52 billion in 2014.

Basically, everything should run smoothly at the factory: we have recently went public with a prospective contract - the joint production of 120 to 600 Ka-226T helicopters in partnership with India.

With KumAPP now onboard, Vadim Ligai will bear responsibility for the contract for Ka-226's mentioned above. And, as many experts now assure, the future of Russian helicopters in their most important market in Asia will depend in many respects on accuracy and quality of implementation of this contract. The point is that if Ligai manages to "drain the bog" that is the Bashkir factory, turning KumAPP into a blossoming enterprise, its positions will naturally be strengthened and KHF will become the largest helicopter manufacturing facility not only in Russia but in all of Eurasia.

*Nikolai Korobov*



# Air Ambulance Factors. Helicopters for Children



**Starting next year, a new air ambulance will begin servicing the Russian Capital Region. The medical authorities came to the conclusion that a specialized helicopter ambulance be created for providing pediatric care tailored to the needs of little patients, whether for rapid response to child victims of car accidents and other children in life-threatening situations or for transporting children from one hospital to another.**

**Currently, medical aviation undergoes intense development in Russia, much of it is built upon experience from the powerful Soviet air ambulances, which had at one time access to substantial resources and a sizeable fleet. However, a plethora of organizational and conceptual details in Russia's new air ambulance service have been inspired by the experience of other countries and their wealth of experience in using helicopters for medical purposes.**

**A breakdown of the modern components behind our concept of medical aviation is shown below.**

### **Medical Aviation as a Macroeconomic Factor**

Within Russia, medical aviation is almost never evaluated from the viewpoint of economic investment. The justification for this is how few medical aviation services are provided in Russia and their modest territorial reach. In reality, the global medical aviation industry is very young, so here Russia is in a position to overtake the developed countries in the next few years. In the U.S., basic data have been gathered on this industry since 1980, when there were only 39 helicopters involved in medical evacuation operations. By 2011, their number had grown to 929, peaking out; today, the country has just over 900 medical helicopters.

Long a niche area of application for helicopters in the U.S., medical aviation continues to develop in the U.S. despite the financial crisis, in terms of jobs, profits and GDP share.

The industry has a revenue of \$6.3 billion, while direct and indirect employment has resulted in 43,300 jobs created, with the evacuation operations alone involving 19,000 dispatchers, technicians, pilots and paramedics. These impressive results illustrate perfectly the thesis that this industry includes a whole set of economic multipliers. American national reports on medical aviation usually contain a few chapters describing these multipliers. In Russia, the economic impact of the helicopter industry and medical aviation as such is not taken seriously.

### **The Causes Behind the Boisterous Growth in the Global Medical Aviation Industry**

In the opinion of the experts, the fast-paced development of medical helicopter aviation in many countries has been spurred on by standard set of factors:

Mass shut-downs of rural hospitals coinciding with expansions at remaining medical centres;

An aging population;

The capacity to provide intensive care in the air;





New safety standards and a better quality of life;

The first two trends are absolutely identical in the U.S. Great Britain and the Russian Federation. The third and fourth factors are only starting to come into play in Russia.

In terms of application, the most important factor here is having installed intensive and neonatal care equipment on board the sanitary helicopter and scheduled air transfers from general care clinics to specialized medical facilities. Emergency transportation, so important for improving survival rates from motor vehicle accidents and cardiac problems in adults and children, stays within the golden hour and is usually less than 50%.

### Financing Types

In addition to the well-known types of financing—100% state-sourced or funded through from hospital and non-profit agencies, the Red Cross or other humanitarian organizations—various types of charitable support are currently used more and more commonly. These include special lotteries, charity telemarathons and charitable competitions. Nearly all medical helicopter operators in the U.S. and Canada are able to take advantage of any of those forms of fi-

nancing in their activities. This has no effect on their baseline insurance premiums and payments from patients who received the medical aviation services.

The Texan medical operator HALO-Flight took an interesting approach by holding an annual Charity night in Casino, golf tournament and target shooting competition with all funds going toward the operator's main activities. HALO-Flight serves 26 counties in the state of Texas covering an area twice the size of Moscow Oblast. Based on the reports, charity accounts for 50% of the company's financial requirements. Only 6.5% is transferred from state and county authorities, and the same amount is comprised of personal donations. 25% is provided by hospital funds and 12% comes to HALO-Flight from corporate donors.

HALO-Flight has partnered with Driscoll Children's Hospital for many years. Pediatric aid became foundational for the operator, providing an unprecedented level of service for children in critical condition and with injuries throughout southern Texas.

The opposite is true of Swiss operator Rega. The company receives no government financing, but 2.5 million Swiss citizens deposit funds into the company's account every

year, while the rest is provided by commercial contracts (1,500 out of 13,800 missions).

### The Territorial Factor

As has already been mentioned, the various kinds of air ambulance aid include scheduled patient transfers. Unlike emergency missions, these flights are not bound to keep within the golden hour, and can be conducted by helicopters throughout a broad territory, assuming the helicopter can be refueled. This difference enables serious optimization of costs for medical flights. Emergency response is one thing, when pilots must remain on duty along with medical teams; medical transportation on a pre-planned schedule is something else altogether.

In terms of the flight and technical characteristics, the latest Russian Ansat helicopters can carry out both emergency missions and long-distance patient transfers at the highest level. A single helicopter is capable of accomplishing flight patterns in a range of 100-120 sq. km (the average area of three oblasts in Russia's central economic region).

### We Only Have Our Own Medical Aviation

Considering the role played by medical avia-



tion in our country's economy, a very important question is also who are the suppliers of equipment to air ambulance operators. This means countries that manufacture their own helicopters. For France and Germany that number is 100%, for the U.S., it is 90%. The Russian Federation is actively procuring Airbus and Bell helicopters for its medical aviation needs. And that while Russia has its own cutting-edge mid-weight helicopters with developed and certified medical modules: Ansat and Ka-226-T. New helicopters such as Mi-171A2 and Mi-38 are also close to release.

### Moscow's Experience and National Pediatric Air Ambulance Services

In Russia in particular, Moscow has implemented a pediatric air ambulance project based out of the Pediatric Surgery Clinic. This is a trade name for three centres, the Moscow Pediatrics and Pediatric Surgery Research Centre under the Ministry of Health and Social Development (MSD), G.N. Speransky Municipal Pediatric Clinical Hospital No. 9 and Zashchita All-Russian Disaster Medicine Centre, also under Russia's MSD.

## The latest Russian Ansat helicopters can carry out both emergency missions and long-distance patient transfers at the highest level

Children are transported to the Moscow Pediatric Surgery Clinic in an intensive care ambulance with a team from the Moscow Oblast Territorial Disaster Medicine centre or in an air ambulance from the Moscow Aviation Centre, accompanied by an intensive care



doctor from The Moscow Emergency Medical Aid SPC (Scientific Practical Centre).

In other words, evacuations are carried out by a multi-functional aviation centre that for the most part transports adult patients and conducts surveillance, fire-fighting and other miscellaneous missions. For instance, in 2015, Moscow Aviation Centre carried out 4,316 flights, 1,172 of them involving medical helicopters, delivering 478 people to hospital.

Over the last five years, the program aimed at rescuing child victims of motor vehicle accidents on the roads of Moscow Oblast evacuated 592 children, 499 of them in an intensive care ambulance and 93% by air ambulance, or 15%.

In total, approximately 12% of all children injured on the road are evacuated under the program, but only those children in severely critical condition with the most complex and dangerous injuries.

These are statistics for a region with a population of 19.5 million people (Moscow and Moscow Oblast).

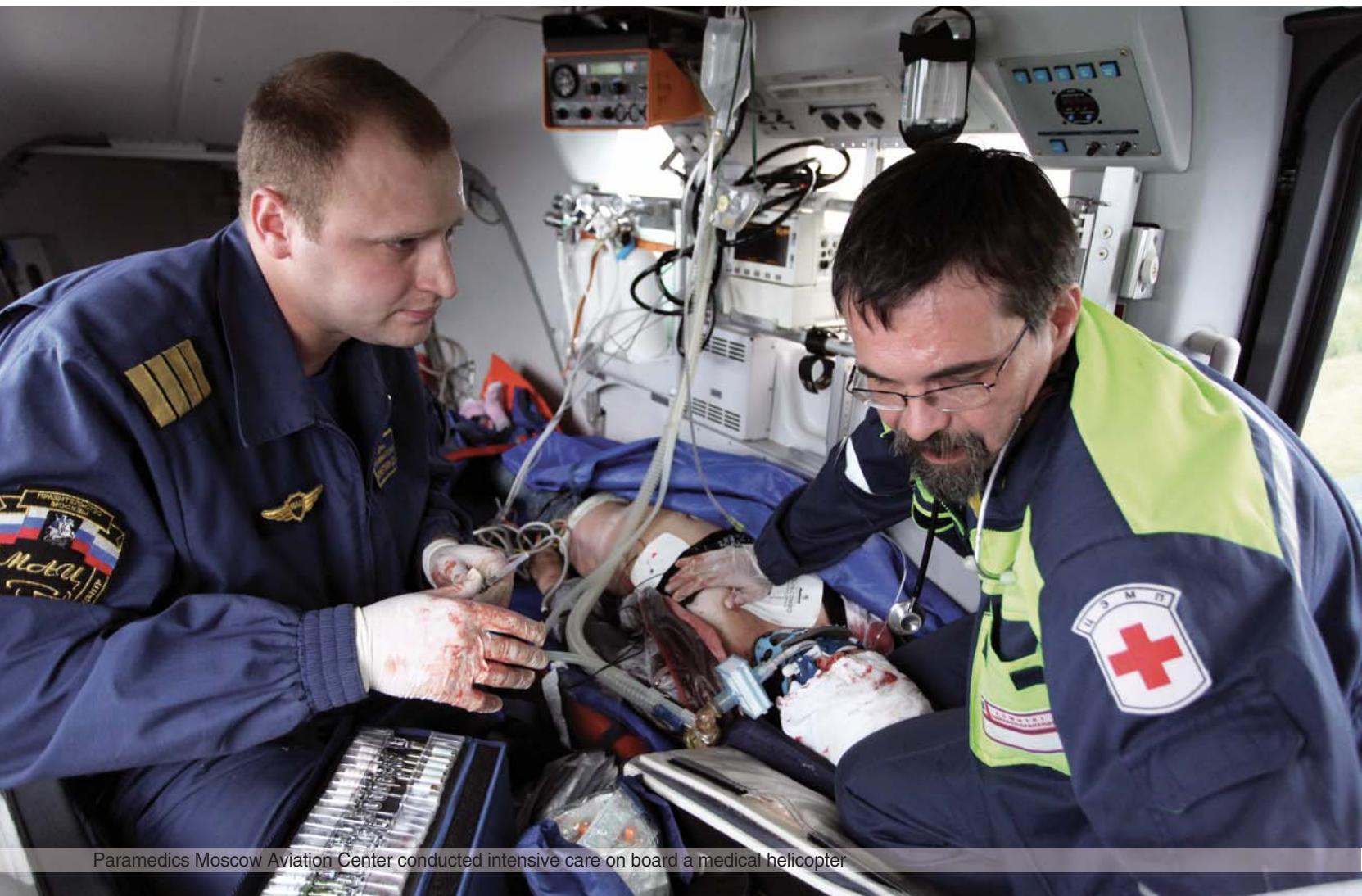
That being said, most developed countries

use a format for air-based pediatric emergency care that is based on national and regional service providers. In the U.S. it takes the form of the Children's National Rapid Helicopter Transport Service, and in the U.K. there is the Children's Acute Transport Service (CATS).

Such services were created as a direct result of the fact that hospitals with specially equipped children's ambulances are few and far between, something of critical importance to newborns. In reality, simply providing emergency transportation for children is not enough, but rather what is required are aircraft equipped with pediatric intensive care equipment. A key problem resides in the fact that a majority of children in critical condition are delivered in hospitals that are not equipped with intensive care equipment.

Children's Acute Transport Service (CATS), which serves several hospitals in London, conducts 2200 transport flights per year, 1,200 of which involve intensive therapy.

The experience gained by Scotland's pediatric air ambulance service is another great example, where emergency medical trans-



Paramedics Moscow Aviation Center conducted intensive care on board a medical helicopter

port is provided to 11 hospitals in the Region. The service, which has operated since 2001, has responded to more than 7,000 calls and transported 5,600 children. As a rough average, 375 children were saved for each of the past 15 years. The total population of the region is 5.3 million people.

It is a good reference point, because of similar operating conditions. Scotland is at a similar latitude to Russia's central and most highly populated territorial units (Moscow, Smolensk, Kaluga, Ryazan, Nizhny Novgorod and other Oblasts) and the challenges faced by pediatric air paramedics during evacuations are similar.

Data from Scotland on the number of helicopter flights transporting child patients show there are fewer of them there than on average in the U.K. and substantially fewer than in the U.S. Here we should mention just the state of Maryland, which has been a pioneer in the organization of regular air ambulance services, where more than 64,000 medical flights have been conducted over the past 25 years.

Thus, following the Scottish example, it is easy to calculate that in the Moscow Region, the number of adults and children evacuated by helicopter is nearly equal to the number of children transported by Scotland's pediatric

air ambulance service; and this despite the fact that the population of the region is four times that of all of Scotland.

The use of emergency evacuation in the capital region has at this early stage led to certain positive results.

The severity index for injuries suffered by children in motor vehicle accidents in the territory of Moscow Oblast (the fatality rate per 100) dropped by half from 2003 through 2009. Whereas 108 children out of 1,439 involved in crashes perished in 2003, in 2009, there were 37 fatalities out of 1,010 victims. These dry numbers belie the hundreds of saved children's destinies.

### Why are Medical Flights Conducted Only Using Helicopters with a Category A Safety Rating?

We will conclude with a few words about the discussion that occurred among Russia's expert community about which helicopters should be used for conducting medical flights. At one point, the Russian helicopter market experienced excessive liberalization, which allowed foreign helicopter manufacturers to easily penetrate the Russian market and obtain the required type certifications for aircraft. But this liberal career went further, and today the discussion has been warped out of plane, turning into a question of whether the new Russian helicopters Ansat and Ka-226T are even capable of fully meeting the needs of emergency medical aviation, without the procurement of French, Italian or American helicopters, and whether the transport category for medical helicopters should be lowered.

We should start by saying that there are unlettered helicopter categories ("normal category") and helicopters of transport category "B". These include all single engine helicopters and dual-engine helicopters that, due to their design cannot guarantee the necessary level of flight safety.

Helicopters in these categories may be used for a whole range of multiple aviation purposes: surveillance, aerial photography, freight transportation, and aerial support for law enforcement. Whereas in the U.S., helicopters in these categories can be used for transporting special repair crews and as air taxis for a restricted list of search and rescue missions, in densely populated Europe, which boasts thousands of cities, the use of such helicopters for missions like those is forbidden. Instead, the so-called JAR OPS 3 set of legal standards regulates civil transportation helicopters in Europe, the main idea behind which is to restrict flights by single-engine helicopters.

For flights over cities and for medical missions, only helicopters in Category A are permitted to be used. This standard has already been steadfastly followed in Russia for over 45 years.

Usually, when discussing the features of Category-A certified helicopters, we talk about flight performance requirements when one engine fails, including sustained take-off, gaining elevation, and re-circling the landing zone. But these are not the only requirements for helicopters in the safe transport category.

This category also requires decoupling for engines and engine systems and the requirements for equipment and failsafes are higher (includes specifications for system decoupling). A catastrophic one-time failure must have a likelihood of no more than 1 in 109. Nowadays, the idea would enter no one's mind to use single-engine aircraft for medical flights, e.g. the wonderful commercial helicopters Bell 407 or Robinson R66. Bell 407 is truly one of the best helicopters built in recent years, and has simplified requirements for flight attributes on its certificate, including H-V checking in the event of engine failure, aborted take-off or windmilling on landing. Its certificate does not require system decoupling. As a result, the failure of one system can lead to a loss of power and windmilling upon landing. The engineers planned to make Bell 407 dual-engine, but the idea did not see the light of day and Bell 427 and Bell 429 were created—expensive dual-engine

aircraft that confirmed they met Part 27 of the certification requirements for normal Category-A helicopters.

Of course the fact that Russian industry lobbies have taken up the mantra of "simplify and save" and have begun to suggest that our air paramedics start using foreign-made single-engine Category-B helicopters bears the marks of anti-competitive behaviour. It is obvious that the simplification and savings will come at the expense of flight safety, which underscores all of the experience gained by the air ambulance services of France, Germany, the U.K., Spain, Italy and by Russian medics and rescue workers over nearly half a century of experience with domestic emergency medical aviation.

The discussion turned out to be very timely indeed, and now, riding the wave of our policy of import displacement, the position of proponents of Russia importing air ambulances has been noticeably shaken. In any case, the helicopter fleet of the new pediatric helicopter service, which will begin operating in Moscow Oblast late this year, will be comprised only of the newest Russian-made medical helicopters.

*Vladimir Orlov*



'Rosneft' named as the dynamo for the Russian domestic helicopter industry



# The best place never goes empty – or a real development strategy?

At the end of October this year, information appeared in the media that the Rosneft corporation had concluded a deal with Rostec and Finnmeccanica for the licensed localised manufacture in Russia of around 200 Arctic-class ship-based helicopters, for use in Russian waters. The contract will be fulfilled by Joint Project between Russian Helicopters and Europe's largest helicopter producer – Agusta Westland. The project is already under way, and the first helicopters – AW189 models – will be assembled in one-and-a-half or two years. In the light of this, can there be talk of a new quality breakthrough in manufacturing civil-class helicopters for the Russian domestic market – and who is 'calling the tune'? These are questions worth investigating.

**About helicopters in civil aviation in Russia**

We should start by mentioning that experts believe around 80% of helicopters in Russia have been domestically produced. Even so, this doesn't make deliveries of foreign-produced helicopters very unusual – they make up at least 10% of the overall number. The last major orders date back four years – at the MAKS-2011 Russian air show, at which two major helicopter contracts were signed – by commercial operators UTair, and Gazprom Avia. Each operator planned to buy up to four dozen Mi-171 craft (also badged as Mi-8AMT). Alongside these deals, Russian Helicopters also had a contract from that time, for 16 light Ka-226AG helicopters for Gazprom Avia.

However, until now these contracts (for the Mi-171/Mi-8AMT) are still 'on the waiting list' - particularly in the case of UTair, but also with the market generally – or are 'in a consultation process about a relaunch of the project'. This latter especially refers to the Ka-226 orders, for which Russian Helicopters would now prefer to offer an updated model, the Ka-226TG.

On the topic of contracts, it's worth mentioning the recent contract from the very same Rosneft corporation. Russian Helicopters are due to deliver two Mi-171's and two Mi-8AMT's in 2016. These craft will be deployed for offshore shelf oil projects and mainland operations for Rosneft.

It's planned that the Mi-171's will be in a passenger configuration to provide transport for security staff and payloads to oil and gas locations on the Russian mainland. The Mi-8AMT's will be fitted with modern avionics. The new technical set-up of these Mi-8AMT's has been installed to conform with recommendations of the OGP (the Organisation of Gas & Petroleum producers) for mid-range sea-going helicopters. These are multi-purpose helicopters which will be used to transport security staff, for search-and-rescue duties, and for the possible emergency evacuation of crews from offshore drilling platforms (or ships).

Yet despite this, as we see, even though there have been some orders, there haven't



been any actual deliveries of helicopters for the Russian domestic market in the past few years – even though Russian Helicopters is ready and able to make such deliveries at any time. On top of this, prices for helicopters on the Russian domestic market have hardly changed for three years. To put it bluntly, everything is fine with the manufacturers – so what is up with the buyers?

**The King is dead – shall the King live long?**

The largest operator of helicopter services in Russia has always been thought of as UTair. The company's annual turnover for helicopter services in the Russian Federation and abroad is 20.1 billion roubles. UTair was al-

**The new technical set-up of these Mi-8AMT's has been installed to conform with recommendations of the OGP (the Organisation of Gas & Petroleum producers) for mid-range sea-going helicopters**



Owned Rosneft helicopter AW139

most the only company in Russia which purchased domestically-manufactured helicopters for domestic operations. And it bought them in huge numbers. The airline owns around 350 helicopters, featuring different Mi-branded craft, Ka-32's, along with some foreign-produced models. No other organisation had the same buying-power, nor the top-level connections among Russian authorities.

**Rosneft has little interest in the AW139 model, and is more focused on the AW189 - with its maximum take-off weight of 8.3 tonnes**

Things are looking far worse (with the exception of Gazprom Avia) with other air operators. Most of them are trying to coax the last usage out of helicopters with 30-35 years of service. Overall, it can be confidently said that if it hadn't been for UTair, domestic helicopter production in Russia could easily have packed up and gone home. What's behind all this? Why is it impossible to establish a civilised domestic helicopter market based on attractive leasing conditions on a debit basis for air operators, for small operators, or for those who are stuck with old equipment?

Or maybe they don't want to? Maybe it's easier for them to carve off a slice, and do their own thing? Definitely easier. But that kind of ease is worse than thievery. And if your own thing conks-out, what's to stop the same thing happening with UTair? Even so, expert opinion mostly agrees that UTair isn't likely to end up in bankruptcy, since the airline can always count on its majority shareholder (more than 60% of UTair's shares belong to Surgutneftegaz Corp). But even if things work out

that way, it's still very grim that the domestic market will be left without its main player. No-one wins from that kind of situation – neither manufacturers or users, and in fact it's quite the reverse. To prevent this sort of collapse, the new dynamo of the Russian domestic helicopter business has been heralded as another of 'our own things' – Rosneft.

### **I came, I saw... and I bought it.**

The gift – in the form of a gigantic order – was presented to Agusta Westland, or rather to the Helivert corporation, which provides assembly facilities for the AW139 in Russia. Until recently Helivert had felt somewhat isolated within the great expanses of Russia, and without much of a track record – only five helicopters had been produced in three years. Worse still, the Russian Ministry of Defence spiked a large order for 15-20 craft. And then suddenly comes a gigantic order for 200 helicopters, and all business-class! As part of the deal, Rosneft will acquire a 30% stake in Helivert Corp – a joint venture (JV) between Russian Helicopters (itself a wholly-owned

subsidiary of the giant State military corporation Oboronprom, which in turn is part of Ros- tec), and the Italian corporation Finmeccanica – which assembles helicopters at Tomilino, in Moscow Region. Until now the JV had been on a parity fifty-fifty basis. With Rosneft's new involvement, the remaining ownership is to be split between Russian Helicopters taking 30%, and Finomeccanica having 40%. Another element of the deal is that details of the capital invested in the JV will not be disclosed.

It was already known in December 2014 that Rosneft would become a strategic partner of the JV. The petrochemicals giant promised to ramp up the JV's production capacity and become the principle client for its helicopters. However, Rosneft has little interest in the AW139 model, and is more focused on the AW189 - with its maximum take-off weight of 8.3 tonnes. In June Mr Yuri Ushakov – Aide to the Russian President – estimated that the investment in the project would run to €3 billion euros in the period to 2025.

It's worth noting that go-ahead for joining the JV was given after expert research calculated that doing so would 'reduce costs in purchasing of logistics facilities', along with 'maximising the effectiveness of the JV's operating model', when factoring in long-term planning. The management of the newly-built fleet will be put in the hands of another state corporation – RN-Aerocraft.

Preliminary estimates predict that assembly of the AW189's will begin at the Helivert facility before the end of 2017 - on the basis of a timetabled transfer of production capabilities to Russia that is scheduled to run through to 2025, with an eventual level of direct manufacture in Russia of more than 50%.

So what do we know of the helicopter itself? The AW189 is a multi-purpose helicopter, specifically designed by Agusta Westland for work on offshore oil shelves, along with search-and-rescue duties and other payload operations. The passenger configuration can seat 16 passengers, with an operational range of 1111 kilometres (when fitted with supplementary fuel tanks). The Russian-produced models will be certified for off-shore shelf operations, search-and-rescue, and



Helicopter Base Airline UTair in Surgut

anti-icing systems. The unit price of the helicopter is set to exceed €15 million euros. Until now, Helivert has been assembling the AW139 helicopter, with a take-off weight of 6.4 to 6.8 tonnes. Production will continue, but since the order for the AW189's is firm, while demand for AW139s is less certain, production resources will be more directed to the models ordered by Rosneft. In fact, to speed things through, the first ten AW189 craft will be fully built in Italy.

The result is that at last a really serious player has emerged on the Russian helicopter services market – with big ambitions, far-reaching plans... and government guarantees. Yet can the arrival of this heavyweight producer seriously affect the situation for Russia's helicopter operators? Will it give the necessary nudge forwards? Or will we still be stuck with a situation in which one major operator pays the piper (or manufacturer), and calls the tune? Should a single operator set all the market conditions to suit themselves? Because if we are back to that again, there will be nothing

new for us around the corner. We can only wait and see. And in truth, it's really still too early to talk about the output of any big helicopter production facilities. The complex situation can only have a negative effect on demand for helicopters from small players, which makes suggesting answers to the many issues involved something that must wait until the actual situation gradually becomes clearer.

*Dmitry Gnatenko.*

**UTair has been practically only company in Russia, that bought many civilians domestic helicopters**

## DEVELOPMENT OF PRODUCTION

Progress is planning to increase its production volumes of helicopters



# Investment in «Progress»

**N.I. Sazykin Progress Arsenev Aviation Company, part of Russian Helicopters Holding (which is part of Rostec State Corporation), kicked off 2016 by announcing the expansion and further upgrade of its manufacturing processes. This “regional” helicopters asset of Russian Helicopters Holding is being transformed to become one of the country’s most state-of-the-art aviation plants.**

In 2016, N.I. Sazykin Progress Arsenev Aviation Company (Progress AAC) will spend more than RUB 1.5 billion on the modernization.

As part of the Federal Target Programs, Progress AAC has been actively engaged in implementation of plant upgrade projects,



namely retrofitting of galvanization, composite and mechanical manufacturing facilities, pre-production facilities and other enterprise departments.

Progress AAC Managing Director Yury Denisenko said, "Continuous improvement of manufacturing processes will bring the enterprise to a whole new level of quality. The planned build up of production rate and capacities should be the result of re-training and improvement of skills and qualifications of our current staff and not come out from hiring of additional personnel. This year we will place a greater emphasis on training and education of enterprise employees."

To improve the quality of its products, and enhance the enterprise's overall efficiency, Progress AAC is currently undergoing structural reorganization. Special attention is being paid to the company's engineering and manufacturing departments.

#### **Flight-Test Base and Air Field Modernization**

As part of the large-scale upgrade project, Progress AAC's airfield base will also undergo a retrofit. The company is planning to increase the number of helipads and to construct an aircraft parking apron.

Retrofit of the airfield will help to complete two of the company's top priority tasks: secure flight safety during operational acceptance testing and ensure crew training at the flight-test base of enterprise.

The Department of Industry of Primorsky Krai stated that the large-scale retrofit of the facilities in Arsenyevo, which has been underway over the last years, leads to a new round of development.

The new landing strip will feature artificial pavement and its length will be 1.3 km. Later on, the strip will be able to accommodate civil aircraft. Thus, Arsenyevo will gain a possibility to regenerate its own airline industry which ceased to exist in the early 1990's.

At the same time, the company will build up its production capacity. According to Russian Helicopters, airline company will be working at full capacity until 2022 thanks to available orders which were scheduled or already signed.

The Ka-52 Alligator reconnaissance and combat helicopters have become the company's hallmark. These are the most advanced aircraft in their class. They are designed to destroy tanks, armoured and non-armoured ground targets and weapons, enemy helicopters both on the front line and in tactical reserves. The helicopters can operate around the clock and in all weather conditions. The company has been awarded a State order from the Russian government for the production of Ka-52 until 2020.

The naval modification of Ka-52K introduced at MAKS-2015 has stirred up great interest in Russia and worldwide. Batch production of ship-based helicopters for the Ministry of Defence will also be the task imposed on Progress aviation plant.

#### **Alligators Ordered Under The Contract To Test In 2016**

Flight testing of first Ka-52 Alligator all-weather reconnaissance and combat helicopters made by N.I. Sazyking Progress Arsenevo Aviation Company (part of the Russian Helicopters Holding Company) was started in early March, as part of Defence Procurement and Acquisition 2016.



"The test flight duration of each Alligator is approximately one hour. At altitude, combat aircraft complete basic maneuvers as follows: climb, hovering, rotating, and others maneuvers as indicated in the test flight program", as reported by the press service of Progress.

The Alligators are also capable to execute some more aerobatics. The coaxial system of the rotors and the improved longitudinal control capabilities allow them to perform flat turns, circle-strafting and slalom.

By 2018, Progress is planning to increase its production volumes of military and civil helicopters. In particular, the enterprise intends to build up production of the naval modification of Ka-52 helicopter, a new Ka-62 multipurpose helicopter and Ka-52 Alligator reconnaissance and combat helicopter, including for export.

*Andrei Vezhnovets*

**Continuous improvement of manufacturing processes will bring them enterprise to a whole new level of quality**



## SPECIAL TYPE OF AIRCRAFT

Russian developers have extensive experience in designing helicopters to Arctic



The Ulan-Ude Aviation Plant has concluded a contract with the Russian Defence Ministry for the delivery of helicopters for Russia's military forces in the Arctic. The Plant has developed a special Arctic modification of the Mi-8AMTSh-V, to be known as the Mi-8AMTSh-VA. These helicopters will come fitted with the gas-turbine VK-2500-03 engines from the manufacturers Klimov, along with an auxiliary TA-14 power unit. This new technical configuration will enable the helicopters to make flights during the Polar night, in conditions of extreme low temperatures.

# The helicopter with the letter A

### Solutions found for well-known problems

In recent years Russia has taken a more active position on taking real hold of its northern territories. A whole series of measures have been wheeled out to protect Russia's national interests in the Arctic, notably including a number of military developments. The importance of having heli-

copters capable of operating under such conditions for these tasks was noted in a speech given in Rostov-on-Don in 2013 by President Putin. Similarly a start was given for an upgrade of Russia's civilian helicopter fleet – the delivery of new and modernised helicopters, with new engines, avionics, and equipment.

There have been actively-followed discussions on issues of developing transport infrastructure and providing air transportation across the Northern Sea Route among the expert community. At the First International Arctic Investment Summit, held in Moscow in February 2014, discussions in topic-groups and at round tables focussed on the issues facing aviation in Russia's Far North. There was a prominently-expressed view of the lackadaisical government approach towards the Russian North. Little account seemed to be taken of the climatic extremes, or of the social, economic and technological aspects of life in Russia's vast Arctic regions. This was reflected in little planning of transportation, along with an absence of firm orders for either the R&D aspects or actual production of innovation-oriented aviation equipment from major companies aimed at getting a real handle on Russia's Arctic territories. There is feeble development for even the primary sectors of the economy of the Far North, let alone high-tech developments, or transport.

#### We aren't guests in the Arctic

From 1960 to 1980 the Arctic regions of the USSR were served by helicopters produced by the Mil and Kamov plants. The most well-known were the Mi-4, the Mi-6, and the Mi-10. Then a decade later came the arrival of other members of the Mi- family, including the Mi-8, the Mi-14 and Mi-17. Overall 17,000 such helicopters were built in the period after 1961. More than thirty different air companies in the USSR were actively operating the Mi-8

in even the most severe climatic conditions. Nowadays the extreme polar regions of Russia are served by modified versions of the Mi-8, Mi-26 and Ka-32 helicopters.

It's no coincidence that the Mi-8 came to the forefront when selecting a helicopter to do

the main work in the Russian Arctic. Most experts believed that this model had what was needed to meet the primary requirements for Arctic use. Moreover it was the only helicopter in the world to have flown to both the North and South Poles. Lieutenant-General N.F.Gavrilov, Hero of the RF, was, until



The final phase of the Arctic helicopter assembly



1999, Russia's top military helicopter test pilot. "We really know how to build top-end aviation engineering" said Gavrilov. "When these helicopters had to fly to the North Pole, and the South Pole, they performed exactly as required."

In consequence, the Ulan-Ude Aviation Plant began work on a special version of the Mi-8 family of helicopters, to fulfil a contract from

### Everything begins with the welded body

The principle factor behind all the adaptation processes needed for the helicopter was the need to operate in extremely low temperatures. Heating in the cabin is provided using technologies developed for use in spacecraft. This means that the onboard power supply has to be able to cope with the current demands made by the heating system or drops in power capacity. The advanced



Arctic helicopter in red and black tones

the Russian Defence Ministry in 2013, for use by Russia's military forces in the Arctic. Based on the latest military-transport model of the helicopter, the Mi-8AMTsh-V 'Terminator', experts reworked the craft for the punishing weather conditions – including the low visibility levels of the Arctic night, and locations in which navigation is a touchy job.

power systems of the helicopter enable it to keep flying even if one of the two engines fails. The Arctic version of the helicopter features a ski-based chassis for landings on soft snow or swampy ground.

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. There are sliding doors on either side, and the automatic ramp saves vital seconds for parachute descents.

The on-board technology has been designed and installed by KRET, a radio-technology division of Russian state corporation Rostec, and provides the Mi-8AMTSh-AV helicopter with a non-platform inertia navigation system (SINS). This is the first time a SINS installation has been made on domestically-produced Russian helicopters. This is a new development which enables the helicopter to navigate and carry out missions in the climatic extremes of the Russian Far North.

#### The pride of the civilian and military models

The Russian Ministry of Defence first took delivery of a the new Arctic helicopters in November 2015, when 25 were delivered. It's notable that this was a significant date for the Ulan-Ude Aviation Plant. It marked the 1000th helicopter which the Ulan-Ude plant has produced of the Mi-8 model. The needs of the Russian armed forces might run to 100 craft. This model can truly be called the pride of the civilian and military helicopter models – since it has no equivalent anywhere in the world.

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

“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.

It's planned to release a civilian version of the Arctic helicopter too. “Such a helicopter

8AMTSh-VA is the only Russian-produced helicopter in the race to reclaim the Russian Arctic. Alongside it, Russian Helicopters corporation is looking at remodelling other helicopter models to serve in Arctic conditions. Specifically, the new Mi-38 model is set to be launched in a special Arctic configuration. There are also plans afoot to launch a new series of the Ka-62 passenger helicopter for Arctic use, and the Ministry of Defence is also looking at the possibilities of adapting the Mi-26T2 for use in the Far North.



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.

#### The first of a family of Arctic choppers

Even so, it shouldn't be assumed that the Mi-

It all gives good grounds for forecasting that the upcoming decade of Russian Polar aviation will see a quantum leap forwards, and demand for helicopters adapted to Polar conditions will increase. There is certainly enormous scope for such developments.

**Andrei Vezhnovets**

## LOCAL COLOR

Valdai has been upgraded, with its own airstrip and heli-deck



# Valdai-Avia – from practicalities to the pleasures of life

*...or how to use a take-off/landing airstrip to create a tourism centre*

There's an astonishing place in the North-Western Province of Russia, called Valdai. A beautiful lake, with clean pine-scented air, pristine nature, and its own special atmosphere that's both romantic and wistful, yet simultaneously amazingly creative and thought-provoking. There's probably no other Russian Region that can boast a similar range of forums, festivals, or meetings with the loyal 'residents'.



Today this remarkable region can be reached not only by road – but also by air fans. Very recently this exceptional destination was upgraded to include its own airstrip, which is certain to add to the attraction of the location to tourists.

The forests, lake, sandy shore, fresh air, green horizons and blue skies have seen an addition since spring 2015 – in the sound of planes either landing, or taking off. The location immediately became a firm favourite among pilots, due to its situation almost immediately between Moscow and St Petersburg. Despite its very brief history (so far), Valdai Avia has earned the loyalty of frequent visitors, with flights arriving once per fortnight in an AW109 helicopter. It's not surprising that the airstrip quite quickly grew beyond its purely aviation-related activities, and acquired a number of tourist houses, a car-hire service, some water sports facilities, and even its own bear cub. In fact Valdai Avia has every chance to become a fully-fledged and popular tourist location. The history of its set-up, operation, its plans and prospects for the future were discussed with Helicopter Industry Journal by Valdai Avia's director, founder, and main investor, Sergey SAKOVNIKOV.

#### For ourselves, and for customers too

As very often happens in Russian business, the construction of Valdai Avia began initially 'for ourselves'.



**Sergey Sadovnikov:** *Comparatively recently I took up aviation, flying a Colibri. Of course, it's great – but there's no infrastructure in this region at all. I had to get on with sorting it out myself.*

**Helicopter Industry:** *Did the process take a long time?*

**Sergey Sadovnikov:** *No, not at all. I began it in spring, and by the next spring the landing strip was already ready. Why drag things out, eh? Just lay it out, and build it!*

**H.I.:** *Surely it wasn't so easy to sort out the documentation quickly?*

**S.S.** *There were no problems. I bought the land as a training airstrip, and completed the ownership documents – and that was the whole bureaucracy side sorted. The rest was just a question of arranging the resources.*

But there was a huge amount of work needed – there are a huge number of gullies round about. Of course, it helped to have access to his own construction equipment. Sergey Sakonikov owns his own construction firm, which organises leasing services for heavy road-building and construction equipment.

*The landing strip and heli-deck at Valdai Avia are intended for light aviation – light and superlight aircraft, all categories of helicopters, and gyrocopters. Of course, we don't get so many gyrocopters, mostly because they haven't yet become really popular in Russia.*

*We have two heli-decks, 24 x 24 metres. You can even land heavy helicopters here. There's a safe-distance of 20 metres between the two decks, with grass all round.*





During his career Sergey has also run a crushing plant and a concrete factory. This meant that when it came to Valdai Avia, he was working almost entirely with resources which were his own anyhow. Sakovnikov himself readily admits that “if I'd had to get outsiders in to come and do this for me, it would never have happened. It's just not realistic.” It all means that Sakovnikov was a very lucky find for Valdai.

Of course, he had exactly the right professional background for the project – from the original concept, through to the required standards for quality-control to the level required. The asphaltting of the runway has been assessed by Russian and foreign pilots alike as being the highly possible standard.

**S.S.** *The asphalt surface is completely flat, and laid with a durable asphalt coating. Trainee pilots love to train here, especially from St Petersburg, which is just 300 kilometres away. And people come from Moscow too.*

The conditions which Sakovnikov has set are particularly democratic. There's no charge for taking-off or landing. “Well, I built it for myself anyhow, so I don't really mind. I'm happy for people to use it”. And use it they do – many on a regular basis. For example, once each fortnight Valdai Avia lands its own Agusta-109. Pilgrims going to the Iversky Monastery also land here – since, of course, landing or taking off at the monastery itself isn't permitted.

**S.S.** *During the last tourist season – which wasn't even a full season, since we only opened after the start of the season – Valdai Avia received around thirty craft, 20 planes and around 10 helicopters. And this isn't including those who came several times – some came 5-6 times. We had people coming here in gyrocopters from Cherepovets, Orlivka, and Kronstadt – even though there are very few gyrocopters in Russia overall.*

### A hairy mascot

But everyone will agree that it's not every landing strip which can be turned into a tourism centre. Here, it was the wonderful nature of the local landscape, and its gentle climate, which made the extension into providing tourism facilities possible. Somehow facilities like the accommodation for visitors, car-hire (currently only one car is available) and water-skiing facilities just appeared 'by themselves', as Sergey Sakovnikov says.

The most unusual attraction of Valdai Avia must be the bear-cub named Misha – well in fact, his full name is Misha Sergeevich. He wandered into the Valdai Avia site when aged one-and-a-half, and decided somehow to stay. He's grown quite a lot, and is now a kind of hairy mascot at the site, where he happily engages with the guests.

### Service comes next

There are a number of upgrades planned at the landing strip currently – as a result of which it will extend to 700 metres, plus being rolled-out a further 100 metres in each direction. It all enables larger aircraft to make use of the landing facilities. “Sure, of course a Boeing couldn't touch down here. But twin-engined Aztecs will find it easy. We're expanding the options here.” says Sergey Sakovnikov.

Another issue which is under current development is providing aviation fuel.

**S.S.** *We're getting together the documentation to provide a fuel service. The lion's share of this process has been taken on by the head of JSC Aviaservice, Mr Sergey Gordeyev, and we're very grateful to him for this. While the situation is still being finalised, we're using fuel sent from elsewhere.*

Another main issue is the Rosaviatsiya report on flight frequency in the region. This could give the airstrip operator an operations certificate – giving the right to offer a dispatching service that would lift the services for pilots onto an even higher level.

**S.S.** *The only remaining issue is providing the services – but as you can imagine, that's an endless process. Next season we are planning to open more accommodation facilities for guests – currently we only have one two-person room. We'll be opening a car-parking space, a filling station, and a tourist facility for pilots. At the moment we only have one car available for hire, a Chevrolet – but if we see a need, of course we'll provide more. It's obviously very convenient – you land your helicopter and park it, then get into a car, and set off into the countryside to enjoy the beautiful environment. And really there's a lot of environment to enjoy! There's the forest, we have 186 different lakes, and a National Nature Park. Access is easy – our airstrip is located just 200 metres from a main highway. Everyone's happy – they like the quality of the runway, and the surrounding landscape too. Overall, we just have to do the work, because all the facilities are already here.*

Sergey Sakovnikov tries to keep up with all the latest news in the aviation industry, “since I'm already involved in the aviation business”. He goes to exhibitions and conferences to watch the latest trends. This was what caused him to fly to Moscow in May 2015, to visit the HeliRussia exhibition.

One project which is being actively discussed is the idea of an inter-regional gathering for pilots of small aircraft. There are many proposals, but competent management of the event will be needed, and experienced flight leaders, so that all safety procedures run at the highest level.

**S.S.** *From our side I can guarantee economic support – but we need experienced experts to provide the rest. There's no place for amateurism in this. Everything needs to be run on a professional and competent level. Dialogue is welcomed – so come along, we can go flying, and talk things through!*

Report prepared by  
Maria Scherbakova