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The present and the  
future of Russian  
HEMS





# HeliRussia

**– Helicopter Exhibition  
Number One on Eurasian  
Market**



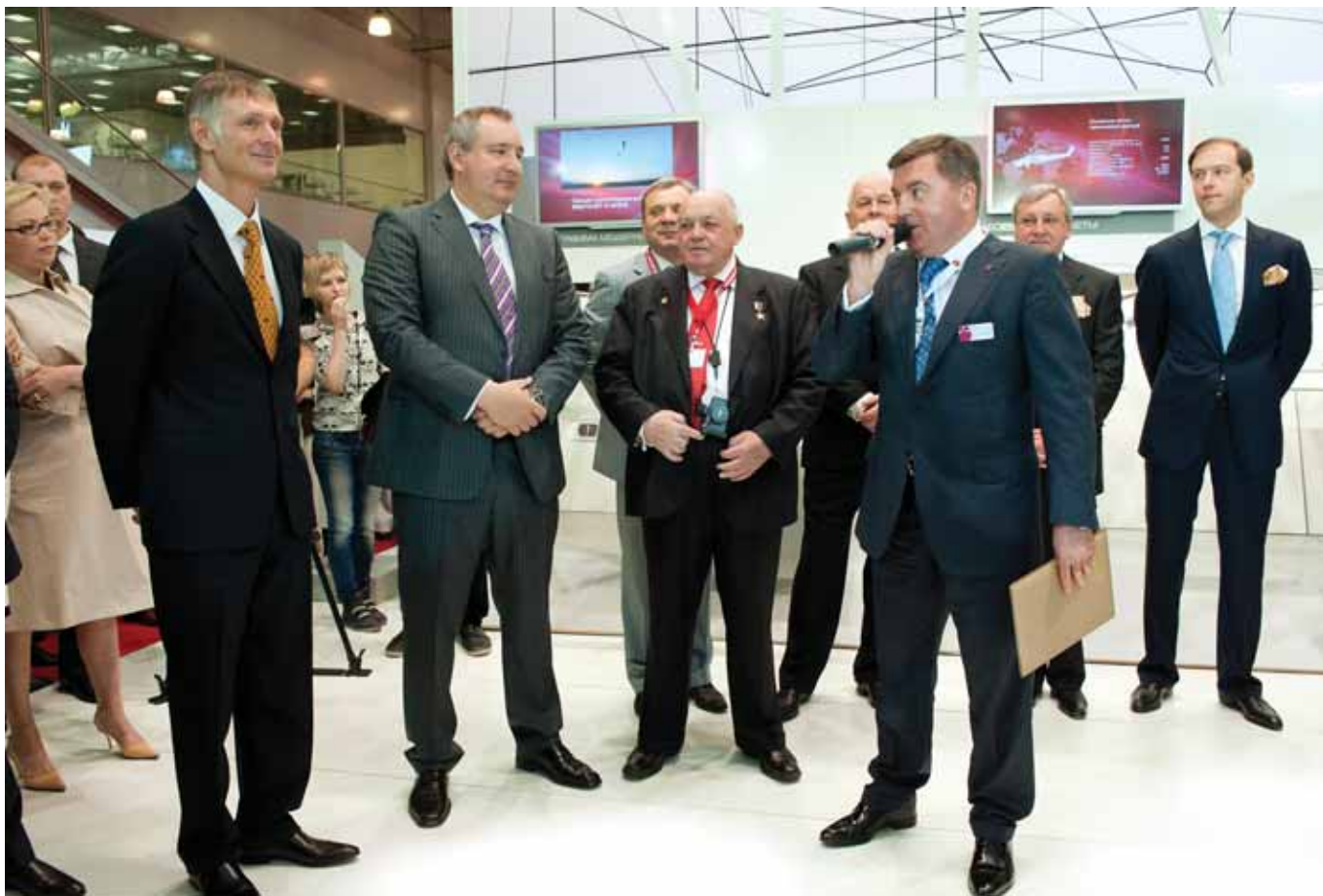

## HELIRUSSIA 2012

**International helicopter industry exhibitions are an integral part of the world rotary-wing technology market, where a manufacturer can show, and a customer can see the product and make a purchase or an order on the spot. The importance of, and the demand for such forums has been growing over the past years, and new opportunities for solving the most diverse issues facing the helicopter community appear.**

A clear revival of the world helicopter market has been noticeable over the past years, which was confirmed by the results of the last year's largest and oldest International helicopter forum, the HELI-EXPO 2012. This statement fully relates to Russia. In this country, the achievements of the helicopter industry are exhibited at HeliRussia. This national exhibition is still quite young, but its popularity is growing every year. Suffice to say that, five years since its inception, the number of participating companies has almost doubled.

More than 7 thousand people visit the exhibition annually. Among them many top level politicians and state officials of the Russian Federation and other countries, foreign military representatives, as well as businessmen and helicopter sport fans.

HeliRussia not only allows to expose the achievements of the Russian industry, but also attracts the best companies of the world to the Russian market, and promotes the development of international cooperation in the helicopter industry.



The annual growth of the number of HeliRussia exhibitors occurs mostly on account of foreign companies being attracted by the forum. On the one hand this fact shows the openness of our market, and on the other hand – the keen interest on the part of the major players of the world helicopter business.

It provides the opportunity to meet the industry leaders, company directors and to discuss matters of cooperation and interaction. The exhibition is a perfect platform for communication with foreign partners, where Russian participants can set the tune for the dialogue. And today, according to experts' research, HeliRussia confidently takes the first place in the Eurasian helicopter industry market. The appearance of such a forum in our country has obviously affected the whole native helicopter industry. So, during the years of the HeliRussia exhibitions, since 2008 the production of Russian rotary-wing aircraft has increased by 55%. And so far, the Russian helicopter industry is one of the few branches of the domestic engineering that shows a continuous upward development trend over a long period of time.

Moreover, after the formation of the "Russian Helicopters" holding, the strategy of development of the domestic helicopter industry was worked out and is now being realized. And the results became obvious pretty quickly. When it comes to numbers, last year Russian Helicopters manufactured more than 300 helicopters for the total amount of 150 billion rubles. The order portfolio of the corporation has increased considerably and came to 859 helicopters, and the value of the firm orders portfolio reached 330 billion rubles. At the same time, there are no visible trends of the production rates slow down: in 2013 the Russian Helicopters enterprises are fully loaded with contracts, at almost 100%. At such growth rates and the existing demand, the assigned task to bring annual helicopters production output to 450 – 500 machines by 2015, is quite feasible. Such a dynamic restoration of the helicopter industry positions, which is one of the leading high-tech industries, will further promote the development of the national economy and help make it a high-tech one.

Whereas in the early 2000s, the Russian helicopters's share in the world was

estimated at only 3%, today the volume of deliveries took us up to a whole 14% of the world market. Now we account for 9% of the of civil helicopter market and 22% of the military segment of the world helicopter market. According to the experts of the Rosoboronexport State Corporation, the sales volume of helicopters increased twelve times over the past 10 years. Russia has sold abroad over 400 military helicopters from 2001 for 2012.

The demand for Russian helicopters today is so high that it is now considerably exceeding the production capacity of the factories. That's why the "Russian Helicopters" holding carries out a high tempo modernization program for manufacturing. For example, the order portfolio of the Kazan helicopter plant, thanks to the efforts of Rosoboronexport and the contract with the Ministry of Defence of the Russian Federation, is completely full for the next 2 years. All the helicopter technology supply contracts under the State Defense Order, are concluded till 2018.

The development of the helicopter design and production is one of the priorities of the Government of the Russian Federation. The necessity of helicopters for Russia is self-evident: Russia lags be-



hind the leading countries in the quantity of civil helicopters per capita. Whereas in Canada, there are 56 helicopters for 1 million inhabitants, in Russia there are 14. In total, the civilian helicopter fleet in Russia is about 2 thousand aircraft, which does not satisfy the country's requirements. The demand for Russian helicopters is great both at home and abroad. Helicopters is one of those few products of the Russian engineering, that is today used in over 70 countries of the world.

By the way, it is exactly the shortage of rotary-wing machines over our vast open spaces, that is the most attractive factor for all leading world helicopter manufacturers. And here HeliRussia allows the foreign companies not only to show their presence and to judge the changing quality of the Russian helicopter market, but also to actively promote their own products.

Last year, the overseas machine import into Russia peaked. The indisputable export leader to our country was and is the Robinson light helicopter. Just one distributor of this company in the Urals, the Ural helicopter company "URALHELICOM", supplied 25 aircraft of this manufacturer, and the Moscow "Aerosoyuz" has doubled the deliveries compared to a year ago.

But, despite this, the Russian helipark is also quite actively reinforced with

medium class foreign helicopters. The Eurocopter company takes the lead here. Last year 16 helicopters were delivered to Russia, among them: AS 350, AS 355, EC 120, EC 130, EC 135. More than one hundred helicopters of this producer are operational now in our country. Eurocopter differs fundamentally from its competitors – their Russian park structure consists not only of private owners, but also of government organizations (the Ministry of Emergency Situations, the Ministry of In-





ternal Affairs, the Moscow Firefighting Service) and commercial operators, including oil and gas companies ("Utair", GAZPROMAVIA). Last year five Eurocopter helicopters were delivered to Russia by other companies as well. Thus, the number of Eurocopters in the country has increased to 21 machine.

The AgustaWestland company also feels not bad in the Russian market. It has supplied seven helicopters to Russia, among them: AW139, AW119, AW109 models. And in February this year AgustaWestland got the first Russian order for the AW169 and AW189 helicopters. In general, this company wants to grow deep roots in our country, and is

going not only to sell the products, but also to manufacture in the territory of Russia. The Bell Helicopter company, that had slowed down a couple of years ago, is back on the increase. Eight Bell 407 and Bell 429 helicopters had been delivered to Russia. And finally, speaking about "monsters" of foreign helicopter engineering, one cannot help mentioning the famous Sikorsky Aircraft. However, this company is just planning to enter the Russian market. It is known to actively advance here the S-76, S-92 and S-300C helicopters at the moment.

So, the Russian helicopter market has been considerably activated. Last year medium helicopters of foreign production

were supplied to Russia in the amount similar to Robinson in 2011, namely – 36. There are twice as many Robinson helicopters now than a year ago. Thus, all foreign producers of helicopters: both Eurocopter and Bell Helicopter, and AgustaWestland and, certainly, Robinson are getting on quite well in the Russian helicopter market. So it becomes obvious that the interest of the world leaders of helicopter engineering for the Russian market is not only stable, but is increasing. And it is significantly promoted by HeliRussia that annually gathers and exposes all that is best and available in the helicopter world today.

**Dmitry Gnatenko**



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# International cooperation and the localization of production

An Interview with Yuri Slusar, Russia's Deputy Minister of Industry and Trade

*The leadership of the Russian helicopter industry has been constantly adjusting its plans concerning the product line as well as the promotion and production of helicopters since the program to transform the industry*

*began in 2008. What is the ministry's position on where the industry is going? What sorts of changes does the ministry want to see in the medium term?*

The main vector of the industry's development hasn't changed much. Helicopter manufacture is an important factor in the development of Russia's regional economies. Ever since the performance indicators of the helicopter



industry began to improve, plants in Tatarstan, Buryatia, Bashkortostan and Rostov-on-Don have been catalysts for economic growth and contributed to an increase in the gross regional product. The industry still has a huge impact on the development of a number of related industries, such as instrumentation, engine-making and so on.

As for the constant adjustments being made to the plans, they are mainly due to changes in the global market and the quite natural position of the manufacturer, Russian Helicopters, which reacts quickly to the situation and seeks to strengthen its position on the competitive global market.

As for the industry's medium-term prospects, I would point out two things: international cooperation and the localization of production. Russia is developing its domestic industry while actively pursuing international cooperation, which gives buyers more choices and helps us to improve our product line for our customers around the world. Meanwhile, China, India and Brazil are becoming global players alongside the United States and the European Union. We collaborate with companies such as AgustaWestland and Eurocopter in manufacturing. The plant in Panki has begun to assemble the AW139, AgustaWestland's most popular model. We're planning to build the Ansat helicopter as part of a joint venture in China and jointly design and build a heavy helicopter. We can start building certain models of foreign helicopters in Russia to fill gaps in our product line. Eventually this will mitigate the problem of depending on imports of light helicopters.

***Russian manufacturers are exporting more and more helicopters, but still not selling many to domestic companies. Are there any plans to stimulate the development of the internal market through tax breaks and special financing terms?***

The domestic market is developing under the direct influence of the world aviation services market.

Successful export-oriented companies had no problems in the 1990s and 2000s offering financing and leasing programs to facilitate purchases of new Russian helicopters. They were able to find financing. On the other hand, those

that were focused on the domestic market need to upgrade their products. These issues are being worked out not only by the Ministry of Industry, but also the helicopter community and the Helicopter Industry Association. Someone suggested going back to building the Mi-8T for the domestic market, as it is more affordable for Russian companies and would allow them to update their fleets after many years of using old helicopters. Accordingly, these steps will be taken. Of course, the time is right for such a program.

One of the goals of the Russian government program called "Developing the Aviation Industry in 2013-2025" is to help domestic airplane and helicopter manufacturers to meet the country's aviation needs. The program includes measures to improve the regulatory framework across the industry, including issues concerning the development of mechanisms for loan financing, export financing and interest rate subsidization on commercial loans, subject to the requirements of the WTO. These issues are currently being worked out with the Finance and Economic Development ministries.

***Some Russian helicopter manufacturers and operators are going to attend the Heli-Expo exhibition in Las Vegas. What are the prospects for Russian helicopters in developed countries, including the U.S.? How important are those markets for Russia?***

Heli-Expo is one of the world's top exhibitions. All the top manufacturers from around the world attend it.

Russian companies need to be there to demonstrate their global contribution to the world helicopter industry and talk about their ambitions.

Marketing Russian helicopters in Europe and the U.S. is also important because highly competitive markets are the only places where we can test and confirm our competitiveness. This spurs us to create competitive products as we gain experience in marketing, serious experience in certifying products on Western markets, and in preparing and conducting advertising campaigns. All of this makes us stronger and contributes to the promotion of our helicopters on other markets.

***by Vladimir Orlov***

**The Russian Ministry of Industry and Trade is the federal executive body that makes policy and devises regulations governing industry, the military-industrial complex, aviation technology development, technical regulation and the establishment of standard units of measurement, and is the authorized federal executive body that regulates foreign trade.**

**The current Minister of Industry and Trade is Denis Manturov, who was appointed in 2012.**

**Yuri Slusar**, Deputy Minister of Industry and Trade, previously served as Head of the Aviation Industry Department.

Born on July 20, 1974 in Rostov-on-Don, Mr. Slusar graduated from Moscow State University in 1996 and holds a Ph.D. in economics.

As Deputy Minister, he currently coordinates work and exercises authority in the following areas

- Industrial policy concerning aviation, radioelectronics, bioengineering technologies, chemicals, pharmaceuticals and the medical field;
- Preparing programs, strategies and plans concerning development efforts in civilian industries, including short-term and medium-term industrial development forecasts;
- Industrial investment policy in the specified area;
- Modernization, technological development and stimulating innovation in industry in the specified area.

# Robust, Multi-Purpose and Quality - The Advantages of the Russian Helicopters.

Russian helicopters presently occupy up to 14% of the global helicopter market and as the trend continues towards growth in the manufacture of helicopters the following question seems logical: can Russia repeat the success of the USSR during 1970-1980 when it occupied up to 30% of the global helicopter market ?





## The Aim – One-third of the market

Based upon the growth in helicopters manufactured by the Russian factories year on year, this seems a feasible goal to achieve. Since 2004, when only 85 helicopters were produced in Russia, the number had risen to 262 aircraft by 2011. It is also worth remembering that Russia has remained the market leader in several segments of global helicopter manufacturing including helicopters in the medium and heavy classifications. Additionally about 5200 Russian helicopters of all types have been in operational service in more than 80 countries. So, the possibility of achieving a third of the global market cannot be considered unrealistic.

However, just the quantity of helicopters being manufactured cannot serve as an indicator or hope a guarantee for success in the global market. The quality of the helicopters is also a very important factor to success. Russia enjoys an undisputed advantage with decades of manufacturing low maintenance affordable helicopters behind it. The established Russian helicopters from the "Mil" and "Kamov" companies are perfect platforms for potential modernization programs.

## Hope for the Medium class Helicopter

What can Russia offer in the global market ?

Today Russian Helicopters offer a diverse range of multi-purpose Russian helicopters in all of the weight classifications; capable of performing an array of tasks ranging from passenger service, commercial operations to specialist operations in support of disaster relief. In the light weight classification are the Mi-34S1 and Ansat, in the medium weight classification by the Mi-171, Ka-32, Mi-38 and a new design in the Ka-62. In the heavy weight classification the Mi-26 is available.

Today's helicopter operators are looking for multi-purpose, flexibility and reliability combined with an affordable purchase price and low operating costs as top priorities. Russian Helicopters see the most flexible segment as the medium weight classification and has focused its commercial aircraft in this class of helicopter.

The Mi-8/17 series has been a huge success story and is the most widely operated of the Russian built helicopters and their many different configurations account for nearly 60% of the total sales volume for Russian Helicopters Holding.

The company's primary focus is the medium multi-role Mi-171 used in passenger and cargo transportation. This helicopter has a 4000kg (8800lbs) payload capacity or can carry 37 passengers and has a range of 610Km (330miles) at a maximum cruise speed of 250kph (130knots). The Mi-171 is available in a number of variants and has improved its capabilities with the introduction of modern technologies including a glass cockpit and an integrated avionics suite produced by the Russian company Tranzas.

The twin engine, co-axial Ka-32A is a direct replacement for the Ka-27PS naval helicopter and has been developed specifically for civilian operations building on the success of the earlier Ka-25 and Ka-27 aircraft that also operated from ships. The flexible capability of the Ka-32A provides opportunities for a growth in sales in the new worldwide helicopter markets. The lack of a tail rotor means the Ka-32A is capable of lifting loads of 5000kg (11000lbs) externally and at higher OGE hover ceiling. The all-weather, multi-purpose helicopter of this classic co-axial configuration has been employed in a wide variety of missions: passenger and cargo transportation, search and rescue, high-altitude construction projects and fire-fighting. In 2009 the

Ka-32A11BC was granted type certifi-

cate by EASA, allowing commercial use by European operators.

The new multi-purpose Ka-62 has been designed by the Kamov Design Bureau using new technologies and materials. The aircraft is a single-rotor design with an enclosed anti-torque tail rotor system and the airframe and rotor blades are manufactured from over 60% composite materials. The new design has pro-

## Experience Matters

The Mi-8/17 family of helicopters is currently operating in such extreme environments as the Sahara desert and the frozen Antarctic and their operational reliability is very high. Typically the aircraft are often serviced and parked outside even in the most severe temperatures of the Far North. Despite this they can be

now considerably higher alongside a growing global service network that Russian Helicopters have in place.

## Specific Helicopters – Specific Parameters

Mi-171A2, also known as Mi-171M, is a complete modernization of the Mi-171 helicopter. The development of this new



duced a helicopter with improved efficiency, high cruise speed, reduced fuel consumption and a decrease in maintenance man-hours. The Ka-62 will be able to carry an external payload of

2500 kg (5500lbs) or 16 passengers in the cabin and a medical rescue variant is also being developed and will be fitted with a 300 kg lift capacity winch.

The Ka-62 will be powered by two French built Turbomeca Ardiden 3G engines.

This highly reliable engine is of a modular design and has dual channel Full Authority Digital Engine Control (FADEC) and has the added benefit of exceptionally low fuel consumption. The helicopter will also be equipped with a Tranzas glass cockpit and the first flight of the Ka-62 is scheduled for August 2013.

started with no difficulty at temperatures below -30 degrees, although at -10 degrees the operations manual stipulates that the main gearbox preheat is required before start-up. The new helicopters will inherit all the best features of the unique Mi-8/17 and the newly designed Ka-62 will also not require compulsory hangarage in such conditions.

Being able to keep helicopters outside when not in use has another important advantage as the operator does not necessary have additional purchase and operational costs for ground handling equipment. Taking into account the rotational operations of most multi-purpose helicopters and add to that extreme climatic conditions, the list price of ground handling equipment can add

10% to 15% to the helicopter purchase price. So the attractiveness of robust and low-maintenance Russian helicopters is

helicopter is based on the Mi-171A1, manufactured by Ulan-Ude Aviation. The modernization programs is aimed at improving the performance of the helicopter by reducing maintenance and flight per hour costs along with a significant increase in the time between servicing by the use of condition based monitoring.

The Mi-171A2 will be fitted with new powerful and efficient engines, which will increase cruise speed to 260kph and extend the operating range, without long-range fuel tanks, to 800 km (500 miles). The increase in shp will also increase the external sling payload to 5000 kg (11000lbs). Directional stability will significantly improve operations in cross-wind limits with the installation of an X-shaped tail rotor system. The aircraft will also have composite main rotor blades, a reinforced transmission and a LCD multi-functional display integrated avionics

suite. The all weather VFR and IFR Mi-171A2 is expected to be certified in Russia in 2013 followed by the first customer delivery in 2014 and will be able to operate in temperatures from -50 to +50°C.

The Ka-32A11BC medium multi-role helicopter has now been certified in a number of countries including: Russia, Canada, Spain, Portugal, Switzerland, China, Austria, South Korea, Indonesia and

ing the annual HeliRussia exhibition.

During the design process extensive work was carried out to minimize the aircrafts aerodynamic resistance and reduce the aerodynamic efficiency index to four. This was achieved with the use of improved fuselage profiles and a new main rotor blade design. This has resulted in a decrease in fuel consumption combined with an increase in cruise speed and load

ply the KBO-62 avionics suite, built around two 12.1-inch TDS-12 primary flight/navigation displays and two 8.4-inch TDS-84 multifunction displays. Also included are the TTA-12H terrain awareness and warning system, two TNC-1G flight management systems with built-in Glonass/GPS sensors and a four-axis autopilot. The helicopter will also be equipped with a health and usage moni-



Brazil. The South Korean Coastal Defense and Forestry Protection Service operate a fleet of 32 aircraft and in Latin America the Ka-32 is operated in fighting forest fires and developing the industrial infrastructure in Peru and Brazil. The Ka-32 has also been effectively used in the worldwide construction industry for installing high-level structures. Brazilian Ka-32 operator, Helipark Taxi Aereo, President João Velloso, said "The Ka-32A11BC demonstrated outstanding performance in the tropical humidity and high temperatures of Brazil. We witnessed this when we saw a Ka-32A11BC of the Canadian company, VIH, operating in Brazil. The reliability and load capacity of the Ka-32A11BC are impressive compared to other helicopters of a similar class,"

The new transport and passenger Ka-62 has become a headline grabbing helicopter with its stylish design at worldwide aviation trade shows, includ-

ratio, all improving the overall operating efficiency. Designers have also worked particularly hard to reduce the helicopter's environmental footprint.

The Ka-62 has a five blade main rotor system, dual hydraulic system, integral anti-icing and fire-fighting systems plus an enclosed tail rotor system providing protection from accidental damage. The aircraft has been designed to meet current international flight safety regulations such as single-engine operation. In case of a hard landing, injury to passengers and crew has been minimized with the installation of a number of safety systems including: an energy-absorbing wheeled landing gear and shock adsorbing seating in the cockpit and cabin. Flight testing is expected to begin in 2013 and the new helicopter will be produced by the Arsenyev Aviation Company in Eastern Russia.

St. Petersburg based Tranzas will sup-

porting system (HUMS). The export version will be powered by two Turbomeca 1750 shp Turbomeca Ardiden 3G engines providing a maximum take-off weight of 6500kg (14300 lbs) at a maximum payload of 2400kg (5290lbs), and will have a range of 650 km (400 miles) and a maximum cruise speed of 290 kph (157 kts). Brazilian operator Atlas Taxi Aereo has placed the first export order for seven aircraft with deliveries starting in 2015.

All of this work over recent years means that in the medium weight helicopter classification Russia has a lot to offer the global helicopter market with their two well established multi-purpose helicopters, the Ka-32A11BC and Mi-171A2. Now with the new Ka-62 they are adding a new level of luxury and high quality to the range, making Russian helicopters one of the best value-for-money commercial products in the global helicopter market place.



# Russia's Ka-32A11BC

## Becoming a Global Symbol of Helicopter Firefighting

The multipurpose Ka-32A11BC civilian helicopter with coaxial rotor continues to conquer international markets. Built in the Republic of Bashkortostan, Russia, by Kumertau Aircraft Production Enterprise (Kumapp), which is part of Russian Helicopters Holding Company, the helicopter is unequalled in many applications. In addition to transportation and patrolling, it can be used for search and rescue missions, as a flying crane for very complex erection work, and is one of the best fire helicopters in the world.

The Ka-32A11BC has demonstrated unsurpassed capabilities in firefighting,

especially in mountainous areas and densely-built urban environments at the level of the top floors of high-rise buildings. The Ka-32A11BC is highly configurable with more than 40 different options available, including Bambi-Bucket and Simplex fire-fighting systems of various capacities, water cannons for horizontal fire-fighting, turret water cannons and stowable lifting cabins for transportation and rescue operations. In the early 2000s, Kumapp in Kumertau developed a horizontal telescoping water cannon for the Ka-32 series that can shoot a stream of water about 40 meters. The first production Ka-32 helicopter with a water cannon of this type

was delivered to South Korea in November 2005.

With every new mission, pilots learn more about the unique capabilities of the Ka-32A11BC helicopter. For example, it can put out fires in dense urban areas that are out of the reach of fire trucks, as was demonstrated at the Moscow City Complex where, in April 2012, one was used to put out a fire that had engulfed over 300 square meters of a skyscraper at a height of 67 floors (270 meters). It's no exaggeration when the company's engineers claim that the Russian-built 32A11BC fire helicopter with horizontal water cannon can extinguish a fire even

higher up, such as in the upper floors of the Burj Khalifain in Dubai, which is 828 meters tall and has 163 floors.

Today, more than 140 Ka-32A11BC helicopters are being used in more than 30 countries. The Ka-32A11BC meets the Russian standard AP-29, Western standards such as FAR 29, and is EASA certified. Compliance with Western standards means that it is marketable anywhere.

International certification is also conducive to design improvements. Many significant design changes have been made since the helicopter was certified in the West. It now has an innovative bi-cameral PC-60F booster, an improved control and hydraulics system and improved propulsion systems (including the fuel system, fire protection, APU and gearbox). The instrument panel, autopilot and alarm system have been refined. The composition of airborne equipment has been changed, a number of additional bench and flight tests have been performed, and the documentation has been completely revamped.

As a result, the helicopter was certi-

fied for use in Canada in 1998. The certificate was amended to allow the conveyance of public officials in 2006. Certification for use in Mexico was obtained in 2005, followed by Chile and South Korea in 2007, and Japan, China and Indonesia in 2008. The European EASA.IM.R.133 certificate was obtained in 2009. Since 2011, the helicopter has been certified for use in Brazil and India. Finally, in 2012, the Ka-32A11BC was the first Russian helicopter to be certified for use in Australia. This will allow Australian operators of helicopters to use the Ka-32A11BC in search-and-rescue, fire fighting, external load work and construction/erection work.

The first production Ka-32 helicopter was built in 1980, and the current model, greatly improved after all these years, is operated on many continents, in all climates and in a variety of capacities. Ken Hopu, President of Vancouver Island Helicopters Logging (VIHL), whose company once acquired two of them and has substantial experience using them, says frankly, "We use both the Ka-32 and S-61 models and have found the Ka-32 to be

more productive. It can carry more than the S-61, is more stable, can turn around faster when bringing down a load, and is powerful enough to lift its rated load on a hook vertically."

His assessment is in line with the ever growing popularity of the Ka-32A11BC. The number of orders for the helicopter is on the rise. In March 2011, one Ka-32A11BC was delivered to Brazil with an option to buy two more machines. In Brazil, the Ka-32A11BC is currently one of the few helicopters that is maneuverable enough to drop water along winding edges of fires and transport heavy equipment in disaster mitigation situations. The Ka-32A11BC is used in Spain in firefighting and search-and-rescue missions. The certification of the Ka-32A11BC in Australia in 2012 was a major step forward because of the constant need there for specialized helicopters that are versatile and reliable for fighting wildfires, among other things.

The Asian market looks very promising for the Ka-32A11BC. In October 2011, Russian Helicopters and the General





Public Security Directorate of the city of Ordos in China's Inner Mongolia Autonomous Region signed an agreement for the supply of one Ka-32A11BC medium-sized multipurpose helicopter fitted out for firefighting. On May 4, 2012 the Emergency Situations Ministry of the Republic of Kazakhstan acquired two Ka-32A11BC multi-functional rescue helicopters. Those in the know say this order was completed in a short time, as the helicopters were delivered under a contract signed on August 15, 2011. In 2012, Kumapp signed a number of contracts with its Chinese partners for the supply of an additional batch of Ka-32A11BC helicopters fitted out for firefighting for China's Public Security Ministry, the city of Shanghai's Public Security Directorate, civilian operators and airline companies.

Beyond a doubt, the Ka-32A11BC is an excellent Russian-made multi-purpose helicopter and a significant export product that is popular worldwide.

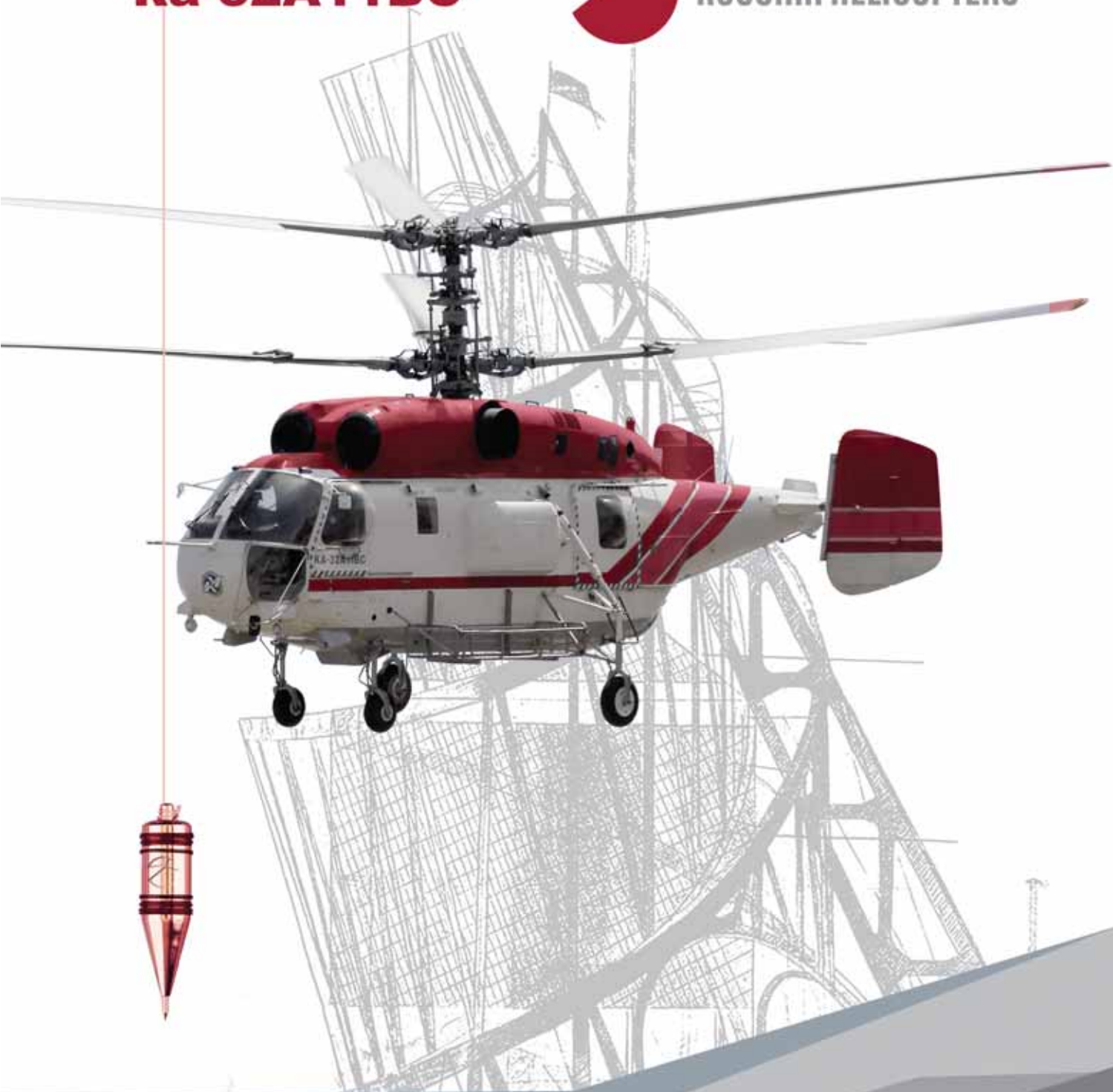




**Ka-32A11BC**



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# The present and the



## Exchange of experience and prospects

The 2nd Interdepartmental Conference on Russian Air Ambulances and Medical Evacuation will be held from May 16-17, 2013 in Pavilion 1 of Crocus Expo in Moscow as part of the business program of the 6th HeliRussia 2013 International Helicopter Exhibition ([www.helirusia.ru](http://www.helirusia.ru)). The conference is being organized by the Helicopter Industry Association, Mobile Medicine LLC and HeliRussia.

# future of Russian HEMS



The organizers of the conference are providing an open forum for government officials, air ambulance service providers of various forms of ownership, designers, manufacturers and certifiers of medical evacuation aircraft and medical equipment to discuss a large range of issues associated with efforts to revive medical evacuation services in Russia.

Last year, the scientific program of the conference was attended by representatives of the Russian Ministry of Health, Ministry of Transport, Emergency Situations Ministry (Emercom), the Federal Air Transport Agency, the Interior Ministry,

[www.helicopter.su](http://www.helicopter.su)

Ministry of Defense, Russian Helicopters Company, United Aircraft Corporation, the All-Russia Center for Disaster Medicine ("Zashchita"), the Federal Medical-Biological Agency, the Moscow Institute of Pediatrics and Pediatric Surgery, the All-Russia Scientific-Research and Testing Institute for Medical Technology (part of Roszdravnadzor, the health oversight service), scientific associations, businesses and non-profit organizations.

Noteworthy among the attendees was Pavel Muller, President of the European HEMS and Air Ambulance Committee (EHAC), who spoke on "Helicopter

Ambulance Services in Europe."

By gathering many stakeholders in one place, it was possible to discuss the full range of emerging issues, share experiences and get the latest information in a friendly and constructive atmosphere.

The attendees were by and large pleased with how the conference was organized, which is why the conference program will be expanded in 2013.

The two-day conference format includes symposia, round tables and workshops on helicopter ambulance technologies led by leading Russian experts.



## New helicopters, new experience

Evacuations by aircraft are the most important component of disaster medicine. Everybody knows how crucial air evacuation is to Russia, with its vast distances and poor land transport infrastructure. But even in Moscow, you can count on two hands the number of aircraft in the air ambulance fleet. Nationwide, there are no more than a few dozen. It is very telling that there are 6 air ambulance helicopters that are actively being used in Moscow, no more than 10 under separate permits, and 10 landing sites (including airports, a heliport and helipads). For comparison, Paris has an active fleet of 150 helicopters and 104 helicopter pads. In New York, the figures are 350 and 137, respectively.

Creating a full-fledged, regular air ambulance service depends on many factors: What will it cost per hour of flight and who will pay? Will licensing be required? Will foreign-made helicopters be available?

Nevertheless, there are already good examples of success in the air ambulance field. In particular, the government-run Moscow Aviation Center (MAC) has produced an optimal flowchart from the standpoint of the law and everyday practice.

The MAC has been evacuating victims in Moscow and the Moscow region since 2009.

The center has three VK-117S2 helicopters that are fully equipped to provide emergency medical care. This includes removable medical insoles, medical kits and

a mattress. The walls of the helicopter allow personnel to quickly change the helicopter, for example, from ambulance-type to rescue-type (for which there are mounted a winch and external sling) or passenger-type.

The VK-117S2, which can carry two patients on stretchers, one seated patient, two doctors and a rescue worker, has first-class flight characteristics. It is fitted out in a way that ensures safe take-off and landing, even in adverse conditions: outside the air cushion zone and in areas of the city without helipads.

The MAC is convinced that the VK-117S2 is optimal for the missions on which it is used. Its maximum take-off weight is 3583 kg and its rotor diameter is 11 m. It has a maximum altitude of 5480 m, a maximum range of 640 km and maximum flight duration of 3.5 hours.

In emergency (or even extreme) situations, the helicopter demonstrates the same capabilities as in normal mode. The VK-117S2 can hover at the height of the surrounding buildings as well as take off and land if one engine is damaged. There have been no mechanical failures during three years of operation. This again confirms the correctness of the choice of helicopters. A total of 5480 flights were made in Moscow from 2009 to 2012, totaling 1791 hours and assisting 1,668 people. In Moscow region, there were 285 flights, and 167 people were assisted.

The crew consists of two pilots, which is the minimum. One of them is the commander of the crew, while the second is

the co-pilot. The medical team consists of an emergency doctor and a resuscitating doctor from the Center for Emergency Medicine (CEM) who is also a qualified rescue worker. He or she is responsible for deciding whether to transport the patient. Together, they provide medical treatment during the flight, each in accordance with his or her professional qualifications.

The work of the MAC consists of "providing medical assistance using aircraft." Their work is regulated by a number of documents, first of all, an air operator certificate and a license from the Ministry of Health and Social Development of the Russian Federation. The latter is required for using the certified medical equipment on board the helicopter and employing the resuscitator. These two clauses made it possible to expand the scope of the work and ensure life support in transit.

Victims and patients are evacuated under an agreement signed between the MAC, the Moscow Health Department and the Head Office of the Russian Emergencies Ministry (Emercom) in Moscow. The duties of the parties are delegated as follows. The CEM analyzes the information that it receives during emergency calls, separates out the calls that require the use of helicopters, submits a request to the MAC for a mission, provides the helicopter crew with medical supplies and communications equipment, determines the destination hospital, issues orders for the hospitalization, and delivers the patients from the helicopter to the hospital.

For its part, the MAC is responsible for

the readiness of the aircraft and crews for missions, keeping a duty officer on duty at all times, dispatching properly fitted-out ambulance helicopters at the request of the CEM, getting permission from the authorized bodies, admitting and dispatching helicopters, maintaining the MAC's helicopter pads at the hospitals and making sure that the personnel of the CEM being flown are insured.

Each party bears its own costs. Since the MAC is a government agency, all of its costs are paid out of Moscow's budget. Transportation is provided to the public free of charge.

### Military-like readiness

The team takes seriously the instructions which, just like the agreement, were adopted by the Head of the Moscow Head Office of Emercom and the Head of the Moscow Health Department. The instructions include a flowchart of the actions of all the participants. In day-to-day practice, the routine is as follows:

Every day, a helicopter use request is submitted for missions within a 250 km radius of Moscow. The permanent helipad where the helicopter flies daily is located at City Hospital No. 15. This helipad and the helipads of clinical hospitals in the suburbs are equipped with control stations, alarms, navigation equipment and indoor space where crews can rest between flights.

The request is received by the duty officer by phone (from the phone numbers 01, 03 or 112) and subsequently confirmed by fax. If the incident is local, it goes through the senior doctor of the operations section of the CEM. If the incident is systemic in nature, the request goes through the senior duty officer of the Moscow Crisis Management Center. If an incident occurs outside the city, it goes through Emercom's Crisis Management Center. The duty officer makes the decision whether to fulfill the request, taking into account the weather and other circumstances. The decision is communicated to the flight dispatcher on duty at the helipad and the aircraft commander. Each pilot uses an electronic map in a tablet PC to determine where to go. From that moment and until they return, all the crew and team members, along with the passengers, unquestioningly obey the commander of the vessel, faithfully carrying out his or her orders.

Missions are generally limited to a 200 km



radius, but patients may be transported up to 500 km, this number including the extra distance flown around restricted areas. The exit time depends on the readiness of the crew. There are three degrees of readiness. The everyday (third) degree allows 90 minutes to collect the patient(s). The second degree of readiness gives the crew one hour. In the first degree of readiness, the crew arrives on duty, and in this case, the real time from the receipt of the command to take off is no more than 5 minutes. The helicopter arrives at the scene, anywhere in Moscow, in 10-15 minutes.

After the mission (provision of medical care and, if necessary, delivery of the patient to the hospital), the helicopter is flown back to the home base or a refueling station. But a new mission may be assigned during flight. Sometimes missions involve picking up passengers from Moscow region and taking them to the city for high-tech medical care.

### But can it be commercially viable?

As you can see, the practical experience of the Moscow MAC could well serve as a model to emulate—if not for one thing. As noted above, the MAC, unlike commercial airlines, doesn't have to worry about financing. For this reason, the experience of the MAC cannot be replicated nationwide. If the financing model requires patients to pay for the service, then air ambulance service will never be a realistic option for the masses.

Mandatory certification and licensing also affects the profitability of the business. To speed up and simplify the trans-

portation process, operators do not always claim to be providers of air ambulance services. It is therefore necessary to adopt separate rules for small carriers, and this subject was also discussed at the conference. And the draft of such rules is ready and has even been discussed in and approved by the relevant departments. Now we have to wait for the day when they enter into force, which is not far off. Well, let's wait.

The second condition for providing regular service commercially is gaining access to the global aircraft market (including helicopters). In other words, customs rules must be simplified. If these conditions are met, we can count on a long-term relationship between the customer and the owner of the helicopter, i.e., on a certain stability.

Either way, Russia has some experience with air ambulance services, albeit fragmentary. And this experience must be drawn from if such services are to be expanded to the rest of the country.

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# Memorial Hermann Life Flight 35 Years

**A conference “Air Ambulance of Russia and Medical Evacuation” will take place in Moscow for the second time as part of HeliRussia 2013 Exhibition in May of this year. The participants of this two-day event from Russia and other countries will share their experience of helicopters’ application in emergency medicine. Our British colleague Alan Norris describes in his article the experience of the American operator HEMS, which has recently celebrated its 35th anniversary.**



**The Texas Medical Center hospital is home to one of America's busiest and highly respected air medical programs in the United States and celebrates 35 years of operation. Memorial Hermann Life Flight was the first air ambulance program to operate in Texas and the second in the United States and is still the only hospital based air ambulance program in Southeast Texas transporting in excess of 3,000 patients annually.**

In 1976, the idea of providing emergency air transportation was still in its formative years and most hospitals had never considered the option of building a helipad on site. But Dr. James "Red" Duke, who still is medical director, and "Whitey" Martin, the then deputy chief of the Houston Fire Department, had a vision to provide a hospital based, non-profit organization responding to emergency calls regardless of a patient's ability to pay. This led to the founding of Memorial Hermann Life Flight which still functions on these same founding principles. Originally known as Hermann Life Flight the "Memorial Hermann" name was added in the late 1990's following the merger of the Hermann Healthcare System and the Memorial Healthcare System, and is still the United States largest not-for-profit health care system.

It is now estimated to cost more than \$3 million annually to support the program, none of which comes from federal, state or local tax subsidies. Instead the program is entirely funded by the Memorial Hermann foundation and its benevolent partners plus the financial support of the community through fundraising.

Operations began on 1st August 1976 with a single French built SA 319B Alouette III leased and operated by Rocky Mountain Helicopters. The Alouette III only had room for a pilot, a single patient, a registered nurse who was the principal crew member, and a surgical resident to

assist the nurse with medical procedures and patient care.

Despite the success of the service, during the initial first four weeks over 40 patients had been flown to the trauma center, this new flight program initially did not have many supporters, as critics saw the helicopter as an expensive tool. However, a fire at the Texaco refinery in Port Arthur in 1977 put Life Flight in the spotlight as the helicopter transported many of the critically injured to hospital, and attracted a lot of media attention, all helping to promote the idea of EMS helicopter transport in Houston.

The Alouette III proved to be a very capable helicopter for the role and in the following two consecutive years another two were added to the fleet. At the time



the three aircraft operated from Hermann Hospital covering an operational area of 120 mile radius from the hospital.

The Alouette III served the program well but they were eventually replaced in 1983 by a newer aircraft, the AS355 Ecureuil 2 "TwinStar." The TwinStar was a big step up from the Alouette III with improvements in range, power, speed and more importantly a larger cabin area plus improved flight safety that comes with twin engine aircraft operations.

As developments in helicopter based EMS medical equipment improved Me-

memorial Hermann Life Flight soon realized that the existing aircraft were not large enough to accommodate the newly emerging medical apparatus. So in 1988 they acquired a Bo105CBS4 and three BK117B1 helicopters. These new aircraft offered improved operating environments for the crews, the BK117B1, with its lack of structural beams to obstruct the cabin space, introduced a new style of layout allowing for the complete use of the rear cabin area. Both aircraft had a double patient load capacity and the Bo105CBS4 had a high skid configuration which improved safety around the tail rotor. Both helicopters also had rear opening "clamshell" doors a major improvement over loading and unloading patients on stretchers from the side of the Twin Star. Life Flight was now able to fly new specialized transports, including neonatal transport, intra-aortic balloon pump patients, and double patient loads from the same scene.

Houston is the largest city in the state of Texas, and the fourth largest city in the United States, and as the population continued to expand the city's only air ambulance service felt it was unable to fully service Houston and the outlying areas of Harris County, Sugar Land and Baytown stretching across a 150 mile radius of Houston. Life Flight was now operating with four helicopters, one of which was always in maintenance rotation, leaving only three available at any given time for emergency flights.

Despite answering over 3000 tasking requests every year Memorial Hermann Life Flight still found itself unable to respond to over a 100 requests per year. So in 2006 the Campaign for Life Flight was initiated by the Memorial Hermann Foundation to raise \$40 million to replace and expand the fleet through the purchase of six Eurocopter EC145 helicopters. It was just one year later at the Air Medical Transport Conference, in the Tampa Convention Center, American Eurocopter officially handed over the first new EC145 to Memorial Hermann Life Flight Director, Will David, and Director of Aviation Operations, Eric von Wenckstern.

Through the success of the campaign by 2009 the remaining five aircraft had been delivered with four replacing the ex-

isting fleet. The fifth helicopter was fitted out with specialist medical equipment dedicated to pediatric cases, this was in response to the 25% of emergencies that represented emergencies dealing with children. They also opened a new east side heliport with the sixth EC145 stationed there to provide an enhanced response time to the large Port of Houston and surrounding communities in the east of Houston. This also covers the Ship Channel where many of the energy companies are based and who generously contributed to the fundraising campaign.

Memorial Hermann Life Flight is a 24 hour, 365 days a year service and since the initial flight in 1976 has flown more than 130,000 missions. Its main base, the John S. Dunn Helipad, is located on the 12th floor of the Memorial Hermann Hospital, a level-one trauma unit, part of the Texas Medical Center. This is also the location of the communications center, dispatching the closest helicopter from the out lying five bases depending upon the where the incident is located. The communications staff handles flight dispatching, with the helipad handling up to four helicopters at any one time, as well

as coordinating critical care ground transports and coordinating patient transfers between facilities.

When the pilot receives a call from the dispatcher he is only given the location of the emergency and no specific patient information. This is a conscious action as it means the pilot does not make the decision to fly based on an emotional response to the emergency but bases his flight on the weather and operational conditions, not on the type of patient or their condition.

In collaboration with the other Texas Medical Center (TMC) facilities they will also accept and transport patients to whichever TMC hospital is most appropriate, at no charge to that facility. In an emergency they will also fly organ transplant missions and Memorial Hermann Hospital is the largest organ donor hospital in the country.

Today Life Flight employs 18 pilots, 18 critical care flight nurses, 16 flight paramedics, and seven mechanics across five bases. The North of Houston is covered from David Wayne Hooks Memorial Airport, the South from Pearland Regional Airport which is also home to the

maintenance base and the East out of Baytown Airport. In the West of Houston two bases have one helicopter based alternately during the month between Memorial Hermann Sugarland Hospital and Memorial Hermann Katy Hospital.

Pilots fly shifts based over a two week period working seven days out of fourteen days and crews change at 6am and 6pm each day. Shifts are divided up with three days on and two days off for two weeks then two weeks working two days on and three days off. They also work every other weekend and four weeks of days and four weeks of nights.

All flight nurses and paramedics are employed by the Hermann medical system unlike some other helicopter medical systems that employ crews on a freelance basis. Before being tasked on the helicopter EMS flight nurses will be expected to have had a minimum of three to five years experience in an emergency hospital or an intensive care unit. Paramedics are expected to have had a similar number of years in a high volume service like a fire department working in a pre hospital environment.







## Katrina

In August 2005 the Atlantic Hurricane Katrina devastated New Orleans and the upper Texas Coast, Memorial Hermann Life Flight was quick to respond and was the first of the Texas aeromedical transport services to establish a mobile command in Baton Rouge, Louisiana. One of the hospitals severely damaged by the floods was Ochsner Foundation Hospital, which sits just south of the Mississippi

River. The hospitals own EMS helicopters had been commandeered for mass evacuation duties a few days earlier and Ochsner's medical staff had called the Memorial Hermann hospital system for help as soon as they realized the magnitude of their situation. Life Flight's initial mission was to ferry critical patients from the hospital to Baton Rouge Regional Airport where they would then be put on a private EMS jet aircraft to be flown to various destinations in Texas. Memorial Her-

mann Life Flight sent two aircraft a day and flew out over a 100 patients operating from the roof of the damaged car park. The Superdome in New Orleans was used as a "shelter of last resort" for those unable to evacuate from Katrina and Life Flight were the first HEMS service to land at the Superdome to evacuate patients. During the aftermath of Katrina, Life Flight also transported and assisted with evacuations from numerous hospitals in New Orleans.



## Aircraft

The new EC145 helicopters were all initially delivered to Metro Aviation, based in Shreveport, Louisiana, for completion of the EMS medical fit. This included the Metro designed liquid oxygen system (LOX), capable of 7.5 litres of LOX per cylinder,

which is designed for external installation with an option of either a single or double cylinder on the EC145. Other equipment included the Ferno litter system with two patient capacity, LED cabin lighting, temperature controlled drawers to store medications and a custom air medical interior specified by Memorial Herman Life Flight. Each helicopter is fitted with a wireless vital monitoring system that sends information on the patient to the emergency room during flight enabling the waiting medical staff to prepare any specialist equipment or medications in advance

of the helicopter arriving at the hospital. The large sliding side doors, rear clamshell loading doors and high set main and tail rotors make for safe working environment when loading of patients.

The new helicopters are larger, quieter and better equipped than the previous fleet and the 133 knot cruise speed of the EC145 has allowed for an increase in missions flown as response times have been reduced by as much as 33 percent. The average mission time now is 42 minutes from the time a Life Flight base receives a call to the time they land on the hospital helipad, well within the recognized "Golden Hour".

From a pilot perspective the aircraft are fitted with OuterLink satellite tracking,



Avidyne TAS610, Bendix King RDR2000 weather radar, dual transponders and a five inch high contrast color display Garmin GNS 530W GPS integrated avionics. A Jeppesen database, that can be updated with a data card, contains all airports, VORs, NDBs, Intersections, FSS, Approach, DPs/STARs and SUA information and the GNS 530W makes practical use of this information with features like intelligent frequency nomination. Originally Life Flight pilots were not able to make full use of the Wide Area Augmentation System (WASS) capability of the GNS 530W but in early 2011 the Instrument Flight Rules (IFR) for single pilot operation on the EC145 were upgraded by Eurocopter and now allow operators to utilize previously unavailable landing sites during inclement weather on IFR

flights. Hospitals, metropolitan heliports and remotely located heliports are now more accessible in IFR conditions.

A Terrain Avoidance and Warning Systems (TAWS) is also fitted with the system giving an audible warning of obstacles from a data base which is updated every 28 days, but does not provide real time radar warnings of obstacles or wire hazards. Normal operational flights are flown at 800feet AGL, which is also their IFR weather minimum. If during a flight the weather ceiling drops below this then protocol says they must land and request a land ambulance to con-

tinue the journey to the hospital.

The local Fire and EMS departments all speak on a different frequency and so the onboard multi band radio has over 40 frequencies to allow the pilot to tune into and contact all the ground organizations.

Memorial Hermann Life Flight flies over 50 patient missions a day and has become an essential service for Houston and the surrounding communities. It has come a long way from the early pioneering years and the red EC145 helicopters are now a reassuring sight at any emergency scene. Accredited by the Commission of Medical Transport Systems, this critical air ambulance service has always been on the cutting edge of patient care and safety. It is now a permanent fixture in Houston and is committed to continue its excellence in aviation safety and clinical care for decades to come.





**Ka-226 "Police"**



**ВЕРТОЛЕТНАЯ  
ИНДУСТРИЯ**

# AW139 the start of Russian-Italian cooperation in the helicopter industry



Sales figures for the AW139 helicopter provided by Italian manufacturer AgustaWestland show that in its class this helicopter has excellent prospects in a number of different operational markets. Highlighting this potential from September to December 2012 the international media published more than twelve reports relating to new deliveries of the AW139.

Additionally the helicopters were operated in different configurations: VIP, offshore, Air Ambulance and military applications. Customers included: Azerbaijan Airlines, Kaan Air the largest Turkish operator, Chinese aviation companies, Swedish Maritime Administration, Japanese Police, Royal Thai Army, Brunei Shell Petroleum and a South African tour operator. Also, in December it was announced by RIA Novosti the AW139 will be used to transport top Russian officials.

## Expand the market and create a base

The new HeliVert production plant opened in the Moscow regional town of Tomilino and built as a joint venture between Russian Helicopters and AgustaWestland, has now assembled and test flown the first AW139 helicopter. This new local production facility provides a number of benefits for the Russian helicopter industry including the opportunity to observe and adopt the expertise that the Western helicopter industry

In turn, AgustaWestland generates an increase in its profits in the form of increased production and active market expansion with this joint venture in Russia and both partners have finally achieved their original aim of cooperation following their early discussions on working together on new helicopters.

These ideas not only take shape now but are also supported by the Russian political leadership. "The government intends to support foreign manufacturers that wish to locate their industrial fa-

## Building the best

The fact that a fully loaded AW139 helicopter is capable of taking off with only a single engine in high altitude conditions indicates the multifunctional characteristics of this twin-turbine helicopter. This is also the only helicopter in its weight category equipped with a Full Ice Protection System (FIPS), enabling flights in permissible icing conditions. These two features alone clearly meet the requirements for helicopters that carryout offshore



brings. There is also expected to be a high demand for this 6 tonne class of helicopter as currently the Russian helicopter market is lacking in this segment, a favourable factor for the success of the AW139 in Russia. The success of this first AW139 aircraft has shown it was quite logical to support the initiative of encouraging the domestic helicopter assembly and development of Western aircraft in Russia.

ilities in Russia with the technology transfer" stated Deputy Prime Minister Dmitry Rogozin during his visit to the National Helicopter Center. "Foreign industrial facilities located in Russia should increase on a progressive scale from small to large and could reach 60% or more. The manufacturing of this new multifunction medium helicopter AW139 is a positive start for Russia in the first instance."

flights, VIP helicopter operations and in the military role. Also the AW139 noise specifications make it suitable for operating in urban areas. The multifunctional AW139 is one of the best twin-turbine helicopters in its class in terms of speed, handling qualities and passenger cabin volume and has a cruising speed of 306 km/h, a range of over 927 kilometres and endurance of five hours.



### Mutual Interest Inspires Future Prospects

The Russian helicopter market and other CIS countries, remains attractive for the majority of global helicopter manufacturers from a sales prospective. This is why the majority of helicopter manufacturers did not ignore the Russian market during the stronger financial times in Europe, America and Asia. In the case of AgustaWestland several factors were seen as important for the company in particular sales in the offshore helicopter market. This interest was due to the global increase in oil prices which directly reflected the pressing demand for helicopters like the AW139, in the medium weight range for operations out to offshore drilling platforms. As the demand for helicopters in the medium class increased so the need to satisfy this demand became more urgent.

As the oil producing companies showed an interest and desire to purchase AgustaWestland helicopters assembled in Russia the company actively started looking for a suitable partner and

production site in Russia. During this time Russian companies were also busy looking for partners in future developments and production of state-of-the-art helicopters as the Russian Federation also had a lot of expertise to offer in this field.

As a result, in April 2007, Oboronprom United Industrial Corporation (UIC) started negotiations with AgustaWestland on the licensed assembly of the AW139 helicopter at the Ulan-Ude Aviation Plant. Further discussions led to the first milestone of this partnership when Oboronprom UIC, Lloyds Investment Corp. and AgustaWestland established the official exclusive distributor of AgustaWestland helicopters in the Russian Federation and CIS: Exclases Holdings Ltd. in June 2008. Just two years later, at the HeliRussia 2010 exhibition, the technical specification for the construction of the AW139 assembly plant was signed with HeliVert Joint Venture.

By the summer of 2010 building work on the HeliVert assembly shop was started on a 40,000 m<sup>2</sup> site within the industrial area of the Russian Helicopters'

National Helicopter Building Center in Tomilino, Moscow region. The building was designed to house the assembly line for the civil AW139 medium twin helicopter for the Russian and CIS market with the plant expected to assemble up to 15 to 20 helicopter year. By the middle of 2012 orders had been placed for 40 helicopters including ten aircraft for UTair Aviation, the largest helicopter operator in Russia, who has signed a Memorandum of Understanding for 20 AW139 helicopters to be assembled in Russia.

On 18th December 2012 the first AW139, with the tail number 60001, assembled in Russia was rolled out to perform ground running testing and on the following day it performed its first take-off and controlled hover. The second AW139 off the new assembly line, number 60002, is expected to be ready for flight testing in the first quarter of 2013.

### Future Co-operation

Following the success of this first joint venture Russian Helicopters and AgustaWestland have now signed a pre-



liminary agreement to jointly develop, produce and market a new 2.5 tonne class single-engine helicopter.

The agreement was signed by Russian Helicopters CEO Dmitry Petrov and Bruno Spagnolini, CEO of AgustaWestland. The overall program will be shared on a 50-50 basis, with the new helicopter being designed for the worldwide market and design work will start in early 2013. The agreement was formally ratified between the Russian Government Vice-Premier Mr. Dmitry Rogozin and the senior management of AgustaWestland during a visit to Italy.

"We and AgustaWestland accept a more serious and profound co-operation – we will not merely be assembling a finished helicopter, but be developing a new one" Mr. Rogozin said as he set out the priorities.

The successful launch of AW139 manufacturing in Russia, not surprisingly, has led on to even an more equally successful co-operation in the field of joint development and application of the new technologies. The Italians see this prospect optimistically, based on the success of the building program of the AW139 multi-functional helicopter, a global leader in its weight class. The Russian management shares this optimism, having delivered responsibility for its portion of the work.

**Herman Spirin**



# HUMS RU zone

For example, the collection of data on the condition of Mi-8 and Mi-26 and Ka-32 helicopters, their engines and main systems is performed with different versions of the flight data recorder (FDR), "SDK-8". But these systems only collect basic data and can't meet the needs of customers in today's competitive global market.

## Huge Savings, Optimal Control

To get accurate information about the economic and technological efficiency of HUMS one still needs to turn to foreign experience. For example, installation of HUMS on Eurocopter and Agusta Westland helicopters had increased the efficiency of technical problems detection by 70%. Use of the elements of retrospective failure analysis will bring it up to 85%.

In value terms, the example of use of HUMS for 20 UH-60 Black Hawk helicopters in combat in Iraq in 2003 is very illustrative: beside the fact that in 12 months HUMS equipped helicopters set a flight hours record, the monitoring system saved up to \$ 45 million in cost maintenance and flight operation. According to the data published in the Heli-Power & Police Aviation conference in 2008, the installation of HUMS saved 130 thousand man-hours, 27% more tasks were performed at the level of equipment serviceability of about 89%.

These figures make the Russian experts to pay close attention to everything that concerns HUMS. At the moment, just to monitor their development and implementation by various companies. For example, back in 2009, the U.S. Army made a decision to equip

**Design and implementation of helicopters monitoring complex A-HUMS (Advanced Health and Usage Monitoring System) is believed to be a prerogative of Western companies. However, when it comes to Russian systems of monitoring of helicopter units and systems, the things are not so definite.**

its entire fleet of helicopters (3000 plus) with monitoring complexes. Civil helicopter operators are not far behind the military. Within a short time a number of companies offering solutions in monitoring the helicopter systems have entered prospective market.

For example, Bell-206L helicopters with Pratt & Whitney's engines can use «Intellistart Plus», «Bell Helicopter Vibration Monitoring» (BHVM) systems, S-92 helicopters - «Goodrich Aerospace» HUMS, A-139 - «GE Aviation» HUMS, S-76C and EC-135 can use «VXP "C Vibration Expert» system by «Honeywell».

## Russian HUMS: At the starting line

In June 2012, with some lag compared to foreign manufacturers, "Vertolety Rosii (Russian Helicopters)" Holding Company announced the development of the promising A-HUMS monitoring system. The introduction of this system, in addition to increased reliability, can provide lower operating costs, thus increasing the economic efficiency of Russian helicopters.

However, proprietary solution from major manufacturer will only partially resolve the problem. One of the crucial issues here is to have local independent developers and manufacturers of monitoring systems capable to operate at the level of the leading international companies. This segment of the Russian industry is not totally void. Beside scientific organizations working on the subjects related to the development of HUMS, there are several new companies that

have realized projects in Russia and abroad, have stable working relationships with leading manufacturers of components and software as well as their own innovations under their belt.

One of such companies is "Dimax Technology", a Russian developer of HUMS and vibro-diagnostic systems. "Dimax Technology" is a 100% Russian company that has not just technology, know-how and patents. It also has extensive experience in developing and implementing HUMS both as a "turn-key" and as an intellectual rights partner of major international manufacturers. For example, the algorithms and technical solutions developed by specialists of the company are used by Snecma (a leading manufacturer of jet engines in Europe) for vibro-acoustic diagnostics of engines.

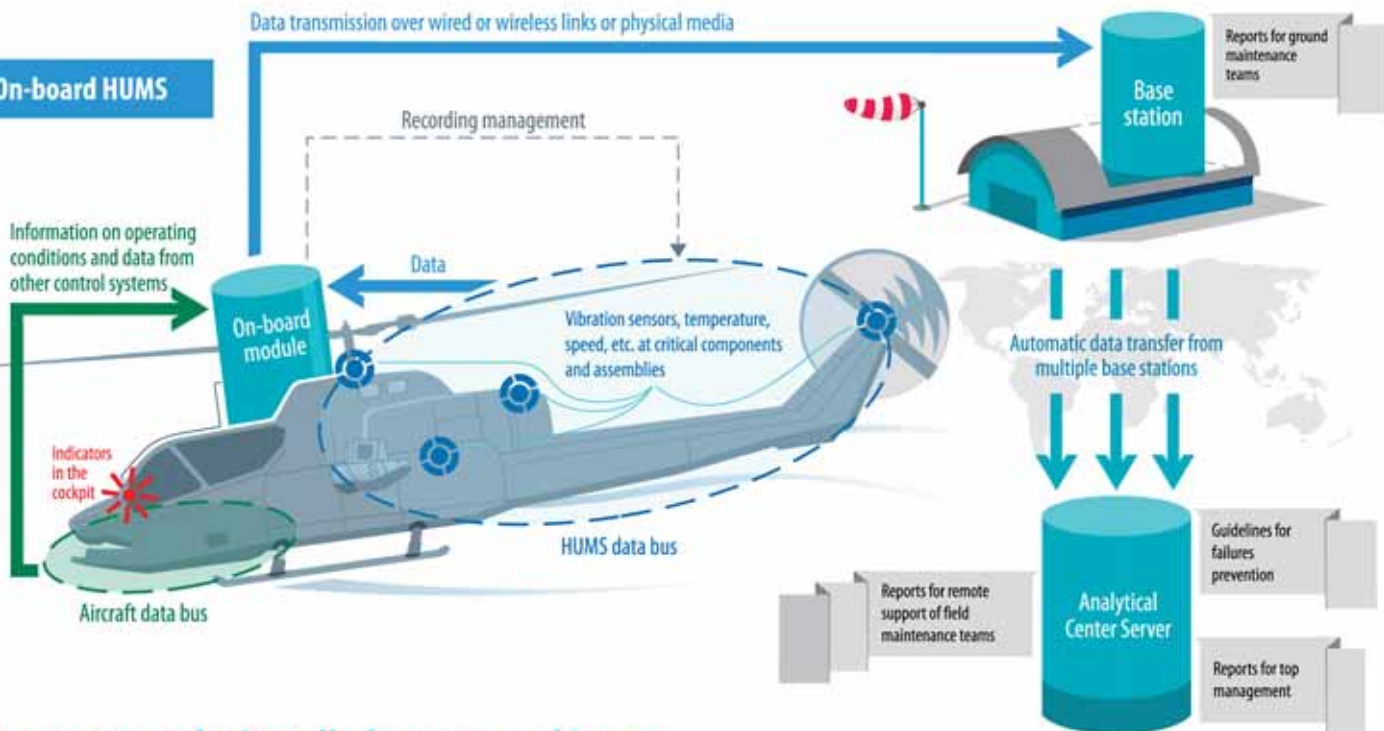
"Dimax Technology" experts took part in the development of a T-HUMS monitoring system for Israeli helicopters. The company's specialists have participated in the entire development cycle, from the creation of basic technology to the installation of the system on Apache helicopters. Today T-HUMS system successfully competes with solutions from other industry leaders. "Dimax" portfolio also contains HUMS adaptation for large unmanned aerial vehicles and wind turbines.

- From the user's point of view, the diagnostic system means information: accurate, rapid and easy to analyze, says Eduard Rudyk, "Dimax Technology's" Technical Director.

We've developed the architecture that provides for that task at all levels -

# Three-tier HUMS architecture

## 1. On-board HUMS



The system can be installed on new and in-use helicopters, as well as integrated with other control systems

## 3. Analytical center

from the cockpit to the office of the Chief Engineer. Depending on the flight mode, our system manages data recording mode and transmission of information. Critical information can be transmitted to the pilot in real time. The main bulk of flight data is analyzed at the base station that provides information to repair team's mechanics and engineers. The next level is the Analytical Center which collects and analyzes information on the status of the entire helicopter fleet. Data extracted from the array are important for both management and engineers providing remote technical support for the field staff. The algorithm is implementing smart learning function - the more data had been accumulated, the more accurate are both the current diagnosis and the prognosis. Data collected provide a complete picture of the entire operational process for the management.

Operators conservatism is a known limiting factor in the implementation of

innovative solutions in the aviation industry as they prefer to use a particular software or hardware. **Dimax Technology** believes that their decision not to "tie" their architecture and software solutions to a single manufacturer products (sensors, airborne and stationary computers, etc.) is one of the company's competitive advantages. According to the developers, the key element of the system is powerful data analysis algorithms implemented in the structure of the layered architecture. Hardware, in Dimax opinion, should be selected for specific customer needs.

- For operators of small helicopters overall weight and dimensions, as well as the number of sensors installed on board, are crucial characteristics - says Maxim Volk, "Dimax Technology" Executive Director. For large machines, this system characteristic could be less crucial and the number of monitored components may increase. We must also consider the cost the solution. Using the

basic elements of different manufacturers and adapting our solutions accordingly, we are able in each case to achieve a reasonable or even ideal balance of all the important factors. In addition, a flexible hardware solution permits to comfortably adapt it to helicopters that are already in operation.

The "Dimax Technology" solution is in accordance with technological standards and requirements of the international market, of modern and high-tech fleet management - regardless of geography and scale.

Implementation of the system permits operators to optimize inventories of components, to get information about the state of the equipment in the field, to manage its maintenance, and allows for an objective assessment of suppliers and new technical solutions.

**Evald Gherbst, technical analyst and columnist**  
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# Helicopter transportation from “U” to “T”

According to experts, Russian helicopter service providers will face a growing demand in the coming years. An expansion in the use of medium class helicopters, in particular, will be seen. Another global trend of recent decades: growth in the operation of helicopters for private and corporate purposes. UTair Aviation, the world's largest operator of helicopter aircraft, confirms these trends through its own experience.



For 10 months in 2012, UTair Aviation helicopter operations increased its workload by 20.8% compared with the previous year. This dynamic growth is connected with fleet modernization and an expanding orders portfolio. Since the beginning of the year more than 600,000 passengers and 120,000 tons of freight have already been transported. Many types of aviation services have been provided: transportation of oversize loads, firefighting operations in Russia and abroad, and VIP passenger transportation on specially-equipped aircraft.

The UTair Aviation customer base in Russia is concentrated in the oil and gas sectors. Cooperation with this branch of industry is traditional for helicopter companies, whose appearance and development over the past decades was stimulated by oil and gas exploration. UTair Aviation helicopter operations now performs about 60% of the work on behalf of oil and gas companies. Further development of oil and gas production leads to an expansion of flight routes, number of operational bases and line stations. For example, the Irkutsk region became the leader among regions of the Russian Federation for the number of open large-scale deposits by the middle of 2000. To advance regional service in 2007, UTair purchased a major stock holding in the Ust Kut Airport—one of the key transport hubs of the area. Today, 27 UTair helicopters of the Mil and Eurocopter series work in Irkutsk.

UTair Aviation helicopter operations president Alexey Vinogradov says: "Now foreign companies are involved in implementation of many projects for oil and

gas production in Russia and joint ventures are created. Thus foreign participants introduce international standards applied abroad for flight safety and quality control. New standards for aircraft, flight personnel and maintenance are required." Maintenance needs of foreign oil companies leads to Mi-8 helicopter replacement with its variants: Mi-8 MTV, Mi-8 AMT, and also on Mi-171. "Mi-8 has not been in demand abroad recently. Its aircraft performance and economic viability did not always conform to the requirements of the customer. One of the main customer considerations is the helicopter's age - it should be no more than 20 years old, and last Mi-8 was made in 1991. That's why we practically don't use it in our foreign projects. From the very beginning we counted on the more modern Mi-8 MTV, Mi-8 AMT and Mi-171," Vinogradov adds.

### AS, BO, EC, Mi ... The list is growing!

In the domestic market Mi-8 also loses its status. However, there are jobs which can't be performed without this helicopter: freight transportation, search and rescue operations, forest protection and firefighting. In recent years UTair has placed two orders for Mi-171 helicopters which will partially replace Mi-8 in rotational and cargo operations at the Ulan-Ude Aviation Plant. Forty aircraft have already been transferred to the company and have started flying in Russia, as well as in Peru and other countries of UTair presence. New deliveries are expected in 2013.

At the same time, the need for new helicopters in the light and medium

classes is growing. Closely observing market development trends, UTair Aviation helicopter operations started looking for prospective models a few years ago. "An analysis of the popularity of all helicopters manufactured in the world was carried out among the customers of the various models; all plants and production sites were examined. As a result, the BO105, manufactured by Eurocopter company (Germany) has been chosen," Alexey Vinogradov explains. "An analysis of the BO105 showed all the benefits and drawbacks of foreign aircraft, including differences in the Soviet and foreign methodology of helicopter operations. The Mi-8 has a working lifetime of 1500 flight hours, for example. After that, the aircraft should be sent to an aircraft repair plant to be completely dismantled; each part examined and repaired if necessary. Foreign aircraft maintenance is typically conducted in a different way, on a phased basis. Fuselage work only is considered to be an overhaul. Regular, routine maintenance insures a schedule of continuous operation. Components are replaced routinely after a certain number of flight hours when the helicopter is not in use. This is the most effective aircraft operating scheme from the standpoint of economy," Vinogradov says.

UTair has become one of the main Russian customers of the Ecureuil series made by Eurocopter. Twenty units of this series are expected to join the inventory in 2013. "We are glad that the new AS350 B3e helicopters of the improved version are part of our fleet now. They are notable for their increased flight operation safety and high reliability. They are also more

economical and more powerful, which allows us to offer a more competitive product in the helicopter service market to our customers in the sphere of oil and gas services and business transportation," the UTair Director General Andrey Martirosov notes.

In another development, UTair has secured contract financing (Summer 2013) from British bank HSBC under a guarantee

fulfilling a contract to provide personnel training for piloting control and service of 20 Agusta Westland AW139 helicopters. Additionally, UTair will establish an authorized service centre for the AW139.

Domestic Ka-32A11BC helicopters acquired by the company are targeted for the European hi-tech market. It's anticipated that these helicopters will be in high demand.

support operations for coastal shelf oil and gas companies. These are the so-called "offshore operations" that require frequent passenger and freight transportation to and from the platforms.

### No roads, just blue sky

Today, in addition to the oil and gas industry, there are other major customers of helicopter services such as geologic exploration firms, special service providers and construction companies. One of the nearest future goals is to implement a more efficient operation of the helicopter inventory. "Of course, Mi-8 cannot be replaced yet. We speak about those projects which can be redirected to less expensive aircraft," Alexey Vinogradov explains. "In the course of conversion to lighter-class foreign aircraft, we realized that Russian customers were accustomed to Mil series helicopters and didn't trust the small, light Eurocopter EC175, AS355, AS350, BO105 and Robinson R44."

Over time, the convenience of certain foreign helicopter models was appreciated. Ecologists and other experts liked the panoramic view available in the AS350 during their airborne surveys and monitoring flights for pipelines and high voltage lines. After a while, requests for new types of helicopters appeared in the Bidding Data Sheet. As a result, considerable cost reduction for the customer is achieved because of the efficient use of the fleet.

It is absolutely impossible to substitute helicopter models while carrying out installation and construction work in mountain conditions. "The first question of potential customers at a meeting is: 'And do you have Ka-32?'" Vinogradov shares the work subtleties. Since July 2012, UTair helicopters have been working at the Olympic construction site performing transport and installation work in



by French insurance agency COFACE. This makes UTair the first Russian aviation company to secure insurance coverage from an international export agency for acquisition of helicopters whose registration is carried out in the Russian register of civil aircraft. Earlier, export agencies participated only in transaction on aircraft acquisition.

An agreement on the delivery of ten Mi-34 helicopters (in new modification) has been concluded. UTair has also begun

UTair is the initial customer and the largest buyer of the new twin-engine Eurocopter EC175 helicopter. The new aircraft will be supplied during 2013-2014 under a contract to acquire 15 units. UTair will become one of the first in the world to begin EC175 service.

UTair is planning to use the EC175 in one of the most dynamic segments of helicopter operations to date: airborne

the Krasnaya Polyana area. The Ka-32 and Mi-8 AMT helicopters perform many tasks, carefully executing special construction work. In Sochi, UTair aircraft carry out external load transportation, installation and construction projects for ski lift erection, installation of special canons at avalanche-prone sites and other ski resort infrastructure projects. UTair is planning helicopter work expansion in the North Caucasus region, using all its flight experience in complex mountain environments. Participation in a ropeway erection in the Arkhyz settlement of Karachai-Cherkess Republic is one of the latest contracts.

"I was watching our Ka-32 helicopter executing the difficult mounting of two cargo ropeway pillars of 40 and 45 meters high," UTair's Sochi office manager Danil Lobadin recalls. It looks very impressive to onlookers. Installation of the pillars was conducted at the mountain peak, practically at the altitude ceiling—2200 meters above sea level. Space is limited there and the pillar's base must be put at the exact point on the foundation bed, as in the eye of a needle.

UTair was not present in the southern region until this summer, as it is too far from the main bases and mountain flights differ significantly from work in the northern region. But the presence of the largest helicopter operator in Russia in such significant projects for our country as the Olympic construction site is also a political matter, as well as a matter of prestige and demonstration of capabilities of the company.

Such work will never be large-scale or involve thousands of flight hours. The value in these projects is in their unique character and complexity. The experience gained can be useful for drilling platform service, for example.

UTair helicopters are involved in many social projects. These include moving passengers in hard-to-reach or remote areas, forest firefighting and transportation of sick or injured persons (here the operator acts as a partner with the Disas-

ter Medicine and Emergency Situations Center, providing the BO105 helicopter with a crew).

It should be noted that, in other countries, some of the projects just mentioned are carried out in a different way. It often allows the operator to use the rotorcraft inventory more effectively and to perform operations with better economy.



One more opportunity for helicopter business diversification is the ambulance aircraft sector. As Alexey Vinogradov says, medical airlift specifications are currently not regulated in Russia. "No one determines requirements or specifies the equipment inventory of such a helicopter. Now we have the minimum set of provisions in the sanitary BO 105 helicopter, while it satisfies our customers," Vinogradov says. "There are different approaches in

the system of rendering medical care between Russia and countries abroad. In some countries, insurance companies—not the state—are in control. The insurer signs a contract with a medical institution and with the helicopter operator, and potential clients pay insurance fees. Later, a person can be delivered medical care.

"Our regions' budgets are planning for the assignment of hospitals, which later hold bids for rendering such helicopter services and sign a contract," director of UTair Aviation helicopter services explains.

### Where are we flying?

In search of new business opportunities, UTair entered the international market at the beginning of 1990s. At that time there were projects in Africa speci-





fied in peacekeeping contracts with the United Nations. At the present time, UTair is one of the primary suppliers of transport services for the UN. Last year, for example, 70 aircraft and about 2,000 UTair staff members were involved in missions for this international organization. Presently, 37 UTair airplanes and helicopters work in Sudan, Southern Sudan, Congo, Sierra Leone, Liberia, Cote d'Ivoire and Afghanistan. This represents 51 crews, which is more than 300 people including technicians.

During 3-4 months of business trips, pilots and flight attendants will conduct many different operations including transport of citizens, freight and the service support of the peacekeeping force. Today, even in a small mission in Sudan, more than 4,000 soldiers—not to mention officers and service personnel—take part and they rely on dependable "air assistants." One of the most critical responsibilities is the performance of medical tasks and stand-by duty for search and rescue flights, which assumes continuous readiness. Working on missions under UN contract is far from romantic; flight crews must be ready and equipped to respond 24 hours a day.

Beyond the UN contracts, in order to increase and diversify the client base, UTair is attracting commercial clients in Eastern Europe, South America, India and the Republic of South Africa. In the future, UTair will develop foreign subsidiary companies and will consider purchasing other new assets abroad.

"Our first steps in European market conquest were successful due to the uniqueness of the Russian-manufactured

helicopter fleet. Such aircraft aren't present in Europe and have the advantage due to lower operating costs," says Vinogradov. "In addition, we master new aircraft of foreign manufacture and adapt them for the requirements of that market. We furnish training to local aviators. This is politically competent: people understand that the company has come to the market seriously and for the long term. The second stage of development is the delivery of new types of rotary-wing aircraft to our missions and foreign subsidiaries.

"For example, EC175 will go to Brazil. The market there is divided between the leading players, but they all have the same types of helicopters, and we are coming with a new fleet. There are many small companies in Eastern Europe which are comparable with our daughter company, so the competition is severe. We must offer services which are not available to other operators: some special installation projects which other companies can't execute due to the lack of aircraft with the necessary weight-lift ability, etc. Now we work very diligently in this sector. We also perform firefighting work and we're considering participation in medical flights."

"For seven years, UTair Europe has been performing unique and difficult projects. Towers for mobile telephone operators, lifts for European ski resorts, power transmission towers, conditioners and logos of world companies on high-rise buildings—all this was mounted, constructed and renovated by means of our air company helicopters," the director

of UTair Europe Oleg Lysenko notes. "There are several projects in which we are planning to take part. One of them is in Bulgaria. The project involves dismantlement of several sections of television towers in Bulgarian cities and installation of new equipment in one section. It is absolutely a new type of work which will require us to modernize fittings and install equipment for azimuth orientation of loads on Mi-171 helicopters."

In another region — South America — UTair has formed a joint venture in Brazil and work will begin soon at the oil company's request. "Most of all we are guided by BRIC countries. Economic growth is expanding quickly there, the oil and gas industry is developing. In Brazil — a striking example—oil extraction is growing annually and there is a need for helicopter equipment and specialists," Vinogradov says.

Alexey Vinogradov assumes that the example of Peru, where UTair purchased the local operator of Helisur for market promotion, can likely be repeated in other countries. Such steps are possible in South East Asia, a market the company is approaching via its division in India. Each local market where UTair enters has special requirements which must be carefully considered. This adds complexity to contract negotiations and project preparation. Successful ventures, though, where difficult challenges are met, are the greatest reward!

# HEMS and pilot training:

## A new phase of Eurocopter's expansion into the Russian market

### Emergency medical services

The role played by Eurocopter helicopters in emergency medical services (EMS) is difficult to overestimate.

Russian ambulance aviation, which has its own long tradition of using helicopters, stands today on the threshold of modernization. And in these transformations, Russia's EMS relies on the extensive experience of Eurocopter to supply helicopters that are used to carry out emergency missions throughout the world.

"The concept of Eurocopter EMS helicopters have been developed by doctors, for doctors, and therefore perfectly adapted for EMS missions," says Laurence Rigolini, CEO of Eurocopter Vostok.

In late 2012, the company introduced its medical helicopters at an international conference in Moscow on innovation in Russian healthcare.

Eurocopter's Moscow Aviation Center, which was created to carry out EMS missions, owns three Eurocopter EC145s, which have been used to rescue more than 2000 people since 2007. Its fleet logs a combined average of over 1,500 flight

hours annually. In 2011, the figure was 1632 hours. During this time, the lives of 488 people were saved as part of emergency medical missions.

The experience of the Moscow Aviation Center is representative and attests to the wide use of Eurocopter helicopters in EMS throughout Russia and the CIS. Eurocopter helicopters have now become the standard of quality, given their use by the Ministries of Emergency Situations and Ministries of the Interior in Russia and the CIS. In Moscow, they are most often used to perform EMS operations, and have reduced the duration of the average patient trip from over 40 minutes to under 10 minutes.

Another clear sign of confidence in Eurocopter helicopters is the recent order of a model EC135T2e by the administration of another region of Russia, Krasnodar Territory, as part of an effort to significantly improve EMS in the region. The configuration of the EC135 was designed in accordance with the customer's requirements. Engineers of Eurocopter's German unit jointly with the Austrian Air Ambulance Technology company worked

in close contact with the doctors from the Hospital of Krasnodar who will work on-board the helicopter. The machine is equipped with the most modern medical equipment, including a defibrillator and a ventilator (IVL).

The EC135 is the standard for medical evacuation missions. A total of 1000 of them were ordered last year for this purpose. The main customer of the EC135 on the European market is the German public motorists organization ADAC, the largest of its kind in Europe. The Polish Ministry of Health recently purchased 23 x EC135s to revive the National Sanitary Aviation.

### Training helicopters

The good prospects for the expanded use of Eurocopter helicopters in Russia for a variety of missions, public and private, are being confirmed again and again. In December 2012, Eurocopter became the first foreign supplier of helicopters to Lyapidevsky Omsk Flight Technical College, Russia's only college that trains helicopter pilots for civil aviation.



Eurocopter Vostok supplied the college with two AS350 B2 helicopters. The machines are intended for students' initial flight training. The training of the future pilots will begin in June 2013. It is the college's first purchase of imported helicopters.

"We're proud that the Omsk Flight College has revamped its fleet with models of Eurocopter family. The fact that this is the educational centre had not previously worked with foreign producers has emphasised the importance of our cooperation," said Eurocopter Vostok CEO Laurence Rigolini.

"Our purchase of the AS350 B2 helicopters in College Park will allow us to significantly streamline the process of flight training, thus reducing costs. In 2014-2020 we're planning to acquire at least six more AS350 B2s," said Anatoly Yakush, Director of Omsk Flight College.

The AS350 B2s were modified specifically for the new customer's needs. They were made as light as possible in order to improve their performance characteristics, making it possible to train for a variety of flight situations in the air. Co-pilot dual controls, which are essential for training, were also installed.

The Eurocopter AS350 B2 is a lightweight single-engine helicopter with excellent performance and safety characteristics as well as low operating costs. We should add that the helicopter has been in production for over 30 years and remains the most popular helicopter in its class in the world.



May 2013 will mark the second anniversary of the launch of the UTair Airlines Aviation Training Center (in the city of Tyumen), which trains pilots and engineers to work on helicopters made by Eurocopter Group. In May 2011, the training center became the only training center for the retraining of pilots and technical staff in Russia approved by Eurocopter Group.

Eurocopter fully supports the UTair Training Center, which includes providing it with the best practices and the latest training materials. Training is conducted in Russian. The collaboration has improved and strengthened UTair's training programs and expanded the range of services that the airline provides. The UTair Training Center in Tyumen provides refresher courses and advanced training to pilots and mechanics of AS350 B3/B3e and AS355 N/NP helicopters.

Seventy pilots and 69 engi-

neers had already taken courses at the center by the end of last fall.

The airline company's helicopter fleet includes twelve helicopters of the models AS355 N/NP, BO105 and AS350 B3, which are used for VIP passenger service, the oil and gas industry, pipeline inspection and small cargo. Soon to be delivered are another 15 helicopters of the models AS355 and AS350. In 2013, Utair will be one of the first airline companies in the world to use new-generation EC175 helicopters. Eurocopter helicopters are used for a wide range of missions. Besides medical evacuation missions, they are also used to carry workers to and from oil and gas platforms, monitor pipelines, perform external load work and passengers transportation. That's why 4 of the top 10 commercial operators of helicopters—UTair, Gazprom Avia, Yamal and Nord Aviation—use Eurocopter helicopters.

**Nikolay Korobov**



# Helicopters: The Soldiers of the Air

The 100th jubilee of the Russian Air Force became the main event in Russian military aviation in 2012. The entire epoch of two world wars in the 20th century prefaced helicopters' appearance as part of the Air Force. Active introduction of helicopters at the end of the 1940s was the new word in combat operations practice, a technological reply to the evolving needs of new military elements. On the 28th of October, 1948, the first helicopter squadron of the Soviet Air Force was created in Serpukhov, in the Moscow region. This laid the foundation for incorporating Russian army aviation as a single combat arm of the Air Force.





troops on the battlefield. This moment became a milestone with regard to the defined place and role of a "chopper" in combined arms operation.

Domestic army aviation gained wide battle experience during several decades of continuous development. The Afghanistan war of 1979-1989 became a serious trial for army aviation pilots. According to ground-based forward air controllers, it was the helicopter that had the highest effectiveness in fire-support operations. Helicopter application enabled the Soviet command to respond immediately to the unpredictable tactics of mujahidin fighters.

Helicopters were used for multiple missions: fire-support for ground elements,



At first, helicopter aviation was considered an auxiliary resource. Helicopters completed air freight lift tasks, airborne fire control, reconnaissance and real-time communications support. Over time, helicopters also became an agile, independent fire-support tool to compliment ground troops engaged in battle.

Due to its success, auxiliary aviation evolved to become the Army Air Force at the beginning of the 1970s, when the Mi-24 was phased in. The Mi-24 became the primary helicopter to support ground

pursuit of the retreating enemy, air-alert missions and transport columns escort, vertical assault at strategic locations, troop supply, rescue of downed pilots and evacuation of the seriously wounded.

Helicopters in Afghanistan became "flying armor," armored fighting vehicles that could cope with the most complex cross-country terrain. For this reason, helicopters became top-priority targets for mujahidin fire. The Mi-24 became the primary helicopter during the Afghan conflict. By the end of 1980, the number of Mi-24 grew to

251 in the 40th army. As a rule, Mi-24 employed rockets from 1200-1500 meter range in battle and opened fire with machine guns from a distance of 800-1000 meters. Helicopter armament was quite effective against enemy manpower: each HAP C-8 warhead provided a saturation effect within a radius of 10-12 meters, and four-barrel machine guns gave especially powerful and accurate fire and could penetrate a duval up to a half-meter thick. Aerial bombs of 250 and 500 kg or incendiary tanks of 500 kg were used to destroy fortified objects, resistant to HAP.

In Afghanistan, in the first months after Soviet troop introduction, Mi-8 helicopters were added to the Mi-24 fleet to strengthen overall helicopter support. Notably, some of the machines were adopted from the "Aeroflot" civil aviation company. Mi-8 did not employ such threatening firepower as Mi-24, but they

were irreplaceable in airborne operations. The sheer volume of daily combat performance by helicopter pilots was very impressive. In comparison with Su-25 and MiG-23 aircraft, which averaged 216 and 112 combat flights respectively in 1985, the average helicopter made 360-400 annual sorties, and some machines made up to 1,000 annual sorties.

Combat operations in Tadjikistan became a bright spot in the history of army aviation in the 1990s. At that time the army pilots were tasked to provide safe evacuation of Russian troopers' families from the civil war area. From the late 1990s to the middle of the next decade, military helicopter aviation was actively applied to combat terrorism in the North Caucasus. The experience of the Afghanistan war useful to Russian helicopter pilots both in Tadjikistan and Chechnya, but in the course of new com-

bat campaigns, the tactics and methodology of helicopter application started changing. In the latest decade, army aviation experienced considerable technical and organizational changes, as did the Russian army as a whole.

The "old warhorse" Mi-24 and Mi-8 are remaining on airborne alert. These seasoned combat machines continue to be a valuable resource which can solve the most complicated battle missions. However, the era of new combat helicopters is fast approaching; new designs that began to take shape in Soviet design bureaus at the end of the 1980s are now here. More than 1,000 modern helicopters will be supplied to the Russian Air Force in the near future: new Ka-52 "Alligator" attack helicopters, the Mi-28H "Night Hunter," new modifications of troop-carrying Mi-8 and Mi-35 helicopters, heavy-lift Mi-26 helicopters and light training "Ansat-U."

**Nikolay Korobov**





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# Air Glaciers, Alpine Ski World Cup, Lauberhorn, Switzerland

The International Ski Federation (FIS) Alpine Ski World Cup is one of the top international ski competitions in the world. Once a year the small Swiss alpine village of Wengen becomes the focus for one of the ten downhill and slalom competitions which form part of the FIS Ski Grand prix circuit.







This, the biggest annual winter sporting event in Switzerland, takes place every year against the beautiful mountain backdrop of the Eiger and Jungfrau glaciers. The downhill course is the longest race in the Ski World Cup cover-

ing a distance of 4415m (2.75 miles), it is also the oldest downhill ski race, held here since 1966. Spectator numbers have been growing annually along with the increasing media presence which has meant that helicopters now play a crucial support role in the event.

Glaciers base heliport, located 2624ft (800m) above sea level and in the shadow of the Eiger Mountain. Up to 20 tons (20000kg) of equipment has to be flown to the top of the mountain range, including everything from the TV equipment, advertising banners to the toilets.

Air Glaciers are the official transportation company of the Lauberhorn Race and as the downhill race starts at 7595 ft (2315m) and is only accessible by train (the highest in Europe) or ski lift the majority of the equipment and people needed to setup and stage the event is transported to the top by helicopters.

Flying in the high mountains is something the company is very experienced at as mountain work is daily routine for the pilots and ground crew. Their normal work is broad and varied ranging from: air ambulance, long line lifting, ski lift repairs or transporting anything needed to be taken on or off the mountains; even bringing down rubbish collected at the top. Air Glaciers has done it all, "we have everything needed for our operations here in the high mountains at the Lauterbrunnen base" says Peter Almer Deputy Flight Operations Manager and one of the highly experienced base pilots. "Air Glaciers have been operating the SA315B Lama and SA316 Alouette III for over 40 years now and are the largest operator of both types in Switzerland with ten SA315B's and five Alouette III's in our fleet. We were the first com-

The build up to the race meeting begins as early as November the preceding year with flights taking race organizers to the race slopes to install poles for safety nets and generally preparing the slopes. One week before the arrival of the competitors a fleet of trucks transport equipment for the Swiss TV companies to the Air



pany in Europe to operate the Alouette III in civilian configuration and now the only operator of the type in Switzerland since the Swiss Air Force replaced its fleet with the EC635. Both types are our main work horses and both machines are perfect for high altitude work. We have tried other types of helicopter but always come back to the helicopters which are

loved by both the pilots and ground crew."

The company fleet also includes three AS350B3, one each of the EC120 and EC130 and as recently as February added two Bo105 for rescue flights with one each operating out of their Lauterbrunnen and Sion bases.

The type of operations carried out by Air Glaciers means that all ground crew are fully trained and undergo an annual re-assessment, important for safety but also ensuring the long term trust relationship between pilot and ground crews is maintained. "This working relationship

is important when you have loads suspended at the end of an 262ft (80m) line and are working in close proximity to trees and unforgiving solid granite rock faces", comments Peter "we have even worked with long lines up to 820ft (250m) and regularly transport 0.8 tons (800kg) of cement and materials to build a new hotel or repair ski lifts".

The two main race days, Saturday and Sunday, are early starts for everyone at the Lauterbrunnen base which soon becomes the main focus for all the helicopter activity. Pilots and ground crew arriving at 0600 for a final briefing on the weather, and any last minute changes to the day's operations, the normal base ground crew of six swells to 20. Once the helicopters are moved out of the main hanger it becomes a passenger handling area, after all no one wants to stand outside in -5°C waiting for a helicopter taxi.

Also waiting are visitors who can afford the cost of 130 Swiss Francs (\$142) for a one way flight to the top, which includes skis and toboggans. A fleet of helicopters start to shuttle passengers to the top from 0800 through to midday when the race starts. In just over three hours 19 helicopters have ferried over 1000 passengers the ten minutes to the top of Lauberhorn.

The first flights take off at sunrise transporting a one man air traffic control unit and a small team of helicopter ground marshallers who take up positions on temporary helipads for their days work at the top of the mountain. To off load the passenger's temporary landing pads are created in the snow during the proceeding days up to the event using the tractors which normally maintain the ski runs. Time is not wasted at the landing pads with 45 seconds being the average time to land, drop off their passengers and take off again to collect the next group.

For some the flight up is a one way trip as every 15 minutes one of the helicopters will arrive with an under-slung canvas container full of skis. This is a necessity as although most of the helicopters are equipped to carry their passenger's skis, due to the high number being taken to the top it would slow down the unloading process. Once the



# AIR-GLACIERS



race has finished passengers who have arranged for their skis to be flown to the top make their own way down the slopes to enjoy the prize giving ceremony in Wengen.

By Sunday afternoon the racing has finished and the FIS tour prepares to move on to the next destination for the following weekends racing. The pilots and crews of Air Glaciers start the process of bringing all the equipment back down again, including the 119 toilets that went up the on previous days. A team of Swiss

Army soldiers dismantle the infrastructure of the race such as the safety fence, slalom poles and even the rubber mats at the end to stop the skiers crashing through the fence. Soldiers, TV crews and engineers load cargo nets with the equipment ready for the helicopter ground crews to connect to slings as the helicopters ferry between the base and

the mountain. By 1700 the mountains are empty and the helicopters have finished flying for the day.

This is the largest helicopter event of its kind in Switzerland and is impressive because of the speed in which it all happens. The reliability of the French built SA315B Lama, Alouette III helicopters and skill of the Air Glaciers pilots and support team play an important role in the success of the whole weekend.

**Alan Norris**



# Balkans frontier guardians

The Bulgarian Border Police is among the latest frontier services in Europe to establish its own aviation element. It operates some of the most modern law enforcement technologies, implemented the so-called 'Schengen helicopters', in a bid to protect the southern fringes of the European Union. Alexander Mladenov and Krasimir Grozev report.



is tasked to support the efforts of the ground and sea patrol forces in securing the Bulgarian borders with its non-EU neighbouring states - the so-called non-EU or 'Schengen borders' with Turkey, Serbia and the Former Yugoslavian Republic of Macedonia (FYROM) as well as the country's Black Sea and Danube river borders.

Established in April 2009 within the structure of the Border Police Chief Directorate, the Specialised Air Surveillance Unit (SASU) is stationed at Sofia Airport – North Area and

The SASU commenced regular flight operations in January 2011, with a pair of its brand-new helicopters deployed to the forward operational location at Bezmer, a military airbase situated near the Turkish

border. There the SASU flight crews initially started their in-country flight training under the supervision of instructors provided by AgustaWestland, and the following month the first operational land patrol missions were flown on the border with Turkey, followed by patrols over Bulgaria's Black Sea borders. The main mission comprises surveillance, detection and tracing of people, vehicles and vessels that crossed illegally the state border or are performing other legal offences. There is a strong migration pressure on the border between Bulgaria and Turkey, mainly by illegal migrants coming from Africa and Middle East, trying to enter within the guarded frontiers of the European Union (EU). One entered in one of the countries, they have the freedom to travel to all the other EU member states, because there is no border control at the EU's internal orders.

## Fleet

Two AgustaWestland AW109 Power light twin-engine helicopters, serials 514 and 515, were delivered in December to the Bulgarian Ministry of Interior's (MoI's) Border Police Chief Directorate. A few days earlier, an AW139 medium twin, serial 520, was also delivered to the same operator, while the formal handover ceremony for all the three machines took place on 15 January, 2011.

These helicopters, financed under Schengen, feature extensive and nearly identical mission equipment for day and night border surveillance and patrolling; it includes FLIR Systems Star SAFIRE HD day/night sensor payload, NVG-compatible cockpits, moving map displays, search/weather radar, SX-16 searchlight, external loudspeakers, digital video downlink, video recorder, dedicated mission consoles for a surveillance system operator and sophisticated integrated radio suite for tactical communications and airborne command and control functions. Both the AW109 and AW139 are fitted with floats for emergency water landings.

Additionally, the larger and heavier AW139 also features a double rescue hoist, rappelling rings, an enhanced ground proximity warning system (EGPWS) and traffic collision avoidance system (TCAS).

The ground component of the downlink system comprises of a fixed receiver station for the downlinked in real time TV and infrared image, audio and GPS information, provided with a 20-in HD display as well as vehicle-carried briefcase receivers, supplied by the UK company Enterprise



## Control Systems.

The three AgustaWestland border patrol helicopters were procured by the Bulgarian Ministry of Finance on behalf of Ministry of Interior in 2009 and 2010, utilising European Union (EU) financial aid provided through the EU's Schengen Facility aid programme. According to information released by the Bulgarian government at the time of the handover ceremony, their total price is exceeding Euro 29 million.

The helicopters join another AW109E Power, also owned by Border Police Chief Directorate, procured with government funding that had been delivered in March 2010. This machine, which features the same configuration as the SASU's current AW109s, albeit without the FLIR Systems Star SAFIRE HD payload removable parts, has been leased out to Aviodetachment 28, Bulgaria's government air transport unit (operating under the civil registration LZ-BMB), and upon expiry of the lease period in mid-2013, it will be also incorporated into the SASU fleet.

## Operations

Currently, as Bulgarian Border Police's Deputy Director, Commissar Milen Penev explains, the SASU has day-only border patrol operating capabilities, but it near-term the organisation plans to carry out its first Night Vision Google (NVG) training, utilising the cooperation within the Frontex,

which is providing skilled instructor pilots from another EU state.

Frontex is the European agency, responsible for external border security which exercises coordination of the activities of the national border guard services in ensuring the security of the EU's borders with non-member states. There are four NVG training events for the SASU to be funded by the Frontex that are slated to be carried out in 2013 and it is also planned to organise SAR training. The SASU already has in its inventory the Bulgarian-made Optix Diana-A aviator NVG sets, and two of its pilots have some NVG experience that was accumulated during their military carriers before retirement to join the SASU in mid-2010. The unit is planned to play a role in the EU's Frontex programme from 2013, by the means of reinforcing, on as-needed basis, the border protection effort in other countries experiencing a strong illegal migration pressure, mainly in the south part of Europe. All flying carried out by the Bulgarian Border Police helicopters is done under military rules and airworthiness of its helicopters falls under auspices of the Bulgarian MoD's newly-created military aviation authorities. Helicopters carry military-style codes and the pilots and technicians are also provided with military-style licenses. Despite their sophisticated mission suites, both the helicopter types proved to be easy to support and demonstrated pretty good reliability performance so far.

The SASU is headed by Chief Inspector Ivan Denev, an experienced ex-Bulgarian air force helicopter and fixed-wing pilot and commander, with over 3,000 flight hours under his belt. Likewise, all the SASU pilots and a vast majority of the technicians are ex-military personnel, who flew or maintained during their military careers

the Mil Mi-14, Mi-24, Eurocopter AS532 Cougar and/or Bell 206 helicopters. Backbone of the SASU's flight crews has been formed by an initial cadre of five ex-military aviators who received their type rating training on the AW109E and AW139 at AgustaWestland's Training Academy in Sesto Calende near Milan in the second half of 2010. In 2011, they accumulated a significant in-country flying experience thanks to the intense training and operational flight activity carried out at Bezmer base, with two of them receiving instructor ratings. Training of new SASU pilots continued in 2012, as the service employed a large group of ex-military aviators in a bid to be capable of sustaining 24/7 quick reaction alert at several key locations alongside Bulgaria's non-EU borders.

### Border protection scenarios

The SASU personnel training programme in 2012 included a significant project for improving its air surveillance capabilities, utilising the know-how provided by the Aviation Group of the Federal Police in Germany, as the fledging Bulgarian air unit had little or no experience and expertise in the border protection business.

types of operational sorties, called E-1, E-2 and E-3, to be undertaken by the SASU. The first of them, E-1, is an urgent mission, prompted by a developing emergency situation at the border and using a helicopter on standby at a forward operating location scrambled to provide air support to the surface patrol forces. The second one, E-2, is a routine scheduled border patrol mission and the third one calls for undertaking reinforced surveillance within a pre-designated border sector, looking for signs of illegal activity such as border crossings of immigrants or smuggling of goods.

According to Commissar Milen Penev, this joint Bulgarian-German training project was aimed at integrating the SASU flight operations within the overall border protection effort, working in a coordinated manner with the ground and sea forces. The final exercise held in the first half of June covered three different scenarios on the land border and another scenario practised at the sea border. All these scenarios should be considered as representative ones for the vast majority of border protection missions in which the SASU helicopters are going to be employed in near to mid-future.

The first of the land border scenarios, practised at the border with Turkey saw diverting an airborne helicopter whilst on a routine patrol flight, in a bid to react to a border crossing violation detected by the ground sensors of the integrated border surveillance system. The helicopter was re-tasked in the air to detect and track a group of illegal immigrants using his sensor payload, downlinking the real-

ness. This EU-funded project, which culminated with an exercise held in June, introduced a new concept of operations of the SASU (the so-called methodology). In general, this concept, strongly influenced by the German experience, calls for three main





time video image to the regional coordination centre, which also controlled the operation of the surface patrols dispatched to apprehend the immigrants. The second scenario saw search, detection and tracking of a car, which managed to escape inspection at Lesovo border checkpoint. The search for the escapee car was carried out by a helicopter, kept at standby at forward operating location. The third scenario at the land border was the most complex one and involved both the AW109 and AW139 utilised to counter the border crossing of a large group of illegal

immigrants. The AW109, staying at standby, was scrambled to search for the group using its sensor payload and downlink the real-time video image to the ground control and command facility, while the larger AW139 was utilised to deliver to the crime scene an airborne detention party to pursue and apprehend a proportion of the 'illegal aliens'. The sea border scenario called for supporting the border protection vessels during an inspection of two fishing vessels, one Turkish and one Bulgarian, suspected of ferrying illegal immigrants, with both

the AW109 and AW139 called in action once again. The smaller helicopter was used for tracking the suspected ships and downlinking live video images onboard the border police patrol ships, while the AW139 deployed a sniper team covering from the air the boarding party dispatched to carry out inspection onboard the suspected ships and apprehend the illegal immigrants.

### Future developments

In addition to the core business of the SASU, the border patrol missions, its helicopters are considered valued assets of the Bulgarian MoI that have already been used on a few occasions to enhance its law enforcement capabilities throughout the country. Both the AW109 and AW139 are planned to be deployed in a good many homeland security missions, on behalf of other MoI directorates and even other ministries and government agencies in Bulgaria. The most prominent of these non-core missions are the fire monitoring and mapping, the rapid transportation of MoI's 'Red Berets' counterterrorist unit and use as airborne sniper platforms as well as the highway monitoring, SAR and detecting marine pollution.

The concept of the SASU's near- to mid-term development foresees construction of a modern base, including maintenance hangars and administrative building at Sofia Airport, where the unit's main operative base is located, utilising EU funding that is being provided under the External Borders Fund facility. The Sofia-based helicopters are responsible for patrolling alongside the Serbian and FYROM borders and a host of other support missions, also using a forward operating base at the city of Kjustendil. Bezmer will be maintained as a secondary permanent SASU base, responsible for operations on the Turkish border and the Black Sea coastline, with two forward operating locations established in Elhovo and Burgas.

Bulgaria has been an EU member state since 1 January 2007 and was originally slated to join the Schengen zone as a full-right member in 2011 though acceptance was postponed for indefinite time. Notwithstanding, its borders with non-EU states, Danube river and Black Sea borders are now considered as the outer borders of EU, with its new helicopters providing high-tech support to the overall border protection effort against illegal migration, contraband smuggling of goods and drugs and all other forms of trans-border criminal activity Bulgaria may face.



# BUSINESS PROGRAM OF HELIRUSSIA 2013

May 16-18, Moscow, Crocus Expo Exhibition Center

<b>Thursday, May 16</b>	
<b>10.00-11.00</b>	Press conference led by Russian Helicopters OJSC
<b>10.00-15.00</b>	2nd Interdepartmental Scientific and Practical Conference on "Air Ambulance and Medical Evacuation 2013"
<b>13.00-18.00</b>	Conference on "Aviation On-Board Equipment"
<b>14.00-17.00</b>	5th International Conference on "The Helicopter Market: Today and Tomorrow"
<b>15.00-18.00</b>	Round Table on "MI-8T: Prospects for Development and Application"
<b>15.00-17.00</b>	Workshop for Air Ambulance Workers
<b>Friday, May 17</b>	
<b>10.00-15.00</b>	2nd Interdepartmental Scientific and Practical Conference on "Air Ambulance and Medical Evacuation 2013"
<b>10.00-18.00</b>	"Tools for Combating Counterfeiting in the Aviation Industry: International Practice"
<b>12.00-15.00</b>	Seminar on "New Helicopter Safety Technologies"
<b>12.00-15.00</b>	Round Table of Russian Helicopters OJSC's Component Suppliers
<b>13.00-15.00</b>	Seminar of Aviation Lawyers
<b>15.00-18.00</b>	Round Table on "Using Composite Materials in Rotorcraft"
<b>16.00-18.00</b>	Conference on "Russia's Aviation Fuel Supply System: Today and Tomorrow"

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