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"Russian Helicopters" Holding Company started works on the construction of the largest in Russia facility with a flight-test center on a site which covers almost 800 ha. Works on the construction of a new helicopter production cluster have been started at the former Bataysk military aerodrome in the Rostov Oblast on a total area of almost 800 hectares. The core element of new cluster will be production facilities of Rosvertol which is part of "Russian Helicopters" Holding Company.



Unique and universal
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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.

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



Against Peruvian drug lords
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For over half a century, in some countries of Latin America a hard confrontation between the government and drug cartels has been going on. This is a struggle in which an overwhelming victory of law enforcement authorities is hardly possible, however any success has a positive impact on health, potential drug addicts and the fight against global organized crime. Proceeds from sales of cocaine do not remain in the country of production – they are transferred to the countries of consumption – the US, EU and Russia following drugs.

The cluster will include five new and three supporting plants to ensure the production process

New helicopter production cluster in Bataysk

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Works on the construction of a new helicopter production cluster have been started at the former Bataysk military aerodrome in the Rostov Oblast on a total area of almost 800 hectares. The core element of new cluster will be production facilities of Rosvertol which is part of "Russian Helicopters" Holding Company.

Currently, the main focus in this project is placed on the construction of the flight-test center of Rosvertol. In March 2016, experts of the Rostov enterprise of the holding obtained a permission from Glavgosexpertiza to move the flight-test center to the aerodrome in Bataysk.

The airfield infrastructure was restored, and a section of an artificial landing strip was put into operation as a helipad. Furthermore, a substantial part of the training flights of Rosvertol was redirected to Bataysk.



Opening of the Rosvertol flight-test center is scheduled for 2019, afterwards the construction of a new helicopter production cluster will be started near Bataysk. The project is aimed at the construction of helicopter production facilities, service center and a branch of the Helicopter Academy.

The cluster will include five new and three supporting plants to ensure the production process in which at least 20 thousand people will be involved.

The project will be implemented in two stages. The first stage assumes the construction of a flight-test center at the former military aerodrome in Bataysk. The Statement of work has been already received, start of design and construction/installation works is scheduled for 2015, commissioning is scheduled for 2019. The main objective of the flight center is to provide a safe environ-

This plant manufactures modern Mi-28N attack helicopters, Mi-35M transport and strike helicopters as well as Mi-26's



ment for helicopter testing and to bring experimental flights outside of Rostov-on-Don. It is expected that the center will serve the core production facilities of Rostvertol and will also be used for testing equipment that is repaired on requests of the Defence Ministry and other customers.

Once the flight-test center is commissioned, works on the construction of the cluster will be commenced. The cluster will accommodate the Helicopter Service and Repair Centre of the Defence Ministry for the Southern Federal District, the Russian Advanced Commercial Helicopter (RACHEL) production facility, a composites components production facility and a branch of the Helicopter Academy of Russian Helicopters.

Research fellow at the Institute for Transport Economics and Transport Policy Studies of NRU HSE Fyodor Borisov welcomed the idea of creating a helicopter production cluster and noted that helicopter engineering is one of the few high-tech industries in Russia where products being manufactured enjoy successful sales.



Boris Rybak, the head of analytical agency "Infomost", shared the opinion of Borisov and expressed the idea that this cluster would be in demand, given the high level of global demand for helicopters. Besides, according to the expert, the construction of the flight-test center will be inexpensive since it is created on the basis of the former airfield, and just a flight area and several laboratory buildings

are required for its operation.

Fyodor Borisov also mentioned the need to tackle the issue related to training of staff necessary for project implementation. Amidst the expected expansion of production, specialists graduating from the relevant Chair at the DSTU (Don State Technical University) specifically for Rostvertol will not be enough.



The development of the helicopter cluster in Bataysk will allow this area to become the largest development center of the region and to create at least 10,000 new jobs



transport and strike helicopters as well as Mi-26's, the world's largest helicopters with the highest payload capacity in the world ", said Alexander Mikheev, CEO of Russian Helicopters Holding Company.

As stated by CEO of Russian Helicopters, the range of equipment produced at holding enterprises is constantly being improved, and the demand for the products of Rostvertol plant is growing not only on the Russian but also on the global market.

"For the Rostov Oblast, a helicopter production cluster means decades of manufacturing traditions combined with innovation, this is the pride of people for the excellent work. The development of the helicopter cluster in Bataysk will allow this area to become the largest development center of the region and to create at least 10,000 new jobs. The core element of new cluster will be production facilities of Rosvertol. In the first place, we will move the flight-test center outside the boundaries of Rostov-on-Don, a city with over a million inhabitants", said Vasily Golubev.

On 22 August 2016, Alexander Mikheev, the CEO of Russian Helicopters Holding Company held a meeting with the Governor of Rostov Oblast Vasily Golubev within an official visit to Rostov-on-Don. During the meeting the parties discussed a wide range of issues related to the activities of the plant of Rostvertol which is part of Russian Helicopters. The head of Russian Helicopters and the Gov-

ernor of Rostov Oblast discussed primarily the progress of production upgrade and improvement programs, current capacity utilization of the plant, retention of skilled personnel and strengthening of workforce capacity.

Rostvertol is one of our most successful enterprises. Exactly this plant manufactures modern Mi-28N attack helicopters, Mi-35M

Nicolas Korobov

APPLICATION

The history of use of helicopters for firefighting in the USSR originates in 1956

Extinguishing and that's all...

The idea to extinguish fires from the air has been recognized as promising without any reservations from its very existence. However, lack of technologies and capabilities has for a long made it not very much effective.

The main things is – capacity

In fact, a 100-liter beer barrel suspended on aircraft could, in principle, not provide the required amount of water to eliminate any combustion on earth. Problems were observed in well-aimed throwing of water. But despite this state of affairs, exactly beer barrels installed on board the aircraft in the late 1920s – early 1930s in North America have been the first to use on airplanes for firefighting.

Similar Soviet practice in the early 1930s, though it advanced beyond the American one, confirmed in general the thesis of the low efficiency of the aviation of those days



Ka-32 helicopter turned out to be the revolutionary development of the subject



to combat fires. Experience in extinguishing forest fires from aerosprayers with chemical solutions and creation of control lines from Po-2 and P-5 aircraft has shown that hang-over creeping fires only could be contained with relatively reasonable success. A lot has changed after the World War II

when thousands of military aircraft and pilots turned out to be marginalised. In the US, the demilitarized training biplanes Stearman PT-17 and N3N converted into agricultural machines were the first to be used for such firefighting purposes. The presence of chemical tank and equipment

on board the aircraft for spraying of chemicals allowed to quickly adapt the aircraft to water discharge. The first Stearman with the registration number N75081 flew on firefighting mission in July 1955. However, this "agricultural firefighting" aircraft took only a little water on board – just 605 litres.

In the seventies, a water discharge device (VSU) for the Ka-26 and Mi-8T was developed. The VSU to the Ka-26 consisted of a 320 l tank (on external sling), with plugs installed at the tank top – 420 litres



Some time earlier, in 1952 the Soviet Union has started testing of 1000-liter aircraft sprayer (APO) on board the aircraft AN-2. The fire-extinguishing liquid was poured into the aircraft sprayer using power-driven pumps from the tanks installed at the airport, and discharged from a flying airplane at a height of 25 meters under a pressure of 5 atmospheres within 5 seconds, thus creating a 80-100 m strip in the open place. However, attempts to create a sufficiently wetted strip in these experiments failed to be successful. However, the topic related to fire extinguishing from the air gained momentum.

Suitable modes of transportation, extinguishing media

As for the helicopters, they were used first time for forest conservation in the US immediately after the World War II. Though initially, they were in service for carrying people and equipment to the places of forest fires in Los Angeles in 1945 and California in 1946. Later on, the light Bell 47 aircraft were adapted to transport water in rubberized 150-250 l bags installed under the fuselage. Afterwards the bags were replaced by two side tanks connected by a tube with drain valves. But even at that time it was all about missing experience, although the helicopter has proved its worth by performing a variety of firefighting tasks. However, this gave rise to conversations about a landmark in the evolution of helicopters' use for firefighting.

The only thing that deserves attention is that evolution was basically related to an upgrade of the water discharge equipment, and not to the helicopters themselves. In 1954, waxed paper bags filled with water were e.g. used as fire-extinguishing containers, although this technique resulted in serious problems as burning embers were flying apart from the fire sources to be extinguished. And yet the US Forest Service has believed this technique to be a great tool to eliminate small fires.

It takes some time to realize the prospects

The history of use of helicopters for firefighting in the USSR originates in 1956. While light helicopters Mi-1, and subsequently Mi-2 were used for reconnaissance and transportation of people and equipment, the load-lifting Mi-4 was used directly for firefighting. With a M-800 motor pump on board and two tanks with a capacity of 1 cu. m. of water each, with wetting agent reserve, it could supply a jet with a length of up to 30 metres, punching the leaves with a jet and spinning flame tips with aerial currents in the direction of the burned area. There were also other, similar systems, but at that particular time few people realized real prospects of the new fire suppression system in the country, and as soon as people showed less interest in the novelty product, it was used just for water supply.

Thus, the Western and Soviet fire extinguishing technology has been virtually developed in parallel to the use of aircraft. This means, as a rule, development of tanks and systems for water intake on board and water supply to the fire area. The only thing worth noting is that the Americans made use of everything related to fire suppression technology and tools suddenly appeared at that time.

Scooped, poured out

Over time, firefighters have started to use helicopters with water discharge devices on an external sling which could be filled in almost any reservoir on hover mode. This layout resulted in some advantages, such as greater efficiency due to the increased discharge accuracy and tank filling efficiency (it takes only a few seconds), enhanced safety of the crew (there is no need to move downwards to the height of 50-80 meters over the fire).

In the seventies, a water discharge device (VSU) for the Ka-26 and Mi-8T was developed. The VSU to the Ka-26 consisted of a 320 l tank (on external sling), with plugs installed at the tank top – 420 litres. Water from the reservoir is taken by scooping and discharged to the fire by tilting the tank. Di-



Western and Soviet fire extinguishing technology has been virtually developed in parallel to the use of aircraft



The alternative was fitting helicopters with suspended or onboard water tanks and pumps inside the fuselage for water intake on hover mode

mensions of wetted strip at the water discharge over the open place – 5x30 meters. In real practice, the water discharge devices have shown good results when extinguishing spot fires (10x10 meters), especially in the mountains.

Since 1979, water discharge devices have been used on board the Mi-8T helicopter. They were used to fight creeping ground forest fires by discharging water on the burning edge, or by the creation of fire trace before the fire front being propagated. The technology has been widely developed in the early 1980s when the Canadian company SE1 Industries LTD started to widely put into practice Baby Bucket containers. These containers were filled with water once they were laterally immersed into a water reservoir. The alternative was fitting helicopters with suspended or onboard water tanks and pumps inside the fuselage for water intake on hover mode. For example, the S-64 Skycrane helicopters were equipped in a similar way.

Special fire-fighting helicopter

To some extent, a certain stage of development was also creation of Mi-14 PZH "Eliminator" in the Soviet Union. This aircraft had a tank with a capacity of 4 tons instead of military equipment. Thanks to the water intake system, the tank was filled within two minutes while the aircraft was hanging above a water reservoir with a depth of 30 cm or more. Water was discharged with the use of burst (accelerated way within 3 seconds) and controlled methods (within 15 seconds). In addition, it was able to transport loads with an external sling, to deliver up to two dozen rescuers to the facility to evacuate people from the disaster area at any time from any areas in simple and challenging weather conditions.

Ka-32 helicopter turned out to be the revolutionary development of the subject. Fire-fighting equipment of this helicopter included a light tank with a capacity of three tons, a built-in water intake and discharge system and was installed at the fuselage bottom. When compared to conventional

helicopters with external fire-fighting sling, restrictions in terms of flight speed, reservoir depth, reduction of hook and disbalance risks have largely been lifted in respect to Ka-32. Water from a surface water reservoir comes into the tanks within 80 seconds through the use of two electric pumps. Subsequently, the Ka-32 can carry and discharge up to 28 tons of water on a distance of five kilometres within an hour.



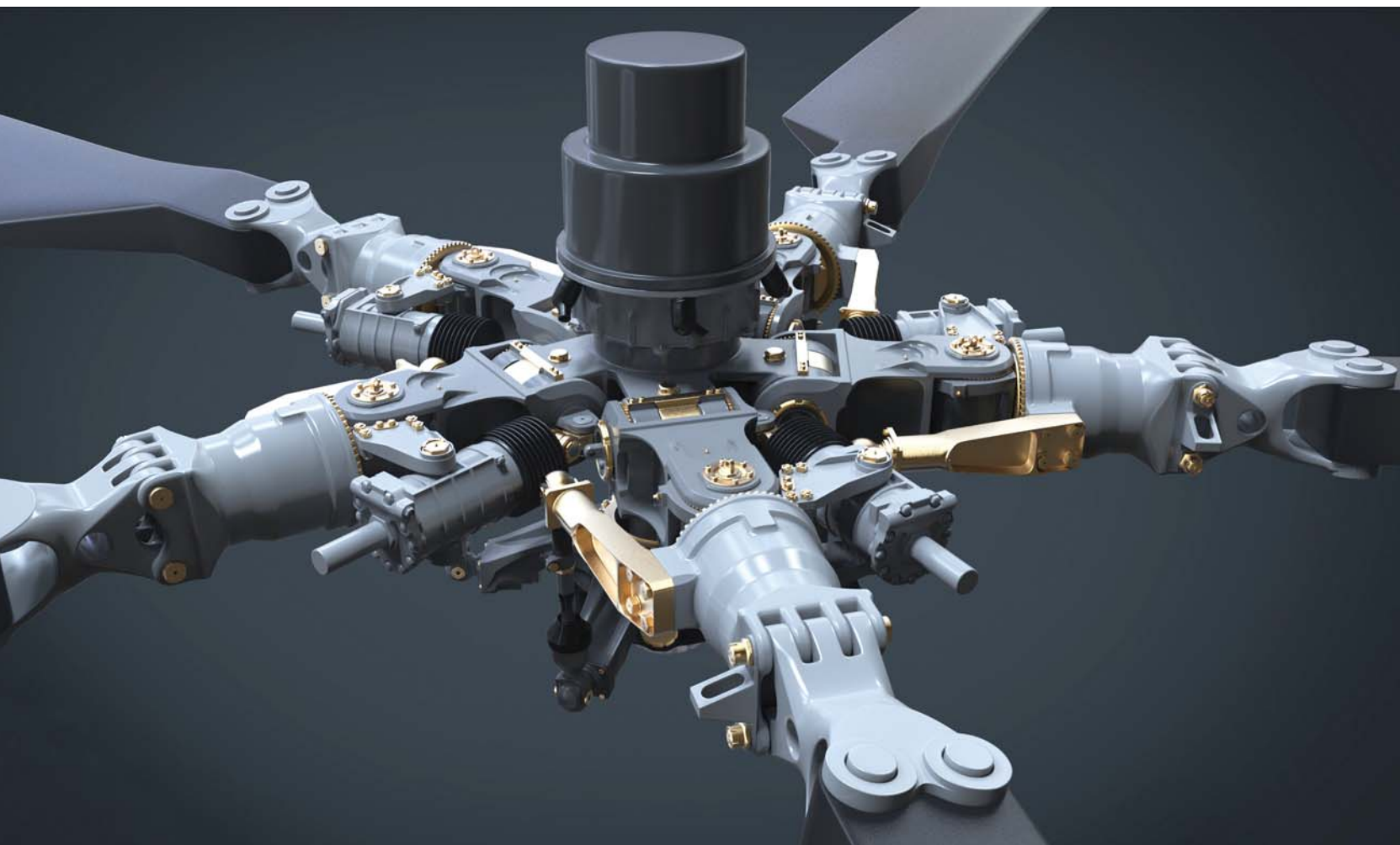
What else, except firefighting

Over just three decades, helicopter firefighting systems have come a rather long way in their development. They play a crucial role in assisting while fighting forest fires. It became possible only due to unique features of helicopters platforms themselves which apparently have not yet revealed even the smallest part of their potential.

Herman Spirin

IMPROVEMENTS

Innovative technologies used in the helicopter industry allow to obtain a number of operational capabilities



The parade of new technologies

Printing components on a 3D-printer

Within the framework of the Moscow exhibition "Innoprom 2016", Russian Helicopters showed for the first time their developments in additive technology. On the Holding booth, there were presented the elements of the steering control of the helicopter, as well as non-bearing components printed on 3D-printers.

The core element of the exhibition of Russian Helicopters was a tail rotor control slider for the light multi-role helicopter ANSAT,

made in three versions: one – using a conventional method through machining, and two variants of the component with a bionic aluminum and titanium design produced using additive technologies of layered sintering of metal powders. Compared to the element made in a conventional way, the weight of components printed on a 3D-printer has been reduced almost by half. Furthermore, the Holding specialists have demonstrated non-bearing parts (hollow lightweight door handles) made of alu-

minum, also created by using additive technologies.

In accordance with the request of the Ministry of Industry and Trade of Russia, Russian Helicopters are actively implementing components made by means of 3D-printing in the production of its technology. These innovative technologies used in the helicopter industry can provide a reduction in weight of the machine parts up to 40%, shorten the time of development of new products and prototyping by several times,

as well as allow to obtain the elements of complex shapes that cannot be made in the usual way.

"Additive Technology is one of the fastest growing areas of aircraft production today. They change fundamentally the way of production and are currently the world trend. Russian Helicopters Holding Company intends to actively implement 3D-printing for mass and prototype production of their helicopters," said the Deputy General Manager for Production and Innovation of Russian Helicopters Andrey Shibitov during the "Innoprom 2016" exhibition.

Additive Technology is one of the fastest growing areas of aircraft production today. They change fundamentally the way of production and are currently the world trend

The system to identify hidden damages to helicopter blades

Russian Helicopters developed a unique system for detecting hidden damages to helicopter blades. Development of technologies for scanning blades of main and tail rotors is carried out by the experts of the design bureau VR-Technologies of the Russian Helicopters Holding Company (part of Rostec State Corporation). VR-Technologies was established in 2014 as an innovative design office of Russian Helicopters to provide helicopters with competitive scientific and technological solutions.

Currently, the creation of a device prototype is underway, and the tests are being conducted. It is planned that the last test stages will be completed in the next two years. Moreover, the experts of VR-Tech-

nologies are completing the release of design documentation under the project of modernization of the main and tail helicopter rotors. According to the project, the structure will not feature a conventional spar and honeycomb core in the blade fin rear part, and the blades will be manufactured according to a single-step molding technology using polymeric materials. This technology will increase the strength of the blades, will lower vibrations and enhance the quality level of their production at the stage of mass production, including through the use of modern manufacturing operations.

Accident-free fuel system for helicopters

Technodynamics Holding (which is part of Rostec) has completed the test operation in the extreme conditions of the first in Russia accident-free fuel system for helicopters designed to protect from the consequences of hard landings.

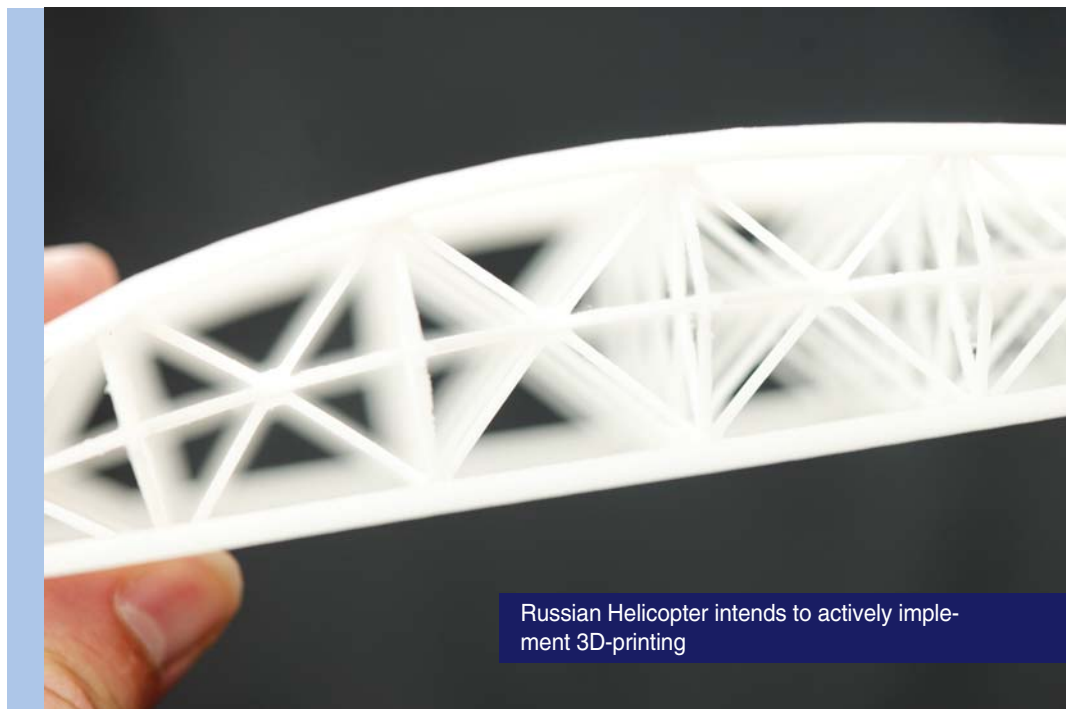
The peculiarity of the system is that "in the event of an accident, the tanks retain their integrity and the connections are broken in special elements which prevents from leakage of fuel."

"It is important that this development is used on the Russian helicopters: this will significantly increase their reliability and security, and therefore their competitiveness on the Russian and global markets", said the Deputy Minister of Industry and Trade Andrei Boginsky.

According to the General Manager of the Holding Maxim Kuzyuk, "such systems have not been ever developed in Russia and there are only a few "peers" in the world."

"Once the weight is improved and adaptability for a specific helicopter is increased, we will conduct comprehensive tests on its reliability. After that, we will be able to certify our development according to the international standards and to offer it to national and international manufacturers of helicopters", he said.

After emergency falls of helicopters, fires are quite often on board due to the deformation of the structure of the fuel tanks, short circuit or contact of spilled fuel with hot objects.



Russian Helicopter intends to actively implement 3D-printing



On modern rotorcraft, there are various types of fuel tanks with various degrees of anti-shock performance. Some of them are compartments within the aircraft fuselage, sealed with covering (for example, cellular polyurethane foam), which prevents spillage. Some tanks are metal cans or containers, which are molded from various synthetic materials and large plastic bottles. Domestic soft fuel tanks are made by bond-

ing a layer of elastomer (any kerosene-resistant rubber), adhesive layers and a special rubberized fabric. Engineers and scientists of the British GKN Aerospace Company have developed a new composite material for fuel tanks. It has a high level of reliability in the event of impact and poorly susceptible to punctures and other point-like damage. For the production of flexible fuel tanks, the aerospace industry has tradition-

ally used a multi-layer bonding technology of composite materials and protective textile layers.

This significantly complicates the manufacturing process. The developed material is produced on the basis of a thermoplastic polymer and contains a textile layer inside, which increases the impact resistance of the material in the event of an accident.





The structure will not feature a conventional spar and honeycomb core in the blade fin rear part, and the blades will be manufactured according to a single-step molding technology using polymeric materials

With such a material, the use of solvents containing volatile organic substances is reduced many times.

In the event of falling down, the metal pipes are cut by the surrounding structure; they are broken because of the displacement of

the airframe and chafed by other metal elements of the system, which leads to the leakage of fuel. In such areas, it is strongly recommended to use flexible nonmetallic hoses armored with steel braid. In fuel systems, where the shut-off valves are not installed, it is necessary to use flexible hoses, which are 20-30% longer than the minimum length of hoses required by the design.

The Eaton Company in cooperation with Russian Helicopters launched a production facility in Russia to manufacture flexible Teflon hoses. The advantage of Teflon hoses compared to rubber is a longer useful life despite the high cost of manufacturing.

The use of modern technology of computer modeling - software STAR-CCM+ one made by CD-adapco helps numerically analyze with high accuracy and granularity of detail all the complex physical

processes that occur in the fuel system in the event of a helicopter crash. The results and methodology of process modeling in the hydraulic system allow the developers to observe at the design stage the behavior of the liquid in the tank and eliminate defects by increasing the reliability of the fuel system and the helicopter as a whole.

Andrei Vezhnovets





Mil Mi-171

ВЕРТОЛЕТНАЯ
ИНДУСТРИЯ



PRODUCT LINE

The Ka-32 and its latest model, the Ka-32A11BC – are truly universal machines

Unique and universal



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.

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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



The coaxial design and the absence of a tail rotor give the Ka 32A11BC compactness, high power-to-weight ratio, manoeuvring capability and excellent controllability

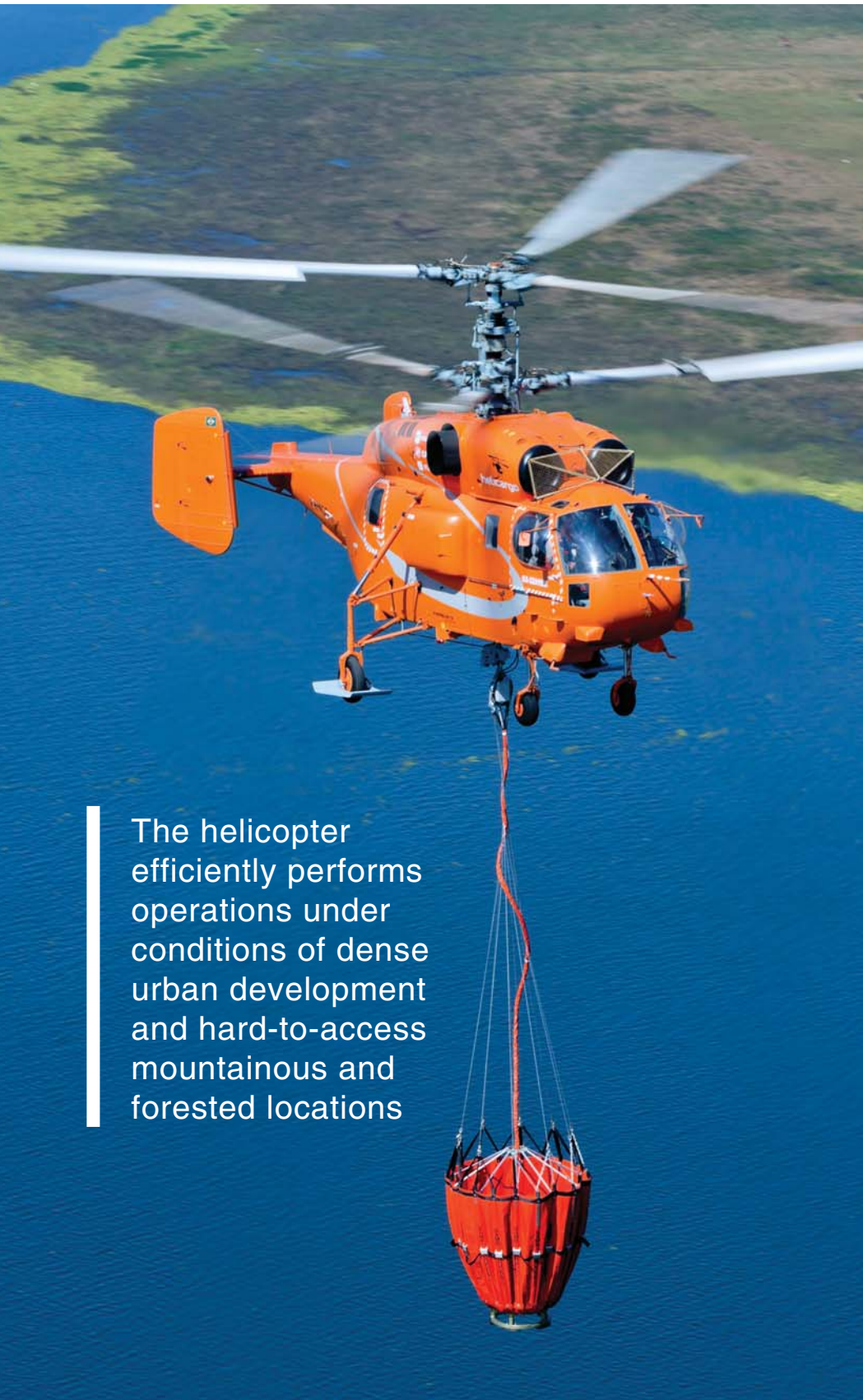
water cannon can extinguish a fire even higher up, such as in the upper floors of the Burj Khalifain in Dubai, which is 828 meters tall and has 163 floors.

Today, more than 150 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 bicameral 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 certified for use in Canada in 1998. The certificate was amended to allow the conveyance of public



The helicopter efficiently performs operations under conditions of dense urban development and hard-to-access mountainous and forested locations

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.

The process of international recognition of Ka-32 began in 1992 when the Heliswiss owner Joe Reedy proposed Kamov company to make use of the Russian helicopters in moving timber and at other works. This was mainly due to the fact that, pressured by the green, the laws were passed in a few countries forbidding usage of tracked vehicles in timber logging, and forest operators willy-nilly had to remove timber by air. To do this, for example in Europe the helicopters of the European consortium Eurocopter were used. It turned out, however, that even the latest model of Eurocopter – AS 332 Super Puma – yields Kamov's machine the majority of points, to say nothing of the price. Astute Reedy had backed the right horse, and Kamov's team, in the toughest competition, managed to be both feasible with buyers, and demonstrated unrivalled skills of experienced negotiators, too.

When the Swiss first got Ka-32 its operation costs per hour were about \$2000. Thanks to maintenance benchmarking this amount lowered down to \$800! The developers kept moving in this direction and managed to extend the overhaul period of gear assembly from 500 to 2000 hours, and even more extension to 3000 hours was scheduled.

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 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 Ka 32A11BC inherited the best traits of the Naval Ka-27PS on which base it was designed

The history of the Ka 32 helicopter completely reflects its special capabilities. There are quite a few well-known types of helicopter technology that are well adapted to accomplishing a narrow range of tasks. The Ka 32 and its latest model, the Ka 32A11BC – are truly universal machines. The largest

regional operator – South Korea – demonstrates that these helicopters can do everything. More than 60 helicopters of the Ka 32 type have been put into operation for vari-

pany have logged around 17,200 hours. Spanish operators have decided in favor of Ka 32 helicopters in a firefighting modification. The fire season in the Iberian Penin-



ous jobs today in South Korea; they have logged over 100,000 hours of flight time. The Department of Forest Aviation uses the Ka 32 for firefighting; the country’s Air Forces use them in search and rescue operations; and the Coast Guard uses the helicopters for patrolling the coastal waters. In addition, the Ka 32 is used in the commercial sector for transportation of freight, construction and assembly work, logging, and other tasks.

The Canadian company VIH Helicopters, as the most successful operator with the largest fleet of Ka 32’s in the world, has demonstrated the operational capabilities of the Ka 32A11BC. Over more than 15 years, the Ka 32’s operated by the Canadian com-

pany begins each year in mid-May and runs until October. During this period 20 Ka 32A11BC helicopters are positioned at base points near bodies of water throughout the peninsula. The primary hotspots are located in southern Spain in the provinces of Seville and Valencia. One helicopter may log up to 300 hours in a season. At times a machine must carry out challenging operations up to 14 hours a day. Depending on the remoteness of a body of water, the helicopter is capable of taking a load of water from 5 to 30 times an hour.

The coaxial design and the absence of a tail rotor give the Ka 32A11BC compactness, high power-to-weight ratio, manoeuvring capability and excellent controllability.



The specified service life of the helicopter has now been extended to 32,000 hours, which gives the helicopter low operational costs and good efficiency. In addition, the Ka 32A11BC can be equipped with a medical module with modern equipment for intensive therapy. Thanks to this, resuscitation measures can be conducted while transporting patients and injured persons. This is a very important capability for companies performing a wide range of aviation operations.

Along with clients in southern Europe and South America, today the Ka 32 helicopters are being acquired more and more frequently by clients in the growing markets of Southeast Asia.

In February, 2016, the Russian Helicopters Holding Company signed a number of agreements on the delivery of seven Ka 32A11BC helicopters to the People's Re-

public of China. This year the Fire Department of the Public Safety Agency of the city of Qingdao (CPR) will be the recipient of two Ka 32A11BC helicopters in a firefighting modification. Four multi-purpose Ka 32A11BC's will be delivered to the Chinese company Jiangsu Baoli, and one more Ka 32A11BC is to be supplied to the company Easy Best Group. The Russian Helicopters Holding Company previously delivered eleven Ka 32-type helicopters to various Chinese clients. In 2015 three machines were delivered.

The Ka 32A11BC is ideally suited to the highly urbanized cities of China and its natural and climatic peculiarities. The helicopter efficiently performs operations under conditions of dense urban development and hard-to-access mountainous and forested

locations, and is also capable of landing on the decks of small size vessels, on drilling platforms, and on an unprepared surface.

And not so long ago the helicopter was able to prove its unbelievable capabilities in rescuing people. The Ka 32A11BC helicopter played a key role in rescuing the passengers on the research vessel "Academic Shokalskiy", which was stuck in Antarctic ice. On 2 January 2014, a helicopter based on the Chinese icebreaker Xue Long successfully performed an operation to evacuate the passengers. Since 24 December 2013 the vessel had been imprisoned in the Antarctic ice 1500 nautical miles from the coast of Australia.



The latest Russian The characteristics of the Ka-32A11BC allow it to make flights under conditions of increased turbulence and storm winds, while the coaxial design permits accurate hovering



Vessels of the icebreaker class - the Chinese Xue Long and the Australian Aurora Australis – had tried without success to push through to the Academic Shokalskiy, after which the decision was made to evacuate the passengers. A Ka 32A11BC belonging to the China’s State Oceanographic Agency and based on the icebreaker Xue Long sailed off to help the people.

The Ka 32A11BC helicopter made five flights, transporting the passengers in groups, and also completed two additional flights in order to deliver the expedition’s luggage and equipment onto the Aurora Australis. Totally, 52 people were evacu-

ated—foreign citizens, among them were scientists and tourists. The evacuation operation lasted about four and a half hours.

The Ka 32A11BC inherited the best traits of the Naval Ka 27PS on which base it was designed. The Ka 32A11BC effectively operates under conditions of low temperatures and high humidity and is highly

resistant against the influence of the aggressive marine environment. The characteristics of the Ka 32A11BC allow it to make flights under conditions of increased turbulence and storm winds, while the coaxial design permits accurate hovering, maneuvering, and landing on small areas, which is especially important when being based on ships.

The tests of the Mi-28NM are coming to an end



The first flight of the Mi-28NM

The first test flight of the newest Russian-made Mi-28NM was carried out in mid-July on the Flight-testing station of the Moscow Helicopter Plant named after M.L. Mil in Lyubertsy, near Moscow. According to the test profile, the first flight is usually a liftoff and hover at a low altitude to test the helicopter controls, its alignment, operation of engines and transmission gear.

Attack helicopters Mi-28NM Night Hunter, put into service by the Ministry of Defense last year, after its upgrading will receive high-precision weapons, a new control system, and a "glass cockpit."

"We are currently implementing significant upgrade of computing, visualization and navigation systems. For this helicopter, we ordered weapons with optical guidance in Kolomna (Engineering Design Bureau, EDB). Some new prototypes are coming very soon", said Givi Janjgava, Deputy General Manager of Radio-Electronic Technology Concern (KRET) for Research and Development of Onboard Equipment.

Also, according to him, the Mi-28, from the very beginning was designed in such a way that its actions could be coordinated with other helicopters. "We are developing an upgraded system of preparation of flight missions for coordinated actions of helicopters. This system already has some precursors for integration into the network-centric control system," the expert said.

The principle of this system lies in the fact that Night Hunters will be able to constantly communicate not only with one another, but also to receive information from the aircraft, ground control stations or satellites. "This system in its simplest form can be compared with the Internet.

The actions of a helicopter will be more effective if it kills not only those target that are visible, but also those which are observed by the other helicopters," said the agency interlocutor. The upgraded Night Hunter will also receive a "glass cockpit", which will be virtually deprived of mechanical devices and conventional control panels.

"It is getting more and more closer to imaginative displays. The intelligent system operations work in such a way that the system offers a final decision and options from which the pilot selects the desired ones. The helicopter will be "filled with" intelligence in order to reduce the load on a pilot," said Janjgava. Speaking of deadlines for the modernization

procedures, the designer said that the innovations were to be introduced two or three years later.

At the same time, the KRET experts have plans to include the EW systems in the design of a Night Hunter. "We will gradually incorporate electronic warfare means and systems - to make the Mi-28 a real versatile hunter", concluded Janjgava.

The combat helicopter Mi-28N Night Hunter is designed to find and destroy tanks, armored and soft-skinned vehicles, as well as enemy troops on the battlefield, and low-

The installation of the N025 will allow the helicopter to effectively recognize and destroy targets on the ground, including (in the future) on the principle of "fire and forget it."



speed air targets both at day and night time in simple and adverse weather conditions.

The tests of the Mi-28NM, which is the latest, highly upgraded version of the Russian attack helicopter Mi-28N Night Hunter are coming to an end, reported the Deputy Defense Minister of Russia Yury Borisov on Wednesday to the journalists.

"This is an all-weather, around-the-clock helicopter - these are its fundamental differences. It will get a practically new navigation system, the intelligence complex, new optics, and a new control system that allows the "blind" landing. The Mi-28NM, having all possible advantages of a helicopter, is now in great demand on the market. The tests are currently coming to an end," Mr. Borisov said.



This is an all-weather, around-the-clock helicopter - these are its fundamental differences. It will get a practically new navigation system, the intelligence complex, new optics, and a new control system that allows the "blind" landing

The representatives of the Radio-Electronic Technology Concern said that for the up-graded Night Hunter their company has developed and tested the newest electronic warfare (EW) system with a laser to defeat enemy missiles (laser suppression station).

A powerful compact solid-state laser is designed to misguide missiles. The new modification has a standard mast-mounted radar station of the type N025 installed. It is worth noting that the serial Mi-28N's do not have a mast-mounted radar station. The installation of the N025 will allow the helicopter to effectively recognize and destroy targets on the ground, including (in the future) on the principle of "fire and forget it." This solution will also enhance the vitality of the combat vehicle as the radar station will allow to timely identify potential threats.

The Mi-28NM will be equipped with a redundant control system which allows the navigator-operator to fully control the fighting machine. The new version of the helicopter has changed purely on the outside: the front

part of the Mi-28NM is very different from all previous versions of the combat vehicle. Obviously, the changes have been made taking into account the extensive experience of the attack helicopter operation.

The Mi-28 made its first flight long ago, in 1982, and it was put into operational service in 2013 (the Mi-28N). As of 2016, the Russian armed forces had more than 50 helicopters of this kind. In addition to that, some foreign customers also showed interest: not so long ago, Iraq received an export version of the Mi-28NE.

Earlier, it was reported that another Russian attack helicopter - the Ka-52K "Katrán" - will get a new radar station with an active phased antenna array. Thanks to the new radar station, it will be possible to identify large vessels at a distance of up to 180 km. The Mi-28NM helicopter.

The General Manager of the State Ryazan Instrument Plant (SRIP) Pavel Budagov said that they managed to significantly enhance the performance of the onboard computer of

the Mi-28NM radar (modernization of the Mi-28N "Night Hunter"). According to Pavel Budagov, a significant increase in performance means increase by dozens of times. The statement of the General Manager of SRIP which is part of KRET, is published on the official website of Rostec Corporation:

Compared with the radar of the Mi-28N, each module was subjected to improvements. Viewing is now 360-deg and is performed on several radio frequency bands. The radar station is able to process information from several channels at the same time, and through this the accuracy of measurement of target coordinates and obstacle parameters has improved. The number of simultaneously tracked targets has increased. Novel modes have been developed. The performance of the onboard computer has increased tenfold.

Pavel Budagov called the upgraded mast-mounted radar station a new generation radar station. According to him, this domestic product allows us to get ahead of mast-mounted locators produced abroad in terms of all major technical specifications.

The term "mast-mounted" for the radar station used is bound up with the fact that the antenna-receiving-transmitting part is located above the mast bearing the rotor - under the special fairing made of radio-frequency-transparent material.

Abstract from the statement of the General Manager of SRIP:

"This arrangement allows to obtain a radar image of the terrain, hiding in the rugged terrain of the artificial and natural obstacles and remaining invisible for the enemy".

For reference: The Mi-28NM speeds up to 300 km / h, its static ceiling is 3.6 km, rate of climb - more than 13.5 m / s, maximum take-off weight - about 12.1 tons.

The tests of the modernized Mi-28NM Night Hunter will be completed in 2017. The Deputy General Manager of Russian Helicopters Igor Chechikov reported this to RIA Novosti.

Nikolay Korobov



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A special role in the implementation of counter-terrorism strategy had to be assigned to helicopters



Legendary Russian "Mi"
helicopters against
Peruvian drug lords



Police operation in Peru's Madre de Dios region



Government forces were redeployed by Mi-171Sh's to hard-to-reach sites of the VRAEM area, as close as possible to the supposed shelter of senderistas

For over half a century, in some countries of Latin America a hard confrontation between the government and drug cartels has been going on. This is a struggle in which an overwhelming victory of law enforcement authorities is hardly possible, however any success has a positive impact on health, potential drug addicts and the fight against global organized crime. Proceeds from sales of cocaine do not remain in the country of production – they are transferred to the countries of consumption – the US, EU and Russia following drugs. The latter is cooperating more and more intense with the national governments of the region to overcome evil at an early stage. It is worth noting that this policy which also includes supplies of helicopters as an important part thereof bears fruit.

The drug mafia has significant financial and human resources, it is mobile and especially in hard-to-reach mountainous areas it is impossible to fight against it without reliable and state-of-the-art supporting means, i.e. Russian-made helicopters that are used for this purpose. They provide mobility for force groupings and their fire cover in places where aircraft can not be used. "Russian helicopters" figured out which high-profile special operations in Latin America had been supported by the Russian-made helicopters over the past 3 years.

Shutting off the "Death channel"

VRAEM area (valleys of the Apurímac, Ene and Mantaro rivers) in Peru is a sparsely populated area, almost as big as Caribbean state Puerto Rico, which is located in the

heart of the Amazon rainforest. Humid, rainy and hot climate made VRAEM an ideal place for growing coca plants and it quickly turned into one huge drug plantation while simultaneously becoming a haven for militants of the Maoist terrorist group Sendero "Luminoso" (Shining Path). After the capture of self-perpetuating leader of senderistas Abimael Guzmán in 1992 (Guzmán held power from 1960), the militants gained a foothold in the rainforest and started to provide security for drug traffickers who, in turn, funded organized crime groups, as it was already the case in the neighbouring Colombia. Since



A helicopter flies over the Ene river in Pangoa district before the detonation of landing strips used by drug trafficking aircrafts

2012, Peru has exceeded Colombia and become the biggest producer of cocaine in the world, and the VRAEM area, without exaggeration, turned into a new hot spot on the map of Latin America and headache for the Peruvian government.

Coca leaves grown in the VRAEM area are processed in handcraft camouflaged labs close to the plantations and exported to the neighbouring countries by light aircraft which get airborne from secret improvised landing strips located directly in the rainforest. Elimination of drug traffic landing strips and destruction of the rest of the terrorist and drug lord infrastructure is one of the key ob-

In late 2013, Peru and Russia signed an agreement on the delivery of 24 additional Mi-171Sh helicopters. The agreement was performed in the beginning of 2016

jectives of the government in the VRAEM area since finishing off the infrastructure of drug traffickers directly affects the financial condition of the Sendero "Luminoso" group.

To meet this challenge, ex-president of Peru Ollanta Humala formed in 2012 new mixed special operations forces from the staff of the Anti-terrorist unit of the Peru National Police as part of a new counter-terrorism strategy of fight against Sendero Luminoso. These forces had to fulfil reconnaissance and target designation tasks. Moreover, contingent of the joint special forces was also included in the structure of mixed forces. A special role in the implementation of counter-terrorism strategy, as conceived by the government, had to be assigned to helicopters.

In 2010, Peru's Armed Forces purchased six Mi-171Sh helicopters to be supplied from Russia. Aircraft arrived in the country in 2011, and since 2012 they have been in active use for the elimination of terrorists. Russian helicopters helped the mixed forces quickly and efficiently reach target places, and where necessary provided fire support to forces on the ground. Government forces were redeployed by Mi-171Sh's to hard-to-reach sites of the VRAEM area, as close as

possible to the supposed shelter of senderistas. Afterwards the members of the military were for several days working their way in the rainforest on foot to destroy the selected target (there were usually rebel camps or drug plantations).

In 2012-2013, the government forces conducted the "Asylum", "New horizon" and "Red sunset" operations which helped to detect and destroy several terrorist camps in the VRAEM area, capture 16 senderistas, free 11 children held by the terrorists for committing acts of terrorism and eliminate almost all the leaders of Sendero Luminoso which greatly weakened this terrorist group. The key success factors of such operations is their speed and suddenness, and that was how the Peruvian government acting in the VRAEM area was able to eliminate the rebel camps and to get their most important documents: layouts, terrain maps, codes, etc. And thanks to this, final suppression of senderistas was only a matter of time and additional helicopters. To strengthen the fight against terrorists and to bring it to the end, the Peruvian government decided to increase the number of helicopters for redeployment of military forces across the whole VRAEM area by drawing a noose around the terror-

ists and cutting off all the routes of escape. After a series of successful operations with the involvement of Russian helicopters Mi-171Sh, Mi-25 and Mi-35 which are also in operational service with the Peruvian Air Force, the Armed Forces of the "country of Incas" decided again on the Russian military transport helicopters Mi-171Sh. In late 2013, Peru and Russia signed an agreement on the delivery of 24 additional Mi-171Sh helicopters. The agreement was performed in the beginning of 2016.



Illegal settlement smashed by armed police



Other cases where Russian helicopters have distinguished themselves:

1. In January 2016, the Mi-171 of the Mexican Marine Corps was involved in the capture of the most dangerous criminal in the world, El Chapo, head of the extremely powerful Sinaloa drug cartel, and his delivery to Altiplano, the maximum-security prison in Mexico.
2. In June 2013, the Mi-35 of the Brazilian Air Force intercepted a light aircraft that did not respond to call signs in a place located 200 km from Porto Velho (on the border with Bolivia). The Mi-35 forced the offender to land in the nearest airport. Once the circumstances were cleared up, the aircraft crew was set free. Such operations are standard practice for a helicopter squadron which patrols the Western Amazonian region. Mi-35's have been successfully used by the Brazilian Air Force to intercept light low-speed aircraft that are often flown by drug traffickers while transporting their illegal cargo.

Prepared by the Press Relations Service of "Russian Helicopters" Holding Company

MISSION

Over the past three seasons in Portugal, the choppers have helped to effectively put out thousands of wildfires

Ka-32A11BC helicopters successfully tackled fire in Portugal

Ka-32A11BC multirole helicopters produced by Russian Helicopters Holding Company (part of State Corporation Rostec) have been employed this summer in extinguishing massive fires raging on the Portuguese island of Madeira. The Russian-made helicopters belonging to the Portuguese Interior Ministry have shown their ability to extinguish fires quickly and effectively in the most challenging situations.



Both Portugal's mainland and the island Madeira, region of Portugal, have been experiencing the most extensive fires after the lack of rain and amid abnormally high temperatures. Ka-32A11BC multirole helicopters produced by "Russian Helicopters" Holding Company were used for extinguishing fire sources.

The firefighting version of Ka-32A11BC helicopters is equipped with the most up-to-date firefighting systems – Bambi-Bucket and Simplex as well as with water cannons. The Ka-32A11BC is capable of taking up 3,200 liters of water and dumping it over fire in just 1.5 minutes while hovering.

The Ka-32A11BC helicopter can operate in critical conditions thanks to avionics developed by KRET. Specialists of one of concern enterprises developed e.g. the SAU-32 automatic control system for Ka-32A11BC's. The SAU-32 system is designed to manage manual, automatic, and automated piloting of the Ka-32A11BC helicopter. SAU-32 enables a first category manual approach using ILS signals, provides an automated flight route, collects and releases information in the electronic display system, and utilizes built-in controls while in flight and on the ground.

Over the past three fire seasons in Portugal, the Ka-32A11BC helicopters have helped to

effectively put out thousands of wildfires, to preserve thousands of hectares of agricultural land and prevent fires in 20 localities. According to Grupo Faasa, total flight time of Portuguese Ka-32A11BC fleet amounted to 2,500 hours.

The firefighting version of Ka-32A11BC is capable of delivering up to 5 tonnes of water to the fire location, and can be equipped with more than 40 different types of equipment, including a helicopter bucket and water cannon for horizontal fire-fighting. The helicopter is capable of operating in thick smoke and can perform tasks on the upper floors of high-rise buildings. The oil industry also uses it to extinguish fires on oil facilities. Depending on where the helicopter is based and where it has to fly to, in just an hour it can make from

5 to 30 water drops. At times, the Ka-32A11BC helicopters have to complete flight operations for 14 hours a day. Total flying time of several aircraft over the entire season is up to 300 hours.

The unique helicopter Ka-32A11BC is operated in various regions of the world. The design solutions employed in this model make it a leader in its class. Due to its manoeuvrability and compactness, the aircraft is able to carry out special operations in virtually any conditions. The KA-32A11BC is able to put out fires both in cities and in remote mountainous and forest areas. The helicopter received high accolades from operators and is in great demand on the international market.

The advantage of Ka-32A11BC is that the helicopter is equipped with two rotors built according to a coaxial design. This design allows the aircraft to maintain a stable hover even amid air turbulence caused by fires, and to achieve impressive manoeuvrability. As a result, the Ka-32A11BC is able to hover directly over the fire source and carry out high-precision firefighting.

In recognition of its high level of performance, exactly the Ka-32A11BC model is depicted on the emblem of the Global Firefighting helicopter initiative (GFHI) – a program aimed at improving the efficiency of specialized firefighting helicopters.