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**Editorial/advertising**

**Editor**  
Vladimir Orlov  
orlov@rvs-holding.ru

**English editor**  
Alan Norris

**Maker-up**  
Irina Danenova

**Advertising manager**  
Marina Bulat  
bulat@rvs-holding.ru

**Translator**  
Moscow Translation Agency MTA,  
Inna Frolova, Translation Agency  
Translink

**Photographer**  
Dmitri Kazachkov

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

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**Russian Helicopter Systems**  
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Tel. + 7 (495) 926-60-66  
URL: www.helisystems.ru

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podpiska@helicopter.su  
Contact us:  
+ 7 (495) 926-60-66  
Marina Bulat

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**Russia and China**

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No matter how strange it may sound for the helicopter industries in both Russia and China - today they have reached a point at which they are in the same position. Even so, it's a position that both countries have reached from entirely different directions – yet very similar mechanisms are needed to find the way forwards.



**俄罗斯与中国在巴基斯坦会谈**

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北约部队从阿富汗撤出，必定恢复俄罗斯和中国在该地区的影响力。为了在中亚地区的战略利益，俄罗斯正在加强与巴基斯坦建立关系。尽管 俄罗斯总统向巴基斯坦的首次访问，大概无限期的推迟，从2001年开始，俄罗斯和巴基斯坦的关系出现了升温。俄罗斯高层军官第一次来到伊斯兰堡，讨论举行联合军事演习和提供军火物资的可能性。

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“China is an important strategic partner of Russia in the field of delivery of aviation technology. Now our interaction in a number of key directions will become more effective,” Aleksandr Mikheyev, general director of the holding company Helicopters of Russia.



**中国直升机航母是什么样的？**

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中华人民共和国是正在积极发展自己海军的国家之一。其中包括自己研发的两栖攻击舰。第一个这样的新一代军舰 DVKD 昆仑山号 (071项目), 在2007年年底委托由上海沪东中华造船厂建造。071项目 (西方称号 Yuzhao ) 是一艘2万至2万5千吨总排量的军舰, 能够容纳多达800技术人员和四个重型直升机Z-8运转平台。在2008年中国科协CTSC派出较小版本舰船在马来西亚竞标 (1.3万吨满载排水量)。

The helicopter industries in Russia and China need each other

# Russia and China on the verge ● of agreement

No matter how strange it may sound for the helicopter industries in both Russia and China - today they have reached a point at which they are in the same position. Even so, it's a position that both countries have reached from entirely different directions - yet very similar mechanisms are needed to find the way forwards.

## First Coordinate – the State

### Russia

Of course, here we are discussing the influence the Russian state has over the helicopter industry. The questions, then, are how, in what way, and what is actually being influenced? If we are to judge by the spate of recent helicopter accidents in Russia, then a lot of interest is going to be brought to bear on how systematically this influence is wielded, rather than any kind of 'crackdown'. Surely, this is the most important thing – how continuous such influence will be? It certainly exists in the manufacturing sector. Even the most inured sceptics are choosing to keep their own counsel. Matters are somewhat worse in the spheres of control and observation of interests.

The first is a bit like a gopher – we know it's there, we just can't see it. The relaxation of the tough conditions that govern the operation of private helicopter flights - and permission for them to take place in the skies above Moscow, or at least in the air-space above the Moskva River, has actually become reality. So much so, in fact, that law-makers in the State Duma have even begun talking about the need to tighten things up in the private helicopter aviation sector. As far as the State's interests are concerned, there is almost nothing up for discussion – as far as can be seen, they barely extend to the small private helicopter business. This, though, could be seen as a good move – it offers the opportunity for the development of all sectors, despite not looking especially attractive from a distance.

### China

On the Chinese side things are exactly the same, but on the other side of the mirror – in other words, just a micron's distance away from the way things are in Russia. This means that the state's influence on the helicopter industry program is total. Specifically, any contract for the purchase of any kind of air vehicle in China, even in the commercial sector, requires getting written authorisation from the government. So this is 100% control of the industry? If that still



Bell 407GX Airlines Beijing Pine Valley Star General Aviation Co., Ltd.

## Thus Russia has reached a situation in which it drastically needs to review the system of training – not only for pilots, but of all professionals

seems too little, simply take a look at how things were in 2008. This was the year when the Chinese government called on Chinese airlines to hold off buying any new aircraft at all in 2009. Bloomberg explained the announcement as motivated by a cooling economy - likely to prompt a droop in demand for air travel. Yet this isn't the whole story. These recommendations to Chinese airlines also included a suggestion to preserve old aircraft that were not even needed – and also not to extend any expiring leasing contracts with foreign owners. Lo and behold – all happened exactly as the state had suggested. The entire scenario took place because Chinese airlines had suffered 4.2 billion yuan losses in the first

ten months of 2008. The Chinese government stepped in sharply to prevent the loss scenario worsening.

This all makes the fact indisputable that the Chinese aviation industry is in a separate case of its own, and is directly managed in a results-driven fashion. How can this be reconciled with the announcement of the United China Air Industry in November 2008 – the exact period of the warning not to purchase new aircraft – that China's civil aviation traffic was expected to increase five-fold over the next twenty years? As though anyone thought otherwise? They were wrong, if they did. In fact China forecasts that air passenger figures are set to rise to 700 million by 2020 – and that this number will double again by 2030.

As far as short-hop low-altitude flying over and around cities, China is gradually snipping the red tape. One example of this trend is burgeoning popularity of the Beijing Air Taxi industry. It's been no hurdle that even a city air excursion has to receive official approval twenty-four hours in advance of departure. From the end of 2013, the procedures for short-hop flights have been considerably simplified. All this stands to make China one of the world's major markets for light aviation in the upcoming five years.

### Second Coordinate – Personnel

This is another area where the similarities between China and Russia can be pointed out. Both countries face personnel shortages – for pilots, and for ground crew.

#### Russia

This problem took root in Russia on the basis of the disappearance of the so-called 'magic of flight', and similarly in the post-perestroika close-downs of flying schools and aviation technology academies. If the first of these reasons can be written-off as a sharp decline in the state's general policies for youth training, the second leads to a brick wall – airlines simply have nowhere they can recruit pilots. The answer lies in hiring former military pilots – which is the only way out.

Igor Malikov – a test pilot, and Hero Of Russia medal-winner – says that between 1995 and 2009 Russia's official pilot training programs failed to produce more than 160 pilots per year – while around 700 pilots working in the air industry were quitting annually, for

various reasons. Bearing in mind that pilot training needs a minimum of 3-4 years, the situation with pools of qualified and experienced pilots in the industry has already reached crisis-point. The situation is worsened by the unwillingness of air companies to spend money on pilot training – it's easier and cheaper for them to buy-in ready-trained pilots, even from abroad.

Thus Russia has reached a situation in which it drastically needs to review the system of training – not only for pilots, but of all professionals involved in aircraft maintenance and flight operations, and of those who design the aircraft of the future too. Russia needs to reinstate the system that was in place before – although some elements would need to be adjusted to allow for current market conditions. Russia needs an aviation system which redefines the levels of pilot training, of aviation equipment, of education training at institutes, the quality and number of training aircraft, and the facilities at aerodromes. "It could all be brought back

to normal", Mr Malikov affirmed. "Even so, simply boosting the numbers of cadet pilots won't solve the problem on its own. First of all, there's no-one qualified to teach them. We need teachers and instructors, people who left the industry during the years of decline, who found other jobs since then."

#### China

China's problems with insufficient qualified aviation staff are growing for different reasons. "The question of prestige is very important" says Sherry Curberry, Vice-President of Boeing Flight Services. We have a situation in which many guys leave it too late in making the decision to make the aviation industry their career. We are making continuous efforts to attract young people into the industry – explaining the kinds of opportunities which are on offer, and what kind of careers are open to them", Mrs Curberry said. Mrs Curberry is involved in organising pilot training programs in an international program, aimed at bringing young specialist staff into the aviation industry.



Skaiste Kinzayte, CEO of the internet portal AviationCV.com has his own theories as to why pilots are reluctant to work in light aviation. "While conventional major airlines have their own in-house programs for career advancement, job protection, promotion, and a stable salary, the light aviation industry can't offer similar benefits. Pilots have to find work in small companies, which offer little in the way of career advancement."

Aviation industry experts are sounding the alarm. Against a background in which air passenger traffic in China is set to triple over the next 20 years, no thought has been given at all to amending the strict rules which govern pilot retirement from the industry. It means there will be a phenomenal boom in demand for qualified professionals in the industry in the very near future.

A further problem is the equal shortage of aviation support professionals. Everyone may be talking about the prestige of the pilot's work – but they prefer to forget about the teams of crews who are working on the essential maintenance of the aircraft day and night, in all weathers. "It's our number one



Enstrom 480B Airlines Chongqing General Aviation Limited

task" explains Bonnie Sharma, Vice-President of Mil-Com Aerospace Group, the Singaporean aviation training company. "We have to attract young people into the industry. Of course, many young people say they prefer the air-conditioned offices of an IT company to the problem-ridden conditions of the airline industry. It all makes recruitment of young people a major problem". Exactly the same answers are being heard in the Chinese Air Traffic Control industry – which

needs to expand its staff numbers by 7000-8000 people.

Against this background, China has a rapidly-growing and affluent middle class, for whom the attractiveness of air travel is almost irresistible. The Chinese air transport market is the fastest-growing in the world – a ten-percent increase in passenger numbers is expected imminently. Alongside this, access to flights below 1000 metres is expected to provide a huge stimulus to the increasing num-



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## Оборудование GARMIN со склада в Москве от официального дилера

125424, Москва, Волоколамское ш, д.88, стр1, оф.206

Наши телефоны: +7 (495) 490-6105, 491-3610

[contact@neboservice.ru](mailto:contact@neboservice.ru)





All this stands to make China one of the world's major markets for light aviation in the upcoming five years



bers of wealthy Chinese individuals able to afford their own private helicopters. The result is that the helicopter industry in China is making every possible effort to fill the staffing gaps in air companies.

“The staffing crisis in air crews is a global problem – but in the Asia-Pacific region it’s a problem that is becoming very acute” says Bob Belitto, International Sales Director at Boeing Flight Services. “Many companies are already suffering from the negative aspects of insufficient numbers of qualified pilots. We see it in factors such as flight delays, or cancelled services. The booming economy of the region is causing a rapid uptake in demand for additional services. It means that air companies and training centres have to find a way of solving the problem, so that they are in a position to supply the necessary numbers of pilots for the industry in the future, alongside a similar number of ground maintenance crews”, Mr Belitto said. “And I have to add, that aviation is now considered one of the most attractive industries for a career in modern China”.

### Third Coordinate – the need to expand

We could easily devote extensive space to listing the problems which Russia and China



Number of light helicopters is growing in China

are suffering in their aviation industries, and which are increasingly similar. They include issues such as the inadequate number of second-grade aerodromes and landing-strips, and poor industry infrastructure. It all conspires to restrict the development of private helicopter companies. They have nowhere to fly to, even if they were able to. The inevitable conclusion is that the helicopter industries in Russia and China need each other. For example, the Chinese industry

needs Russia's experience, and training programs – while Russia needs China's aviation industry expansion, which demands pilot training, expansion of air training facilities, quality and numbers of aircraft, and development of high-end aerodromes. All of this would have immediate payback for both countries, provided that the staff can be found, along with the will to do it.

*Herman Spirin*



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Оборудование со склада в Москве от официального дилера

125424, Москва, Волоколамское ш, д.88, стр1, оф.206

Наши телефоны: +7 (495) 490-6105, 491-3610

[contact@neboservice.ru](mailto:contact@neboservice.ru)



China is an important strategic partner of Russia in the field of delivery of aviation technology

# Russian helicopters in the Chinese sky

“The parties intend to undertake coordinated purposeful efforts to open the potential for bipartisan practical interaction, including the development of a heavy-lift helicopter.” Those words from a joint announcement of the Russian Federation and the Chinese People’s Republic, published on the eve of celebrating the 70th anniversary of victory over fascism, speak to the fact that the countries have shifted to a new level of cooperation in the area of helicopters.



### How experience in interaction was gained

“China is an important strategic partner of Russia in the field of delivery of aviation technology. Now our interaction in a number of key directions will become more effective,” Aleksandr Mikheyev, general director of the holding company Helicopters of Russia, first said to this effect. It is thus obvious that Russia’s and China’s cooperation in the realm of the helicopter industry is constantly gaining returns.

Meanwhile the current level of interaction of the two countries is based on implementation of long-term programs in the helicopter field. Thus, delivery of domestic helicopters to the CPR began with the first mass-produced model Mi 1, and in 1958 – 1979 a licensed copy of the multipurpose Mi 4 helicopter was produced in China under the brand Z 5; altogether 545 machines were produced.

The Z 5 was built by the Chinese company Harbin Aircraft Manufacturing Corporation. The first helicopter of Chinese construction completed a flight in December, 1958, and the model came out for mass production in 1963. The first Z 5 with a metallic bearing rotor took off on 22 June 1966. The Z 5 helicopter was built in several different modifications, civilian and military.

### Useful helicopters up to the minute

The successful collaboration of Russian helicopter builders with China goes back decades. Over that time in the CPR, the Mi 14, Mi 8, Mi 17, Mi 17V5, Ka 28, Ka 31, and Ka 32A11BC were delivered. In 2013 alone exports from Helicopters of Russia to China totaled almost 14 billion rubles.



The most massive helicopter deliveries to the CPR turned out to be the Mi 8/17 series. In fact, they became China’s standard transport helicopters. Transactions for them have been especially useful to the Chinese side, since they were in need of equipment capable of operating in Tibet, where many areas are located at an elevation of 4000 meters above sea level.

In 2011 the CPR signed a contract for licensing production of the Mi 171 on its territory; however, at first China is continuing to purchase them from Russia, since a lot of time is needed for creating the corresponding production capabilities, while China needs a large quantity of military-transport helicopters right now, so to speak. In the end, the Ce-

lestial Empire will possess more than a thousand Mi 171 helicopters. China has created their own enterprise for servicing these machines.

Models of the “Ka” family occupy a special place in sales of helicopters to China. They are marvelously suitable both for the high-mountain regions of the Celestial Empire and for use in modern megacities thanks to the “unique coaxial design of the bearing rotors, which makes it possible to land on small spaces lacking equipment, take off from them, and maneuver in conditions of high elevation and densely built-up urban areas.”

The history of deliveries of helicopters with the coaxial design to China starts in 1996 with the Ka 28PL. Since 2011 five military Ka 31’s, as well as nine 31’s for the radar patrol, have appeared in the list of “coaxials”. A contract has been concluded this year for delivery of 20 Ka 32A11BC helicopters for the company Sino-Russian Helicopter Technology (Tianjin, China). In 2014 the holding



The Mi-26T become the prototype of the heavy Chinese helicopter



company Helicopters of Russia delivered two civilian multipurpose Ka 32A11BC helicopters to Sino-Russian Helicopter Technology, produced by KumAPP.

“At present nine Ka 32A11BC helicopters have been delivered to commercial companies and to Chinese state entities. These helicopters are used by the Chief Agency for Civil Defense of the city of Ordos, by the civil defense agency of Shanghai, and by a number of commercial companies as well. There are also Ka 32A11BC helicopters with the Chinese State Oceanographic Agency,” reported Aleksandr Mikheyev in the course of the MAKS 2015 air salon.

#### China needs helicopters

With all this, the CPR is not limiting itself just to obtaining imported helicopter technology. The country’s tasks include creation and production of modern rotor machines. It is worth mentioning that the CPR’s effort to occupy a leading position in creating piloted

helicopters for the domestic and foreign markets was logically developed in the year 320 CE (long before Leonardo da Vinci), when Go Khuan, a Chinese philosopher and alchemist, suggested the idea of building a flying apparatus that would be supported in the air with the use of a bearing rotor.

At present China is actively collaborating for this with France, the US, Italy, Canada, Great Britain, and Russia. Design of new helicopters is being undertaken by Helicopter Construction Institute No. 602, which supports creative contacts with the Russian aviation institutes Central Aerohydrodynamic Institute, the P. I. Baranov Central Institute for Aviation Motor Construction, and the All-Russian Scientific-Research Institute of Aviation Materials.

State assessments exist on such parameters as the number of helicopters per capita. For example, in Australia it amounts to 1:12000, while in China, for each helicopter, there are

3.1 million people. Thus the Celestial Empire has its work cut out for it. The country is also creating conditions for developing branches.

This is well understood in all countries that are leading in the field of helicopter construction. “With the steady simplification of the procedures for using air space we expect that in the next 20 years China will become the largest helicopter market, with a volume of 3000 to 5000 machines,” says Norbert Ducreau, chief of the Chinese branch of Airbus Helicopters.

But even with such an optimistic scenario, by 2030 in the country, the economics of which in any event will grow at paces outstripping world development, there will be one helicopter for every 260,000 people, which is obviously not much. This is also understood in the CPR, and they are developing collaboration with world helicopter brands, which are also getting into contact with China.



China's Navy has 17 Ka-28 helicopters



The Mi -171 People's Liberation Army of China

#### In the footsteps of the Mi 4

Along with that, having a domestic source of inexpensive transport helicopters, essential in large quantities for their civilian and military markets, is extremely important to the country. And here Russia could play a key role with mutual projects for creating modern helicopters with which that same source for access to a relatively inexpensive and efficient helicopter technology could be fairly quickly reached. This is especially so since the end of 2014, since Helicopters of Russia has been named to the Russian-Chinese Joint Intergovernmental Commission on Collaboration on Military Technology.

An example of that sort of interaction is the

development of a mutually beneficial process for joint development of a large transport helicopter based on the existing Russian Mi 26T, capable of transporting 80 passengers. It is projected that the holding company Helicopters of Russia and the Chinese aviation manufacturing corporation AVIC will sign a contract for joint production of the heavy-lift helicopter by the end of 2015.

At present the concept and class of the new machine has already been confirmed. The helicopter, having received the designation AHL (Advanced Heavy Lift), will have a take-off weight of 38 tonnes and a load capacity of around 15 tonnes, and will operate in any suitable conditions. It will be used for per-

forming transport, evacuation, fire-fighting, and many other tasks.

It is interesting that the new PD 12V engine, developed in Russia for the Russian-Chinese heavy-lift helicopter, is available from the United Engine Construction Corporation (UECC), as announced at the Le Bourget International Aerospace Salon in 2015 by Vladislav Masalov, general director of UECC. He also noted that UECC is examining the PD 12V, created on the basis of the Perm PD 14, which is undergoing stand tests and will be installed on the MS 21 narrow-fuselage mainline airliner, "in the role of an engine for the Mi 26 heavy-lift helicopter, which fits within its architecture."

"Design of the heavy-lift helicopter will be undertaken by the Mile Commercial Bank, and production by Rostvertol in Rostov," said Victor Kladov, chief of the Department of International Cooperation of the Rostekh group of companies about the preliminary plans of the parties. From the Chinese side, by 2040 the demand for the new heavy-lift Russian-Chinese helicopter is assessed at more than 200 machines.

Joint proposals for production of updated versions of other existing Russian helicopter models could also turn out to be actualized. Thus the government of China has allocated two billion yuan (322 million dollars) for assembling Russian Ka 32 helicopters in the CPR. Viktor Kladov reported on this at the "Innoprom" exhibition in Yekaterinburg. The project to assemble the helicopter will be actualized by the joint Russian-Chinese enterprise China-Russia Helicopters. By the end of 2015 China is planning to begin assembling Ka 32A11BC helicopters for extinguishing fires. The basic agreement envisages large-component assembly of 20 units. "This pilot project will allow us to determine the volume of the market and to size up demand," said Kladov. A large portion of the assemblies and components for the rotor machine is produced in Russia. This project is very important for China. Demand in the CPR for this helicopter is assessed at hundreds of machines.

**Andrey Vezhnovets**

The Chinese manufacturers of helicopters are aimed exchange of experience



近十年在中国出现了现代重型直升机。



**“俄罗斯直升机”公司与中国AVIC（中国航空工业）集团公司商定联合生产新一代的重型直升机。这是现在俄罗斯与中国在航空领域合作中最重要的事件之一，可能就是“俄罗斯直升机”公司和中国航空工业集团公司（中航工业）签署框架协议，建立重型直升机的长期合作。双方将进行研发和准备生产（AHL）重型机器。**

### 关于重型机谈判长达7年。

2015年5月8日在克林姆林宫俄罗斯总统弗拉基米尔·普京与中华人民共和国总书记习近平签署了协议。”亚历山大·米赫耶夫总经理代表“俄罗斯直升机”公司和林左鸣董事长代表中航工业集团签署了协议。

“俄罗斯直升机”公司和«Avicopter»公司从2008年开始谈判关于重型直升机先进的重型起重«Avikopter»项目。在2014年7月初步达成直升机的联合开发协议。它的载重量可达15吨。

有人认为，新的直升机将比现有1980年研发生产的Mi-26更现代化。同时根据“俄罗斯直升机”公司亚历山大·米赫耶夫总经理的说法，这是一款全新的飞机机型。“这种直升机将专门为中国市场开发，执行完成中国不同有关部门制定的任务。

米赫耶夫认为，突发紧急事件安全部门首先需要该直升机。

在中国境内共同开发重型直升机，是俄罗斯 - 中国在航空领域合作的重要主题之一。

在该项目实际工作开始之前，已经签署了协议。

### 高效与经济

根据一些专家的评估，在2014年中国大约需要200架新型的直升机。此前据报道，中国希望建立起飞重量30吨的运输直升机。

AHL 预计起飞重量大约38吨。机舱内最大有效载荷 - 10吨，外部负载 - 15吨。该机型全天候适应炎热气候，高山环境以及不同的天气状况。它适用于每一个复杂繁琐的交通，疏散，消防，等等任务。俄罗斯 - 中国研发的重型直升机，将满足中国方面的要求，将提供高效的使用。高效的使用重型直升机，

是未来关键的参数之一。因为在中国研制的直升机，强烈要求这项功能。在2014年12月底由中国航空工业集团公司研制多用途民用直升机改装的Avicopter AC-313（原机指定Z-8F-100）在CAIG企业2010年进行了首次飞行，军用直升机Z-18（原型携带Z-18A），Z-18A的技术参数没有被披露。然而，AC-313基本版配备了“普惠”公司的三款发动机PT6B-67A。适应高达每小时335公里，最大范围900公里，货物在舱输送的重量 - 4吨，或27人。外部负载可以达到5000公斤。中国媒体此前曾报道说AC-313于2012年，在8000米的高空已成功完成了飞行。

俄罗斯在这方面有宝贵的经验，这显然提供了重型直升机未来共同研发的保障。如果以生产MI-26为例，这就得有生产建造AHL的经验。在MI-26大规模生产之前，已经在军用与民用中取得了多项的世界纪录。在1982年2月4日试飞员G.V阿尔费罗夫完成了在4060米高空载重25吨的飞行。还有直升机攀升至2000米的空中，总重量达到56768.8公斤，这也是世界最高的成就。

此外，MI-26T2是Mi-26T基本的改进版本，减少了直升机操控人员 - 由5人变成了2人。

这种方案做法也符合了中国方面生产新重型直升机的要求。副总理德米特里·罗戈津特别强调了关于生产重型机的方面。他说，发动机将在俄罗斯境内生产”。将适用于MC-21飞机的发动机研发生产。

联合发动机制造公司“Rostec”在这方面，明确提出，在2014年年底与“俄罗斯直升机”公司已经完成了分析开发MS-21发动机，直升机版本的 - PD-12B发动机。

### 中国的直升机工业正在更新换代。

值得注意的是，制定一个长期的重型直升机研发项目，得到了两个国家的政府支持。中国的直升机市场是全球增长最快之一。我们希望与中国建立全面战略互利的合作关系，在直升机的领域发展长期合作。“俄罗斯直升机”公司总经理亚历山大·米赫耶夫这样认为。

中航工业集团董事长林左鸣回忆说，神奇的Mi-26多次出现在紧急情况下救援。在2008年及2013年在四川强烈地震中MI-26TC（中国版本MI-26）发挥了重要的作用。在中国运营俄罗斯的直升机有着丰富经验，因此，双方在该项目合作方面也不会有什么

问题。

“我相信，我们与“俄罗斯直升机”公司，在将来的重型直升机领域的合作将富有成效，并将对中国的直升机产业发展产生重大的积极影响”-中国企业代表强调指明。

到目前为止，“俄罗斯直升机”公司与中航工业集团已经完成了前期的技术要求，并继续努力协调将来的重型直升机的外观。该工程项目的总合同，预计今年签署。



First experience of a presales presentation of a Russian helicopter



# **Ansats** – an open-code program

**It's been a long time since Russia's domestic helicopter producers put out a new model aimed at serving domestic infrastructure. The Ansat is a true post-soviet contender. All the recent preview and re-released models in the Russian domestic helicopter market have been reworked versions of soviet-era models – or helicopters which won't be in commercial production on the market for at least 5-7 years at the barest minimum. This makes the June launch of the Ansat helicopter in Kazan - from the Russian production plant, and for Russian operators – the first event of its kind in Russia. And despite the fact that the manufacturers have taken every possible step, some surprises still remain inevitable.**



KVZ Technical Director Igor Bugakov greets conference guests with production

According to the boss of the Russian Helicopters corporation, the problem with the lack of modern light helicopters designed for Russia's harsh operating conditions could be resolved with the mass production of the 3-4 tonne Ansat. It's the most sought-after category, representing the legacy of Russia's helicopter industry in creating simple helicopters designed to operate in tough Russian conditions.

Preliminary assessment of the Ansat shows that it's not only capable of replacing helicopters within its own weight and size class, but also heavier helicopters such as the Mi-8T on jobs where its heavy-lifting capacity are not completely needed.

Currently the Ansat-U has clocked-up a good track record – more than 30 of them are in use at the Syzran Helicopter Training Centre. Altogether these helicopters have already notched up more than 6000 hours of flying in tough conditions. The Russian Ministry of Defence has plans to buy many more of them – and there are foreign orders for them too.

The Kazan Helicopter Plant has developed a servicing system for the helicopter, as well as training for both pilots and ground crew, with extended airworthiness. The Ministry of Defence will be inaugurating an Ansat Training Centre in the near future.

The certification program for the Ansat is also in full swing. The market research which has been done so far suggests that the civilian version of the Ansat will find its place primarily among oil and energy corporations, in forestry management, for air-ambulance operations, and allied tasks. The Centre for Medical Emergencies suggests that Russia would need to purchase a bare minimum of 60 Ansats for air-ambulance use.

Developers are working intensively with the Ministry of Health, and the Ministry of Trade & Industry on technical issues, and on setting up an optimised system of financing and co-financing. Under prevailing economic conditions and exchange rates a basic Ansat model sells for 243 million roubles – depending on the configuration, the number of helicopters in an order, and payment conditions.

**It's all looking surprisingly good**

The turnkey technical presentation on the Ansat helicopter was that given by Alexei Garipov, the Chief Designer at the Kazan Helicopter Plant. Accordingly to Mr Garipov, the real surprise for Ansat developers was the technical set-up of the "oldest" of the Ansats, which had been in use in Russian police work.

"We carried out a lot of control and upgrading work on it" said Mr Garipov. "We took it right down to the nuts and bolts, and were surprised to find a helicopter in almost perfect condition – there were practically no issues with it at all".

Further confirmation of the advanced aviation and technical characteristics of the Ansat was provided by flights over Mt Elbrus made by the Russian FSB, to altitudes of 3000 metres.

The Ansat's list of technical features includes its hingeless bush, which requires no maintenance. Work continues on moving exploitation of this feature in the technical set-up.



The main rotor blades are composite – following a design rationale for the rotors which they have in common with the Ka-26. The hingeless rotor suspension system not only improves the Ansat's handling and maneuverability while reducing manufacturing costs and size of construction – it also achieves significant cuts in operating costs too. Replacing parts of the sleeve can be made away from the servicing centre, and carried out “according to their condition” and appearance in the information collection system.

### It's a question of money

One of the main issues is the availability of parts, and of helicopters overall. In this regard there is the work-program for the 2016-2018 period on parts for up to 4000 flying hours (currently to 2000 hours, with the exception of some parts). The second stage involves bringing the helicopter up to a new figure of 16,000 hours for the helicopter itself, and its parts for up to 5000-6000 hours. The company is determined to achieve these figures for the helicopter at its own cost. The interval between servicing is 2000 hours, with an intention to increase this to 3000 hours. But this will only happen gradually.

There was obvious interest for leaders of operating companies in the view of the Ansat developers regarding the development in its technical specifications. The Chief Designer



General Director of Russian Helicopter Systems, Ltd., Aleksey Zaytsev



Report of the KVZ Chief Designer Aleksey Garipov

of the corporation went on to say that that basis of the helicopter's design system were established, but not yet fully implemented. In this regard there are developments to the sleeve, which are already ready to be put into operation. The same can be said of other helicopter systems too. A lot of work is being done with suppliers – Alexei Garipov said that many of them have to be brought up to scratch on quality, especially regarding the electrical systems.

*The Ansat light helicopter has a maximum take-off weight of 3600 kg, built to a single-rotor design and a tail rotor, and is powered by twin engines manufactured by Pratt & Whitney (Canada). The PW207k model was certified by the AR IAC with number ST217-AMD, on 25.04.2003.*

*The Ansat helicopter was certified by the AR IAC for airworthiness standard AP-29, and holds certificate ST 236-ANSAT, issued on 29.12.2004. The helicopter is approved for visual flight operations, with de-icing fitted in accordance with the requirements of Category A up to a weightload of 3500 kg, and of Category B for weightloads of between 3500 and 3600 kg. Before the end of 2015 it is expected to be certified for 3600 kg. The Ansat helicopter is certified to operate in icing conditions in accordance with the requirements of Category A.*

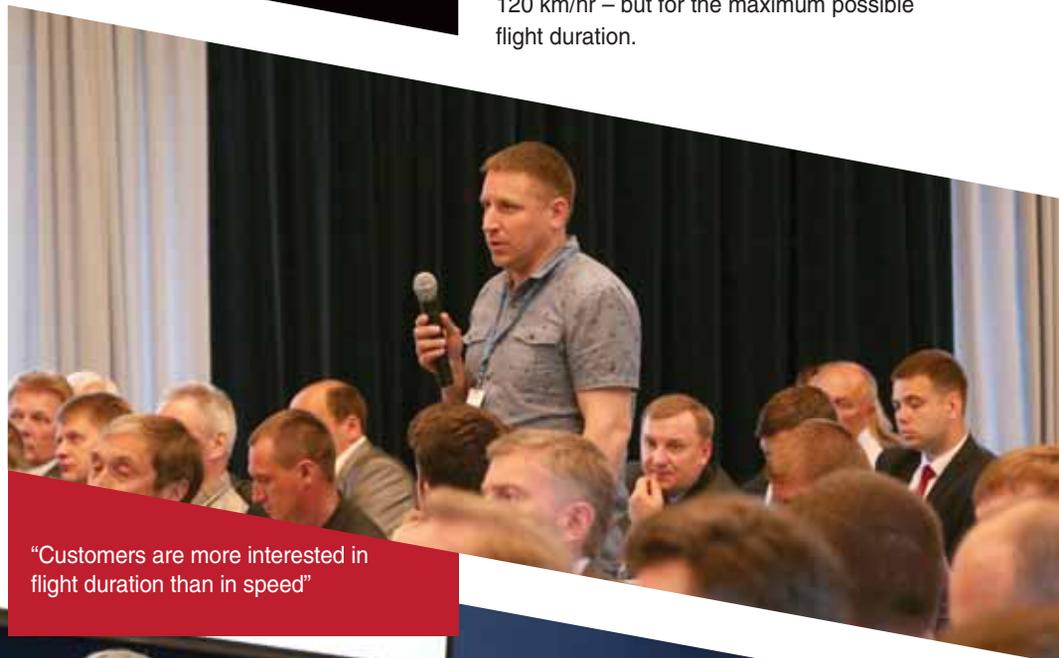
was kept in mind when designing the Ansat. But there are other alternatives, including using engines made by Turbomeca, which has been especially interested in the Ansat of late. Despite this, the current sanctions restrictions don't offer the fullest choice of the most ideal options.

**Buyers prioritise flight-duration & reliability over speed**

The main discussions in which opinions were exchanged centred on the commercialisation of the civil version of the Ansat. Top place was the issue of flight duration. The reason for this was clear. The most likely buyers for the Ansat civilian version will be gas-producing companies, who have a special interest in this issue for one main reason. The speed for overflying gas pipes is standardised at 120 km/hr – but for the maximum possible flight duration.

**The flightpath to import substitution**

Discussions then moved on to the topic of import substitution – replacing the helicopter's foreign-made engines with Russian-made models. As it turned out, there are already plans afoot to switch the Ansat over to the VK-800 engine produced by Klimov JSC corporation. The Klimov engines are in the 500-800 hp category. The main problem here, however, is that developmental work on these engines is expected to take a further three years. There are also options available to use engines produced by other foreign companies. One of these options is to use the MS-500 engine produced by the Ukrainian manufacturer Motor-Sich, which



“Customers are more interested in flight duration than in speed”



Conference presidium chaired by KVZ General Director Vadim Ligay



Demonstration of medical evacuation from a helicopter to an ambulance vehicle

For similar reasons, civilian operators of the Ansat are also less interested in speed than in operational reliability – and most of all, the reliability of a twin-engined craft that can provide the maximum flight duration. These requirements coincide almost exactly with those of VIP customers for the Ansat. If the reliability of its performance is good, there remain questions about flight duration – an achievable 400 kilometres of flight for around one-and-a-half hours at cruising speed could not really be called the optimal trade-off. In parallel with this issue is another – that there is not a current answer to where further fuel supplies could be located within the design. It would require a further 300 litres of fuel to extend the range to 600-700 kilometres. In chopper-operator's slang, “a kilo of fuel for a kilometre's flight”. At present the Ansat is configured to carry around 600 kilo-

grams weight of fuel, and work is in progress to extend this to 700kg. Regarding the operational range, it's a question that's of equal interest to both developers and operators alike, and work is in progress on it. And we should add that the Ansat versions that don't feature FBWCS have enough space in the underbody area to stow a further fuel supply. Operators have suggested that designers look into the idea of fitting exterior fuel tanks with a 300-litre capacity. These would bring the helicopter's specs into the acceptable band, without making fundamental alterations to it. Without these, the Ansat will find it tougher to take its rightful place in the civil aviation roster.

### Servicing made easier

The issue of servicing for the Ansat wasn't mentioned even once at the presentation.

But one question caused operators' ears to prick up at once – the necessity to remove the objective control gear after every landing. How could this be achieved at remote locations? The staff at KB promised to resolve this issue. “In connection with this, we're primarily focussed on improving the regulations. A whole string of such procedures have already been taken out”, commented the Chief Engineer on this situation.

### Ansat is just the like others – only safer

Test pilots, too, gave their opinion of the Ansat helicopter. Their feeling was that there were no special issues about the Ansat's handling. The steering system is primarily similar to what pilots already know



from the Mi-2 and Mi-8. There were similarly no issues of concern in the hover mode – with a 3-degree roll, as in most helicopters.

A big plus for the Ansat is the fast-n-simple preparations for take-off. There are just four simple stages to the procedure: switching on the batteries, pumps, the lighting, and putting the craft into “low gas mode” - after which the engines can be started.

A further advantage of the Ansat was mentioned as compared to other helicopters, connected with training pilots to land the helicopter on just one engine – something that civil aviation regards with great caution. For training for one-engine landings, the second engine doesn't have to be shut down. Instead, it can just be switched into Idle Mode

– from which it can come back to operational mode within 1.5 seconds when the rotors are turning.

#### **Why not learn from competitors?**

As part of the assessment of the presentation and discussion of the civil aviation version of the Ansat helicopters, it's fashionable to quote one of the participants in the event. “In Kazan there's a corporation with huge experience in operating both foreign and Russian-made helicopters? Considering this, why couldn't experts be invited to participate on the Ansat project, whose input would be valuable?” The reply to this question was that “we already know what's needed and how to do it”. If this kind of conference had been held before they began designing the helicopter – or if this kind of event was held more often – then the list of issues with the

helicopter could have been a lot shorter. It's obvious that before embarking on any kind of project of this kind, it would be worth gathering together all the potential operators and buyers, to hear their ideas and suggestions.

But it's worth repeating – Ansat is not just a new helicopter, but the first Russian civil aviation helicopter, and it has yet to receive its first run-in experience or commercial assessments. There's many a slip between cup and lip.

Nevertheless, the Ansat has appeared – although so far only as a training craft. Despite this, persistent improvement on the craft should lead to successful commercialisation of the project. There's already a track-record of experience, and the developers are open to discussions with potential buyers.

# Ka-26



**ВЕРТОЛЕТНАЯ  
ИНДУСТРИЯ**



Interaction of the Ministry for Emergency Situations and private pilots helps save lives

# Keeping Watch



Mother Nature occasionally puts mankind to a 'test of strength'. It requires little effort to list nearly a dozen natural calamities over the last ten years which have struck different parts of the world. Hurricane Katrina.. earthquakes in Pakistan, China, Haiti and Chile... the eruption of the Eyjafjallajökull Icelandic volcano.. flooding in Myanmar and Pakistan...the hurricane in Guatemala, forest fires in Russia... the catalogue of catastrophe runs on and on. Yet today it's hard to imagine an aftermath rescue operation which doesn't actively involve helicopters – whose deployment becomes ever more systematised as time goes by.

AOPA, the Aircraft Owners & Pilots Association – known in Russian by the slightly longer name of International Civil Organisation of Pilots and Aircraft-Ownning Citizens – appeared in Russia in 1998 as an organisation representing the interests of private pilots. Its main areas of activity are:

- legal consultation
- legislative activities
- lobbying for the interests of private pilots
- information and publications
- promoting the sphere of private aviation

After some time, in addition to promoting the interests of private pilots and resolving issues relating to them, the AOPA began operating a search-and-rescue operation – originally with the volunteer rescue team “Liza Alert”. Today AOPA maintains permanent contact with the Ministry of Emergency Services, with over 600 private pilots registered for emergency work in Russia. Any private pilot in Russia can join AOPA, via a standard process. An application needs to be submitted on a standard form, along with a passport copy, a photo, and a copy of their pilot's licence.

### From the rescue annals..

Fortunately, this kind of catastrophe isn't a daily occurrence. But even in quieter times or on standby, the rescue teams are not sitting idly by – expert assistance is needed almost every day. And most often, their assistance comes entirely free, no matter how hard this is to believe.

Today there are many non-commercial organisations involved in search-and-rescue operations – and a good part of these activities is accomplished using private resources or equipment from general aviation. The CEO and President of AOPA-Russia, Mr



Vladimir Tyurin, and Director of the Rescue Pilots team, Alexander Mikhailov, shared their experience of the life of pilots and members of the Aircraft Owners & Pilots Associations (AOPA-Russia) – about the daily work of the rescue squads of the Russian helicopter industry.

**Altruism is everything**

All of these organisations are formed strictly from volunteers and non-commercial bodies. This means that whenever they are called upon to make a search, it is conducted entirely without charge. It sometimes happens that concerned individuals collect money that goes to offsetting the very large costs which are involved in such operations.



**HELICOPTER INDUSTRY (H.I.): How is the collaboration with the Emergency Services managed? How did you first start working together?**

**V.T.** - Our close collaboration with the emergency services evolved over a number of years. During that time we've been able to formalise our joint working procedures – saving a lot of time and making operations run more effectively, and increasing the number of missing people who have been successfully found. Alarms are raised on the short-dial emergency 112 telephone number – the operators there are trained in getting the best possible information about the incident, and

we have occasion to work together. The same is true of recruiting the volunteers – whether they have experience or not. Without any kind of boasting, I can truthfully say that the kind of searches performed today are on the highest professional level.

**Forest Fires or Police Searches**

In order to become (God forbid!) the object of a search operation, you don't have to be an explorer on an ice floe, or a mountaineer on a lonely peak in the Altai Mountains. The day-to-day situations are a lot more banal – such as going off mushroom-picking in a nearby (or not-so-nearby) forest.

**Alexander MIKHAILOV:** When it comes to the Moscow Region, nearly 90% of the searches are for lost mushroom-pickers. For some reason the majority of alarms are raised in the eastern part of the county – and there are different reasons for this. First off,

*The stimulus which kick-started the Liza-Alert Rescue Volunteers was, sadly, a genuine tragedy – a five-year-old girl named Liza Fominka, who got lost in the forest with her aunt around Orekhovo-Zuevo on 13th September 2010 – and for whom no search was launched for five days. It was only when information appeared in the internet that she'd gone missing that hundreds of people took their own initiative to begin a search for her. She was found... but too late. If only the search had begun even a day earlier, the story might have had a happier end. But the searchers decided that this must never be allowed to happen again – and if the State cannot find resources to search and rescue missing persons, then private individuals had to take up the cause with their own resources. The 'Liza Alert' Rescue Volunteers were formed – named after the girl who died. All of these organisations are formed strictly from volunteers and non-commercial bodies. This means that whenever they are called upon to make a search, it is conducted entirely without charge. It sometimes happens that concerned individuals collect money that goes to offsetting the very large costs which are involved in such operations.*



passing this on to our pilots.

**H.I. How is this collaboration with 'rival services' perceived?**

**Vladimir TYURIN:** “Well, the first thing I'd say is that no-one sees any kind of 'rivalry' in this process. They are colleagues and partners in one joint operation that leads to worthwhile and effective results whenever

this isn't a region where posh people have country cottages, like the west region. The people here are much more average, and they're more dependent on the land than the rich folk along Novorizhskoye Highway. The second reason is that the east is more covered with dense spruce-wood forests, and the landscape situation is a lot more tricky



than the open forest steppes to the west of Moscow. This means its much more likely that people will wander off for a walk in the forest, while the forest itself is less conducive to taking such walks.

Even so, people still go off for forest walks, in spite of the risk of getting lost there – professionals call this “loss of orientation”. A lost mushroom-picker (or tourist, or fisherman, or hunter) gets nicknamed a “lostie”.

What's the technology set-up for a rescue situation? Well, either lost people themselves call the Emergency Hotline on 112 – or their worried relations call. The calls are answered by experienced operators, who collect as much information from the caller as they can, and give information to those who are lost:

- whereabouts they went into the woods
- how much battery their mobile phone has left
- the chances of lighting a bonfire to signal the location

Along with any other information, these details are passed immediately to our pilot – the team leader, who is Alexander Mikhailov in our case – along with the contact numbers, and our chopper will head off straight for the incident location.

called the emergency services. The situation was not helped by the fact that he'd had a stroke quite recently – and also, that he had no matches on him to light a bonfire. Without the smoke from a bonfire to guide the pilot, it's very much harder to see a lone man in the middle of a forest. But the main thing – he had a working mobile phone. Alexander dials the number:

**Alexander:** “Great! Now we can descend...” The GPS has pinpointed the location. As soon as they locate the missing man, they throw some water down to him. Most often people's own water has run out long before the emergency services find them, and they are suffering from dehydration. As soon as he gets the water the lost man feels a lot better – they can put the phone down, and start looking for a place to land. But this isn't so easy – the whole area is bog-



**REAL RESCUES**

“We got to the incident location, within 30 minutes of the alarm call coming in” Alexander reports to the controller. There's a coordinator on communications duty. Alexander's assistant is Elena, a Red Cross volunteer, who is set up for forest work and first aid. The most important gear includes drinking water in unbreakable cartons, that can be dropped to the ground from the chopper if necessary. Everything's ready for take-off. The incident happened in June last year, in the Ramenki district of Moscow Region. An elderly man blundered into a bog after twelve hours wandering through the forest. His attempts to drag himself out failed, and so he

land, and they can easily get stuck. It seems the only way of reaching the lost man is to drop one of the crew of the R66 on a dropwire below the helicopter, suspended in the air under the control of an experienced pilot. But no – it looks like a landing-

place has been found. There's also a paramedic aboard the helicopter – who has to go alone to help the distressed individuals, although this is considered unorthodox methodology.

**A:** Okey, we'll get out of the chopper one by one... first we step onto the landing-rail, and then gently down from there. No, it won't work. The video captures all of the heightened emotions. But after a second, more successful landing attempt, the old man was soon returned to the embraces of his worried relatives.



any spare drinking water with them, and so they become dehydrated after many hours of wandering around lost in the forest. Another factor which doesn't help much is the strange Russian habit of dressing in either green or brown for a forest walk – or even, lately, in camouflage clothes. Who are they camouflaging themselves from – the mushrooms? It all makes spotting someone dressed like that very hard from the air. When going into the forest, people should wear bright, easily-seen colours, and clothes which are comfortable for outdoors. Obviously, they need a rucksack with plenty of extra drinking water – enough for the whole day, if not more.

### REAL RESCUES

Alexander Mikhailov's R66 helicopter is rushing to the rescue of an elderly man who has been missing in the woods since yesterday, and cannot find their way out. The information is that their mobile phone's battery is badly run-down as a result of some clumsy attempts in the early stages of the search. The missing person has a heart condition, and was in a bad way when the last phone call was received – and has completely lost their sense of direction. The rescuers found the old man utterly exhausted, dehydrated, cold

### No amateurs needed

**A.M.** People often get lost in the woods when nice bright weather turns cloudy. Someone heads off into the forest knowing which way the sun is shining – and finds their way using the sun. But then the clouds come over - and our wanderer's sense of direction is lost along with the sunshine – nor do they really know how far they've walked. And elderly people get lost in forest mazes more often than others, even though this kind of adventure isn't the best thing for them at that age, and is very bad for their health.

However, people of almost any age can get lost. They might be families with children, or young people – but even so, the biggest number are still the pensioners. The mistakes they make are all similar, though, and almost all over them are victims of their own carelessness. Of course, there are endless safety reminders which tell people how to look after themselves when going into the woods – what to take with you, safety procedures, what to do in the event of an accident – but very few people pay any heed to these warnings.

**A.M.** I'm not talking about things like compasses here. Most people don't even take



*after a night in the forest – lying under a birch tree, and apparently not moving. At first it was unclear whether he was alive or not. Luckily everything worked out well for him – although he had to be carried to the helicopter, because he was too weak to walk.*

### GPS to the rescue

Yet despite all this, these days it's substantially easier to find lost individuals than it was twenty years ago. The rescue teams today can rely on modern, fast and reliable communications and navigation equipment.

*A.M. There's no doubt about it, these devices are absolutely essential, I couldn't begin to list the uses they have for us. Yet despite this, all our wonderful technology is useless if the missing person doesn't have two essential items with them. The first is a mobile phone (which needs to be in working condition!) for communications – and a box of matches, to light a bonfire. But the main thing is communications.*

But if the mobile phone's battery is almost flat at the start of the search – as very often

him with a telephone call. It's also worth bearing in mind that mobile phone coverage in forest regions can sometimes be quite spotty.

Progress is continuously advancing. Recently satellite trackers have become available, which are fitted with a "Help" or "SOS" button. These can be really useful if someone has got lost outside the coverage zone of mobile phones, or has somehow become unable to walk by themselves. In Russia, though, this kind of device isn't at all popular. Even so, over the past two years Russian rescuers have been able to locate victims of a disaster in the Khabarovsk region using these trackers, as well as the crash sites of two planes - one in Canadian waters, another in the Kazakh Caspian Sea – with these devices. There have also been several cases where these tracking devices have avoided mounting expensive rescue operations in the early stages, when they cut in after conventional communication devices failed, or when an emergency beacon on an aircraft began relaying a signal to the AOPA-Tracker.

still running, the main tasks the "lostie" has to do while waiting are:

- dial 112, report their incident, and then stop using the phone until the rescue service arrive (the emergency operator will tell them how long this will be).
  - light a bonfire, if possible, to mark the location
  - remain in place with a stable mobile signal
- When the Rescue Helicopter arrive, the lost person will need to guide the pilot towards them with commands like "to the left", "to the right", "forwards" and "backwards".

*A.M. - I'd like to repeat that in cases where the lost person doesn't have a working mobile phone with them, the chances of success drop to around 2-3%, if we're talking about air searches. Even so, this year I had my first ever experience of finding a lost person who didn't have a working mobile phone with them – in which we were able to find him just using coordinates. In fact he found us, rather than us finding him. It was a really tricky situation.*

### REAL RESCUES

*A retired pensioner, a war veteran, got lost in the Chernogolovka district – he'd been a partisan in the war. After three days of wandering in the forest, the batteries in his mobile phone were practically flat. The rescuers were able to pick up his coordinates, it was almost a miracle, but then the signal failed. All of the Emergency Services forces were*



happens? When someone who is lost in the woods finally realises they are lost, they start to make a whole series of fairly useless phone calls – calling all their relatives and friends, who might be able to come and find

At present, though, most cases which the rescuers deal with involve conventional mobile phones. This means that while the battery is



called out to help in the rescue, but they couldn't see him at all from the air. Frankly, it was looking very bad indeed. However, the old veteran saw the helicopter in the air above him, and ran out to signal towards it. It must have been his old wartime training that saved him.

**A.M.** But let me just say once more, that this was a miraculous exception. The majority of cases of this kind, I'm afraid, do not have such happy endings. It means that your best friend in this kind of situation is your mobile phone. Make sure it's working properly, and the rest depends on technology.

Text written by  
**Maria Scherbakova**  
English translation  
**Neil McGowan**

## Rules for Forest Walks

If you are heading into the forest, please stick to the basic rules:

- Study the map of where you're going
- Make sure your mobile phone is fully charged, and write down the number of the local forest department
- Wear bright, easily-seen clothing that's comfortable for the outdoors

Make sure that your rucksack contains:

- a compass
- a first aid kit
- pencil and paper
- a bar of chocolate
- a rainproof jacket
- drinking water (enough for the whole trip)
- a camping knife
- a whistle
- a torch (flashlight)
- matches

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Wherever the volcanoes gush, that's where the helicopters will fly

# Volcanomania

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It's probably the concept of a helicopter – the way it hangs in the air, and can turn to make panoramic views – not to mention many other features that open astonishing new horizons for business, industry, art, and other contemporary trends valued by the more active city-dwellers in modern metropolises. They rank alongside super-fast communications, the pulsing rhythm of mobile communications, the Internet, and power modern digital hardware. The spheres of tourism, creativity and research are all buzzing to the resonance of the helicopter industry. And there's good reason for all of this.





#### Out of the sky at sunset

Volcanomania covers three sorts of fans – extreme sports enthusiasts, tourists, and researchers. Of course, there are extensive cross-over areas between these groups. Someone whose amusement involves tickling the rim of a gulf of fire could be either a qualified volcanologist or a badge-holding photographer – or both.

We should probably start with photography. The chance to capture volcanoes and their lava-flows on camera can rarely be better than from a helicopter, and it's probably this that has encouraged photographers in their efforts. Photographers have their own particular approach – firstly taking photographs from the ground, before taking to the air in search of images of the earth belching forth

its depths into the skies above. One example of this kind of professional approach is Viktor Smolyarenko – blogger, professional nature photographer, guide, traveller, and explorer. Once Viktor had shot volcanic eruptions from the ground, he was filled with the desire to take the same shot from the air, at sunset.

This led to helicopters becoming his closest helpmate in nature photography – although not as cheap, as he would like to inform his readers. Yet the capabilities of a helicopter, compared with other kinds of air transportation, more than make up for the drawbacks. In the first place, this kind of aerial shoot is hugely more flexible, compared to trying to do it by aircraft. A helicopter can linger longer near the lava, so that you can even

In a helicopter it's possible to stay longer next to the lava; it's possible to literally hover, changing the height and choosing the angle

feel the heat. You can really hover over it, change the altitude and viewpoint. Of course, there is a certain element of risk involved, but the payoff comes in terms of the results of the shoot.

#### Ablaze with enthusiasm

The work of modern volcanologists is impossible to imagine without air support. Aerial-view fly-overs and aerial photography are



ing. Staff at Russia's Far Eastern Department of the Institute of Volcanology and Seismic Activity (FEB RAS) remember how the Koryaksky Volcano suddenly awoke at the end of 2008. A huge ash plume rose from its crater, that spread over 200-300 kilometres; a glacier perched on the volcano's slopes began to move; and the snow covering the volcano melted. Seismic experts and government officials were kept on tenterhooks until autumn of the following year. The increased seismic rumblings suggested a possible eruption that might have sent a flow of lava down the slopes of Koryaksky towards the nearby settlement of Elizovo. The town hosts a helicopter base for the Kamchatka heli-fleet, and for Kamchatka Airlines – the largest air operator serving Russia's far-eastern Kamchatka Peninsular.

But while the Koryaksky Volcano's ash and gas emissions eventually slumbered back to quietness, the Tolbachik volcano massif erupted into a fire-fountain just three years later. On November 29th 2012, Tolbachik belched forth flame and fire that was immedi-

An excursion to the valley of geysers and the caldera of the volcano Uzon is one of the brightest events during a visit to Kamchatka

daily routine. When a slumbering volcano wakes, sending seismic signals to observation stations warning of spasmodic volcanic tremors, the scientists jump into their 'copters to make overflights, and assess the real chances of an eruption.

The average relative safety of a newly-awakened volcano, and its gaseous emissions, may require months of continuous monitor-





ately listed as red-alert – the highest level of danger – for aviation. Despite this, the warning was downgraded to orange on the following day, when flybys confirmed the nature of the eruption – outleaking of very fluid lava, with very little ash emission. Not long afterwards an Mi-8 helicopter was able to make a comfortable landing on the upper Tolbachik slopes – carrying volcanologists and their gear, cameras, video equipment, tents, backpacks, and supplies. There were even some unusual Christmas presents – in the form of lava and ash samples. The research done by the scientists at Tolbachik confirmed that the

volcano would continue to erupt. Fountains of lava were spewing from the centre of the crater at the rate of more than one meter per second – but further from the centre, the rate was a lot slower. The eventual length of the lava flow ran to fifteen kilometres.

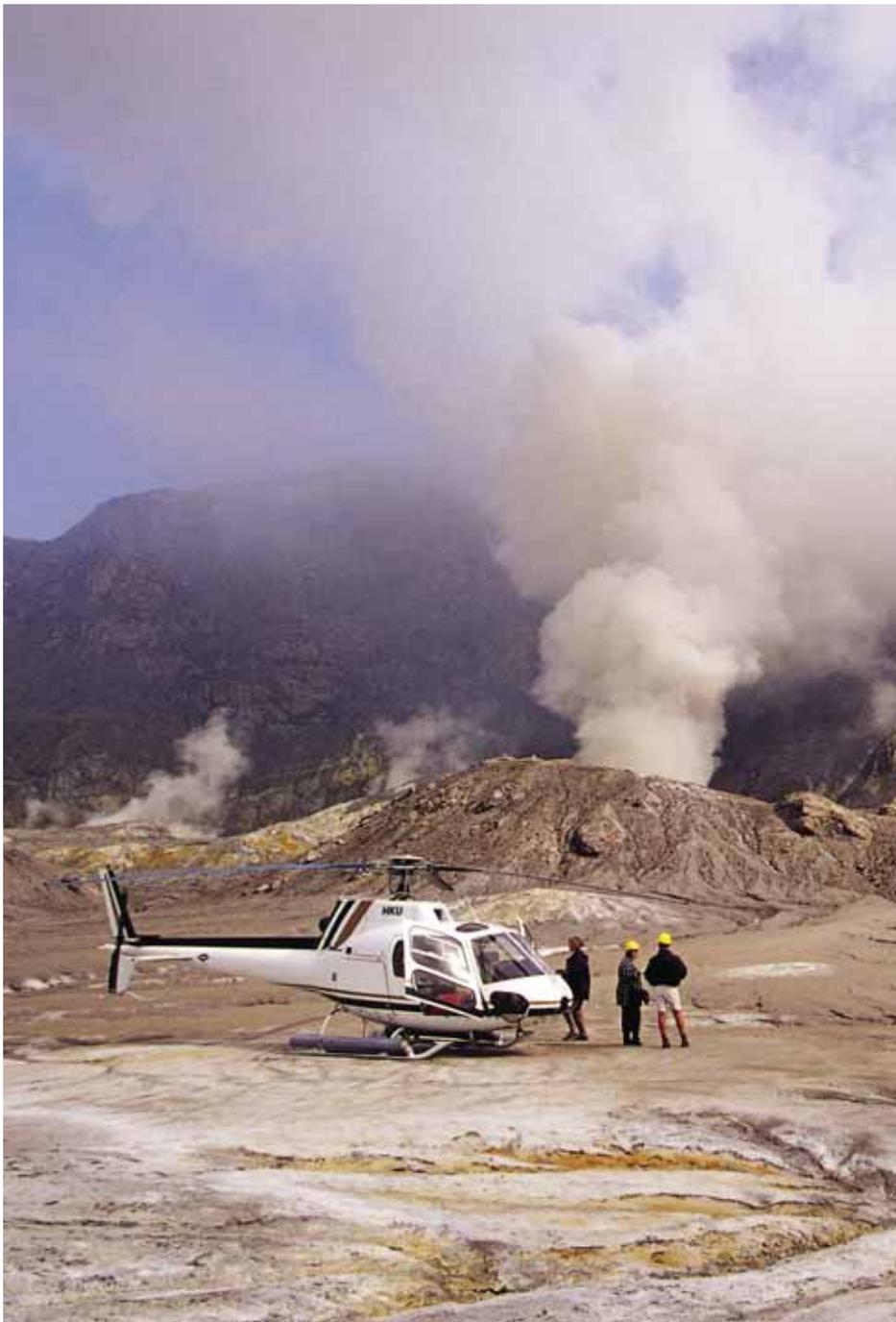
#### Let the gates be closed

The topic of tourist flights around and over volcanoes merits separate discussion. Rotor-driven craft offer excellent solutions to all kinds of terrain-related difficulties on expeditions of all sorts. For example, in 2013 it was helicopters which afforded visitors the best

views of the Hawaii Volcanic National Park, even though the area of the park itself had been closed as a safety measure.

Despite the Park's official closure, under lock and key, helicopter trips above it didn't stop for a single day. As well as offering Hawaiian visitors amazing views of the glowing flows of lava, the helicopter companies were enjoying revenues of up to 30% more than usual.

Of course, Hawaii is a well-known and well-developed volcano-spotter's destination – there are few more wondrous sights to com-



pare to a live volcano. No vacationer would imagine a trip to Hawaii without a volcano excursion by helicopter – a unique chance to observe the natural beauty of volcanic fire from a bird's-eye view, with the chance to make photo-hovers over the most majestic views. Many would say that the Hawaii Volcanic Na-

tional Park offers the most accessible chance to see live volcanoes anywhere in the world. Even so, when any of the Kamchatka Peninsular volcanoes wake up, it's only an 8.5 hour flight from Moscow to get to the regional capital, Petropavlovsk. The Hawaiian volcano of Kilauea is one of the world's most active volcanoes. It can be ob-

served on a two-hour excursion flight from either Oahu or Maui, taking in the Hawaiian Volcanic National Park and a circle over the coasts. A longer six or six-and-a-half hour flight to Kilauea, that includes landings on the way, with a private pilot, will run to around \$7,200 US dollars per person.

Another volcano-spotter's paradise that has exceptional access by helicopter from a new angle is New Zealand. Although well-explored by surface, a helicopter trip to Taurangi offers visitors a chance to see the volcano destination of White Island close-up. An R-44 helicopter can even make a landing on the crater ridge. Few would dispute the abilities of helicopters in volcano-spotting after that – a unique way of experiencing the adrenalin and unforgettable beauty of the natural world.

### A helicopter above the untouched wilderness

Although there are many tourists who prefer exotic southern climes, others are tempted to visit the volcanoes of Russia's Kamchatka Peninsular. A helicopter flight here can carry visitors along the Valley of the Geysers, or the Uzon Volcano – the highlight of any trip to the region. The Valley of the Geysers is hemmed-in on all sides by high mountains, with the helicopter route leading through a narrow valley. Only crystal-clear weather permits this kind of flying. Unfortunately many tourists who come to Kamchatka still fail to find the weather-window that will make their heli-trip come true.

The flights here are made using the versatile and durable Mi-8 helicopter, which can seat up to 20 passengers for an unforgettable trip on the 200-kilometre route through the peninsular's astounding scenery. Surprisingly the route is also punctuated by stops along the way – which only add to the heart-pounding emotions that the landscape induces. One of these stops is a one-hour stopover at the Dzendur Nature Camp, on the banks of the Zhupanova River.

text by

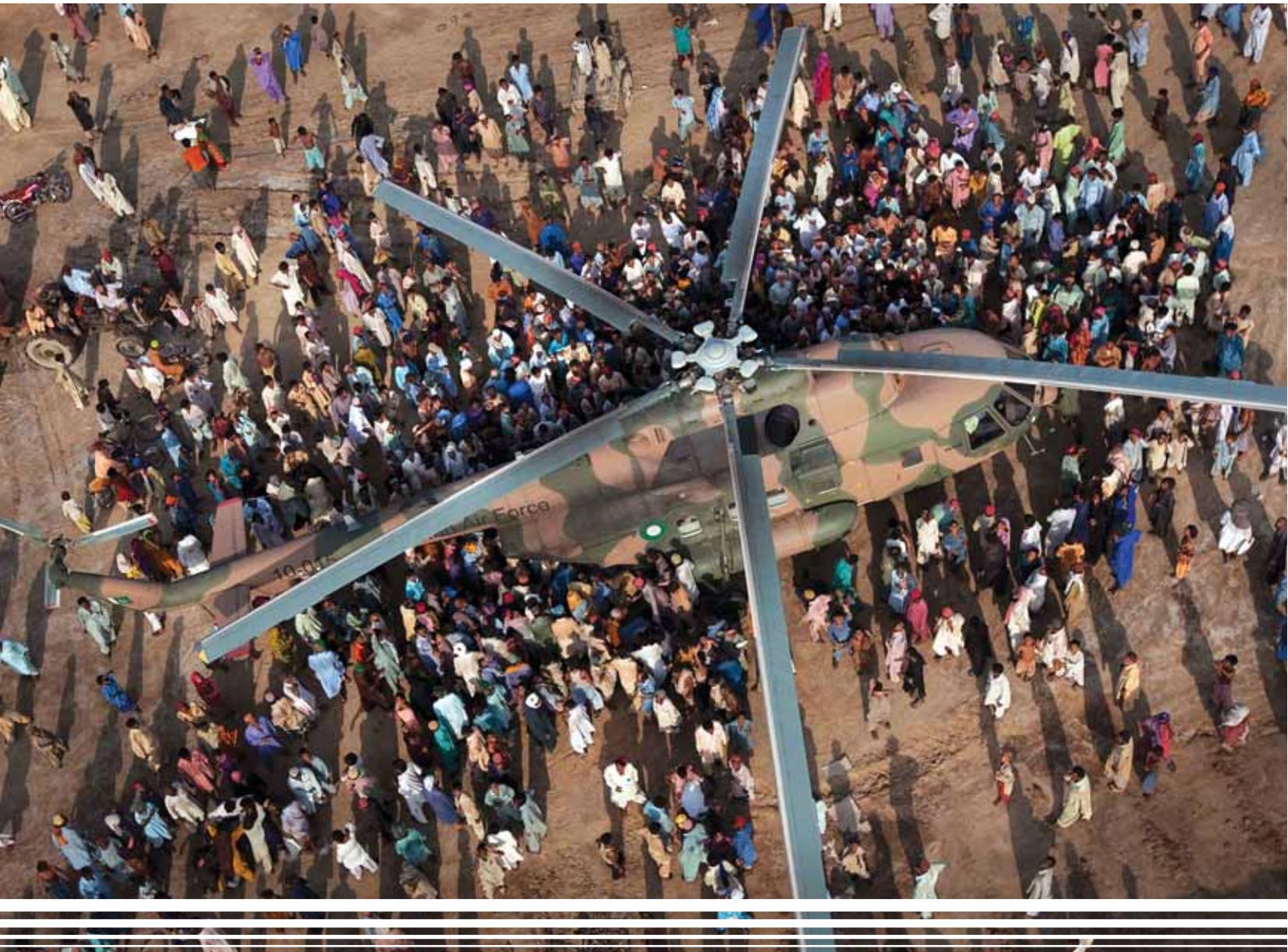
**Herman Spirin**



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Pakistan intends to purchase a variety of helicopters for comparison in combat



## 俄罗斯与中国在巴基斯坦会谈

北约部队从阿富汗撤出，必定恢复俄罗斯和中国在该地区的影响力。为了在中亚地区的战略利益，俄罗斯正在加强与巴基斯坦建立关系。尽管俄罗斯总统向巴基斯坦的首次访问，大概无限期的推迟，从2001年开始，俄罗斯和巴基斯坦的关系出现了升温。俄罗斯高层军官第一次来到伊斯兰堡，讨论举行联合军事演习和提供军火物资的可能性。

政治分析专家并没有忽视，伊斯兰堡与莫斯科建立稳定友好的关系，会使巴基斯坦与美国的关系恶化，美国是南亚长期的合作伙伴。

俄罗斯同意向巴基斯坦出售直升机并准备建造20亿美金的天然气管道，这可能是在该区域近十年来最大的投资。通过伊斯兰堡和莫斯科双方高级别代表的一系列访问，8月20日巴基斯坦宣布，将买了四架军用米格-35M直升机。合同金额没有透露。巴基斯坦正在考虑针对与美国日益紧张的关系，美国认为在邻国阿富汗打击伊斯兰的斗战，伊斯兰堡是不可靠的盟友，做出的外交政策合作方案。长期以来，巴基斯坦是美国的盟友，而俄罗斯正在积极发展与印度的关系，事实上伊斯兰堡与邻国政府为敌视关系。据华尔街日报专家分析，美国长期的盟友伊斯兰堡，将转向以前的敌人。美国正日益被视为制衡印度与中国的关系，而双方认为是战略敌人。这将促使以前的敌人，俄罗斯和巴基斯坦改善关系。「巴基斯坦已经决定，不再愿意依赖于美国政府」，该报引述一名巴基斯坦前外交官扎法尔·赫拉里。「巴基斯坦已决定，虽然美国是非常重要的，但是应该寻找

新的出路」。

上个月在乌法，巴基斯坦总理纳瓦斯·谢里夫与俄罗斯总统弗拉基米尔·普京会面并宣布，开展“多方面的关系合作”，其中包括国防，贸易和能源领域。俄罗斯“Rostec”公司准备建设1100公里的天然气管道，相关协议将在下个月签署，这是俄罗斯和巴基斯坦之间关系明显的一个信号，提升了一个新的水平。该管道将卡拉奇港口连接到其他巴基斯坦城市拉合尔。俄罗斯总统该最亲密的朋友之一，将管理俄罗斯公司25年。

俄罗斯不得不与中国竞争巴基斯坦市场，考虑到该国是其重要盟友之一。中国和俄罗斯倾向于在巴基斯坦通过经济投资，在该地区稳定伊斯兰的环境。中国在巴基斯坦基础设施上大约已经投资了460亿美金。中国可能是巴基斯坦最友好的盟友，帮助其发展国家核电能源项目。俄罗斯为巴基斯



俄罗斯直升机用于执行巴基斯坦空军人道主义救援任务。





坦提供大型能源项目具有深远的前景。需要强调一点，俄罗斯在国际舞台上寻求发展关系的国家，他们或反对美国或不受华盛顿的影响控制。今年七月，上海合作组织（上合组织）国家元首签署了一份对印度和巴基斯坦加入进程

手续文件。提供米格-35可能成为两国之间长期军事合作的开始。例如有这样实例。从1996年到2010年期间俄罗斯向巴基斯坦提供了超过70架多功能米格-8/17/171 直升机。从1960年期间双

方就开始了军事技术合作。攻击直升机米格-35M是攻击直升机米格-24B的升级现代版。该直升机装备了新的航空电子设备和机载设备，新的尾桨，固定起落架，同时有更强劲的发动机。在2005年批量生产。原本是为出口设



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计的，而后来被俄空军购买，做了些很小的调整变化。米格-35M直升机接近新一代的机型，可以摧毁敌方装甲车，火力支援，降落，伤员后送，同时货舱可以运输货物和外部吊索。多功能的机型具有作战和运输能力，同时提高了作战生存能力。

巴基斯坦的直升机都是中国为其积极提供。按照今年一月份的协议，在春天向巴基斯坦交付了三架攻击直升机Z-10雷电。该批直升机散件交付给驻扎在拉瓦尔品第市卡西姆附近的一个陆军基地，使用之前的装配和调试由巴基斯坦方面来完成。在此之后，在开伯尔山上直升机进行了测试，做了适当的修改工作，工作人员已培训了维修技师。

Z-10由昌河飞机工业集团和中国发展研究院和中国直升机研发中心（CHRD）专为中国的解放军设计研发，但它的设计对“卡莫夫”公司影响很大（941项目）。在2003年首次试飞，目前中国解放军大约装备了100架这类的直升机。从外部来看，Z-10载重7-8吨，相似的同类产品如：安-64阿帕奇直升机，米格28N和韦斯特兰八月。属于现代攻击直升机，能够广泛的适用携带SD和NUR，包括HJ-10反坦克导弹，以及携带23毫米口径的机枪，达到每分钟600发的速率。在Z-10前端的陀螺稳定平台上放置了瞄准和定位监控摄像头，包括激光测距仪，远光灯，电视摄像机和热成像仪。在初始阶段，Z-10将补充到巴基斯坦AH-1眼

镜蛇基地，大约51架直升机。但是Z-10还可以装载大尺寸的设备，可配备比AH-1F更强大的热成像仪和夜视仪，同时具有UR“自动发射”系统。此外，Z-10具有激光指示器，能够支持导弹制导，协助武装无人机Burraq作战。未来更新的Z-10可以装载毫米波雷达，类似美国的长弓系统，更强大的涡轴发动机WZ-16，这将提高飞行速度和装甲的重量，加强红外和电子对抗导弹威胁，并与无人系统交互的功能。

如果投产，巴基斯坦Z-10很可能在阿富汗边界中使用打击喀布尔和扎布的塔利班。如果巴基斯坦认为Z-10的平台能力够用，很可能在不久的将来，用中国的机型取代美国的“眼镜蛇”。如果中国在巴基斯坦成功地出口Z-10，也就是说该机型的出口前景非常好。成功的战斗机使用，Z-10对其它的外国买家非常有吸引力。

目前，双方关于米格-35的供货合同已经签定。据悉，由于在许多领域合作关系，双方有着良好的意愿，关于价格双方都可以接受。值得强调的是，该机型有着很好的口碑。近期该批米格-35将交付给巴基斯坦空军。据说，该批直升机将用于打击其境内的恐怖组织。一些专家预计，巴基斯坦在将来还要订购俄罗斯的军用直升机，用来更新加强巴基斯坦的空军力量。一方面可以看出巴基斯坦打算



购买各种样品的直升机，在战斗中比较其性能。另一方面购买俄罗斯和中国的军用直升机可以向华盛顿展示其独立自主。时间会证明一切，在任何情况下，新的趋势总是表现出非常积极的一面。

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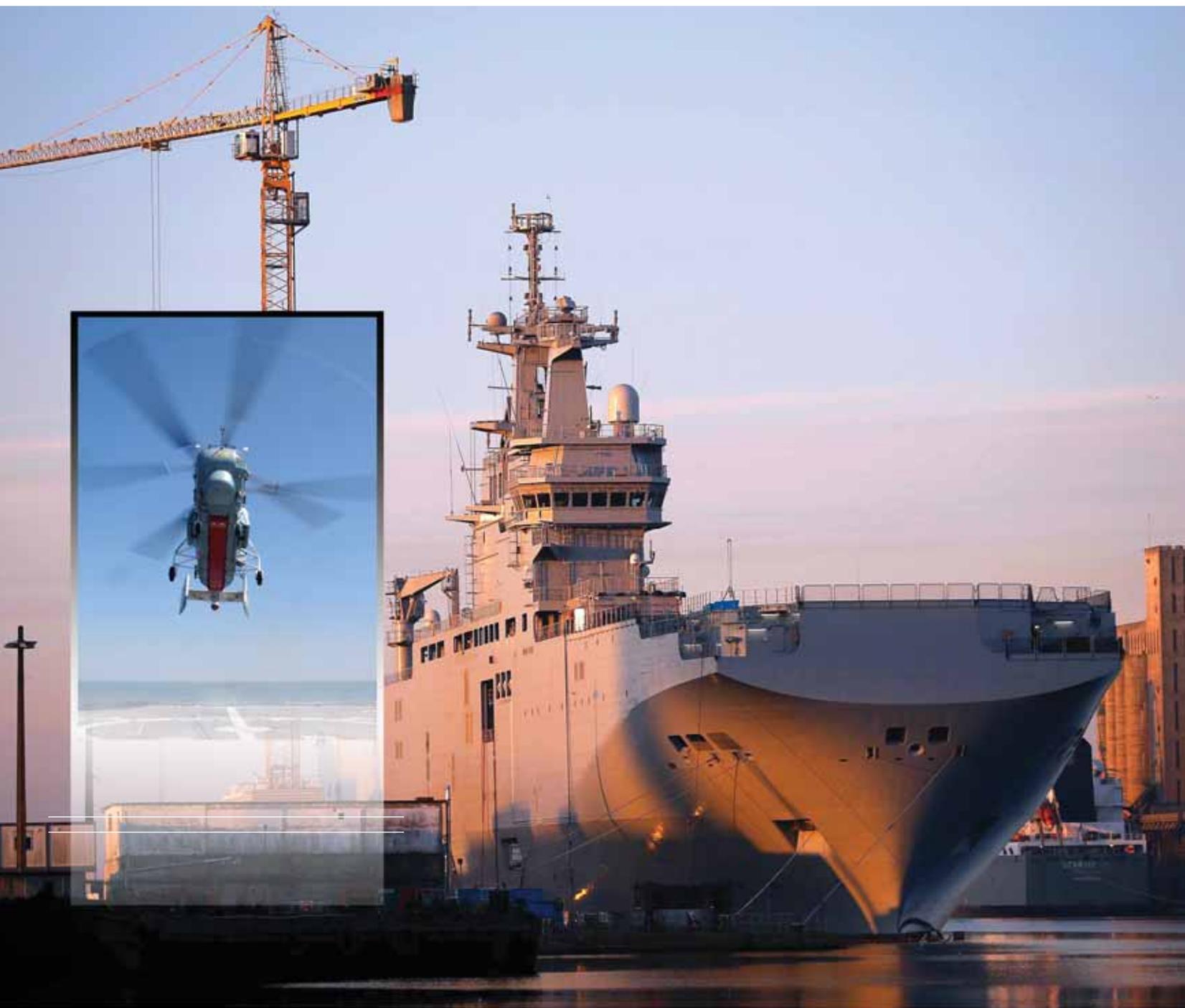
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Growing tensions in the region motivates China to create a helicopter ships



## 中国直升机航母是什么样的？

中华人民共和国是正在积极发展自己海军的国家之一。其中包括自己研发的两栖攻坚舰。第一个这样的新一代军舰DVKD昆仑山号(071项目),在2007年年底委托由上海沪东中华造船厂建造。071项目(西方称号Yuzhao)是一艘2万至2万5千吨总排量的军舰,能够容纳多达800技术人员和四个重型直升机Z-8运转平台。在2008年中国科协CTSC派出较小版本舰船在马来西亚竞标(1.3万吨满载排水量)。在2012年“国防与安全”展会期间,中国船舶重工国际公司(中国国家船舶工业集团公司隶属中国船舶重工集团公司)中国外贸协会在该项目上推荐两栖攻击舰的出口,外

### 中国新的项目

四月底在中国的网站上出现了,新一代的程控室图片,发生了很大的变化。在生产商的网站上把这种图片外型称为«081项目»。虽然中国军工制造商很早以前就开始使用该机型的样本平台,但是经常出现很多复杂不确定的可靠信息。除此之外,中国公司销售的平台样本,项目常常不切实际。然而,据一些中国和其它来源的消息称,近十年中国计划采购6艘两栖攻击舰。他们将在071项目中补充六艘舰船,其中4艘正在建造。

照片中新的两栖攻击舰样本排水量达4万吨,

飞行甲板空间。下面吊车清晰可见用于两栖登陆,最有可能在两栖登陆舰上携带各种装甲车辆或气垫船。设计了输送轮式或履带式车辆。可能中国两栖登陆舰可以携带比西方同行更重的导弹。除了两个发射SAM HHJ-10,模型显示了三个垂直发射装置,两个在左侧一个在右侧。这样的配置在法国航母“戴高乐”号上使用了SAM Aster 15。

因为建造新的两栖登陆舰,中国与周边国家的关系日渐紧张。因为日本在2周前宣布下水该国二战以后最大的军舰-“出云号”直升机航母。同样类型的军舰预计在2017年建造。据官方



型类似法国的“西北风”军舰。该军舰推荐给了泰国海军。舰长180米、吃水深8米总排量超过2万吨。船上装有连续的飞行甲板,有四个直升机停机坪和一个车载升降机。程控室在舰尾。武器装备包括16个垂直发射平台,两个30毫米口径高射炮系统,(例如:730型)和四个小口径火炮。

在2012年10月份,海军上将YIN ZHOU在中国电视采访时说出。由此可以看出,该舰船可以载14架长河Z-18直升机设计,用“卡莫夫”同轴转子。很难确认是俄罗斯的直升机型号,但是很明显,中国从2006年开始就没有准备采购卡-29TB机型。吊车位于舰尾,就像“西北风”舰一样,但移动到了右侧,节省了更多的

统计,它属于直升机航母-驱逐舰。但是这也不完全正确。驱逐舰长度很少超过248米,排水量2.7万吨位。他们两侧没有飞行甲板沿和机库,最多可容纳达14个战斗直升机。中国的专家立刻认为这是重型直升机航母或是航母,在两侧上面可以装载从美国进口的F-35型飞机。美国的F-35B型适合在“出云号”级别的

舰上垂直起飞和降落，可以携带8-9架五代“隐形”技术战机。

日本拥有过世界上最大的航母舰队。到二战结束时，大多数日本航母都沉在了海底，日本发誓决不再拥有进攻性武器和航空母舰。据东京方面消息，“出云”号是为了搜索、摧毁潜艇和水雷。同时也可以用于处理自然灾害危机。现在，中国已经提出了关于“钓鱼岛”的争端，为了“防御”的战略，要求自卫队拥有自己的海上飞机基地。事实上，改装“出云”号并非如此简单。也许，这将是很昂贵代价。购买可能花费十倍的成本（F-35B目前的身价高达1亿1600万美元），其飞行甲板还得加固。这艘舰总价会超过20亿美金。

#### 如果俄罗斯没有了“西北风”

大家很快都明白了法国的欺骗，俄罗斯已经回到了创建自己的两栖攻击舰，直升机航母的想法。国产舰样“雪崩”号2015年在克雷洛夫斯基国际展览中心展台展出。这个方案已经递交到海军最高统帅部。俄罗斯海军上将维克托·契尔科夫认为，该舰艇排水量达到2.4万吨，可携带多达16架直升机(从卡-27和卡-29到卡-52K)，运输450人海运陆战队员和80台设备。此外，还有对接仓可以容纳六艘两栖或空降突击艇“塞尔纳”和“猛禽”号。舰上还可以安装AK-176M和AK-630M-2机枪（两用齐发）和“贝克-ME”火箭炮。

据军事造船中心主任弗拉基米尔·别别列耶夫



在其传统的航母基地，俄罗斯航母舰载直升机解决了许多复杂的现代战争战术问题。



的说法，俄罗斯两栖攻击舰建造可以在圣彼得堡“北方造船厂”和北德文斯克造船厂，“设计稿的制作大约需要一年的时间，技术设计和施工设计文件需要1-2年的时间，建造需要3年的时间。总体大约需要5-6年的时间。据专家介绍，俄罗斯联邦开发和建造两栖攻击舰前期花费需要300亿卢布。未来该舰艇的价格在很大程度上取决于不同种类的武器和其它系统的安装。武器的价格占总价的80%，舰船的壳体占总价的20%。

法国政府打算建议中国为俄罗斯建造“西北风”。据中国时报报道，法国两艘舰艇在上海港访问期间，谈了关于这一问题。另据报道，法国舰船有可能被中国作为样舰使用。俄罗斯可以在上面装载卡-52，在直升机航母上建造机库。但是，这事没有谈成，或者是中国方面不同意，或者俄罗斯方面不同意。此前，副总理特米特里·罗戈津说，没有莫斯科的同意，巴黎不能出售“西北风”。这是合理的假设，俄罗斯和中国联合两国的海军，该项目可能更容易...