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Special analytical export project of the United Industrial Edition

№ 12 (43), September 2019

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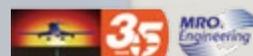


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'International Aerospace & Technology Guide' № 12 (43), September 2019

Special analytical export project of the United Industrial Edition

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EDITORIAL



The best offers for China and Asian-Pacific area

It has become already obvious and undeniable that security is becoming increasingly important among the various values of civilization. Today, for any state, the ability to reliably and securely protect the territory, residents and values is a priority.

Political situation in the world (conflicts, sanctions, threats of war and other) makes nations once again reconsider their defense possibilities. Threat of local conflicts to be evolved into global ones, failure of worldwide system of safety and nonending crisis – all of this leads to an unstable and dangerous situation.

One can predict raise of defense means market in times like this. But together with developing of defense technologies in order to safety, rivalry among sellers of weapons and defense systems increases in order to achieve such goals as increasing profits and market share. The 18th AVIATION EXPO CHINA presents in Beijing the best world (Russian also) aerospace innovations for global market, which are the undisputed world leaders on price and quality in their segments.

These expo shows that it is not serious about how many weapons and planes you have, but quality and possibilities of every single one of them is fact what leads to victory on the battlefield and on the global market. Other significant factor is technological independence from seller – modern technologies make it possible to shut down any device from any place of the globe if you have appropriate access. With high-tech products, solid aftersales service and proven reliability, Russia is honest and friendly partner for all countries, ready for mutual work.

Taking part in AVIATION EXPO CHINA 2019 Russia continues the policy of open partnership with India and other countries of AsianPacific area. Russia has a wide product line that meets all the needs of this region and ready propose the best technology and the best price offers.

Valeriy Stolnikov

ANSAT TO GET AUSTRIAN MEDICAL MODULES



The Russian Helicopters Holding Company (part of Rostec State Corporation) and an Austrian company Air Ambulance Technology signed a cooperation agreement. The parties agreed on joint development and Russian certification of the medical module which may be installed on Ansat helicopters.

The document was signed by Director General of Russian Helicopters Holding Company Andrey Boginsky and managing director of Air Ambulance Technology Nicole Kuntner-Hudson during the international aerospace exhibition Paris Air Show 2019.

'We are pleased to announce the start of cooperation with Air Ambulance Technology and we hope that this will be long-term and fruitful work. Creation of the new medical module which meets international standards for medical aviation will allow the holding company to expand the pool of potential customers, including European companies. We expect that installation of such equipment will help Ansat get a certificate of the European Union Aviation Safety Agency', said Director General of Russian Helicopters Andrey Boginsky after the ceremony to mark signing of the agreement.

The light multi-purpose helicopter Ansat, which has the largest cabin within its class, is actively used by the Russian air medical services. This twin-engine helicopter is compact, and it does not require a large landing area. It can also be used for passenger and VIP transport, cargo delivery and environmental monitoring. High-altitude tests of Ansat have been successfully completed, which confirmed the possibility of its operation in mountainous terrain at altitudes up to 3,500 meters. The helicopter can be operated in a temperature range between -45 and +50 degrees Celsius. The possibility of keeping the helicopter out of the hangar and low cost of operation are its significant advantages.

'技术动态' 为中俄航空项目组建人员储备

俄罗斯技术国家集团的'技术动态'控股公司鲁勉采夫机械制造生产联合企业资助莫斯科航空学院十位优秀本科生在中国领先科研综合性大学——上海交通大学进行培训，以实施未来中俄航空领域内的项目。

鲁勉采夫机械制造生产联合企业与莫斯科航空学院已经合作多年。大学生们每年在企业中实习，而最优秀的毕业生会得到就业的机会。

从今年起，依据与莫斯科航空学院签署的协议，鲁勉采夫机械制造生产联合企业资助优秀学生在上海交通大学进行培训。莫斯科航空学院'飞行设备发动机'系的本科毕业生在鲁勉采夫机械制造生产联合企业的竞赛中展现了自己的作品。从中挑选出十人，他们将根据中俄大纲研究在现代飞机设计下管理产品生命周期的技术。

学生将在中国度过2019-2020学年，在2020-2021年他们将继续在莫斯科航空学院学习，之后返回上海完成学业。完成大纲后，年轻的工程师将立即获得两所大学（莫斯科航空学院和上海交通大学）的文凭，并在鲁勉采夫机械制造生产联合企业开始他们的职业生涯。

上海交通大学成立于1896年，它是中国最负盛名、历史最悠久的大学之一。该大学在金砖国家大学排名中名列第五，并且在获



得的专利数量方面位居中国前三所大学之列。自2017年以来，莫斯科航空学院和上海交通大学已开设目标企业计划。学生有机会成为三个航空主题培训方向的研究生。

鲁勉采夫机械制造生产联合企业是在自身行业中领先的俄罗斯公司。联合企业生产涡轮喷气发动机和涡轮螺旋桨飞机发动机自动控制系统适用的精密燃料控制设备，以及调节向地面燃气轮机动力驱动器供应气态或液态燃料的计量装置。企业的优先事项之一仍然是培训高素质的专家，他们为企业不同项目的实施做出贡献。

'KAMAZ-Master' 隊成功地結束 '絲綢之路2019' 這個比賽

與 'KAMAZ-Master' 隊的勝利的同時，'絲綢之路2019' 國際賽車會結束。團隊駕駛員安東·希巴諾夫在他生涯中首次贏了這個多天的有聲望的競賽。領航員德米特里·尼基京與機械員伊萬·塔塔里諾夫同他一起慶祝勝利。'KAMAZ-Master' 其他對手安德烈·卡爾吉諾夫和艾拉特·馬爾傑夫也獲得了第二名、第三名分別。



國際賽車會 '絲綢之路2019' 最後第十個階段於7月16日舉行，路線為嘉峪關到敦煌。此路線上有相對這個中國地區的沙地、無路可走的荒野、滿石頭的河床。團隊的乘務組在全部路線中演出高級開貨車能力，結果成功地達到終點。安東·希巴諾夫不僅成為競賽這一段的勝利者，而且獲得了賽車會的冠軍。

最主要的車賽會結果是 '卡馬絲大師' 的勝利：貨車賽的三個一等獎取得團隊

的乘務組，4輛俄羅斯貨車都進入了前五名。'我首次贏了' 絲綢之路 '這個競賽，因此我而會記住這次賽車會。組織者安排真努力，準備很有意思的線路及道路，每天安排新的活動。一開始我就感到了我會贏競賽。最難的是最後兩天的無法可走的道路'。安東·希巴諾夫分享自己的印象。

賽車會開始於7月6日，位於俄羅斯、蒙古、中國這三國國家的領土。運動員在10天的時間內跑過大幅5千公里，這個距離的一半是測試時間的路段。

賽車會的冠軍安東·希巴諾夫以26小時1分40秒跑超過2,7公里的測試時間的路段。對他最近的運動員，就是安德烈·卡爾吉諾夫與艾拉特·馬爾傑夫，比他慢25分22秒與52分5秒分別。另外一名 'KAMAZ-Master' 對的駕駛員謝爾蓋·庫普里亞諾夫成為第五個達到終點的運動員，比冠軍慢4小時12分41秒。

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- ▶ China Commercial Aircraft Additive Manufacturing Technology and Application Forum 2019
- ▶ The Civil Aircraft Materials Industry Development Forum China 2019
- ▶ 2nd International Aero-Engine Conference 2019
- ▶ China Airport Conference: Innovation and Development 2019 (4th Event)
- ▶ The 1st China Civil Aviation Technology Equipment and Service Expo

RUSSIAN HELICOPTERS AT PARIS AIR SHOW 2019



Russian Helicopters Holding Company (part of Rostec State Corporation) presented the light multi-purpose Ansat helicopter equipped with the new Mku30 satellite communication system at the 53th International Paris Air Show 2019.

The Holding Company actively develops the introduction of modern satellite communication systems for helicopters. We entered into an agreement with the MOST-satellite systems company on joint promotion of these products. The Ku-band satellite communication system was created for Ansat and integrated into its avionics. It ensures data transmission and reception at the speed up to 2 Mbps regardless helicopter's location. We plan to offer this system as an option for all civil helicopters of the Holding Company,' said Andrey Boginsky, Director General of Russian Helicopters.

The Mku30 satellite communication system allows single-point and multi-point video conferencing on board, smooth real-time transmission of selected amounts of data and high-quality video content.

At Paris Air Show 2019 held in the French capital on June 17-23, Russian Helicopters showed two Ansat helicopters – medical and VIP versions.

The light multi-purpose Ansat helicopter, which has the largest cabin within its class, is actively used by the Russian air medical services. This twin-engine helicopter has compact size and does not require a large landing area. It can also be used for normal passenger and VIP transport, cargo delivery and environmental monitoring. High-altitude tests of Ansat have been successfully completed, which confirmed the possibility of its use in mountainous terrain at altitudes up to 3,500 meters. The helicopter can be operated in a temperature range between -45 and +50 degrees of Celsius. Its significant advantage is the possibility of storage out of the hangar and low cost of operation.

The international air show in Le Bourget is one of the largest and oldest air shows in the world. It takes place every two years at the Le Bourget airport, 12 kilometers from Paris. Russia is a regular participant of the show. The first Russian aircraft presented in France was ANT-35 in 1936. In 1965, the Soviet Union showed Mi-6, Mi-8 and Mi-10 helicopters for the first time at Paris Air Show.

俄罗斯国防产品出口公司担任‘斯帕斯塔楼-2019’音乐节的赞助人

俄罗斯技术国家集团的俄罗斯国防产品出口公司照例为‘斯帕斯塔楼-2019’国际军事音乐节提供赞助，该音乐节将于2019年8月23日至9月1日在莫斯科红场举行。自2007年以来，按照弗拉基米尔·普京的指示，在莫斯科克里姆林宫城墙附近举行世界上最大的军乐队游行。



俄罗斯技术国家集团总经理谢尔盖·切梅佐夫指出，‘斯帕斯塔楼’音乐节在举办的多年间成为了最引人注目的文化活动之一，也成为了莫斯科夏季的标志。世界上最好的军乐队丰富多彩的庆祝活动的主要寄语是：‘音乐是和平的语言，而不是战争的语言’。参与者的表演技巧、古典音乐语言赋予这一寄语特殊的力量。

每年为‘斯帕斯塔楼’的数万名观众和嘉宾举办色彩缤纷的表演，在表演中成功结合了国家元首精英卫队的优美姿态、最佳骑兵团的优雅、世界各国军事和民间乐团的惊人音乐、以及世界流行歌星的表演。所有这一切都与巧妙设置的戏剧元素、灯光装置和令人叹为观止的烟花融为一体。

俄罗斯国防产品出口公司总经理亚历山大·米谢耶夫指出，俄罗斯国防产品出口公司的口号是‘团结的力量’，音乐会旨在加

强俄罗斯与其合作伙伴在世界舞台上的联系。‘斯帕斯塔楼’是艺术如何将国家联合起来、将世界各地人民的愿望结合在一起、在人类最伟大天赋的王国-音乐和舞蹈的王国中大胆尝试的最鲜明范例。

项目参与国的地理位置通常覆盖世界各地。今年将抵达莫斯科的有：日本自卫队陆军中央管弦乐团、阿塞拜疆盖达尔·阿利耶夫高等军事学校管弦乐团、土耳其武装部队阿蒙尼管弦乐团、朝鲜人民军军乐团、韩国‘韩努里’音乐团队、意大利‘特里杰恩金’高山射手管弦乐团、挪威‘史卓加斯特’和‘特维特·尤尼欧’乐队、哈萨克斯坦共和国国家近卫军示范交响乐团、埃及军乐交响乐团、白俄罗斯共和国武装部队示范展示管弦乐队、凯尔特管风琴和鼓乐团联合管弦乐队以及凯尔特国际舞蹈队。

此外，在音乐节的框架内举行‘斯帕斯塔楼’儿童项目 – 儿童铜管乐队比赛。不同城市和国家的儿童团体、仪仗队会在特别为客人们建造的场地中表演，在这里还会举办音乐会、互动节目、创意工作室和教育娱乐活动。

‘斯帕斯塔楼’音乐节重要的一部分是内容丰富的慈善计划，它为弱势群体，以及莫斯科、莫斯科郊区和俄罗斯其它地区的儿童机构与学校免费分发数千张门票。

俄罗斯国防产品出口公司向土耳其供应了第一批C-400器材

俄罗斯技术国家集团旗下的俄罗斯国防产品出口公司于今年7月25日向土耳其供应了第一批C-400‘凯旋’开发和‘金刚石-安泰’航空航天防御联合企业制造的远程防空导弹系统器材。

俄罗斯国防产品出口公司总经理亚历山大·米谢耶夫表示：‘俄罗斯国防产品出口公司履行了对土耳其合作伙伴的第一部分义务。总的来说，从7月12日开始，向土耳其供应了30多架专程飞机以及第一批3PC C-400器材。一部分土耳其专家已经在俄罗斯接受了培训。我们将按照双方商定的时间表运送其余的货物，同时我们将对大部分专家的系统进行维护和操作培训。我们目前正在就此问题的合作进行谈判，包括在土耳其组织个别系统元素的许可生产’。俄罗斯国防产品出口公司于2017年4月在莫斯科签署了向土耳其供应3PC C-400‘凯旋’器材的合同。它是该公司与北约国家最大的出口合同。

俄罗斯国防产品出口公司负责人指出：‘供应C-400不仅加强了土耳其的防空系统，而且加强了我们的战略伙伴关系。我



们完全相互信任。俄罗斯国防产品出口公司计划最大程度地扩大与土耳其在实施互益项目上的合作，包括在直升机、军用航空和防空系统领域’。

C-400的主要优势是多功能性。防空系统能够对抗各种类型的空气动力学目标和弹道火箭，直至中程弹道导弹。‘凯旋’在主要的关键功能上优于国外同行几倍。此外，它能够整合到由其它国家生产要素组成的全球国家防空系统中，而不会丧失功能。



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EXPO SERVICES
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MC-21 AND CR929 AT MAKS-2019

United Aircraft Corporation (UAC) represented its advanced commercial, military and transport aviation products during the International Aviation and Space salon MAKS, which has taken place in Zhukovskiy, Moscow Region, from August 27 to September 1, 2019.

'During this important home-run event, we demonstrated to public our leading products. With the consistent UAC strategy implementation based on the government support, the major investments and the engineering aspires we were ready to demonstrate our achievements at MAKS-2019. Our brand new MC-21 airliner was unveiled to the guest of the airshow: they saw one prototype in the flight program and the other two on static display. Pilots of the Su-57 fighter demonstrated aerobatic figures and first-class pilotage. This fifth generation aircraft will be available for observing on static display', - noted Yuri Slyusar, General Director of UAC.

The world premiere of the MC-21 aircraft was promising to be the key event of the upcoming Salon. The three test aircraft were shown to the public altogether for the first time. One of them boasted with the demo cabin installed, so that the future passengers could estimate the high level of comfort of the aircraft.

Another crowd-puller feature of the Salon was the full-scale CR929 cabin and flight deck mock-up, as well as Superjet 100 with its stylish SABERLETS on static display and in flight program.

As for the military premieres, the Su-57 fifth-generation fighter was open for public viewing on a static display. A state contract for the supply of Su-57 fighters to the Russian Ministry of Defense was signed this June. The Mig-35 4++ generation fighter was presented on special podium and also took part in the flights. The novelty of MAKS-2019 was public debut of the new Il-78M-90A tanker. It's the first air tanker manufactured in Russia in the post-Soviet period. It's also planned to demonstrate the Be-200 amphibious aircraft.

UAC presented a commercial market outlook with global fleets data analysis, that comprise the demand forecast for commercial aircraft and the corresponding market potential for each world region, particularly for Russia, China and India. MAKS-2019 became a basement for business meetings and conferences, including the agreements upon digital transformation in circuit of UAC general strategy.

俄罗斯 '施瓦贝' 摄影器材登入上海展会

在2019年7月10日至13日于上海举行的摄影和图像处理领域亚洲领先展览会Photo & Imaging Shanghai 2019上，在C.A.兹维列夫克拉斯诺戈尔斯基工厂和俄罗斯技术国家集团 '施瓦贝' 控股公司的联合博览会上首次展示了国内摄影器材。它包括 '极点M' 无反光镜相机和 '泽尼塔尔' 0.95 / 50镜头，去年它已成为最大的国际光学展览会上的重要展品。

在中国Photo & Imaging Shanghai 2019展览会上展示的 '极点M' 数码视距镜头由C.A.兹维列夫克拉斯诺戈尔斯基工厂与德国相机和高等光学制造商Leica Camera AG联合开发。它周到的人体工程学设计重复传奇摄影器材的外观。

相机能够以每秒三帧的速度进行拍摄，并以Full HD 格式录制视频，频率高达每秒25帧，并且还可以在100到6400的范围内更改灵敏度。与原始型号Leica M一样，手动完成对焦。

相机配备了在俄罗斯设计和制造的35 mm f / 1.0 '泽尼塔尔' 高光圈镜头。它创建出具有独特散景和柔焦效果的图像。同时不需要进一步处理照片。

C.A.兹维列夫克拉斯诺戈尔斯基工厂总经理瓦季姆·卡柳金指出：'在中国最大的城市和金融中心举办的展览是我们工厂的



新平台。重要的是要了解我们不仅展示公司的开发，而且还向亚洲同事展示现代俄罗斯摄影器材的潜力。我们努力不断发展，向世界市场的参与者展示自苏联时代以来在国外享有盛名，并且今天配得上传奇前辈们的C.A.兹维列夫克拉斯诺戈尔斯基工厂相机和镜头'。

俄技集团在 '2019年军队' 论坛上首次展示 '蟒蛇' 自动手枪

俄技集团 (Rostec) 旗下的中央精密机械工程研究院 (TSNIIOCHMASH) 在于6月25日至30日在莫斯科州举办的 '2019年军队' 国际军事技术论坛上首次展示最新自动手枪 '蟒蛇' (Udav) 四种改型。



旨在取代军队中的马卡罗夫手枪，已通过国家测试，并获批投入批量生产。第一批 '蟒蛇' (Udav) 已经交付部队进行试使用。至于民用版的 '蟒蛇' (Udav)，我们已经开始准备进行认证，从而为出口铺平道路。我们拟将其推广到拉美、中东、印度、中国、东南亚等国外市场。'

口径为9毫米的 '蟒蛇' (Udav) 自装手枪完全是俄罗斯研发成果。'蟒蛇' (Udav) 手枪验收跨部门委员会已批准其批量生产并完成委员会工作，手枪得到 'O1' 代号。弹仓容量为18发，比马卡罗夫手枪多10发。

本次论坛上展示9x21毫米专用与通用手枪，以及最新的9x19毫米战术与运动手枪。'蟒蛇' (Udav) 的民用改型努力满足专业运动员要求，其战术技术特性可与国外知名品牌媲美。

'在 '2019年军队' 论坛框架内，我们专门筹备了 '蟒蛇' (Udav) 手枪新改型的动态展示活动。' 俄技集团 (Rostec) 工业总监谢尔盖·阿布拉莫夫 (Sergey Abramov) 指出，'新的手枪综合体 '蟒蛇' (Udav)

'蟒蛇' (Udav) 手枪可使用示踪弹、穿甲弹、扩张弹等全系列9x21毫米弹药的能力。此外，专门为这种手枪还开发了音速与增加穿透性等两种最新弹药筒。手枪握把采用现代复合材料制成，根据其强度可以在-50至+70摄氏度的温度下运作。

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www.helicopter-china-expo.com



IRKUT CORPORATION AT PARIS AIR SHOW 2019

Irkut Corporation (a UAC member) took part in Paris Air Show 2019.

At the stand of the United Aircraft Corporation, the mock-up model of MC-21 aircraft and the upgraded version of procedural simulator for training (retraining) flight crews of MC-21-300 passenger aircraft were presented.

The procedural simulator of MC-21-300 had been upgraded including taking into account the results of flight tests.

The central part of the simulator was the unified MC-21 aircraft cabin module. The module enables to form different variants of training devices.

The simulator has the latest versions of consoles and controls design, display and alarm systems of cockpit, upgraded software and hardware system for the visualization of cockpit environment. The simulator touch panels simulating a complete ceiling console is replaced with a full-featured simulator. The special software and mathematical software that simulates operation of aircraft systems has also been updated.

MC-21-300 CERTIFICATION FLIGHTS

Flight test experts of the European Aviation Safety Agency (EASA) completed the second session of the MC-21-300 validation program.

During the certification tests EASA experts evaluated the behavior of MC-21-300 aircraft in various modes at altitudes till 12,000 m. The flights were performed with a large and low take-off weight, in the conditions of front and rear centering. The operation of the integrated aircraft control system in the normal mode has been verified. Testers rated the aircraft's behavior at minimum handling speeds* of take-off and landing, including with an imitation of engine failure.

Yuri Slyusar, President of UAC said: 'The MC-21-300 is undergoing flight tests in order to obtain Russian and European type certificates. The completion of the second session of certification flights by EASA testers is another step in this direction. In parallel, at the Irkutsk Aviation Plant we are expanding the production of MC-21-300 aircraft intended for initial customer's delivery'. The first session of the certification flights of EASA experts took place in January 2019. In September 2018, EASA test crew completed a special course in theoretical and practical training, as a result of which they obtained permission to fly on MC-21-300 aircraft.

*Minimum handling speed – the minimum speed at which the necessary level of controllability of the aircraft is ensured.

联合发动机公司火箭发动机成功启动 ‘联盟号’

在 ‘库兹涅佐夫’ 工农联合体·联合发动机集团萨马拉公司制造的RD-107A/108A系列火箭发动机成功为俄罗斯国防部的利益·发射了具有 ‘护卫舰’ 助推器块和 ‘子午线’ 卫星的 ‘联盟-2.1a’ 太空火箭。

7月30日莫斯科时间8点55分·从阿尔汉格尔斯克地区的普列谢茨克航天发射场实施了发射。安装在 ‘联盟-2.1a’ 太空火箭助推器一级和二级上的企业发动机运转正常。发射三分钟后·火箭由格列曼·蒂托夫主要测试航天中心的地面自动控制综合体护送。

在估计的时间·‘子午线’ 航天器被发射到目标轨道·并由航空航天部队的地基装置控制。与卫星建立并维持稳定的遥测通信。‘子午线’ 航天器的机载系统正常运行。

该卫星旨在保障北海路线区域内船舶和冰上侦察机与沿岸站·地面站之间的通信·并扩大西伯利亚和远东北部地区的卫星通信站网络。

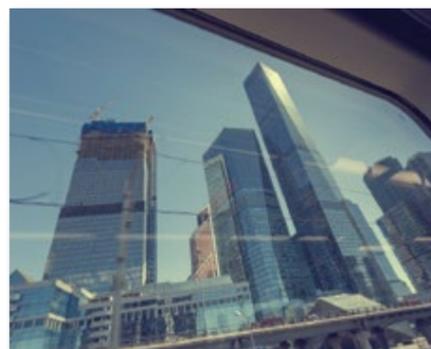
在高度椭圆轨道上使用 ‘子午线’ 卫星将依靠使用频率范围的扩大·引入额外的



干线·增加在轨道上积极活动的期限和更高的可靠性指标·增加现有通信的业务和技术及经济特征。

俄罗斯技术和LG为俄罗斯运输创造 ‘显示器窗口’

俄罗斯技术国家集团 ‘施瓦贝’ 创新公司和LG Electronics在 ‘创新工业-2019’ 国际工业展览会上展示了带透明OLED矩阵的创新玻璃。‘显示器窗口’ 可以取代火车、火车站和其它公共场所中的玻璃窗。



交互式透明显示器是创新产品·它可用于在门窗表面上播放任何格式的媒体内容。如有必要·可以将窗口从透明模式切换到彩色显示模式。在 ‘监视器窗口’ 中使用有机发光二极管上的矩阵·其两侧具有38%的透明度。通过操作控制台以及直接通过触摸表面实施控制。首先计划将该技术应用于铁路运输。

原型机是 ‘施瓦贝’ 控股公司·以及它旗下 ‘地铁媒体’ 公司和LG Electronics联合工作的结果。

俄罗斯技术执行总监奥列格·叶夫图山卡表示: ‘新项目是与韩国公司技术合作的结果·韩国公司首次在俄罗斯开展这样的合作。LG提供使用OLED矩阵的图像传输

技术·我们负责显示器工作表面的生产。例如·这种玻璃可以配备在铁路车辆上·特别是地铁。自动化控制显示器·以便在进入平台时·屏幕将自动切换到透明模式·只留下导航元素。为此·控制器与列车控制系统实现一体化’。

俄罗斯联合项目的主要生产基地是雷特卡里诺光学玻璃工厂·该工厂是俄罗斯领先的高科技玻璃制品制造商·特别是玻璃纤维·大尺寸天文镜·太空透镜等。

‘施瓦贝’ 控股公司副总经理伊万·奥日基辛表示: ‘该技术潜力巨大。交互式透明显示器可以用于不同的领域·但到目前为止·运输制造商公司·特别是铁路·已经表现出最大的兴趣。未来我们希望完全覆盖这个领域’。

LG Electronics 驻俄罗斯和独联体国家的总裁伊里·赫皖·利评论道: ‘LG公司致力于在俄罗斯市场上提供创新的B2B产品·这将使该空间不仅具有功能性·而且具有美学吸引力。通过提供显示器解决方案的全新格式·LG扩展其合作伙伴提供视觉信息的能力’。

OLED矩阵上的透明显示器原型机引起 ‘创新工业-2019’ 国际工业展览会参观者的关注·该展览于7月8日至7月11日在叶卡捷琳堡举行。



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RUSSIAN HELICOPTERS PARTICIPATE IN SITDEF-2019

Russian Helicopters holding (part of Rostec State Corporation) participated in the Seventh International Exhibition of Technology for Defense and Prevention of Natural Disasters SITDEF-2019 held in the territory of the headquarters of the Peruvian Army in Lima from May 16 to 21.

'This year, we presented in Peru the main civilian line of Russian helicopters: the light Ansat, the medium Mi-171A2 and the medium heavy Mi-38.

'We were working closely with our Peruvian partners in creating a mobile service center for maintenance of the multi-purpose Mi-171Sh helicopter in close to the city of Arequipa. The holding has currently finished the first installation and commissioning stage under a contract with Rosoboronexport. Further work will continue in October, as agreed with the Peruvian side. We are planning to finish all operations this year and provide further support to our partners during the first helicopter repairs', said the Deputy Director General for Aftersales Services, Igor Chechikov.

The service center consists of three different maintenance lines: for full airframe overhaul of the Mi-171Sh, mechanical system aggregate maintenance and aviation/radio-electric equipment maintenance.

In 12 countries in North and South America, including Mexico, Venezuela, Colombia, Argentina and Chile, more than 370 helicopters, both civilian and military, manufactured in the USSR and Russia are functioning. Peru operates over 90 civilian and military Mi-8/17 helicopters produced in the USSR and Russian Federation, the highest amount on the continent.

At the exhibition, the holding's experts held discussions about the questions concerning both service maintenance and repairs of the Mi-8/17 series of helicopters operated in Peru. It was also planned to hold negotiations with both Peruvian partners and representatives of other countries on the acquisition of modern Russian civilian technology and its possible deliveries to foreign customers.

The light multi-purpose helicopter Ansat, which has the largest cabin within its class, is actively used by the Russian air medical services. This twin-engine helicopter has compact size and does not require a large landing area. It can also be used for normal passenger and VIP transport, cargo delivery and environmental monitoring. High-altitude tests of Ansat have been successfully completed, which confirmed the possibility of its use in mountainous terrain at altitudes up to 3,500 meters.

俄罗斯技术创造出控制地面飞机着陆的装置

俄罗斯技术将开始大规模生产保障飞机安全着陆控制的新机场雷达系统。新设备将允许高精度地确定飞机与给定降轨迹的偏差，并将信息传输给机组和地面服务部门。



俄罗斯技术创造旨在控制机场附近区域空中交通的系统能够监控任何类型飞机的着陆。新雷达能够精确着陆，包括针对没有配备复杂导航系统的轻型飞机，或者一个或多个机载导航系统失效的飞机。

RSP-2ST准确着陆雷达系统包括AORL-1AS调度雷达和PRL-2ST着陆雷达。该设备能够探测到距离350公里以内的飞机，陪同它们并监测相对于静止物体的运动轨迹参数和移动气象事件。

俄罗斯技术的执行总监奥列格·耶夫图舍卡表示：'俄罗斯技术的新开发将补充国家集团为俄罗斯航空基础设施现代化而生产的现代化机场设备系列。由于价格相对较低，它不仅可以用于大型区域机场，也可以用于小型区域机场。我们的系统成本比国内约低25%，比具有可比性的外国类似物低75%。计划于2020年第三季度开始量产'。

外国军人使用了'战士'装备

在这些天举行的陆军国际比赛框架内，与会者测试了第二代俄罗斯军事装备'战士'，开发它的主要企业是俄罗斯技术国家集团的中央精密工程研究所(TSNIITOCHMASH)。



全不同的装备。不得不开展独特的大师班，展示如何正确穿戴装备品，为了舒服如何使用系带和皮带调整尺寸、高度、形状'。

据俄罗斯军人说，来自白俄罗斯、越南、吉尔吉斯斯坦、中国、老挝、蒙古、巴基斯坦和乌兹别克斯坦的外国同事很快就掌握了'战士'。呈现出来的结果证明了这一点：在'安全路线'比赛中俄罗斯队获胜，白俄罗斯获得第二名，越南和乌兹别克斯坦获得第三名。在'工程方程式'比赛中，还是俄罗斯获得第一名，第二名是白俄罗斯，第三名是中国。

尤其是，整套的'战士'被分发给在秋明州工程部队普罗什利亚科夫元帅高等军事工程指挥学院训练场上举办的'安全路线'和'工程方程式'所有外国参赛者。

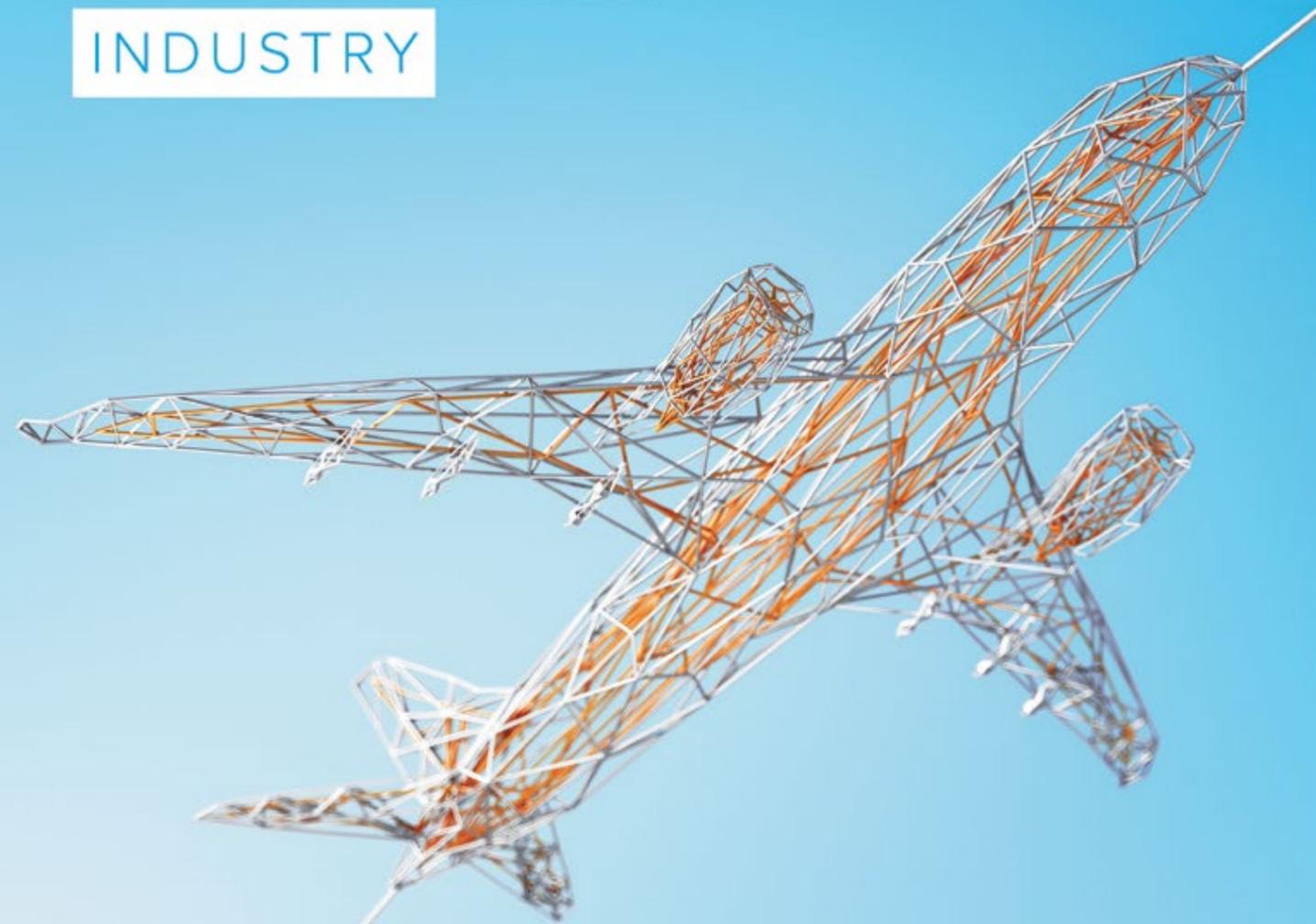
秋明高等军事通信指挥学校导弹和炮兵武器部队负责人谢尔盖·吉洪年科大尉表示：'总共分发了70多套。八个国家的客人首次对这些设备进行了测试，他们拥有完

中，还是俄罗斯获得第一名，第二名是白俄罗斯，第三名是中国。根据比赛条件，团队需要使用俄罗斯军队工程部队所用的设备完成一系列战斗训练任务。参赛者比赛工程勘探、跨越40米渡口、越过障碍物以及拆除森林障碍物。为了创造尽可能接近战斗的情况，使用了1万多种不同的仿制工具。

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KA-32 HELICOPTERS FOR FIREFIGHTING

Russian Helicopters Holding Company (part of Rostec State Corporation) has delivered three Ka-32A11BC multipurpose helicopters to Turkey. The machines will be used in firefighting.

In July 2018 contracts were signed with KAA Air (Turkey) for delivery of three Ka-32A11BC multipurpose helicopters. Currently all three were handed over to the customer. The rotorcraft were purchased primarily for firefighting purposes.

'Ka-32A11BC is the helicopter with the best technical equipment for firefighting missions', noted Andrey Boginskiy, CEO of Russian Helicopters Holding Company. 'This rotorcraft is an admitted leader in its class, and it is capable of solving a wide range of tasks. We are looking forward to further fruitful cooperation with our Turkish partners as far as delivery and after-sales support of helicopters are concerned.'

'Russia has top-tier competence in civil helicopter industry. Depending on the types of tasks and missions, we are ready to deliver a variety of helicopters to our Turkish partners', said Viktor Kladov, Director for International Cooperation and Regional Policy at Rostec. 'Right now Turkey is interested in expanding its fleet of firefighting aircraft, and Rostec intends to continue developing its cooperation with Ankara in this field. We estimate the current Turkish market for this type of helicopters as several dozens of machines.'

The Ka-32A11BC multipurpose helicopter is designed to perform complex firefighting operations, special search-and-rescue and high altitude construction operations, to transport cargo inside the fuselage and on the external sling, to log forest, transport patients and evacuate injured persons. The co-axial scheme and absence of the tail rotor ensure compactness, high power-to-weight ratio and maneuverability, as well as exceptional controllability of the helicopter. Ka-32A11BC has a high load lifting capacity up to 5 tons of cargo on the external sling. The assigned service life of Ka-32A11BC is extended to 32,000 hours which guarantees lower operating costs.

The firefighting version of Ka-32A11BC can be equipped with various fire extinguishing systems, including Bambi Bucket and Simplex type, as well as a horizontal firefighting system. The helicopter is capable of extinguishing flames on the highest floors of high rise buildings and on oil-and-gas industrial facilities. The Ka-32A11BC has been acknowledged by experts as one of the world's best firefighting helicopters; it is a symbol of the Global Helicopter Firefighting Initiative (GHFI) – a program intended to improve the operating efficiency of specialized firefighting helicopters.

'施瓦贝' 向中国投放了一批观测光学仪器

中国公司CBT Optics从施瓦贝控股公司 – 新西伯利亚仪器制造厂的瞄准和观测设备最大开发商之一那里购买了一批夜视单筒望远镜PN21K。产品用于隐蔽监视和在地区间移动，以及阅读地图和其它任务。



PN21K单筒望远镜配备2代+和3代电子光学转换器，用于在夜间使用自然光，以及在完全黑暗的情况下开启红外照明器。

新西伯利亚仪器制造厂的总经理瓦西里·拉索辛指出：'自2012年以来，我们一

直与中国公司合作，提供夜视瞄准具、激光测距仪和其它技术解决方案。特别是我们的单筒望远镜需求量最大。连续供货能证明这一点'。

PN21K的结构允许将两个单筒望远镜组合成一个具有单倍和三倍放大率的双目夜视设备。该产品可以放在头部或头盔上，从一只眼睛移动到另一只眼睛，也可以使用过渡支架或皮卡汀尼导轨安装在武器上用作瞄准镜。

PN21K单筒望远镜每年都会在俄罗斯和国际主要展览会上展出，新西伯利亚仪器制造厂的设备在这些展会上获得专家的积极反馈。亚洲、非洲、一系列欧盟国家和其它地区也表现出对产品的需求。

Counting Saigas With the Aid of Kalashnikov Drones

The World Wildlife Fund (WWF) of Russia has summed up the results of saiga accounting in the Astrakhan region and in the Republic of Kalmykia by using ZALA AERO unmanned aerial vehicles manufactured by the Kalashnikov Concern. According to the data obtained, over 5,000 species were recorded in protected areas, which is slightly lower than expert estimates of the last few years.

Within a month after the aerial survey, experts were busy decrypting aerial photographs obtained from UAVs and their analytics. From June 19th to 26th, experts flew over three highly protected natural territories – the main locations of modern saiga habitat: the Black Lands reserve, the Mekletinsky nature reserve in the Republic of Kalmykia and the Stepnoy nature reserve in the Astrakhan region. The results of image processing showed that the recorded saiga population in the surveyed territories amounted to 5150 animals, including 573 (11%) males and 2049 (41%) saiga of the current year of birth.

'Methods previously used for accounting of saiga from vehicles gave a major error in the accounting accuracy, and using small aircraft or old UAV models for aerial surveys scared away animals, which not only complicated their accounting, but could also have a negative effect at certain stages of their life cycle. We are very pleased



that the new domestic UAV models manufactured by ZALA AERO allow us to obtain accurate data on the number and distribution of saigas without exerting any negative impact on animals', said Dmitry Dobrynin, head of saiga aerial surveying.

The research results will help scientists not only monitor the dynamics of the number and age and sex structure of the saiga population of the Northwest Caspian Sea, but also optimize the conservation measures in the modern location of the species.

'We plan to carry out work in winter period using the UAVs with infrared equipment at the next stage of developing possible methods for accounting of saiga, we also analyze the possibility of using space images for these purposes,' said Valery Shmunk, director of the Russian Caucasus WWF Russia branch.

A report with detailed accounting results was sent to the Ministry of Natural Resources of Russia, the Black Lands Reserve and the Stepnoy Nature Reserve.



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VLADIMIR PUTIN and XI JINPING

Relations between Russia and China are currently on the rise. They demonstrate the embodiment of the best principles of partnership and justice. Both in the political and economic spheres, we observe surprising mutual understanding, interaction and perspectivity. To a large extent, the guarantor of these relations is the interaction of the leaders of the two countries – President of the People’s Republic of China Xi Jinping and President of the Russian Federation Vladimir Putin.

In early October, last year Vladimir Putin sent a message of greetings to President of the People’s Republic of China Xi Jinping on the Republic’s 69th anniversary, where he said: ‘Under your guidance China has achieved impressive successes. The Chinese economy is growing at high speed, as is the prosperity of your country’s citizens. Plans have been approved for national economic development up to 2035 and to 2050. Beijing’s prestige in the global arena is growing,’ the Russian leader stressed in his message.

The President praised the progress in the Russian-Chinese strategic partnership, which is on the upswing: the two nations have stepped up political dialogue, mutually advantageous cooperation in trade and the economy, science and technology, humanitarian and other areas and are coordinating efforts in resolving regional and global problems. Vladimir Putin reaffirmed his readiness for further joint work with China’s President on the bilateral and international agendas.

Also in September of last year, a large meeting of the two leaders took place in Vladivostok. Vladimir Putin

and Xi Jinping made press statements following their talks.

Vladimir Putin said after it: ‘Allow me to begin by expressing my gratitude to President of China Xi Jinping for accepting our invitation to attend the Eastern Economic Forum in Vladivostok, for the first time as the main guest. President Xi is accompanied in Vladivostok by a large delegation, which includes senior government officials, representatives of regional governments and business leaders.

As usual, we paid special attention to trade and economic cooperation.

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Vladimir Putin



We noted with satisfaction that bilateral trade increased by almost one third in the first six months of the year, reaching \$50 billion. We have every reason to believe that by the end of the year, trade will reach a record high of \$100 billion. The signing in May 2018 of the Agreement on Trade and Economic Cooperation between the EAEU and China creates additional opportunities for expanding bilateral trade flows.

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Energy is an important area of cooperation. Last year, Russia supplied 30 million tonnes of oil to China as part of intergovernmental agreements, or over 52 million tonnes

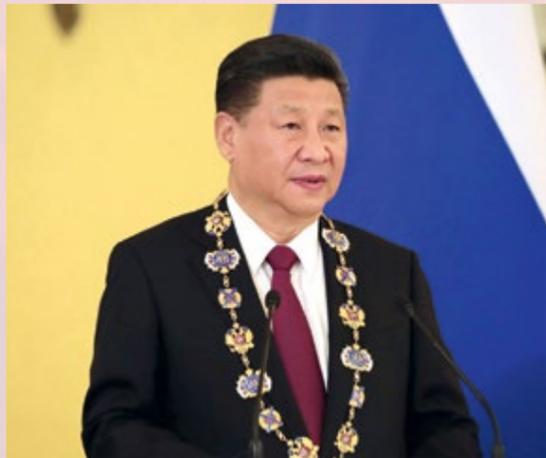
when commercial deals are taken into account.

The construction of the Power of Siberia pipeline is being carried out as planned. The launch is scheduled for late 2019. Agreement has been reached on the main conditions for gas supply from the Far East. Chinese investors own a large share in the Yamal LNG project. Clients in 14 countries, including China, have received four million tonnes of liquefied nat-

‘Much work is being done by the Intergovernmental Commission for Cooperation and Development of the Far East and Baikal Region of Russia and Northeast China. The second meeting of the commission in Dalian in August focused on the expansion of the border infrastructure and international transport corridors. Our humanitarian ties are multifaceted. The citizens of both countries show an increasing interest in mutual tourism. I must note that a record number of Chinese fans, about 70,000, visited the FIFA World Cup in Russia.’

Vladimir Putin





'We are pleased to see that, step by step, joint efforts are turning the political advantages and strategic values of our bilateral relations into substantive results of cooperation. The bilateral trade grew to \$58.3 billion during the first seven months of last year, which is 25.8 percent higher than during the same period last year.'

Xi Jinping

ural gas from this enterprise since December 2017.

China imports a large proportion of its electricity and coal from Russia. Russian-Chinese cooperation in the peaceful atom sphere is also developing. The first stage of the Tianwan Nuclear Power Plant is already in operation. Last year, the third unit has been completed and the fourth is soon to be ready. Rosatom plans to build two more units there.

We also note the expanding cooperation in science, in the peaceful use of nuclear energy. In addition, cooperation in agriculture is developing. Exports of Russian agricultural products to China increased by more than 50 percent during the first six months of last year: for example, 656,000 tonnes of grain were exported, more than during the whole of 2017.

We continue negotiations aimed at increasing the number of the Russian regions that can export wheat to China and at simplifying mutual supplies of meat and dairy products.

We consider the strengthening of direct ties between Russian regions and Chinese provinces to be especially important. The 2018–2019 Years of Interregional Cooperation should promote this.

President Xi Jinping and I will also meet with the participants of the roundtable discussion involving heads of Russian and Chinese regions.

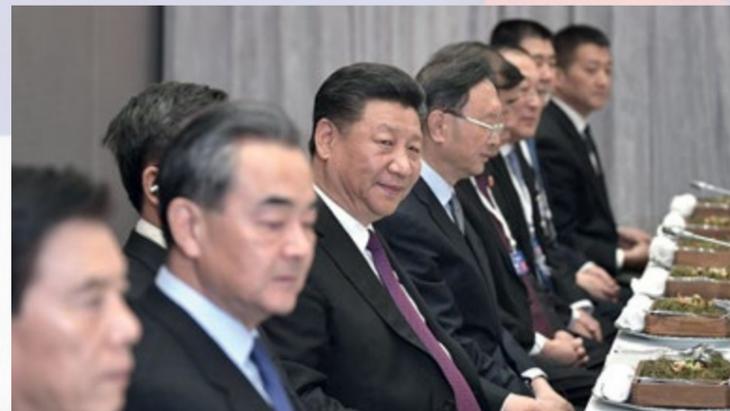
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Our cooperation in education, culture, sports, and youth exchanges is deepening.

We can see growing interaction between our countries in international organisations such as the UN, the Shanghai Cooperation Organisation, BRICS, the G20, and others. We will continue our joint efforts towards political and diplomatic settlement on the Korean Peninsula in accordance with the Russian-Chinese roadmap.



We support the steps taken by the leadership of South and North Korea to restore bilateral relations and hope that the next inter-Korean summit in Pyongyang will be effective. We consider the normalisation of relations between North Korea and the United States an important component in the overall stabilisation process on the Korean Peninsula.'

Xi Jinping said: 'This is my seventh visit to Russia as President of China but it is the first time I take part in the Eastern Economic Forum. I was in Vladivostok eight years ago. This time I see a city that looks both familiar as well as new. I am sincerely happy that the city is developing dynamically.

Today in the afternoon President Putin and I held sincere, deep and fruitful talks, discussed a wide range of matters related to bilateral relations and the topical international agenda and reached important agreements. After this we continued our joint programme: we have a roundtable discussion with the heads of Chinese and Russian regions planned. All these events are very important and representative; they show how wide and

deep our cooperation is. Tomorrow President Putin and I will take part in the 4th Eastern Economic Forum where we will discuss cooperation and development plans with countries of the region.

During the last four months President Putin and I have already had three meetings. This intensity of contacts proves the high level and

special character of Russian-Chinese relations and stresses their priority in our foreign policy. Spanning over a period up until the close of the year President Putin and I have a number of other meetings scheduled which will take place at important events to continue our contacts.



The President and I agree that since the beginning of last year Russian-Chinese relations have been showing dynamic growth, have entered a new era of rapid development and are reaching a higher level. The parties reaffirmed firm mutual support in the choice of the development path that agrees with the national features of both countries as well as our security and development interests. All of this can serve as an example of what relations should be like between states and neighbour countries.

We are pleased to see that, step by step, joint efforts are turning the political advantages and strategic values of our bilateral relations into substantive results of cooperation. The bilateral trade grew to \$58.3 billion during the first seven months of last year, which is 25.8 percent higher than during the same period last year.

Our trade is making progress. Both sides are actively working on the rapprochement of the projects One Belt, One Road and the EAEU, promoting large strategic projects in the energy sector, aviation, space and transport links and also developing our cooperation in new spheres, such as finance, agriculture, and e-commerce. Cooperation is impressive both in quantity and quality, it's being filled with new content and its borders are expanding.

We are developing our cultural and humanitarian cooperation. The ties between citizens of our coun-

tries are becoming increasingly closer. Records are being broken one after another when it comes to the number of student exchanges and tourists. We are particularly pleased to note the strengthening of the mutual understanding and friendship among young people.

The Ocean Russian Children's Centre in Vladivostok is the best example of love and friendship and demonstrates the true feelings of our young people. I am sure that this will build up the inexhaustible strength of friendship between China and Russia.

regional cooperation and the establishment of twin ties between cities, provinces and regions, and all-round interregional cooperation for promoting friendship of our nations. I am sure that tomorrow's Eastern Economic Forum will give a fresh impetus to the deepening of interregional cooperation in the Far East as well as other areas.

As permanent members of the UN Security Council and leading countries in the developing markets, China and Russia bear enormous responsibility for the maintenance of peace and stability together with the promotion of the development and prosperity all over the world.

We have similar or identical positions on international matters, broad common interests and firm foundations for cooperation. China-Russia cooperation in maintaining equality, justice, peace and stability throughout the entire world is gaining ever more importance against a backdrop of growing instability and unpredictability on a global scale.

Together with our Russian colleagues we will be promoting our fruitful cooperation in international affairs

'Together with our Russian colleagues we will be promoting our fruitful cooperation in international affairs and step up our coordination at multilateral venues, such as the UN, SCO, and BRICS. In cooperation with the international community we will facilitate political settlement of urgent matters and hot spots and firmly uphold the goals and principles of the UN Charter. We will work together against the unilateral approach and trade protectionism, and for the creation of a new type of international relations and common destiny of humankind.'

Xi Jinping

This and next years are years of interregional cooperation between China and Russia. A number of major events are being held in this connection. The regional cooperation mechanism in the formats Northeast of China – Russia's Far East and the Yangtze Volga rivers is developing. Contacts and cooperation between other regions of our countries are also growing.

President Putin and I reaffirm our active support for comprehensive inter-

and step up our coordination at multilateral venues, such as the UN, SCO, and BRICS. In cooperation with the international community we will facilitate political settlement of urgent matters and hot spots and firmly uphold the goals and principles of the UN Charter. We will work together against the unilateral approach and trade protectionism, and for the creation of a new type of international relations and common destiny of humankind.' /IA&TG/



RUSSIA, CHINA, BRICS

In Johannesburg (South Africa) there was the 10th summit BRICS, where the leaders of Brazil, Russia, India, China and South Africa were to consider the current situation and prospects for cooperation within BRICS in various areas, the development of BRICS and priorities of the strategic partnership. They will also discuss important current issues on the global and regional agenda, including problems of joint counteraction to modern challenges and threats. They also discussed important current issues on the global and regional agenda, including problems of joint counteraction to modern challenges and threats. The summit programme included a meeting between the BRICS leaders and invited leaders of African and other countries. Vladimir Putin was held a number of bilateral talks with the heads of state and government participating in the summit.

Summit participants discussed steps to further improve the BRICS format, promote political, security and trade cooperation, and coordinate efforts regarding regional problems, including the developments in Syria and the Middle East in general, a settlement on the Korean Peninsula and the Iranian nuclear programme.

Vladimir Putin attended a meeting of BRICS leaders with delegation heads from invited African states and chairs of international associations. Those invited included the leaders of African countries, namely, Angola, Botswana, Ethiopia, Gabon, Lesotho, Madagascar, Mauritius,

Malawi, Mozambique, Namibia, Rwanda, Senegal, the Seychelles, Tanzania, Togo, Uganda, Zambia and Zimbabwe. The meeting was also attended by the heads of Argentina (the current chair of the G20), Turkey (the current chair of the Organisation of Islamic Cooperation) and Jamaica (the current chair of the Caribbean Community).

At the summit President of Russia Vladimir Putin said: 'The advantage of BRICS as a format is that it is free of all the red tape you find in many other associations like this. As President of Brazil, Michel Temer said today, BRICS is an organic association of countries that have many things in common:

they have many shared interests and common approaches to addressing challenges that are relevant to all of humanity, including Russia.

In fact, there is no formal leader within BRICS. All decisions are taken by consensus with full respect for the interests of all the participants in this organisation. This is one of its key advantages. Today, we also mentioned the fact that many countries are showing an interest in what BRICS is doing.

BRICS Plus and an outreach format have already been created to this effect. For now, we agreed to rely on these formats for expanding our reach and drawing into our orbit

countries that share the underlying principles and values of BRICS.

So far, we have no plans to expand BRICS membership, since the existing formats have proven effective. As for our discussions and the issues we intend to address, these are issues relevant for a vast majority of countries and economies around the world. The sky is the limit for us. The same applies to politics and security.

These are the subjects we discussed and on which we have adopted decisions or coordinated positions. You may see, regarding the non-deployment of weapons in space, it boils down to security and the arms race, or rather the prevention of an arms race in this particular case.

We also talked about fighting terrorism, but is this not a vital task facing many countries? In this context, we spoke about Syria, of course, and my colleagues welcomed our idea of encouraging a more active contribution to humanitarian aid to the Syrian people, which is an absolutely natural desire.

The fourth issue we discussed concerned the industrial revolution. This is happening in Russia and the other leading and emerging economies. Why did our colleagues support our proposal on strengthening our cooperation in the humanitarian area, as well as in culture, cinema and sport? Because this is what brings us closer together and creates a natural basis for interaction between people.

The Prime Minister of India said it was a very good idea because we can organise sporting events like a mini-Olympics for the BRICS countries, a sports mini-festival that could include national sports, which are not generally known in other countries but could be interesting for our countries.

This is a natural way to bring millions of people, or even hundreds of millions or billions of people closer together, considering that the BRICS countries account for nearly half of the world's population.

Africa is one of the world's most rapidly developing regions. According to the UN, the population of this continent will reach 2.5 billion by 2050. The level of urbanisation in Africa is increasing as well: the proportion of the population living in

urban areas is expected to reach 60 percent by 2050.

The domestic African market and consumer demand are expanding. BRICS and the African states have similar development goals in many respects. In 2015, the BRICS summit in Russia adopted the large-scale BRICS Strategy for Economic Partnership.

We need to think about involving our African partners and friends in the work of each of the areas we identified then: the economy, finance, and food security.

Russia has always given priority to the development of relations with African countries, based on long-standing traditions of friendship and mutual assistance. We have recently held a number of high-level contacts, including with many of the leaders present in this room.

Russia's trade with African states grew by more than 25 percent in 2017. Food supplies increased by 38 percent, metals – by 30, machinery and equipment – by 24 percent.

Russian businesses are interested in working with African partners in a variety of areas, including industry, agriculture, healthcare, communications, geology and mining. I will give just a few examples of Russian companies' interaction with countries represented at this forum.

I would like to note in particular that Russia plans to increase its assistance to the development of the national energy sector in African states. We are implementing promising oil and gas projects with a number of countries, such as Angola, Mozambique, and Gabon.

In the nuclear power industry, where Russia is a technological leader, we offer our African partners the creation of an entire industry on a turnkey basis. Agreements on cooperation in the field of atoms for peace have been signed with a number of countries in the region, while in some of them the work has acquired a practical dimension. All these projects will be of strategic importance for Africa, where, according to different estimates, as many as 600 million people still live without electricity.

A considerable part of Russian initiatives provides for localising industrial businesses in Africa, including,



among other things, the construction of plants manufacturing component parts and assembly works.

The implementation of these joint projects will serve to strengthen the industrial potential, support local businesses and create new and well-paid jobs. On the whole, this will lead to an improvement in living standards and a solution of social problems in African states.

Russia has a vested interest in intensifying interaction with African regional and sub-regional organisations, primarily with the African Union as well as the Southern African Development Community.

The amount of Russian assistance to Africa exceeded one billion dollars in 2017. Russian contributions to the World Food Programme fund are constantly growing. Russia is the fifth biggest contributor to the UNIDO Industrial Development Fund.

Considerable funds are remitted to the World Health Organisation for the fight against non-infectious diseases on the African continent. Our work to combat the Ebola virus has proved highly efficient.

Russia has for years trained national professional personnel for countries of the continent. Currently, thousands of Africans are being educated in Russia. We will continue to build up cooperation in this sphere.

In conclusion, I would like to inform you that we are studying the idea of holding a Russia-Africa summit with the participation of heads of African states. This could be preceded by relevant meetings of prominent business people, experts, and public figures; I intend to discuss this with representatives of African countries.'

/IA&TG/

EXPORT OF THE BEST

From July 31st to August 2nd, a large meeting which was attended by more than 150 participants was held in Rostec with representatives of the State Corporation in foreign countries. Heads of Rostec and a number of holdings, industrial directors, heads of departments of the central office spoke at the meeting. Work with representatives was carried out in the divisions of the Corporation and Rosoboronexport for the purposes of analysis of the 2018 results and setting objectives for the near future. More on the results of the year of the export, plans and capabilities of Rostec in the world – in our material.

Export Beats Records

In 2018, Rosoboronexport delivered products overseas for a record amount of 13.7 billion dollars, the largest for its entire period of existence. A solid portfolio of foreign orders for the Russian military equipment reached the figure of 55 billion dollars. We managed to achieve these indicators in the conditions of an utmost difficult foreign policy situation, the most powerful sanction pressure on the Russian defense industry complex, on the State Corporation and its organizations, as well as unfair competition. The final figures for the supply of Russian military products and an impressive portfolio of orders demonstrate that the efforts of competitors did not lead to significant results. Work of local level representatives of Rostec was of great importance in achieving record results.

'Last year's record results are not the reason to rest on our laurels. There are quite enough problems in the sphere of Russian military-technical coopera-

tion. Firstly, it is settlements with partners. The sanctions caused damage in this regard, although this issue can be resolved, including by converting contracts into national currencies. Secondly, the difficult geopolitical situation does not allow us to count on a sharp increase in military-technical cooperation in the near future,' noted on the current situation Sergey Chemezov, General Director of Rostec.

Today, Rostec representatives around the world are doing a great job of finding new markets, but this is a long and laborious process. A possible solution here could be to increase the share of exports of civilian products and technologies from Rostec.

Transition to Civilian Tracks

The State Corporation's development strategy until year 2025 sets ambitious goals of increasing the share of civilian products in total revenue up to 50 percent. This indicator amounted to slightly more than 30 percent according to the results of

2018. Significant increase of the civilian products production which are in demand both in the Russian and foreign markets is to be made in the next five years. Rostec representative offices in foreign countries have an important informational and analytical role in solving this problem.

Their task is to provide the Corporation and its organizations with the required information, data on potential partners and recommendations for entering new markets. It is due to the close and productive cooperation with Rostec representative offices that Corporation organizations will be able to form an effective sales system and competently build service processes for their civilian products. Extensive experience in cooperation with foreign structures through the MTC will help Rostec representatives organize the promotion of Russian civilian products.

The work of representative offices in the most technologically advanced countries of the world has its own peculiarities. It should be

aimed primarily at attracting technology and investment in Rostec organizations. It is planned to pay more attention to the promising Asian direction in this matter: India, China, South Korea, Singapore and other countries. Unfortunately, due to the sanctions imposed, cooperation with Western companies in the field of technology transfer and joint Research and Advance Development seems extremely difficult. 'They lose their business opportunities, money and the voluminous Russian market at the same time,' added Sergey Chemezov. – But this is the choice of the political leadership of Western countries. I think that is short-sighted.'

Peaceful Products for the Whole World

If Russian weapons are traditionally in high demand all over the world, then in the 'civilian' sphere we have to work more actively. Rostec is a unique conglomerate of defense industry enterprises with great opportunities for diversification of production. The corporation can offer the world community a wide range of civilian products.

For example, the Russian Helicopters holding company introduces new models of civilian helicopters for various purposes on the market. The multi-purpose Ansat and Mi-171A2 vehicles made a demonstration tour in countries of the Southeast Asia in 2018, which resulted in the signing of a number of contracts. The civilian sector of the domestic helicopter industry is actively developing, and the excellent reputation of our military vehicles helps to promote the civilian ones abroad. A lot of work is being done on after-sales service and repair of helicopter equipment on the spot. Such a corresponding center was opened in Peru last year, it is planned to open centers in other countries. The organization of a support system for the entire life cycle of Rostec products abroad is one of the promising areas of the Corporation's development.

The Shvabe holding company offers comprehensive lighting projects Svetly Gorod (Bright city) for the cities, which have been success-

fully implemented for several years in the regions of Russia. In addition, Shvabe and other Rostec enterprises in cooperation carry out the construction and equipping of medical centers, including the production of modern neonatal equipment. Today, Schwabe medical equipment is supplied to 95 countries.

Another example of the civilian products that can adequately represent the State Corporation in the world are telecommunication equipment and robotics of the Roselectronika holding. The most striking civil project of the holding, implemented in 2018, was the construction of information and telecommunications infrastructure for the Football World Cup. The solutions of Roselectronics ensured the unprecedented quality of television broadcasts and uninterrupted communication for viewers from 220 countries.

KAMAZ heavy load trucks and specialized machinery are also actively exported. The auto giant shipped just over 4 thousand cars and assembly sets of parts in 2018 only. KAMAZ was recognized as the Best Russian Exporter 14 times. PJSC AvtoVAZ does not fall behind KAMAZ and: the export of a passenger car manufacturer in 2018 increased by 57percent compared to the previous year and amounted to about 38 thousand cars. Lada branded cars are sold in 34 countries.

The Rostec strategy is determined up to the year 2025 and involves solving the problem of the State Corporation reaching the level of global players. The development is focused on the production of smart civilian products and their promotion in fast-growing world markets, as traditional markets have already reached maturity. And here the role of Rostec representatives in foreign countries is significant. Using their knowledge, experience and connections, they promote new Russian products for the market, find out the needs of local businesses and government agencies, formulate product requirements and, importantly, service. The development of the export capabilities of the Corporation is mostly in their hands.

/IA&TG/



MAIN PHOTO

MAKS 2019





MSB-2 helicopter

AVIATION EXPO CHINA 2019

MOTOR SICH JSC is specializing in designing, manufacture and aftersale support of aircraft gas-turbine engines, industrial gas-turbine drives and gas-turbine power generating sets with these drives. Currently, the Company also actively creates helicopter-building industry in Ukraine.



Vyacheslav A. Boguslayev,
President,
Motor Sich JSC

Our company has long-term relations with China aviation industry. 65 years ago, the M-11FR piston engine developed by design bureau of plant No. 478 (now Motor Sich JSC) lifted the CJ-5 (PT5) trainer aircraft into the sky. It was the first aircraft created in the People's Republic of China.

At present, more than 1200 gas-turbine engines produced by MOTOR SICH JSC are operated in China in different types of airplanes and helicopters. In order to ensure prompt settlement of issues related to cooperation with companies and organizations in the People's Republic of China, MOTOR SICH has opened its representative office in Beijing in 2003.

The list of our series-produced and being developed engines for different cargo and passenger aircraft includes turboprop and turbopropfan engines featuring power from 400 to 14000 h.p., as well as turbofan engines featuring thrust from 400 to 23400 kgf.

IVCHENKO-PROGRESS State Enterprise and MOTOR SICH JSC are developing the D-436-148FM engine for the An-178 cargo aircraft with load-carrying capacity from 16 to 18 tons. This aircraft is intended to replace the veteran An-12 aircraft. The D-436-148FM is a new version of the D-436-148 engine with take-off thrust up to 7900 kgf and maximum contingency thrust of 8790 kgf due to application of more efficient engine components.

In order to increase efficiency, reduce emission and noise levels, the Company has developed the D-18T

series 3M engine for the An-124-100 aircraft that is the biggest ramp-type cargo aircraft in the world.

For 90 years, MOTOR SICH JSC specializes in designing and production of engines for trainer and combat trainer aircraft. More than three thousand Czech L-39 and China's K-8 powered by MOTOR SICH gas-turbine engines are operated in 45 countries of the world.

Continuing this tradition, MOTOR SICH cooperates with IVCHENKO-PROGRESS in the development of the AI-322 family of engines and serially produces them.

The AI-322 (without afterburner) and the AI-322F (with afterburner) engines are intended for the L-15A subsonic basic and advanced training aircraft and for the L-15B supersonic aircraft produced by Hongdu Aviation Industrial (Group) Corporation (HAIC).

For the further improvement of performance characteristics and efficiency of helicopters that are operated in high-mountainous areas of the countries with hot climate, MOTOR SICH JSC has developed the TV3-117VMA-SBM1V engine. The engine power settings may be optimised for operation on different types of helicopters.

In order to increase the customer appeal and competitiveness of the Ka-32 helicopters, MOTOR SICH has developed the TV3-117VMA-SBM1V-02K version of the TV3-117VMA-SBM1V engine, which power specifications are adapted to this helicopter.

The TV3-117VMA-SBM1V series 4 and 4E engines (with air or electrical starting systems) are new versions of the TV3-117VMA-SBM1V engine. They are intended for re-engining of the Mi-8T helicopters in order to improve their performance.

The TV3-117VMA-SBM1V series 5 engine is a new project. This engine is developed in cooperation with IVCHENKO-PROGRESS SE. The engine has takeoff power of 2800 h.p. and OEI 2.5 minute power of 3200 h.p. Two versions are planned: turboprop engine for helicopters with takeoff weight from 15 to 16 tons (e.g. for the Mi-38 helicopter), and turboprop engine (TV3-117VMA-SBM2) for the An-140T cargo aircraft.

MOTOR SICH develops, manufactures and overhauls helicopter gearboxes. The Company has mastered overhaul of the VR-8A, VR-14 and VR-24 main gearboxes for the Mi-8, Mi-17 and Mi-24 helicopters.

Together with IVCHENKO-PROGRESS, MOTOR SICH develops the VR-17MS main gearbox, which is a new version of the VR-14 gearbox for the Mi-17 helicopters with take-off weight increased up to 14 tons.

The VR-14MS gearbox is created based on the VR-24 gearbox. It is intended for the Mi-8MT (MTV) helicopters and may be used for upgrading the Mi-8T helicopters. All of this allows MOTOR SICH to overhaul the Mi-8, Mi-17 and Mi-24 helicopters and to upgrade them at the same time.

MOTOR SICH and IVCHENKO-PROGRESS actively develop small-size turboshaft and turboprop engines of the AI-450 family. The basic engine was initially developed for the Ka-226 helicopter.

The AI-450M engine is intended for re-engining of the Mi-2 helicopters, as well as for installation on other single and twin-engine helicopters.

MOTOR SICH and IVCHENKO-PROGRESS also work on the AI-450C and AI-450C-2 turboprop versions of

the engines with takeoff power of 495 and 750 h.p. correspondingly. These engines are intended for general purpose aircraft and trainer aircraft.

Now MOTOR SICH develops the MS-500V turboshaft engines of new generation. These engines are intended for different helicopters with take-off weight from 3.5 to 6 tons. The MS-500V engine with take-off power of 630 h.p. and the MS-500V-01 engine with take-off power of 810 h.p. have got Type Certificates of the IAC Aviation Register.

MOTOR SICH develops the MS-500V-02 and the MS-500V-03 version of the engine with take-off power of 1100 h.p. (with forward and rear power offtake shaft correspondingly).

At the same time, the Company develops the MS-500V-C family of turboprop engines. These engines are intended for L-7(CJ-7), Y-12, AC-500, N-5B and other China's airplanes.

Designers of IVCHENKO-PROGRESS SE together with MOTOR SICH JSC have developed a new version of the D-136 engine. The new engine was designated as AI-136T-2. It has electronic-digital automatic control system and maximum take-off power of 10000 h.p. that is maintained up to $t_{amb}=40^{\circ}\text{C}$. 2.5-minute power of 12200 h.p. is introduced. The AI-136T-2 engine is intended for the Mi-26T2 helicopter and may be used to power new types of heavy helicopters, including China's HLH helicopter.

MOTOR SICH JSC has created a scientific and technical base for designing, manufacture, testing and certification of helicopters.

TV3-117VMA-SBM1V
Series 4E engine

MOTOR SICH helicopter production facilities include modern machining and assembly workshops, paint removal and application section, Flight-Test Complex, Simulator Center for training of flight crews in all types of helicopters produced by the Company.

Flight-Test Complex has a multi-purpose test bench intended for optimization and ground testing of airframe components and helicopter systems.

The Mi-8MSB medium multipurpose helicopter with maximum take-off weight of 12000 kg is the first implemented project under MOTOR SICH Helicopter Program. The helicopter is equipped with a powerplant consisting of two TV3-117VMA-SBM1V series 4E gas-turbine engines with electrical starting.

The Mi-8MSB has a large and functional cargo-and-passenger compartment of 2.34 x 1.8 m cross section and 12.5 m² area, that is much larger than the respective characteristics of the US and European competitors of the same class.

Mi-8MSB helicopter





AI-450M engine

As compared with the Mi-8T helicopter (the most popular version of the Mi-8/17 helicopter), the Mi-8MSB helicopter has the following advantages:

- service ceiling is increased by 62 % (it is 7300 m);
- specific fuel consumption is reduced by 14 %. That is why flight range is extended up to 1210 km (with two additional tanks);
- time between overhauls and total service life of the engines is significantly extended. Therefore, operation costs are reduced;
- stable power is maintained in the whole operational altitude and temperature range.

The Mi-8MSB helicopter has already proved itself as an optimal solution for high-mountain regions. Outstanding altitude performance of the TV3-117VMA-SBM1V series 4E engines allows the Operator to use helicopter bases at the altitude of up to 4200 meters.

The Mi-8MSB helicopter is distinguished from similar helicopters by simplicity of maintenance, repair-

ability and reliability. The helicopter design makes it possible to install a wide range of specialized equipment for various missions. The helicopter is equipped with advanced navigational complex complying with EASA and ICAO requirements.

Development and manufacture of light helicopters is another line of MOTOR SICH Helicopter Program. The Mi-2MSB helicopter has become the first certified light helicopter that was developed by MOTOR SICH JSC. Main design change involves replacement of obsolete GTD-350 engines with modern AI-450M-B engines developed by IVCHENKO-PROGRESS and manufactured by MOTOR SICH.

The Mi-2MSB multipurpose helicopter differs from other light helicopters by a spacious cargo-and-passenger compartment and twin-engine power plant. As compared with the Mi-2 helicopter, power of each engine is increased from 400 to 430 h.p. In spite of the fact that the Mi-2MSB helicopter is a light helicopter, its transport capabilities are rather high. 8 passengers may seat in the helicopter cabin (excluding the pilot). Thus, its seating capacity exceeds capacity of more expensive similar foreign helicopters.

The Mi-2MSB helicopter is powered by the AI-450M-B engines featuring takeoff power of 430 h.p.

One of the key advantages of the upgraded helicopter is its altitude performance, that is why it is very popular in mountainous countries.

Another advantage of the helicopter is as follows: it may be stored without hangar. Almost all similar helicopters do not have such feature.

The dual-control helicopter version may be used for training of pilots. The helicopter has one more advantage for training purposes: its design is similar to heavier helicopters of the Mi-8 type. The Mi-2 helicopters successfully participate in helicopter championships. Excellent aerobatic features of these helicopters are well-known. Re-engining significantly increases capabilities of the helicopter as a participant of aviation competitions.

The Mi-2MSB helicopter may be equipped with medevac equipment. The helicopter can be equipped with a search floodlight, a winch for fast lifting of 2 persons, and with other mission equipment.

The MSB-2 is a light multipurpose helicopter partially unified with the Mi-2MSB helicopter. This helicopter has more powerful AI-450M-P engines (465 h.p. each) and new transmission based on the VR-442 main gearbox. The helicopter main features are as follows:

- spacious cargo-and-passenger compartment;
- external layout of fuel tanks;
- automatically driven rear door of the cargo-and-passenger compartment;
- modern avionics;
- perfect aerodynamics.

At present, MOTOR SICH performs ground testing of the first prototype and prepares it for flight testing and static testing of the helicopter airframe.



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苏霍伊超级100型客机

苏霍伊超级100型客机 (Superjet 100) (SSJ100)是新一代飞机，由苏霍伊民用飞机公司研制开发。这个飞机才有最先进的空气动力学，动力装置和航空电子设备方面的技术，保障良好的运营效率和乘客的舒适。

SSJ100 主要为中短程的航线而设计。这个飞机2007年9月第一次亮相。截止2018年10月份，一共在使用138个SSJ100 飞机运营在各个俄罗斯各个航空公司和国家机构，其中包括：俄罗斯航空，俄气航空，雅库特，亚马尔，伊尔库茨克航空，方位角航空 (Азимут)，俄罗斯联邦内务部，俄罗斯联邦紧急情况部，俄罗斯号特别飞行队，RusJet航空公司，以及国外航空机构：Interjet (墨西哥)，CityJet (爱尔兰)，泰国空军。这款飞机一共完成了30多万次商务运输航班，总飞行时间超过46万飞行小时。

为床在新的国产支线飞机SSJ100，2005年俄罗斯远东地区设立了苏霍伊民用飞机股份公司阿穆尔河共青城分公司 (阿穆尔共青城分公司)。2007年首架SSJ100原型机公开展览，再过一年完成第一次首飞。于是，从开始安排生产到系列成品飞机出来只过了5年时间。目前共青城分公司包括了以下组成部分：综合性技术中心-负责将零配件分配到分公司不同的生产基地；机身组装车间，飞机最终组装车间和试飞站。最终组装车间同时操作七个工艺段，机身组装车间同时操作五个工艺段，试飞站两个工艺段对于生产出来的飞机进行地面检查。

SSJ100型客机如何组装？信息图形备注：

工厂结构

无论如何，实现要讲工厂 (共青城分公司) 结构



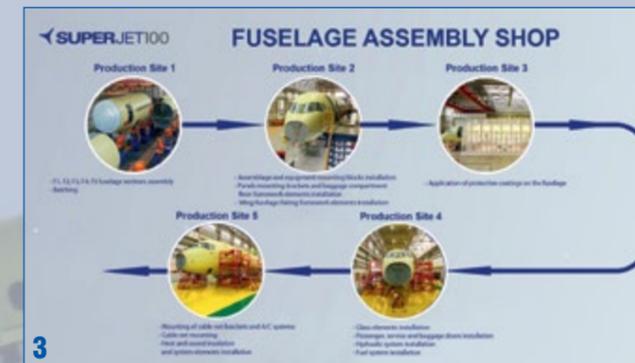
综合性技术中心

零配件先到综合性技术中心



机身组装车间

接着到机身组装车间进行机身的组装



最终组装车间

再将组装好的机身运输到最终组装车间



试飞站

机完成组装以后需要到试飞站进行试验



完成工厂试验以后飞机被送到乌里扬诺夫斯克市进行喷涂和内部设施的安装，之后飞机飞到苏霍伊民用飞机公司在茹科夫斯基市的供应中心，在那面交接给客户。



MC-21: 顺利进行验证试验

新技术保障飞机在国际市场上的竞争能力

俄罗斯伊尔库特集团（俄罗斯联合航空制造集团公司的子公司）在进行新中程飞机MC-21-300的验证试验。参加飞行的有两架原型机，还有一架飞机正在中央空气流体动力研究所进行静力试验。伊尔库茨克飞机制造厂另外在建立两个飞机用于试验飞行和一个用于寿命试验的飞机。

伊尔库特集团航空技术研发副总裁、MC-21型飞机总设计师康斯坦丁·波波夫维奇说，试验已经证明了关键设计和制造方案的正确性，因此目前已经可以为供应给客户的飞机开始生产第一批零配件。由于所有原型机采用批量技术进行生产，这个大量简便了批量生产的安排。

降低耗油

MC-21型飞机的创造者俄罗斯在民航领域的重点国家项目。考虑到单走道飞机市场上形成的双头垄断情况，MC-21的优点主要集中在两个方面：经济效率和舒适性。

经济效率的增长主要基于两个关键因素：更好的空气动力性能和新的引擎。

据有关计算和试验结果表明，MC-21空气动力性能会比现有的西方国家制造的客机高5-6%。这个会按大约同样的比例减少耗油量。

空气动力性能的改善主要基于绝无仅有的大伸长机翼。由于金属制作的机翼无法达到想要的要求，这款飞机采用最新复合材料。值得强调的是，这种级别的飞机从来没有使用复合材料制作的机翼。

另一个减少耗油量的因素是新的引擎。目前MC-21-300安装了Pratt&WhitneyPW1431G引擎进行试验。2018年10月俄罗斯新的PD-14（PD-14）引擎已通过产品验证，这个引擎的性能也是很类似。客户可以根据自己的需要选择配用的引擎装置。

有关计算和初期试验结果表明，MC-21的创造者会达到自己的目标：和当代最先进的其他窄体客机对比降低运行费5-7%是完全可行的。

更加舒适

基本机型是MC-21-300，可载客数量为商务舱16位，经济舱147位。高密度的全经济舱布局可容纳211个乘客。这个比重要竞争对手的基本机型稍微多。

增加乘客舒适性的关键因素是MC-21的加宽机身，它比波音（Boeing）B737大30公分，比空中客车（Airbus）A320和中国研发的C919大11公分。

MC-21创造者认为，乘客和航空公司都会更加重视舒适性这个因素。单走道飞机越来越多用于长途航线，包括洲际航线。这种情况下，另外增加的几公分空间已经会带来完全不同的感觉。比如，乘客在从加宽的走道走过去时，可以更容易的越过空姐推的手推车。

加宽的机身给航空公司也带来一定的利益。希望尽量缩短飞机在地上带的时间的廉价航空公司可以加快乘客上下飞机的速度。伊尔库特吉集团副总裁基里尔·布达耶夫指出：‘每一个阶段节省5-7分钟。一般一年进行1500次航班时，这样帮航空公司省了大约150个小时的时间可以用于飞行。’

效率和舒适性，再加上很合理的价格（MC-21-300目录价格为9610万美元），为新出来的客机很好的机会在快速发展的中程飞机市场上占领明显的份额。在俄罗斯政府指导下创造的有效销售和售后服务制度，也一定会对这个做出相应的贡献。

目前伊尔库特集团已签订了供应175架飞机的合同。首批使用者包括了俄罗斯国家承运人俄罗斯航空公司，它订了50架MC-21型飞机，交付时间2020到2026年。

关于MC-21的详细信息：

<http://mc21.irkut.com/program/>



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李维诺夫: ‘关键的任务是保障CR929具有竞争力’

CR929型新一代宽体远程飞机由俄罗斯和中国航空制造商代表的俄罗斯联合航空制造集团公共股份公司和中国商用飞机有限责任公司联手进行研制工作。这是两国共同实施的伙伴项目当中最高科技的一个项目。

俄罗斯联合航空制造集团公共股份公司和商用飞机有限责任公司各承担了一部分投资风险和时间风险，为在竞争非常激烈的市场上创造CR929型飞机集合了知识、技术和其他资源。

宽体飞机在国际民用航空行业中占领者很特殊的位置。按数量看，宽体飞机在世界所有类型的民用飞机当中的比例不超过20%。但所有宽体飞机累计市场成本占所有类型民用飞机市场成本的50%以上。

根据俄罗斯联合航空制造集团公共股份公司和商用飞机有限责任公司发布的预测，在2023-2045年期间世界在宽体远程飞机方面的需求将达到7200架。其中20%是两国伙伴国家市场需求，即中国15%、俄罗斯5%。需求量的28%是其他亚太地区国家市场。CR929会以项目成员国的国内市场为起步点。

座位新一代宽体远程飞机的CR929要达到哪些基本要求，俄罗斯联合航空制造集团公共股份公司和商用飞机有限责任公司在采访各个航空公司和租赁公司之后形成了一个清单。关键要求包括了使用中的经济效率，更好的耗油性能，更完善的航空器技术保养，飞行技术性能和起落性能方面的保障。

‘设计部面临的关键任务，就是要保障CR929的竞争能力。由于较小的起飞重量，我们希望能保障省油。优越的技术方案会提高使用性能，可以给承运人带来明显的经济利益，而且通过飞机舱工业化设计可以给乘客更加舒适的飞行经验’。— 俄方总设计师马克西姆·李维诺夫介绍CR929对比竞争对手的优势。

目前CR929项目处于Gate 3阶段。这个阶段的主要任务是草图设计和开始供应商挑选。同时这个阶段上还会对飞机各个系统研发出相关的要求，并在空气动力方面进行试验研究工作，选择材料。这个阶段上会确定生产协作模式，研发出售后服务系统和销售战略。这些工作的最终结果是要形成出CR929外观并确定项目的商务计划。

Gate 3 阶段计划在2019年中要完成。

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AEXKS





MAIN AEROSPACE BRANDS

Rosoboronexport presented the Russia's latest combat and transport aircraft

Rosoboronexport (part of the Rostec State Corporation) presented the Russia's latest combat and transport aircraft at the MAKS-2019 International Air Show. Rosoboronexport exhibited more than 160 pieces of military hardware mainly for the Air Force and Air Defense Forces. Its large-scale kinetic installation, demonstrating the Su-35 and MiG-35 multipurpose fighters, the Il-76MD-90AE military transport aircraft, the Mi-38 utility helicopter, the Orlan-10E UAV and the Viking SAM system, was a novelty for international defense exhibitions.

'MAKS is a traditional platform for aviation premieres. This year, Rostec's display includes 250+ new models of aircraft, avionics, aircraft engines and airfield equipment, including over 40 items that are being showcased at MAKS for the first time. I am sure these products will attract a lot of attention of our foreign partners,' said Rostec CEO Sergey Chemezov.

The Su-57E fighter (manufactured by KoAAP named after Yuri Gagarin)

and the Il-112VE military transport (built by VACM) were centerpieces of the military part of Russia's display at MAKS-2019.

'At MAKS 2019, Russian manufacturers will be unveiling the fifth-generation Su-57E multi-role fighter jet and the Il-112VE light military transport aircraft, the hottest and most anticipated new products of recent years. Rosoboronexport is ready, at the request of foreign partners, to present these aircraft and turn a new page in promoting state-of-the-art aircraft systems in the world market.

'I'm sure the interest in them will be massive,' said Alexander Mikheev, Rosoboronexport's Director General and Deputy Chairman of the Russian Engineering Union.

The advanced Su-57E fifth-generation fighter jet from Sukhoi (a subsidiary of the United Aircraft Corporation) and the Il-112VE light military transport aircraft from Ilyushin (a subsidiary of the United Aircraft Corporation) have received the necessary export permits and Rosoboronexport has the right to offer them to foreign customers.

The Su-57E is a fifth-generation multi-role aircraft system designed to accomplish a wide range of missions against air, ground and surface targets. It can be used in any weather, day or night, and in a severe jamming environment.

Its main advantages compared with 4th generation aircraft systems are stealth due to a reduced radar and infrared signature, high immunity of both avionics and aircraft armament system, as well as a strong supersonic cruise capability.

At the same time, the latest Russian fighter surpasses 4++ generation aircraft in terms of key properties:

- multi-mission capability;
- automation and AI technologies incorporated into target engagement processes;
- all-azimuth and multiple target capability, the use of long-range precision-guided weapons;
- super-maneuverability.

The set of features of the Su-57E fighter gives it superiority over the fifth generation aircraft available on the market today at a lower life cycle cost. This fact has been recognized by many world experts in weapons and military equipment.

The Il-112VE light military transport aircraft is the export version of the Il-112V developed for the Russian Air Force and intended for the transportation and airdropping of cargo, vehicles, equipment, ammunition and personnel.

The major competitive advantages of the Russian Il-112VE light military transport aircraft are:



During MAKS 2019, Rosoboronexport showed more than 80 product presentations for representatives of foreign customers, including over 50 presentations of Air Force equipment and about 30 ones of Air Defense assets. The full-scale MiG-35, Su-35S, Su-34, Su-30SME, Yak-130, Yak-152 and Su-57 aircraft were demonstrated to partners in the outdoor display area. Scale models of the Yak-130 combat trainer, the Mi-35M transport/attack helicopter, the Mi-28NE attack helicopter, the Ka-52 reconnaissance/attack helicopter, the Ka-31 radar picket helicopter, the Pantsir-S1 air defense missile/gun system, the Buk-M2E and Tor-M2KM SAM systems with modular combat and maintenance assets were on display at Rosoboronexport's stand.



- versatility enabling a wide range of transport missions, including air-dropping of cargo and special forces groups, transportation of personnel with organic weapons, delivery of weapons, ammunition and materiel, casualty evacuation, etc;
- state-of-the-art avionics that makes it possible to perform combat missions day or night, in any weather and in different climatic conditions;
- the dimensions of the cargo compartment of the Il-112VE expand the capabilities for transporting cargo, including self-propelled and non-self-propelled equipment;
- the Il-112VE is equipped with two new higher-power and more fuel-efficient engines, the TV7-117ST, and AV112 propellers controlled by a single automatic control sys-



tem which increases flight safety and provides high take-off and landing performance allowing the aircraft to be operated from short runways, including unprepared fields;

- on-condition maintenance of the Il-112VE obviates the need for

major overhauls, which ensures that the required level of equipment operational readiness is maintained at minimum operating costs within the service life limit of 30,000 flight hours or for 30 years;

- the presence of advanced handling and drop equipment on board the aircraft that allows loading and unloading without the use of additional special equip-

- compliance with ICAO flight accuracy and safety;

- capability to operate independently, including from unimproved airfields.

It is important to note another important point: Rosoboronexport JSC has invited 120 delegations from 65 countries to the MAKS 2019 International Air Show.

'Today, MAKS has become the main platform for showcasing new Russian military aircraft. Traditionally, the show serves as a starting point for many important negotiations for the supply of aircraft, helicopters and air defense systems, as well as for joint projects in these areas. 2019 will not be an exception. This year, our partners will be able to see demonstration flights of the Su-57 fifth-generation fighter here for the first time, and Rosoboronexport is ready to hold consultations on its export version, including with the involvement of specialists from the aircraft's developer,' said Rostec CEO Sergey Chemezov.

'At MAKS 2019, we'll unveil the new Ilyushin Il-78MK-90A refueling tanker and the Il-112VE light military transport aircraft, tell about a

Rosoboronexport is the only state-owned arms trade company in the Russian Federation authorized to export the full range of military and dual-purpose products, technologies and services. It is a subsidiary of the Rostec Corporation. Founded on 4 November, 2000, now Rosoboronexport is one of the leading world arms exporters to the international market. Its share in Russia's military exports exceeds 85 percent. Rosoboronexport cooperates with more than 700 enterprises and organizations in the Russian defence industrial complex. Russia maintains military technical cooperation with more than 100 countries around the world.



As part of MAKS' business program, Rosoboronexport negotiated with more than 40 foreign delegations led by defense ministers, air force and air defense commanders, chiefs of general staffs and their deputies. A number of representatives of the company's partners took part in familiarization flights on the MiG-35, Yak-130 and Su-30SM aircraft, as well as on the Mi-38 medium utility helicopter.



number of major changes in the upgraded Mi-28NE and Mi-171Sh helicopter versions tailored for special and counter-terrorism operations, and also introduce the latest precision guided air-to-surface weapons,' said Alexander Mikheev, Director General of Rosoboronexport, Deputy Chairman of the Russian Engineering Union.

During MAKS 2019, Rosoboronexport showed more than 80 product presentations for representatives of foreign customers, including over 50 presentations of Air Force equipment and about 30 ones of Air Defense assets. The full-scale MiG-35, Su-35S, Su-34, Su-30SME, Yak-130, Yak-152 and Su-57 aircraft were demonstrated to partners in the outdoor display area. Scale models of the Yak-130 combat trainer, the Mi-35M transport/attack helicopter, the Mi-28NE attack helicopter, the Ka-52 reconnaissance/attack helicopter, the Ka-31 radar picket helicopter, the Pantsir-S1 air defense missile/gun system, the Buk-M2E and Tor-M2KM SAM systems with modular combat and maintenance assets were on display at Rosoboronexport's stand.

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On the sidelines of MAKS 2019, Rosoboronexport signed a coopera-

The advanced Su-57E fifth-generation fighter jet from Sukhoi (a subsidiary of the United Aircraft Corporation) and the Il-112VE light military transport aircraft from Ilyushin (a subsidiary of the United Aircraft Corporation) have received the necessary export permits and Rosoboronexport has the right to offer them to foreign customers.

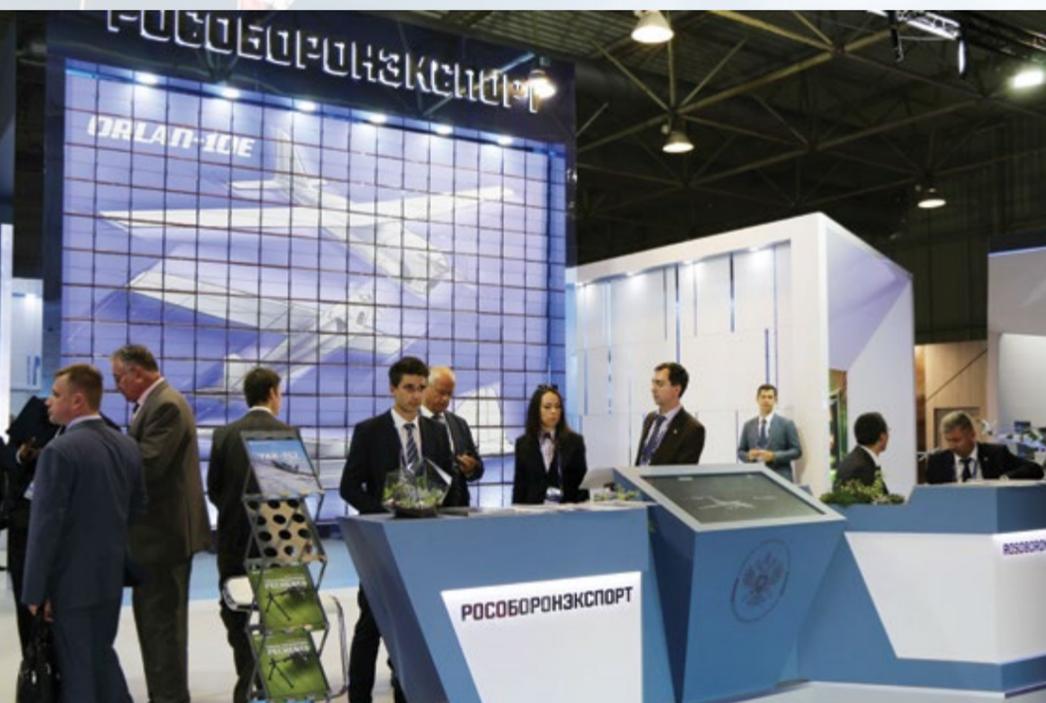
tion agreement with the Government of the Yaroslavl Region, the regional branch of the Engineering Union of which is supervised by Alexander Mikheev.

'Constructive and trusting relations with Russian defense enterprises and the regions where they operate are critical for Rosoboronexport. Thanks largely to the well-established

cooperation and understanding on their part of the importance of arms exports for the development of world-class high technologies in the country and support from the executive branch at all levels, we have managed to deliver abroad more than 800 combat aircraft, including assembly kits for licensed production, more than 1000 military and civil-



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ian helicopters, and air-to-surface weapons totaling over \$40 billion, as well as air defense systems worth over \$25 billion since the company's establishment in 2000,' added Alexander Mikheev.

It is important to remember that only Rosoboronexport has the right to supply the world market with a full range of arms and military equipment manufactured by Russia's defense industrial complex and approved to be exported. Rosoboronexport accounts for more than 85% of Russia's arms exports. Rosoboronexport is among the major operators in the world market for arms and military equipment. Last year Rosoboronexport marked its 18th anniversary.

Rosoboronexport was set up by RF President's Decree as a federal state unitary enterprise tasked to implement the national policy

in the area of military-technical cooperation between Russia and foreign countries. Since 1 July 2011 Rosoboronexport has been operating as an open joint stock company. Rosoboronexport operates under the strict supervision of the Russian President, the Russian Government and in full conformity with the UN arms control treaties and the relevant international agreements.

The official status of the exclusive state intermediary agency gives Rosoboronexport unique opportunities to expand long-term mutually beneficial cooperation with foreign partners, provide guaranteed state support of all export-import operations, and strengthen Russia's leadership in the world arms market.

The main result of biography of Rosoboronexport, despite the difficult economic conditions and fierce, often unfair, competition in the global arms market, that company have managed not only to carry its sales, but also significantly enlarge its footprint in the traditional and new arms markets. Through integrated marketing strategies, company have ensured that order book today exceeds US\$ 46 billion.

The special exporter makes painstaking efforts on a daily basis to increase Russian arms exports resulting in more than a thousand contract documents signed with foreign customers every year. Over the period of its operation in the international market, Rosoboronexport has delivered hundreds of thousands of units of military equipment and weapons worth more than US\$ 120 billion to 115 countries.

Rosoboronexport pays great attention to both major billion dollars contracts and small deals. The company seeks to operate flexibly and efficiently by using modern and advanced marketing and customer settlement methods. The special exporter cooperates with more than 700 Russian defense-industrial enterprises and organizations, which enables it to offer partner countries the comprehensive and cost-effective solutions for strengthening their defense capability and national security.

By concluding export contracts, Rosoboronexport supports the Russian defense industry, which is especially important under difficult conditions in the global market. High-tech products are in increased demand in the world arms market today and thus the company is interested in developing smart manufacturing in Russia. In addition, Rosoboronexport is actively involved in a number of charitable and sponsorship projects. The company provides assistance to military hospitals, military historical museums, and children's educational institutions. Rosoboronexport supports major sporting events and various sports federations, acts as sponsor and partner of the largest industrial exhibitions and cultural events held in Russia and abroad.

Rosoboronexport pursues a marketing strategy targeted to expand the geography, range and volume of export deliveries. A number of special programs and projects for exporting products to specific coun-



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tries have been developed based on a comprehensive analysis of the arms markets and foreign partners' needs. Rosoboronexport seeks to operate flexibly and efficiently in the market, using modern and advanced marketing and customers' settlement methods.

Foreign customers are offered package solutions for national systems intended to defend land, air and seaside borders, which feature the optimal trade-off between cost and performance. These solutions may include both the supply of military products and services and organization of licensed production in customer countries, the setting-up of joint ventures to manufacture and maintain equipment, as well as joint R&D efforts. Rosoboronexport widely uses the optimal offset programs. With regard to foreign customers' interests and the opportunities of the Russian defense industrial complex to increase its exports, Rosoboronexport pays much attention both to major billion-dollar contracts and small deals worth the hundreds of thousands to several millions of dollars. /IA&TG/





★ RUSSIA WILL BE THE STAR OF EURASIA AIRSHOW 2020

Eurasia Airshow 2020 will be held at Antalya International Airport on 22-26 April 2020. The aim of the event is to develop an extremely substantial business volume in commercial and military aviation industries. Furthermore, it is the only aerospace trade show to include flight demonstrations in Turkey.



It is important to underline that Eurasia Airshow has fully targeted the Eurasian market in terms of participants and achieved success in this regard. The Eurasia Airshow 2018 was attended by visitors from 67 countries, from Russia to Qatar, from Iran to UK, from Ukraine to Poland. Worldwide leading companies such as Boeing, Rolls-Royce, Sukhoi, UAC, Antonov, BAE Systems, Rostec, Saab, Qatar Airways, Thales, Honeywell, GE Aviation, Pratt Whitney, Dassault Systems, Goodrich, IRKUT have participated in the Eurasia Airshow 2018. And Turkish Local Industry has been successfully represented by Turkish Airlines, Turkish Aerospace, Aselsan, Havelsan, Alp Havacılık etc. In total 343 companies has contributed.

The Chairman of Capital Exhibition who organize the Eurasia Airshow Hakan Kurt said: 'We had an very succesful edition of Eurasia Airshow in 2018. Also Russian companies got really good deals. Especially for this year. Russia will be the star of the

Eurasia Airshow 2020. Depends on the S-400 air defence systems deal and the upcoming fighter deal there will be very efficient deals on the ground (According to the S-400 air defence systems deal and the upcoming fighter deal we can say that there will be very efficient deals settled on the ground)'. Kurt continued: 'Eurasia Airshow will have more innovation, decision maker, delegation and business for their participants'.

Key Figures	Numbers
Countries	67
Company	343
Trade Visitor	27000
Public Visitor	106000
Trade Volume	\$15 Billion
Delegation	163
Aircraft on static	81
Flight Demonstration	104
Accredited Media	253
Exhibition Area	410 000 sqm

Source: Eurasia Airshow 2018 Final Report

/IA&TG/

EURASIA AIRSHOW



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www.eurasiaairshow.com

ORGANIZER

capital exhibition

Sergey Kulik

SECURE RESCUE AT ANY HEIGHT



Unique autonomous rescue parachuting back-pack system for emergency escape

The innovative Russian private Space Rescue Systems Ltd. (SRS Ltd.) company (www.cosmic-rs.com) proposes a unique and unrivalled emergency rescue vehicle SPARS® – an Autonomous Rescue Pneumo Transformable Chute Back-pack System – a validated forefront rescue solution for guaranteed secure individual emergency escape from nearly any high elevation structure (skyscrapers, offshore platforms etc.). The SPARS® project is resulted in a creation of a brand new pneumo-framed aerodynamic devices technology. There is no doubt in the near future this solution is going to be a must-have in skyscrapers construction all over the world.

The SRS Ltd. proposes a SPARS® high rise escape technology that has a global nature. It is uncovered market niche with an obvious but unrealized human requirement to be and to feel safe while living or working in high elevation buildings. In case of emergency than traditional evacuation is impossible or ineffective those people all over the world have practically no means of urgent secure rescue from the height and need an alternative solution.

Actually the technical reviews shows that at present there are practically no means for secure alternative escape starting from 60÷80 m height and higher available on the market. But according to the said firefighter's statistics about 3÷5% of people being caught in alarm situation on the high-rise building used to try escaping from the windows and

usually perished. On the other side homeland security analytics says that in average an every skyscraper in the world is expected to be subjected to a fire case (terroristic attack or other emergency) once in every 47 years.

So the SRS Ltd. has decided to resolve the problem in finding an alternative to traditional evacuation methods technical solution. It takes about eight years of R&D to resolve the task. Finally it is resulted in creation a brand new escape technology – an Autonomous Rescue Pneumo Transformable Chute Back-pack Solution for secure personal rescue from high-elevation structure in case of emergency than traditional evacuation methods are impossible.

The SRS Ltd company in outsourcing cooperation with 18 leading Russian and foreign aerospace companies has fulfilled full-scale research and development activities to devel-

op the project from conceptual proposal stage to releasing operating prototypes unparalleled anywhere in the world.

The SPARS® escape technology is based on a synergy of sophisticated aerospace technologies such as Air-Aspirator Rapid Inflation; Elastic Pneumo-Frame Catapult Ejection; Air-Drag Deceleration; Air-Bag Shock Absorbing and others. Such technologies were invented for space probes deceleration during descent in atmospheres of Solar system planets and its landings on surfaces.

The SPARS® device provides a secure individual escape of untrained person or valuables cargos with weights 45÷120 kg. from about any of existing high-rise (50÷1000m) facilities (skyscrapers; towers; offshore platforms etc.) with guaranteed safe landing on any underlying surface in urban terrain or water in

case of emergencies than traditional evacuation methods are impossible.

The SPARS® solution meets the Russian Ministry of Emergency Situations (EMERCOM) requirements for high-rise emergency escape apparatus (GOST R 22.9.08–2005; GOST R 12.4.206–99) and provides for the following unique capabilities, never implemented before:

1. Alternative of emergency escape (so-called 'last resort rescue')
2. Emergency evacuation of an untrained person having weight of 45÷120 kg, from heights of 50÷1,000 m;
3. Ready-for-use in 45÷60 sec;
4. Self-sustained operation and independently selected escape route;
5. User-friendly operation for untrained persons and fully automated rescue procedure right from start;
6. Personal protection against external hazards during evacuation;
7. Appropriate weight of a back-pack-type carried device;
8. Secure injury-free landing on any underlying surface.

The SPARS® unit for individual use had required a special certificate basis. In this regard the National Standard (GOST) 4240-001-2012 specifying medical and technical requirements for injury-free operation by untrained persons rescued by means of new type SPARS® shock-

absorbing systems entered into force in 2013.

To have certification tests performed a special Hybrid-III (USA) crush test dummy-based anthropomorphic (bionic-like) instrumentation station has been developed and created by the SRS Ltd., which has no equals in Russia.

A full cycle of comprehensive calculations and testing to validate design properties and performance has been performed. Up to now the SPARS® device technical operational reliability is 98.7% but further testing is under way.

New SPARS® escape solution provides the following advantages:

1. Alternative (a 'last resort') escape mean for ordinary person in case of emergency in the high-rise structure;
2. Secure rescue of untrained personnel (18÷70 years old) from high elevations from 5 till 1000m (no practical means available starting from 50 m height);
3. Off-line capability of the system provides mobility that helps to find optimal self-escape way of out from emergency situation;
4. Smooth automated ejection from the emergency object after manual initialization of the system;
5. Guaranteed deploy of the canopy with 3÷5 m loss of height irrespective of air flow speed pressure;
6. Protection from dangerous external factors (fire, hits, smoke) during descent;

The SPARS® General Specifications

1. Total Assembly Weight – 25 kg
2. Rescue Payload Weight – 45÷120 kg
3. Descent Elevations – 5÷1000 m
4. Landing Velocity – 5÷7 m/s
5. Landing Angle – < 30°
6. Footboard Barrier Elevation – 1.5 m
7. Descent Time – 3÷150 s
8. Ready-to-use Time – 45÷60 s
9. Launch Initialization Time – 15÷20 s
10. Inflating Gas – Air;
11. General Dimensions:
 - a. Assembled – 900x450x300 mm
 - b. In Descent mode – 6,500x2,700mm (without canopy)

Actual Landing Impact Loads:

Acceleration directions:

'chest-to-back' – up to 8÷10 g

'side-to-side', 'head-to-pelvis' – up to ± 6 g

Acceleration Exposition Time – less than 0.5 s

Acceleration Growth Velocity – less than 500 1/s

User's age – 18÷70 years

7. Safe landing on any underlying surface in urban terrain;
8. Reusable and does not sink.

In packed and assembly complete mode the SPARS® system weights 25 kg with back-pack dimensions





850x450x350mm and has easy – to-use suspension system.

The SPARS® has its Technical Data Sheet (TU 801130–5047075064–01–10) and working design documents issued. Under the SRS Ltd requirements Russian gas-filling systems (GFS) manufacturing company has mastered Autonomous Two-Stage GFS for SPARS® (TU 8042–017–45307693–2013).

The SRS Ltd. Intellectual Property Rights on SPARS® and its 'know-hows' have been completely protected within Russia (9 Patens, 3 Trade Marks) and abroad under PCT (Patent Cooperation Treaty) procedures 2 'umbrella' requests for SPARS® have entered national level in 15 countries and covered 78% skyscrapers and

95% potential SPARS® manufacturers. 13 Patents of the US, China, Japan, Canada, South Korea, Singapore, the Ukraine, Indonesia, Malasia and Australia have been already received.

Three Russian EMERCOM Certificates of Conformity were received for the SPARS®. 'Aerospace medicine and military ergonomics' R&D Institute of the Russian Air Force has granted an official approval for the SPARS® physical adaptability.

The SRS Ltd. company now is looking for cooperation with a strategic Partner and/or investor in order to industrialize the brand new SPARS® product; to make it commercial; to prepare and set up its production and to enter with it into a global commercial market having all nec-

essary intellectually property rights protected.

An accurate assessment of the terms, timeframes and investments required for the SPARS® industrialization it is foreseen that a Partner from the region where product itself (or its production) could be demanded (Middle East, China, US, Europe, Asia-Pacific etc.) could formulate and provide the SRS Ltd. Company with the regional authority technical requirements to upgrade the product specifications and also could determine the necessary level of licensing.

At the same time in order to reduce production costs it is desirable to find and select a local manufacturer taking into account its technical capabilities and possibility to use appropriate production process technologies.

Upon receiving necessary information from a Partner the SRS Ltd. Company could finalize the design documentation, to fabricate a prototype with specifications meeting local needs and to determine expected investments and timeframes necessary to prepare and to run mass production of the product in the region.

Shares and Conditions in the business organization is a matter of further negotiations. The SRS Ltd. Company would be ready to demonstrate its good willing approach and to meet a Partner in negotiations halfway with necessary flexibility in some critical questions aiming to achieve mutually beneficial cooperation.

Such forms of cooperation as Joint Venture, Technical, Manufacturing or License Agreements are feasible.

For a strategic industrial Partner sought who would be interested to

run mass production of the SPARS® in the region and enter an empty market with protected rights it would be necessary to have production technology experience in the fields of:

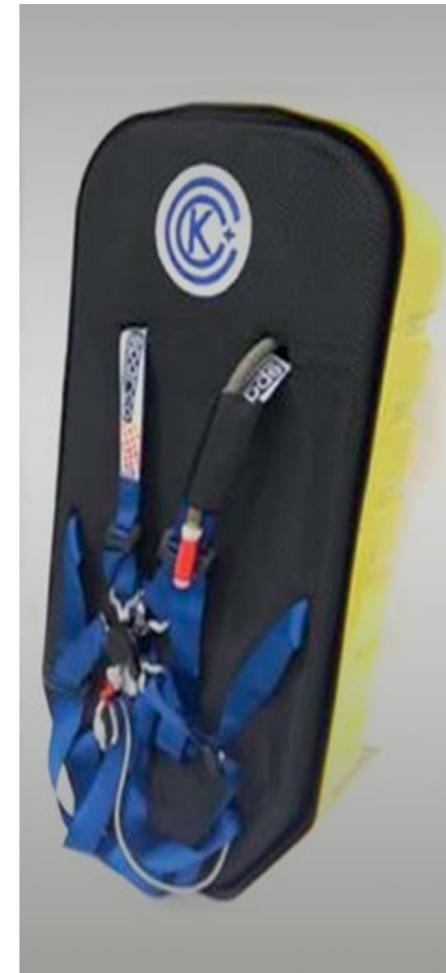
- thin coated/laminated fabric manufacturing;
- assembly from these fabrics a complex air-beam-frame air-proof inflatable structures;
- parachute canopy manufacturing;
- air-aspirator gas filling manufacturing;
- plastics (carbon) manufacturing and forming
- human field (air-borne) tests plastic forming and others.

A Partner sought may be expected to undertake part of those activities or provide financing for already SRS Ltd. Company existing outsourcing manufacturing solution in Russia on a mutually beneficial basis.

As for the SPARS® solution operation such a potential entity sought (hotels, profitable houses; skyscraper's management company; offshore platform management; air-borne attractions & entertainment companies etc.) should only require a free window exit sized 1000x500 mm at the appropriate height to use Autonomous Pneumo Transformable Escape Chute and propose to its clients an additional exceptional secure service with limited warranty.

General market estimations shows there are over 7,303 finished and 2,500 under construction skyscrapers worldwide with the heights of 100÷828m, over 100,000 buildings having height of 50÷100m and more than 800 offshore platforms. Taking that analysis into account the SPARS® may have potential market capacity of up to \$700-850 million annually.

Furthermore, the SPARS® estimated potential market capacity is worth over \$3.5 billion in commercial sector alone. The Governments market is bigger but for accepting that new technology implementation it may require some updates of the appropriate local norms and regulations.

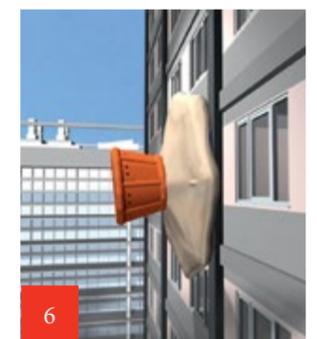
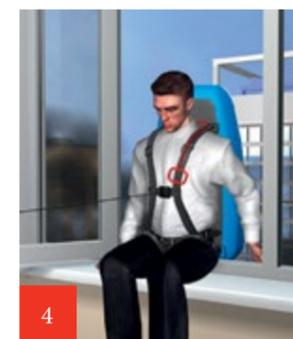
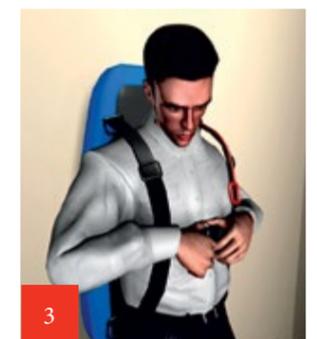


There are following innovations in the proposed SPARS® technology:

1. A brand new free parachuting technology (means and escape method) was created for emergency escape from heights higher than 50 m where practical methods for safe evacuation of a person are not available on the market.
2. Sinergy solution based on specially designed and produced from film-laminated fabric a rapid inflatable air-beam single volume frame structure for:
 - Elastic catapult ejection of a human from a window of an emergency object;
 - Forced deploy of the canopy with only 3÷5 m loss of height and irrespective of air flow speed pressure for deployment (usual parachute requires of 25÷100 m free fall and/or 250÷350 km/h speed of airplane to be deployed);
 - Guaranteed safe landing with 5÷6 m/s vertical velocity on any underlying surface in urban terrain using integrated air-frame shock absorbing pneumo dumper.
3. Fully automatic mode of usage (after manual initialisation of the apparatus) and all the descend envelope accelerations bearable for an ordinary person make the escape solution available for use by untrained people from 18 till 70 years old;
4. New type of light weight air-proof film coated fabric for air-beam inflatable frame structure was created.

The Special National Standard (GOST) for shock acceleration limits for untrained human using new type of lodgment Rescue Parachuting Systems was issued.

The Crash test dummy Hybrid-III 50% percentile was instrumented, calibrated with the help of centrifuge, certified and used as anthropomorphic instrument for human acceleration checking during field tests and validation of the Autonomous Pneumo Transformable Escape Chute.



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INTERNATIONAL AEROSPACE, MILITARY, NAVY AND TECHNOLOGY GUIDES

In 2019

ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
'RA&MG' №11 (42)	August 27th	MAKS-2019 (27.08-01.09.2019, Russia, Moscow)
'RA&MG' №12 (43)	September 16th	AVIATION EXPO CHINA 2019 (18-20.09.2019, China, Beijing)
'RA&MG' №13 (44)	October 01th	CHINA HELICOPTER EXPO 2019 (10-13.10.2019, China, Tianjin) SEOUL ADEX 2019 (15-20.10.2019, Korea, Seoul)
'RA&MG' №14 (45)	September 23th	DSE Vietnam (02-04.10.2019, Vietnam, Hanoi)
'RA&MG' №15 (46)	October 28th	BIDEC 2019 (28-30.10.2019, Bahrain, Manama)
'RA&MG' №16 (47)	November 02th	Defense & Security 2019 (04-07.11.2019, Thailand, Bangkok)
'RA&MG' №17 (48)	November 16th	Dubai Airshow 2019 (17-21.11.2019, UAE, Dubai)
'RA&MG' №18 (49)	December 08th	Gulf Defense & Aerospace 2019 (10-12.12.2019, Kuwait, Al Kuwait)

In 2020

ISSUE	RELEASE DATES	ADDITIONAL DISTRIBUTION
'RA&MG' №01 (50)	January 20th	DEFEXPO INDIA 2020 (05-08.02.2020, India)
'RA&MG' №02 (51)	January 30th	SINGAPORE AIRSHOW 2020 (11-16.02.2020, Singapore)
'RA&MG' №03 (52)	February 20th	IADE Tunisia 2020 (04-08.03.2020, Tunisia, Ariana)
'RA&MG' №04 (53)	February 20th	VIDSE 2020 (04-06.03.2020, Vietnam, Hanoi)
'RA&MG' №05 (54)	March 01th	DIMDEX 2020 (16-18.03.2020, Qatar, Doha)
'RA&MG' №06 (55)	March 10th	ArmHiTec 2020 (26-28.03.2020, Armenia, Yerevan)
'RA&MG' №07 (56)	March 15th	FIDAE 2020 (31.03-05.04.2020, Chile, Santiago)
'RA&MG' №08 (57)	March 15th	SOFOX 2020 (31.03-02.04.2020, Jordan, Amman)
'RA&MG' №09 (58)	April 05th	DSA 2020 (20-23.04.2020, Malaysia, K.Lumpur)
'RA&MG' №10 (59)	April 08th	Eurasia Airshow 2020 (22-26.04.2020, Turkey, Antalya)
'RA&MG' №11 (60)	April 25th	ILA Berlin Air Show 2020 (13-17.05.2020, Germany, Berlin)
'RA&MG' №12 (61)	May 10th	HELIRUSSIA 2020 (21-23.05.2020, Russia, Moscow)
'RA&MG' №13 (62)	May 12th	KADEX-2020 (28-31.05.2020, Kazakhstan, Astana)
'RA&MG' №14 (63)	May 20th	EUROSATORY-2020 (08-12.06.2020, France, Paris)
'RA&MG' №15 (64)	July 05th	FARNBOROUGH Airshow 2020 (20-24.07.2020, Great Britain, London)
'RA&MG' №16 (65)	August 10th	ARMY-2020 (25-30.08.2020, Russia, Moscow)
'RA&MG' №17 (66)	August 20th	GIDROAVIASALON 2020 (September 2020, Russia, Gelendzhik)
'RA&MG' №18 (67)	August 30th	ADEX 2020 (08-10.09.2020, Azerbaijan, Baku)
'RA&MG' №19 (68)	September 01th	Africa Aerospace and Defence 2020 (16-20.09.2020, South Africa, Pretoria)
'RA&MG' №20 (69)	September 10th	ADAS 2020 (23-25.09.2020, Philippines, Manila)
'RA&MG' №21 (70)	September 15th	Istanbul Airshow 2020 (24-27.09.2020, Turkey, Istanbul)
'RA&MG' №22 (71)	October 05th	EURONAVAL 2020 (20-23.10.2020, France, Paris)
'RA&MG' №23 (72)	October 20th	INDO DEFENCE 2020 (04-07.11.2020, Indonesia, Jakarta)
'RA&MG' №24 (73)	October 25th	Airshow China 2020 (10-15.11.2020, Zhuhai, China)
'RA&MG' №25 (74)	November 02th	BIAS 2020 (18-20.11.2020, Bahrain, Manama)
'RA&MG' №26 (75)	November 10th	IDEAS 2020 (24-27.11.2020, Pakistan, Karachi)
'RA&MG' №27 (76)	November 25th	EDEX 2020 (07-10.12.2020, Egypt, Cairo)
'RA&MG' №28 (77)	November 30th	Expo Naval 2020 (December 2020, Chile, Valparaiso)

Международный военно-технический форум

ARMY 2020

OFFICIAL SHOW-DAILY
ДЕНЬ ПЕРВЫЙ

№01, 25 августа 2020 года

ОФИЦИАЛЬНОЕ ЕЖЕДНЕВНОЕ ИЗДАНИЕ ФОРУМА

Главный форум

Инновационный союз ОПК России и Вооруженных сил РФ



«С 22 по 27 августа Министерство обороны Российской Федерации проводит Международный военно-технический форум «АРМИЯ-2017». Это третье по счету масштабное мероприятие, в котором примут участие крупные отечественные и зарубежные предприятия оборонно-промышленного комплекса, ведущие конструкторские бюро и научно-исследовательские институты.

Основные мероприятия Форума пройдут в Конгрессно-выставочном центре «Патриот». Общая площадь экспозиции в павильонах и на открытых площадках превысит 300 тыс. кв. м. Динамические показы ходовых, летных и огневых возможностей вооружения, военной и специальной техники состоятся на аэродроме Кубинка, полигоне Алабино, а также в военных округах и на Северном флоте.

Научно-деловая программа пройдет в формате пленарных заседаний, конференций, круглых столов и брифингов, что позволит обсудить актуальные вопросы обороны и безопасности, дальнейшие направления совершенствования способов производства продукции военного назначения.

Тысячи посетителей смогут ознакомиться с последними достижениями в области высоких технологий и перспективными разработками, которые реализуются в военной сфере.

Сегодня форум...



Международный военно-технический форум «АРМИЯ-2020»

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August 25-30, 2020

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Reports on the work of the Forum, the most important current business and presentations, the representation of participants, their exposition and programs.

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