China to develop satellite-delivery rockets released from airplanes

China will develop a new generation of rockets launched from aircraft that can put satellites into space, according to Li Tongyu, the head of carrier rocket development at the China Academy of Launch Vehicle Technology.

Air-launched rockets can rapidly replace dysfunctional satellites or, in cases of disaster relief, quickly send up Earth observation satellites to assist in the effort, Li said.

Designers at the academy, which is the main developer of Chinese carrier rockets, have designed a model capable of sending a payload of about 100 kilograms into low Earth orbit and are ready to produce one if the government asks, he said. They plan to design a larger rocket that could carry 200 kg into orbit.

“The Y-20 strategic transport plane will be the carrier of these rockets. The jet will hold a rocket within its fuselage and release it at a certain altitude. The rocket will be ignited after it leaves the plane,” Li said.

Large satellites will still have to be put into orbit with conventional rockets, experts said.

Delivery of the Y-20 to the Chinese Air Force began in July. It is China’s first domestically developed heavy-lift transport plane and has a maximum takeoff weight of more than 200 metric tons and a maximum payload of about 66 tons, aviation experts said.

Solid-fuel rockets can be launched from planes much faster than land-based, liquid-fueled rockets, where preparation can take days, weeks or longer, in part because it takes so much time to pump in the fuel, experts said.

Each mission involving a solid-fuel rocket launched by a Y-20 would take only 12 hours of preparation to place a 200 kg satellite into a sun-synchronous orbit 700 km above Earth, according to estimates by Long Lehao, an academician of the Chinese Academy of Engineering, and other researchers at the China Academy of Launch Vehicle Technology. The estimates were in an article published in October in the Journal of Deep-Space Exploration.

Other advantages of such rockets are that they are flexible in deployment and use and do not need ground infrastructure, said Pang Zhihao, executive editor-in-chief of Space International magazine. They also are less susceptible to bad weather and launch costs are lower than those of ground-launched rockets, he added.

The United States undertook the world’s first air-launched space mission in 1990, in which a Pegasus rocket developed by the former Orbital Sciences Corp was launched from a refitted B-52 strategic bomber to send two small satellites into orbit. Since then, 43 Pegasus missions have been carried out,

with the most recent in December.

Several US space companies, including Virgin Galactic and Generation Orbit Launch Services, are developing air-launched rockets.

Chinese designers have been quietly working on the concept for years. China Aerospace Science and Technology Corp, parent of Li's academy, displayed a scale model of a winged, solid-propellant, air-launched rocket in 2006 at the Sixth China International Aviation and Aerospace Exhibition in Zhuhai, Guangdong province.

Water level of nation's largest salt lake rises

A tourist practices Yoga on the bank of Qinghai Lake as a shepherd watches in Qinghai province in October.[Photo/Xinhua]

The water level of China's largest inland saltwater lake has risen over the past decade due to abundant rainfall and rising temperatures, according to a recent survey.

The average annual water level at Qinghai Lake's hydrological station in Northwest China's Qinghai province rose 1.66 meters over the past 10 years.

The rising water level is the result of increased precipitation and meltwater from nearby glaciers and highland snow, according to Dai Sheng, an engineer with the provincial climate center.

Average annual precipitation increased to 421.8 millimeters between 2005 and last year, from 358.8 millimeters between 1961 and 2004, Dai said, adding that an improved ecosystem and vegetation also helped maintain water in the Qinghai Lake basin.

The surface area of Qinghai Lake also expanded to 4,429.3 square kilometers in September, an increase of 169.7 sq km from the same period in 2004, according to a geographical survey in the province.

Qinghai Lake plays an important role in the ecological security of the Qinghai-Tibet Plateau. The lake had been shrinking since the 1950s, but the combined effects of conservation and changes in the regional climate helped turn things around from 2005 onward.

Tibet to open world's highest super-long tunnel

The Mila Mount Tunnel on the Lhasa-Nyingchi Highway is expected to be opened in September, when it will become the world's highest super-long tunnel.

The tunnel is located at the junction of Lhasa and Nyingchi in the Tibet autonomous region at an average altitude of 4,740 meters above sea level, according to the Mila Mount Tunnel Project Headquarters.

As a key section of the Lhasa-Nyingchi Highway on the National Highway 318, the two lanes of the tunnel are 5,727 meters and 5,720 meters long respectively, according to the project headquarters.

Construction of the tunnel started in April 2015, and the project is about 70 percent complete to date, it said, adding that, hampered by the natural environment at high attitude, the construction process has encountered many obstacles.

"With a lack of oxygen and temperature lows of – 30 Celsius in winter, we require highly skilled workers," said Wang Liang, chief engineer of the project headquarters.

Wang said many workers suffered from attitude sickness during the tunnel's construction, and that much time and effort has been spent on recruiting qualified workers.

In order to overcome such difficulties, there are 15 oxygenators, an oxygen

tank and five boilers on the project site, he added.

After it opens, traveling time between the cities of Lhasa and Nyingchi will be halved, Wang said.

“Driving from Lhasa to Nyingchi will take just three to four hours instead of about eight, and it will be much safer,” Wang said.

“It will also have a positive impact on the social and economic development of these places, and it will make life much more convenient for local ethnic groups.”

PLA patents declassified for civilian use

The People’s Liberation Army has declassified and made public more than 2,300 national defense patents, PLA Daily reported on Sunday.

The National Defense Intellectual Property Rights Bureau of the Central Military Commission’s Equipment Development Department has declassified about 3,000 national defense patents and opened 2,346 of them to the public, according to PLA Daily.

It said it is the first time the PLA has declassified and made public military patents since it began to register such patents in 1985. The measure is intended to facilitate the transfer of military technologies to civilian industries to boost the coordinated development of the civilian and defense sectors, the report said.

The patents can be viewed at weain.mil.cn□a website managed by the CMC Equipment Development Department’s Procurement Information Service Center□in the “Patent and Achievement” section where a total of 101 pages of detailed patent entries are available for public viewing.

The first several pages checked by China Daily contain a wide range of patents, such as those relating to missiles, aircraft, communications, vehicles and tracking systems.

Each entry lists details of the patent, including its designated code, the dates of its submission and approval, its inventor and his or her employer, its function and the patent’s agent and its legal status.

PLA Daily said that previously, it was difficult for defense patents, which are generally classified and not available for public searching like those for civilian use, to be transferred to civilian users because of the absence of related policies and poor communication between the PLA and civilian

sectors.

It said that in 2015, the military started to organize patent holders to review their patents and determine whether the patents could be declassified.

The bureau plans to establish regulations on the confidentiality and declassification of national defense patents, pledging to declassify and publish patents on a regular basis, PLA Daily reported, saying these measures will help to make good use of defense patents and to nurture innovation in the development of weapons and equipment.

A defense technology industry observer in Beijing, who wished to be identified as Wu, said that opening suitable defense patents to the public benefits businesses, as they can use these patents to save on their research spending.

“Military and defense contractors can also save research and development funds, because in the past, many defense technology researchers had no access to patent information that was submitted by other researchers, which led to them conducting research that had already been done,” Wu said.

“Now they can check with patent information before embarking on a new project, which will save money for the PLA and their employer,” he said.

Rural workshops manufacture a route out of poverty

Rural workshops manufacture a route out of poverty

Local governments are providing jobs for impoverished rural residents by establishing a number of small businesses in villages. Ju Chuanjiang and Zhao Ruixue report from Juancheng county, Shandong province.

The 300-square-meter building with the words “Targeted Poverty-Alleviation Workshop” emblazoned on the white, exterior walls stands in sharp contrast to the brick-built farmers’ houses surrounding it.

Inside the building, in Xijie, a village in Juancheng county, Heze, Shandong province, dozens of farmers were sorting hair ready for distribution to wig manufacturers.

Sun Zhangcun was one of them. The 60-year-old’s employment options are limited because his left leg was amputated after a traffic accident 17 years ago. Moreover, his wife has advanced rheumatism.

“We can’t escape poverty: I’m disabled, so I can’t leave the village for work, but I can’t shoulder heavy farmwork either,” he said, as he skillfully sorted a clump of hair.

In an attempt to solve his problems, Sun took a job at the workshop, which was founded last year by the local government to provide work for underemployed laborers. He earns about 1,000 yuan ($145) a month.

“Now I am useful to my family. I earn my own money, which gives me a sense of dignity,” Sun said. Last year, he managed to save more than 3,000 yuan after covering daily necessities and medical expenses for him and his wife.

His workshop is one of 536 that have been established in villages across the

county as part of a national campaign to lift farmers out of poverty.

Raising living standards

In 2015, Shandong recorded the third-highest GDP in the country, and the provincial government set the annual poverty level at 3,372 yuan per person.

Last year, 1.5 million people in the eastern, coastal province were lifted out of poverty, and the authorities aim to raise the living standards of a further 2.42 million by 2018.

By 2020, China plans to have eradicated poverty, as defined in 2011 by annual earnings of less than 2,300 yuan per person. On Sunday, at the two sessions, the government announced that it aims to lift a further 10 million rural people out of poverty by the end of this year.

To win the war against poverty, local governments have turned to specific sectors, such as e-commerce, finance, tourism development, relocation and infrastructure improvement.

The workshops in Juancheng provide jobs for the elderly, the disabled, women who need to take care of their parents and children, and others who are unable to leave the village for long periods.

At the end of 2015, Juancheng, located in the mudflats area of the Yellow River, was a designated national-level poverty-stricken county, with 89,600 of its population of 890,000 living below the subsistence line.

“Nearly one-in-10 was living in poverty, which put me under huge pressure,” said Gu Ruiling, Party chief of Juancheng, who is responsible for poverty-alleviation in the county.

Gu didn’t feel a sense of relief until last year, when a number of workshops had been built in villages across the county, providing an effective way of fighting poverty.

Inspiration

County officials conceived the “workshops model” in November 2015, when they conducted research into poverty-alleviation work in Daitang, a village in the county’s Dongkou town.

“We saw several elderly women sorting hair in a shabby 10-square-meter shack made from plastic sheeting and simple wooden boards in a farmer’s yard.

An 82-year-old woman told us she enjoyed working in the shack because she could earn hundreds of yuan a month. However, she had to stop working if it rained and the workshop was cold in winter,” Gu said.

The sight was a revelation to Gu, who found himself asking: “Why don’t we build large, well-equipped workshops in villages to provide more jobs for villagers?”

About six months later, more than 160 workshops had been constructed in villages across the county. Each cost an average of 150,000 yuan to build, so the county finance department provided a subsidy of 100 yuan per sq m and the rest of the money was provided by public organizations and businesses.

The workshops are equipped with modern amenities, including water and electricity, and the operators—mainly businesspeople from large cities, introduced by local governments—can use them as soon as the formalities have been completed.

“We chose to build workshops in places that are easily accessible and convenient for the disabled and the elderly. Locations near kindergartens and schools are best because that makes it convenient for farmers who need to send their kids to school before going to work at the workshops,” Gu said.

Daitang resident Li Aiyun is employed in the workshop in her village. She goes to work after sending her grandson to school.

“I can earn some money while taking care of my family,” she said, adding that she can earn about 500 yuan a month.

According to Gu, workshop operators are required to obey a stipulation that at least 40 percent of the employees in every workshop are unskilled laborers living below the poverty line. The policy is facilitated by financial support from local governments, such as subsidized loans, to encourage the employment of the worst-off in society.

Training sessions

To provide the new employees with the requisite skills, the local government held 320 training sessions to teach them about industries such as furniture manufacture, hair products, clothing and electrical parts.

To date, 536 workshops have been built in Juancheng, and the initiative has prompted similar programs in other counties. More than 1,800 workshops have been built in villages across Heze, which administers Juancheng, providing jobs for 200,000 farmers, who are able to work near their homes. The move resulted in 57,000 rural laborers being lifted out of poverty last year.

Juancheng is known for hair products and furniture making. For the past three years, the output of the county’s hair-product outfits has registered an annual increase of 25 percent.

“Hair-processing enterprises usually need huge workforces. This is the type of work that farmers can easily do and their availability means the employers’ labor costs are reduced,” Gu said.

According to Fan Jifu, manager of Hongjuyuan Craftwork Co, a hair-processing company, sales hit 220 million yuan last year, a rise of 30 percent from 2015.

He said the business operates nine village workshops and employs more than 700 poverty-stricken farmers at competitive rates: “The workshop model has

reduced our labor costs by 20 percent.”

So far, 225 companies have been attracted to four industrial parks built by the county to lure hair-processing enterprises.

Meanwhile, the county is encouraging young people who have moved away to return and set up their own businesses.

Li Zhichao, who worked in South China for six years, learned about the workshop model when he returned to Juancheng at the end of 2015 to prepare for the upcoming Spring Festival. Impressed by the initiative, he rented a workshop for 15,000 yuan a year and started manufacturing cables for cellphones.

The workshop was quickly inundated with orders, so Li rented three more. He now employs about 400 people, half of them living below the poverty line.

In addition to providing jobs, the workshops are also generating tax revenue for the local government. Statistics supplied by the Juancheng government show that tax revenue from the furniture making businesses rose by more than 73 percent last year, compared with 2015, while the tax take from hair-processing operations rose by nearly 41.5 percent.

“The workshops provide places where poor farmers can work close to home and make a better living with their own hands, rather than relying on benefits. This year, we will encourage some operators to register as businesses and expand their sales networks through e-commerce channels,” Gu said.