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CHINA-RUSSIA JOINT VENTURE: HEAVY LIFT HELICOPTER DESIGN AND DEVELOPMENT

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China and Russia have agreed to sign a deal to jointly manufacture heavy lift helicopters.¹ The deal to co-produce the Advanced Heavy Lifter (AHL) is expected to be signed by the end of this year. The proposed lift capacity is said to be between the payload capacity of Mi-17 and Mi-26.² China has a requirement of a large number of heavy lift helicopters, both for civilian and military use. Most of the transport helicopters being operated by China are either of foreign origin or locally produced foreign designs. China is gearing up to attain indigenous capability in designing and building heavy lift helicopters.

It is to be noted that China had already developed a medium lift transport helicopter named the Z-18A. Now the effort is on to acquire the capability to locally produce heavy lift helicopters and this joint venture appears to be the first step in that direction. The total specifications of the helicopter are not yet out, but the speculated design goals are – heavy duty, large tonnage carriage capacity and good high temperature and altitude performance.³ The helicopter will have a maximum take-off weight of 38 tonnes and carrying capacity of 10 tonnes internally or 15 tonnes externally.⁴ In terms of carrying capacity the AHL would be less than Mi-26, which can carry 20 tonnes.

The design requirement appears to be completely driven by the Chinese need, which explains the reason for the heavy Chinese funding for the project. The Chinese industries might contribute in the airframe design, but most of design and development could probably be done by the Russian industries given the prior experience they have in this



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area (Refer Mi-26). China is actually seeking the technology and the skills required to build heavy helicopters. This method of assimilation of technology and skills from external players by pulling them to work with them for promoting indigenisation is now a tradition of the Chinese.

The power plant for the helicopter, by all logic, would come from the Russian side. Russian Deputy Prime Minister Dmitry Rogozin is reported to have said that an engine is under development which might be used in this helicopter project.⁵ The other complex aspect in helicopter design, i.e the power transmission system, would also come from the Russians, which the Chinese industries could learn. The co-production of this helicopter will be a big learning experience for China's helicopter industries.

It is to be noted that China recently conducted high altitude test of its indigenously produced Z-18A chopper in Tibet where it reached a record altitude of 9000 meters. The new helicopter, too, would be capable of good high altitude performance. The Z-18A has a load capacity of five tonnes which might not be sufficient to carry the AH-4 ultra light artillery in the fully assembled form. Here is where the uniqueness of the AHL might prove highly useful. The only region where such high altitude capability is required is in the Tibetan plateau bordering India. The AHL would be capable of transporting heavy equipment like armoured vehicles and artillery to high altitude areas.

The other military requirement would obviously be for a Taiwan contingency. The present plan, as believed, would be for transporting troops and armoured vehicles across the Strait by using watercrafts specially designed for such a role. Taiwan has prepared for such an event by deploying missiles on its coast to try and slow down a Chinese invasion. With the availability of heavy lift helicopters in large numbers, China could quickly transport troops and equipment across the Strait. One of the primary objectives of the PLA would be to take control of the Island as quickly as possible before any external power



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could intervene militarily. It is said that China would require about 200 such helicopters by 2040.⁶

The Russians benefit in this venture by way of heavy Chinese finance which would again kick-start Research and Development (R&D) in this area, which would help them retain the edge in heavy lift helicopter design and manufacturing. However, China is the major beneficiary in this project as far as future market is concerned. Already, China has demonstrated indigenous capability in the design and development of attack helicopters and medium lift helicopter. It is also known that China has developed another 10 tonne medium lift utility helicopter named Z-20 which is undergoing tests. Further, China is slowly mastering the essential technologies for indigenous helicopter manufacturing. Reportedly, China has achieved breakthrough in the research and development of bearing-less rotors which is a latest technology which is more efficient.⁷ This design offers structural simplicity and helps in carrying the various forces using flexible structural elements which otherwise would be acting on the bearings.⁸

The helicopter when in service could be utilised for civilian applications as well like disaster relief operations, search and rescue, fire fighting role and transport. Since the programme is driven by China's requirements the chopper would be tailored for high altitude operations and might be incorporated with terrain following radar, appropriate engines that could efficiently operate at those conditions. Last January, reports from Russia said that Russia has assured China that it will fully consider China's demand to ensure high altitude utility.⁹ The programme points to the long term vision of China where decades from now China might become one of the leading players in the international military and civilian helicopter market.

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End Notes

¹ <http://mil.xinjunshi.com/20150512/228574.html>, 12 May 2015.

² *ibid*

³ *ibid*

⁴ "Russia and China to Develop New Heavy Lift Helicopter", *IHS Janes 360*, 07 May 2015, Available at: <http://www.janes.com/article/51264/russia-and-china-to-develop-new-heavy-lift-helicopter>

⁵ http://bbs.miercn.com/201504/thread_446614_1.html

⁶ No.4

⁷ <http://war.163.com/15/0515/15/APLSP2FL000140MD.html>, 15 May 2015.

⁸ Yu Jin, Luo Yu, Liu Yong, "Vibration Reduction of a Bearingless Helicopter Rotor with Composite Tailored Couplings", Asia-Pacific International Symposium on Aerospace Technology, APISAT2014, Elsevier Ltd, 2014. <http://www.csa.org.cn/uploads/xiazai/xsb/2014/apisat2014/APISAT2014/part20.Structural%20Dynamics/170/Vibration%20Reduction%20of%20a%20Bearingless%20Helicopter%20Rotor%20with%20Composite%20Tailored%20Couplings.pdf>

⁹ "China and Russia Combined Research of S", Military Worker.cn, 22 Jan 2015.
