CENTRE FOR JOINT WARFARE STUDIES

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CHINESE 6TH GENERATION AIRCRAFT DEVELOPMENT

1. **China's Sixth Generation Combat Aircraft Developments: An Update.** Recently, Dave Makichuk gave an update in Asia Times on China's Sixth Generation Combat Aircraft Developments[1]. According to the author, the new warplane, under development by the Shenyang Aircraft Design and Research Institute, could be a clean-sheet design, not a copy of a foreign stealth fighter, but a revolutionary new design. Or it might be a development of the company's older FC-31, an export-optimized stealth fighter[2].

2. Earlier, Shenyang and the military department of the AVIC Manufacturing Technology Institute in 2018 jointly established a team codenamed J.J. with the goal of developing the new type fighter, Global Times reported. The J.J. team is believed to have submitted an illustration of a test piece in November 2019. The joint team reportedly is focusing on developing a curved, S-shape engine inlet. Curved inlets can block an engine's turbines from view, thus reducing a plane's radar signature. But the S-shape inlets are difficult to design and integrate.

3. China is building upon the experience it gained from its first operational stealth fighter, the twin-engine J-20 which entered service in 2019. Around 15 aircraft are expected to be in service with a single front-line regiment. Whereas Beijing specifically commissioned the J-20 from manufacturer Chengdu, the later FC-31 was a strictly private project that Shenyang hoped would lead to domestic or foreign orders. There were rumors that the type might evolve into a sea-based fighter for China's future, large aircraft carriers,but now it appears a version of the J-20 will fill that role.

4. As observed by Mark Episkopos in The National Interest and also appeared in the Global Times the People's Liberation Army Air Force (PLAAF) research and development strategy over the coming decades is that China will not fall behind in the global race

toward sixth-generation fighter jets and is expected to build its own next-generation fighter jets by 2035[3]. There is, an increasingly, well-defined list of basic sixth-generation features that the Global Times expects to see in the jet's design. First, the ability to command auxiliary drones that are closely integrated with the fighter's onboard control systems. These can fill both support and attack roles, and as in the case of the Su-57's recently leaked Okhotnik ("Hunter") attack drones can apparently execute air-to-air operations. Secondly, sixth-generation control systems are expected to offer a whole new level of artificial intelligence integration; immediate benefits include simplified fighter management and real-time analytics for faster targeting. Finally, sixth-generation fighters are expected to boast across-the-board performance improvements in the traditional areas of maneuverability, handling, range, and weapons delivery systems[4].

5. A revolutionary new aero engine design for the sixth generation combat aircraft was conceived by the AVIC long time back. The six-generation combat aircraft will break through the limitations of traditional engines and switch to variable-cycle engines. As early as 2012, the vice president of AVIC clearly stated that China has established a project for variable-cycle engines, so China's variable-cycle engine is expected to be in the development stage now[5]. It is understood that the working principle of the variable cycle engine is to adjust the engine cycle mode to adjust the engine thermal cycle parameters so that the engine can always maintain the best state during the working process, and the variable cycle engine can also make the aircraft have subsonic speed and flight efficiencies of sonic and hypersonic.

6. It is believed that the development of China's six-generation aircraft is basically at the same level as the United States and Russia. At the same time, China's aviation industry technology is considered slightly inferior to the United States and Russia, so it is very likely that China will not be able to follow the path of developing the sixth-generation aircraft. However, once China's sixth-generation aircraft is in service in the future, the Chinese Air Force will have the ability to resist intervention and regional opposition in future wars, which is of epoch-making significance for China[6].

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[1] https://asiatimes.com/2020/03/pentagon-panic-china-ponders-a-better-stealth-fighter/

[2] ibid

[3] https://nationalinterest.org/blog/buzz/forget-stealth-f-22-or-j-20-china-has-some-serious-plans-6th-generation- fighter-44522

[4] ibid

[5] https://www.globalsecurity.org/military/world/china/j-yy.htm

[6] ibid