



# CENJOWS

## CHINESE AERO-ENGINES

**China: Aero-engine Development Update.** Aero Engine Corporation of China (AECC) is a Chinese government-owned corporation which is focused on aero engine and related technology development. The company was established on August 28, 2016. The corporation consists of 46 affiliate companies, including 22 engine companies, and several institutes.

The corporation produces four types of turbofan engines; four types of turboprop engines; four types of turbo shaft engines; six types of turbojet engines; eight types of piston engines and six types of gas turbine engines. The corporation is also developing six types of turbofan engines, two types of turboprops, two types of turboshafts, and one type of gas turbine engine.<sup>1</sup>

Nearly 600 sets of equipment developed and produced by Aero Engine Corporation of China (AECC), were displayed during the military parade held in the Zhurihe military training base. The development of aero-engines and gas turbines has been listed by China as the top one among the 100 big projects of its 13th Five-Year Plan, the country's roadmap for 2016 to 2020.<sup>2</sup> WS-15 is their most modern aero-engine programme.

The WS-15, codename Emei, is an afterburning turbofan engine designed by the Shenyang Aero-engine Research Institute and manufactured by the Xi'an Aero-Engine Corporation, which will be used to power the Chengdu J-20 aircraft for achieving super cruise. It has a three stage low-pressure, 6-stage high-pressure compressor; annular combustion chamber; one-stage high-pressure, one-stage low pressure counter-rotating turbine with a dry thrust of 105 kN and afterburner thrust of 180+ kN.<sup>3</sup> The engine, reportedly, remains unstable after failing to meet reliability targets over hundreds of hours of testing.<sup>4</sup> Therefore, China is trying to overcome the reliability issue by other possible means.

<sup>1</sup> [https://en.wikipedia.org/wiki/Aero\\_Engine\\_Corporation\\_of\\_China](https://en.wikipedia.org/wiki/Aero_Engine_Corporation_of_China)

<sup>2</sup> [https://www.alwihdainfo.com/China-plans-to-catch-up-with-advanced-aero-engine-producers-in-20-years-expert\\_a57651.html](https://www.alwihdainfo.com/China-plans-to-catch-up-with-advanced-aero-engine-producers-in-20-years-expert_a57651.html)

<sup>3</sup> [https://en.wikipedia.org/wiki/Xian\\_WS-15](https://en.wikipedia.org/wiki/Xian_WS-15)

<sup>4</sup> <https://www.businessinsider.com/engine-chinas-stealth-fighter-desperately-needs-unreliable-2018-11?IR=>

The U.S. recently unveiled charges against two alleged Chinese spies for orchestrating a conspiracy to steal jet engine technology from private companies. This follows on the heels of another case in which a Chinese intelligence official was extradited from Belgium and charged with conspiring to steal trade secrets from an Ohio aviation company during October 2018.<sup>5</sup>

China has several other concurrent engine development programmes. Its hypersonic vehicle engine has been successfully developed. China's home-grown turbine-based combined cycle (TBCC) engine system has entered the aircraft-engine integration test phase, a major step toward the development of the country's next generation hypersonic drone.<sup>6</sup> J-20 prototype aircraft assigned to the Chengdu Aircraft Company have already flown with WS-10 engines, and it is rumored that it has flown while fitted with thrust-vectoring variants of the WS-10. Spinoffs from these programmes are likely to help China overcome its WS-15 programme issues as well.<sup>7</sup>

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<sup>5</sup> <https://www.bloomberg.com/news/articles/2018-10-31/chinese-spies-tried-to-steal-aviation-technology-u-s-alleges>

<sup>6</sup> <https://economictimes.indiatimes.com/news/defence/china-successfully-completes-hypersonic-engine-test/articleshow/67435297.cms>

<sup>7</sup> <https://www.defensenews.com/air/2018/11/07/china-showcases-progress-on-stealth-fighter-jet-at-zhuhai-airshow/>