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China's Defence Aviation Industry: Searching for Innovation

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Synopsis

Prolonged systemic challenges continue to strain and divide China's military-aviation industry. Nonetheless the sector's overall modernisation drive is probably the most prominent among China's defence industries.

Commentary

OVER THE past decade, China's military-aviation industry has been gradually transforming its defence, science, technology, and innovation capabilities, and narrowing the once-wide technological gaps with advanced aviation powers. In the fighter aircraft arena alone, it has been developing, testing, and producing a diverse portfolio of new designs - updating and modernising its 'legacy fighters, developing indigenous modern 'fourth-generation' fighters, and preparing to break into the 'fifth-generation' aircraft market.

The recent unveiling of China's next generation fighter aircraft prototypes - the J-20 and J-21 - along with accelerated modernisation of the Chengdu J-10 and Shenyang J-11 fleets, shows not only the increased sophistication of Chinese combat aircraft, but more importantly, the ongoing transformation of China's military-aviation sector.

Rise of Aviation Industry Corporation of China (AVIC)

China's largest aviation industrial group, AVIC, has been on a new path of reforms since November 2008 when the Chinese government remerged twin aircraft manufacturers AVIC I and AVIC II after a decade of separate operations. The principal aim of the re-merger was to move from traditional geographical divisions and consolidate overlapping areas of responsibility that limited the industry's capacity for innovation and technological development. The transformation of AVIC created a new corporate structure and strategy aimed to enhance China's aerospace competitiveness and improve systemic efficiency. Particularly targeted is the delivery of equipment for the People's Liberation Army (PLA) by integrating product lines, instituting best business practices, resource allocation, and accelerating industrial R&D innovation and production capabilities – in both civil and military aviation sectors.

AVIC's Defence structure now includes five core defence-aerospace prime contractors: Chengdu Aircraft Industry Corporation (J-10; J-20; FC-1 fighters), Shenyang Aircraft Corporation (J-8; J-11; J-15 fighters), Hongdu Aviation Industry Group (K-8; L-15 trainers), Xi'an Aircraft Company (H-6; JH-7 bombers), and Changhe/Hafei Aviation (Z-8; Z-9; Z-11 helicopters). These are supported by Tier 1 suppliers and system-

integrators such as Shenyang Liming Aero-Engine (fighter engine WS-10), Xian Aero Engine (fighter engine WS-9 and supplier of WS-10), AVIC Avionics (flight control, power systems). The defence supply-chain is further supported by Tier-2 and Tier-3 suppliers of systems and components such as Chengfa Science and Technology (aero engine components and control systems), AVIC Aero-Engine Controls (aero engine control systems), Hubei Aviation Precision Machinery (electro-mechanical parts and systems), and Jonhon Optronics (connectors).

According to Lin Zuoming, the group's President, during 2008 - 2011, AVIC Group recorded a 20% compound annual growth rate in revenues. In 2011, AVIC's revenue increased 20% to CNY250 billion (USD39.6 billion) and net earnings increased more than 15% to CNY12 billion (USD1.89 billion). AVIC's figures compare favourably with major Western primes, such as BAE Systems, which in 2010 posted annual sales of GBP22.39 billion (USD34.7billion).

PLAAF's operational requirements

AVIC's financial performance reflects China's continued robust defence spending growth, with more resources allocated for procurement of new equipment. With the People's Liberation Army's Air Force (PLAAF) widening operational requirements, there is a growing need to replace China's aging third-generation fighter jets (J-7 and J-8) and modernise supporting logistical infrastructure and equipment. This is projected to drive defence spending higher, leading to the expansion of China's military-aviation sector – from helicopter, trainer and transporter fleets to fourth and fifth-generation fighter jets.

Notwithstanding China's ongoing reliance on Russian assistance in the development of core systems such as engines and avionics, China's indigenous aerospace manufacturing base and its capabilities are now increasingly able to supply the PLAAF with a portfolio of aircraft platforms, technologies, and systems required for its modernisation. This is evident from the proportion of fourth-generation aircraft in service with the PLAAF, which has risen from 23% in 2005 to 33% in 2010, and is expected to reach about 50% by 2015.

Toward further innovation

Indeed, as early as the late 1990s, the bulk of the PLAAF was based almost exclusively on the obsolete 1950's-era Soviet design combat aircraft based on MiG-19 and MiG-21s. In 1999, China's fourth-generation fighters included fewer than 100 operational Su-27 armed with beyond-visual range air-to-air missiles. The PLAAF had no inventory of precision-guided munitions (PGMs) and its pilots received only limited training, constrained by time and weather conditions. By 2010, however, the PLAAF retired most of its obsolete aircraft, acquired over 300 fourth-generation fighters (J-10, J-11, Su-30 variants), armed with advanced air-to-air missiles and PGMs (i.e. Kh-31/AS-17 Krypton), and capable of flying in all-weather conditions. PLAAF pilots are now supported by China's first domestically-produced airborne warning and control system (AWACS) aircraft and new generation of air defence systems (HQ-9).

Depending on the ability of China's aerospace primes to develop and integrate innovative systems and technologies, China's fifth-generation combat aircraft J-20 may become operational by 2020. In the process, the pace, qualitative orientation, and continuous resource allocation toward innovation in China's defence aviation industry may in the long run elevate its position closer toward global defence aviation primes.

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