

# Revisiting the 'Nene Blunder': Western Aviation Technology Transfers to China

*By Marco Wyss*



General Electric (GE), a major player in jet engines and aeronautical technology, plans a joint venture with the state-owned Aviation Industry Corporation of China (AVIC). The American company is supposed to provide its advanced avionics technology – the electronics for communications, navigation, cockpit displays and controls – for the development of the new Chinese airliner: the C919, a potential future competitor for Airbus and Boeing in China. Exporting state-of-the-art technology is neither a new phenomenon for GE, nor for other western companies. Amid competition for lucrative sales to a continually expanding Chinese aviation market, these companies are willing to sell their technological prowess: Beijing asks for technology as an entry price, and plays foreign competitors against one another for handsome commercial prizes. Although Washington and Brussels are well aware of the dangers their companies incur in joint-ventures, particularly by upholding an arms embargo against China, they are nevertheless reluctant to intervene more forcefully against the transfer of their major capital – technology.

The Chinese Government attaches similar importance to the development of the C919 – which is already kitted out with western technology – alongside a number of components used in the national space programme. Beijing not only wants to strengthen its grip on its domestic aviation market, but to branch out internationally as well. Western companies are basically helping China to do this on two levels; increasing Chinese

competitiveness in the civil aviation sector, which inadvertently runs the risk of dual-use technology, which can find its way into Chinese military aircraft developments.

When US Secretary of Defense Robert Gates visited China in January, his hosts disclosed and tested the prototype of their first fifth generation fighter aircraft in an apparently unintended side-show. At first glance, the J-20 prototype seems to have many similarities with the American F-22 Raptor – the world's first and only fully operational fifth generation fighter aircraft yet. Meanwhile, according to Russian experts, half of the Chinese stealth fighter prototype is Russian designed and still powered by Russian engines. Admittedly, it could still take ten or more years until the J-20 is fully operational and, according to most observers, its flight performances will be less than those of the F-22. The US also has the F-35 up its sleeve, an ace it is willing to share with a number of allies as an advanced multirole stealth fighter.

Nevertheless, the J-20's apparently lower, albeit unconfirmed performances should not distract from the great leap forward of the Chinese military aircraft industry. Within a short time span it went from developing fourth to fifth generation aircraft; in ball park terms, that has put them close to Russian capabilities, whose PAK-50-FA fifth generation aircraft made its maiden flight a year earlier. Although Beijing would not have been able of this achievement without its mentors from Moscow, there will

also have been a lot of American and European technology in the new prototype.

The J-20 is only the most recent and most infamous exploit of the Chinese aviation industry. Since the 1990s, Beijing has pushed through reforms and injected enormous amounts of cash to transform its defence industry. Self-sufficiency in defence issues has been one goal, modernising the People's Liberation Army (PLA) the other. Among the defence sectors and military organisations, the military aviation industry and the PLA Air Force (PLAAF) have been the main players in this game. According to the 2008 Chinese national defence White Paper, the aim was to accelerate the PLAAF's 'transition from territorial air defense to both offensive and defensive operations, and increase its capabilities for carrying out reconnaissance and early warning, air strikes, air and missile defense, and strategic projection, in an effort to build itself into a modernized strategic air force'. At least from a material perspective, Beijing is gathering pace on this front. The Chinese aerospace manufacturing base, which is organised into AVIC, can virtually single-handedly supply the PLAAF with the aircraft it requires. The only countries with a more complete aircraft industry than China are Russia and the US.

All that said, China still has a number of steps it must take to close the gap with Russia, and indeed, sizeable leaps when it comes to America. The gaps are mostly in the field of engines and avionics – both areas in which GE has much to offer. Beijing is not afraid to use reverse engineering or the integration of advanced commercial technologies into existing platforms to gain a couple of paces. It also has few qualms about exploiting dual-use technologies.

The defence industry is linked to the commercial sector, which in turn enters into partnerships and joint-ventures with western companies. This allows for the indirect transfer of technologies, know-how and money into the defence industry. AVIC aggressively pursues this strategy in the commercial sector through partnerships – not only with GE – but even with future competitors in the civil aviation market, such as Boeing and the European Aeronautic Defence and Space Company (EADS). As the achievements of China's military aviation industry demonstrate, these strategies have proved to be successful. If nothing else, they make a mockery of the western arms embargo imposed on the Middle Kingdom. The joint-venture between GE and AVIC is illustrative of this 'success story'.

The jauntiness with which western governments allow their aeronautical companies to export technology to China is akin to what the historian Jeffrey A. Engel termed the 'Nene blunder'. At the onset of the Cold War, in 1946 and 1947, the British Rolls-Royce company sold Nene jet engines to the Soviet Union. Britain was the leading nation in jet technology at the time, and the Soviets did not even possess a prototype. But through reverse

engineering, they were able to start production of their own engines. Only a few years later, the Americans were confronted with the Russian Mig-15 in the Korean War; not only did the Mig outperform US aircraft, but it was also powered by a 'descendant' of the Rolls-Royce Nene engine. Until the US was able to align equivalent or superior aircraft, the Migs took a heavy toll on its air force equipment and personnel. London felt the full wrath of Washington as a result. Even before the appearance of Soviet jet fighters in Korean skies, America had voiced concerns over Britain's laissez faire defence exports – even when the stash was going to allied or neutral countries. Unsurprisingly the criticism turned to outright anger in light of the experience. Whitehall had no choice but to admit its blunder. Part of the explanation was that Britain was broke after the Second World War. Lax export policies were designed to earn money and secure a leading position on the international aircraft market. London also considered its large and highly advanced aircraft industry as a means to restore and maintain Britain's world role. Obviously arms sales were off limits to Russia and their allies as the Cold War chilled, but it was not really until the 'Nene blunder' sunk in, that Whitehall fully grasped the security implications of technology transfers.

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But even then Britain remained willing to supply engines, aircraft and the licences to build them to Allies, neutrals and non-aligned countries. The Treasury's position could not really allow for much else. The risk that advanced technology could indirectly fall into Soviet hands was understood, and although London did not direct supply its direct foes, it

still played into the hands of its future competitors on the military aviation market. Partially thanks to British technology transfers, the French – whose aircraft industry had almost been annihilated by the Second World War – soon posed a threat to the British aircraft industry and finally overtook it.

In contrast to London, security interests mostly outweighed business interests in Washington during the Cold War. If a country wanted American technological know-how it had to either be allied or informally aligned. A wealthy US could act from strength as the dominant force in western armouries. Fast forward sixty years, and America is looking more like post-War Britain. The US has massive financial difficulties and a negative trade balance. Washington, similar to its European Allies, has thus become willing to accept that its leading aeronautical companies must export their technological prowess to benefit from the Chinese market. Moreover, just like early Cold War Britain, it holds the erroneous belief that western technology is still so advanced that an industrialising country could never catch up.

But it is not just a case of technological arrogance in the West. What its leaders and companies tend to forget – or willingly disregard – is that short-lived financial gains come with political,

security and economic risks. Despite Washington's and Beijing's continuous assurances that they both desire a cooperative and peaceful relationship, diverging geopolitical interests could lead to antagonism. The PLAAF has made quite clear that its capabilities, doctrine and training are calibrated on an anti-access/area-denial strategy. Defending Chinese sovereignty and territory is the order of the day. As yet, Chinese anti-access capabilities remain a work in progress, and striking power remains inherently limited. Nevertheless, the doctrinal and material modernisation of the PLAAF has raised concerns in the US, particularly around the vexed issue of Taiwan. American capabilities still outweigh Chinese clout in East Asia, but if Washington and Brussels continue to supply the Chinese aviation industry with technological know-how, the material gap could disappear. With additional developments in doctrine and training, the PLAAF could thus become a formidable challenge to US force projection in Asia-Pacific writ large.

Moreover, China could greatly enhance its position on the military aircraft market; that would pose a direct threat to US arms exports, a fate that the Russians already know far too well. After years of technology transfers to China, they have played a fundamental role in building up Beijing's aircraft industry which is now bearing down on Moscow's arms trade interests. Chinese fighters are now competing with Russian types for orders from developing and third world countries; this certainly has raised hackles from Russia Inc, and in particular from the MiG and Sukhoi aircraft companies. Although Moscow is closing the door after the horse has bolted in terms of holding back new engines, it's probably a case of too little too late. Beijing's reverse engineering and western technology transfers will make mince meat of Russian intransigence.

In a few years time, Washington could also be confronted with the same sobering situation as Moscow. US aircraft would have to compete with relatively cheap but highly advanced Chinese types. Hardly an uplifting thought for the US government or commercial big wigs. The only silver lining at this stage is that Beijing still regards military exports as a secondary priority after the equipment of the PLA. But the writing is on the wall; China is increasingly aware of its financial power and the strategic edge this will bring in terms of arms transfers. This not only applies to Chinese military hardware, but future fighter exports to developing states for enhanced political leverage. America and Russia will be the inevitable losers in that game.

As the J-20 brilliantly demonstrates, western and Russian aviation technology transfers to China are extensive. Although an ever more competitive Chinese aircraft industry risks undermining western security, political, and commercial interests, the US and its European Allies will probably continue to sell their inventions for hard cash. The Chinese are thus well 'en route' to reach parity in aircraft developments, first with the Russians, and then with the Americans. This process seems to be irreversible, whether the political fallout will be quite so acute remains to be seen. ■

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Lin Zuoming, left, president of AVIC with GE CEO Jeffrey Immelt, announcing plans last year for an avionics joint venture. Bloomberg News