

On Aug. 9, 2008, eight Su-30MKI strike fighters, two Il-78 tankers, and two Il-76 airlifters from the Indian Air Force (IAF) landed at Nellis AFB, Nev., to begin India's first-ever participation in USAF's renowned Red Flag air warfare training exercise.

The intent was to demonstrate the IAF's ability to project a combat-capable force halfway around the globe, to sustain and support such a presence, to operate alongside other air forces and integrate effectively with them, and to exchange best practices with USAF and other exercise participants.

By all accounts, the experience was a resounding success. The IAF brought a mix of seasoned and novice pilots, flew more than 350 day and night sorties, and rode a steep learning curve throughout the two-week exercise. Although its aircraft were not wired to tap into the US Link 16 communications network, they flowed seamlessly into the Blue Force's daily game plan in every other respect.

After the exercise ended, the desire for more USAF-IAF interaction was well-expressed from an American perspective by a Blue Force planner, Capt. Marcus Wilson. He said the IAF was a "world-class air force with great aircraft and great leadership. ... We would like to have IAF here as a regular participant."

Most Americans remain under the mistaken impression the IAF is a remote Third World air force flying antiquated Soviet-

era MiGs. In fact, India operates the world's fourth-largest air arm with more than 1,300 aircraft at some 60 bases nationwide. It also is one of the world's oldest continuously functioning air services, with roots going back to Oct. 8, 1932, when it was established by Great Britain's Royal Air Force as an auxiliary of the Indian Empire during the time of the British Raj.

Until the early 1990s, the IAF was little more than a support entity for the Indian Army. As such, it had a purely tactical orientation and operated almost entirely in the shadow of its bigger army brother when it came to its budget share and bureaucratic clout. Today, in contrast, the IAF has acquired independent strategic missions, including first and foremost, nuclear deterrence and retaliation. It also operates first-rate equipment and is determined to build its global reach and status.

The Indian Air Force's recent emergence as a full-spectrum air heavyweight has been distinguished by fielding not just fourth generation multirole fighters but also force-extending tankers, an airborne early warning and control system capability, intra-theater airlifters, remotely piloted aircraft, and the beginnings of a military space surveillance capability.

This impressive achievement has naturally paralleled the growing disposition of India's foreign policy establishment to develop a capability for projecting Indian power, presence, and influence beyond the Indian subcontinent. In that regard, a



India's Air Force Evolves

By Benjamin S. Lambeth

Photo by Sagar Pathak

former commander of the IAF's Western Air Command, retired Air Marshal V. K. Bhatia, wrote in 2009 in *SP's Aviation* of the service's "growing aspirations to transform itself from a mere sub-continental tactical force to an intercontinental strategic aerospace power in conformity with other leading air forces in the world."

Indeed, the flight plan the IAF has followed unswervingly since the late 1990s has shown remarkable parallels to USAF's transformation after the Vietnam War. Today, the service has more in common with USAF than with most other air forces in overall size, reach, composition, breadth of missions, and ability to achieve tactical and strategic effects. Its principal operating forte, according to its then-Chief of Air Staff, Air Chief Marshal S. P. Tyagi, in 2006, is its ability "to conduct a swift and decisive offensive campaign."

TRAINED TO THE HIGHEST STANDARDS

The IAF is mainly a fighter force, with the Soviet-designed and indigenously produced Su-30MKI its current pride. This aircraft is not a stock Russian product but a hybrid built expressly to IAF requirements and incorporating both indigenous and Western technology, including Israel's Litening targeting pod. It is back-stopped by three variants of modernized MiG fighters and Jaguars and Mirage 2000s fielded in multisquadron strength.

The IAF is a combat organization in which fighter pilots have traditionally dominated the service's leadership. This comes as no surprise, considering that its ratio of fighter pilots to others is substantially higher than USAF's, due to the small size of the IAF's tanker and transport inventory, its fairly small helicopter community, and its lack of a long-range bomber force.

Among the service's predominant cultural traits are a deeply ingrained can-do attitude, a well-educated and technically literate officer corps, an ability to absorb and operate high-technology equipment quickly, and aircrews trained increasingly to the highest Western standards. These characteristics were directly imparted to the IAF by its RAF progenitor years ago and are well-captured in the service's proud motto, "Touch the sky with glory."

The IAF differs notably from USAF in its composition and command and control arrangements. Its main operating entities—Western Air Command, Eastern Air Command, Central

Air Command, Southern Air Command, and Southwestern Air Command—are regional rather than functional in focus and are not just force-provider organizations but also combat entities with full execution authority. When it comes to the allocation and apportionment of IAF aircraft in joint operations, Air Headquarters in New Delhi remains the ultimate locus of decision making. However, because of the country's large size, the daily operational control of those assets is delegated to the IAF's five regional commands, whose commanders see to the tasking of all air assets within their respective geographic areas of responsibility.

As for its doctrine and concepts of operations, the IAF now stands at the forefront of modern airpower thinking, with its leaders increasingly confident that any major conflict involving India will be air-led and that India's chances for success in any such confrontation will depend heavily on what the IAF can contribute to the joint fight.

IAF fighter pilots log an average of 180 to 200 flight hours a year in a variety of air-to-air and surface attack mission profiles. Continuation training at the squadron level focuses mainly on air defense, aerial combat, and airfield attack, with less emphasis placed on defense suppression and counter land missions. The IAF's long-classic practice of low-level ingress to targets and manual bombing with unguided munitions has increasingly given way to medium-altitude tactics and the delivery of precision guided weapons from standoff ranges. That said, the IAF still remains only in the early stages of its precision revolution and is now about where USAF stood at the time of Operation Desert Storm in 1991, when fewer than 10 percent of its munitions delivered in combat were precision guided.

Recent years have also seen an IAF trend toward the periodic conduct of large-force employment exercises at the squadron level involving multiple tanker hookups and often the inclusion of airlifters, helicopters, and special operations forces.

As for its force structure, the IAF is unusually diversified. It operates seven types of fighters, six types of helicopters, four types of airlifters, and three types of trainers, as well as tankers, new AWACS platforms, and a variety of remote piloted aircraft. Some of its fighters and mobility aircraft have been retained well beyond their planned service life. Because of this virtual

Over time, the IAF has become increasingly like USAF.



An Indian Air Force IL-78 refuels an IAF Su-30MKI Flanker while flying in formation with two USAF F-15s during preparations at Mountain Home AFB, Idaho, for a Red Flag mission in 2008.

menagerie of different aircraft types—26 in all from four nations of origin—the IAF faces a uniquely complex force management challenge and a maintenance nightmare. This requires an uncommonly agile logistics approach.

Advanced weapons training and tactics development and validation are conducted by the IAF's Tactics and Air Combat Development Establishment (TACDE) at Air Force Station Gwalior located not far south of New Delhi. This elite training facility—begun in 1971—and the more recently created air warfare center in the United Arab Emirates—established in 2000—are the only true foreign counterparts to USAF's Air Warfare Center at Nellis or the Naval Strike and Air Warfare Center at NAS Fallon, Nev.

TACDE has long maintained air combat maneuvering instrumentation to support its periodic large-force training activities by providing real-time readouts of essential flight information on each participating fighter to facilitate the most accurate mission debriefings. It also is now seeking to acquire its own fully instrumented range complex for use as a site for future IAF-sponsored exercises comparable to Red Flag.

High-profile international training exchanges have become especially important to the IAF. The service had opened itself to the outside world in 2003 when it invited a detachment of French air force Mirage 2000 fighters to Gwalior to take part in a novel air-to-air training exercise called Garuda. During the 12-day event, IAF pilots did not fare well in simulated beyond visual range combat and learned some important lessons about modern aerial warfare. It was only after that sobering experience that the IAF fighter community began to move decisively beyond its old-school insistence that “the only good kill

is a gun kill” and to appreciate the tactical value of cross-training with Western air forces. This required reassessing what their former Soviet suppliers had long said about the capabilities of Soviet aircraft and weapons.

A year later, the IAF hosted Exercise Cope India 2004 at Gwalior, involving six participating F-15Cs from USAF's 19th Fighter Squadron at Elmendorf AFB, Alaska. That event offered the IAF's fighter community its first opportunity to interact closely with American airmen in a training environment since an exercise in 1963 brought a small detachment of F-100s to India.

The IAF's pilots had learned much about modern aerial combat in the short time since their unexpected comeuppance at the hands of the French in 2003. Thanks to determined efforts to master and further refine their resultant learning, they gave their USAF visitors a surprising wake-up call regarding India's creative and effective use of mostly Soviet-designed fighters.

According to subsequent accounts by USAF participants, the IAF pilots who flew in Cope India 2004 showed impressive flexibility and tactical innovation. In marked contrast to the highly scripted and predictable tactics under close ground control that the Soviets would most likely have employed in any NATO-Warsaw Pact showdown in Central Europe, the Indians varied their aircraft mixes, altitudes, and formations and never reinforced failure by repeating tactical moves the F-15 pilots had easily countered.

The USAF visitors faced “superior numbers [but also] an IAF pilot who was very proficient in his aircraft and smart on tactics,” commented the leader of the F-15 contingent, Col. Greg Neubeck, after the exercise ended. “What we've seen in the last two weeks is the IAF can stand

toe-to-toe with the best air force in the world,” he said. “I pity the pilot who has to face the IAF and chances [that] day to underestimate him, because he won't be going home.”

INVESTING IN AIRCRAFT

The IAF is now pursuing three major combat aircraft acquisition programs. The first, India's indigenous Light Combat Aircraft is intended to replace the service's aging MiG-21s with a domestically designed successor.



The LCA has been pushed hard by the Indian government and even more aggressively by India's aviation industry with its own vested interests. Both of those powerful domestic backers have shown a consuming urge to get a credible indigenous combat aircraft program up and running. The first LCA was delivered to the IAF in January.

A second, and more robust, IAF acquisition effort now underway is the service's Multirole Combat Aircraft (MRCA) program, entailing a \$20 billion bid to acquire 126 new fighters, with all but the first 18 to be manufactured in India. For the winner-take-all prize, the initial



An Indian Air Force Il-78 tanker takes off from the runway at Mountain Home in 2008, while an IAF fighter waits on the flight line.

Photo by Sagar Pathak



USAF photo by Jet Fabara

Photo by Sagar Pathak

competition pitted six foreign contenders against each other: the Lockheed Martin F-16IN, Boeing F/A-18E/F, Eurofighter Typhoon, Dassault Rafale, SAAB JAS-39 Gripen, and a still-developmental MiG-35 derivative of the MiG-29 the IAF had long operated.

To the surprise of many who followed this competition, only the Typhoon and Rafale survived the initial downselect to become semifinalists. In January 2012, India announced Rafale was its MRCA choice.

That unexpected dark-horse choice suggested the fighter pilots who dominate the IAF almost surely got their way in wishing for the most modern of the six contenders, even though the French air force and navy have been slow to acquire their own Rafales—and even though no foreign country had adopted the aircraft before India chose it.

The selection further attested that cost was not the driving concern, given that the likely price of the Rafale is widely assessed as the highest among the contenders.

French willingness to release sensitive technology, including the aircraft's main

mission computer source codes, could have also played a role in the decision. Such a tech transfer would have been proscribed from being shared abroad by US export controls.

Finally, the IAF had long been satisfied with its French-developed Mirage 2000s, and if nothing else, a decision to acquire the Rafale would make for a familiar supplier arrangement.

The two involved governments are still in protracted contract negotiations, so it

Clockwise from top left: A USAF F-15 and an IAF Mirage 2000 fly together over the Himalayas during Cope India 2004. India's new jet fighter will also be French-developed. An IAF sergeant stands atop an Su-30MKI Flanker during flight preparations at Mountain Home. A Boeing C-17 for India arrives at Edwards AFB, Calif., for testing in 2013. India is on track to become the world's second-largest C-17 user, trailing only the US.

USAF photo by TSgt. Keith Brown



USAF Capt. Pete Felser is briefed on Su-30K operations by U. Rakhura, an IAF wing commander, during Cope India '04. It was the first dissimilar air combat training exercise between the two nations in more than 40 years.



Two IAF Mirage 2000s lead a formation of USAF F-15s and IAF Su-30Ks over India during Cope India '04. Plans for future Cope India and Red Flag exercises are in the works.

remains unclear when the MRCA effort will finally succeed in putting rubber on the ramp at IAF bases.

The third and last ongoing IAF force modernization initiative is the planned acquisition of a Fifth Generation Fighter Aircraft once its MRCA buy nears completion.

India signed an agreement with Russia in 2007 to co-develop an indigenous version of the Sukhoi T-50, a Russian stealth fighter said to be comparable to USAF's F-22. This aircraft made its long-awaited maiden flight on Jan. 29, 2010. Sukhoi describes it as incorporating very low observability, high maneuverability, an active electronically scanned array radar, and supercruise.

So far, although Russia and India have each pledged more than \$5 billion to the joint FGFA project, state-owned Hindustan Aeronautics Limited (HAL) has played no part whatsoever in the T-50's development. This raises questions about HAL's co-development role, as the aircraft's main design features appear to be set by Sukhoi.

Another concern regarding the program's long-term viability is whether HAL will have the engineering and industrial know-how to contribute effectively in a cutting-edge fifth generation program, in light of its continuing developmental difficulties with the far simpler LCA.

There remains a chance this fifth generation program could prove a bridge too far for India's aerospace industry. Similarly, should the Russians themselves fail to deliver the T-50 as expected, the IAF could well be forced to develop eleventh-hour fallback options to acquire its fifth generation capability.

In decades past, India's relations with the US were distant and strained because

of Washington's close ties with Pakistan going back to the earliest years of the Cold War. The American inclination to favor Pakistan geopolitically created a natural disincentive against cooperative bilateral ties with India, as did the predominant American view for many years of India being half of the annoying "India-Pakistan problem." American coolness drove New Delhi toward Moscow, which became the main purveyor of the IAF's Cold War combat aircraft.

IMPROVING RELATIONSHIPS

Today, the US and India live in a fundamentally different world of increasingly shared security concerns. These include a robust and expansionist China showing regional hegemonic ambitions in South Asia, an ever more unstable Pakistan, and radical Islamist extremism and its associated threats of global terrorism presenting both current and long-term threats to both countries.

In this new setting, mutual understanding and a mutual willingness to seek a more cooperative relationship have improved US-India relations substantially. So has New Delhi's recent softening of its long-standing insistence on strict nonalignment, which has in turn progressively yielded to closer interactions with the West.

In light of these considerations, USAF chose wisely in 2010 when it opted to make India the 14th country to be included in its periodic bilateral Opera-

tor Engagement Talks. These recurrent discussions have continued in a collegial spirit ever since, most recently in a three-day operator-to-operator exchange hosted last December at Pacific Air Forces' headquarters in Hawaii, with the IAF delegation headed by the service's vice chief and with topics including plans for future Cope India exercises and the IAF's prospective return to Nellis for a second Red Flag, in 2016.

The case for closer USAF interaction with the IAF is compelling for at least three reasons.

First, the IAF serves the world's largest democracy and its fastest-growing economy after China's. It also has more in common with USAF than with most other air forces around the world.

Second, although India chose in the end not to go with either proffered US candidate as its final MRCA choice, the IAF has increasingly acquired other American aircraft, including a recent purchase of six C-130Js. Beyond that, with 10C-17s now delivered or on order and with an option to buy six more, the IAF would become the world's second largest C-17 user. It could yet become a satisfied user of other US aircraft and associated systems in years to come.

Finally, as a result of its increasingly shared regional security concerns with the US, New Delhi has an abiding common interest with Washington in achieving a satisfactory solution to continuing political and strategic challenges in Afghanistan and Pakistan.

To be sure, it would be premature to suggest that today's improved US-India relationship portends anything like a more formal security partnership between the two countries anytime soon. Short of that, however, continued bilateral ties between USAF and the IAF make ample sense on multiple grounds and are well worth pursuing in any case, since the IAF has finally emerged as a world-class air force in the service of a vibrant democracy that has every likelihood of being a constructive participant in today's and tomorrow's global security environment. ✪

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