

# REALISING INDIA'S AEROSPACE POWER AND BEYOND

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The updated version of the Indian Air Force doctrine published in June 2022 gets concise and more focused attention towards realising the air force as an aerospace power. To be an agile and adaptable air force that provides decisive aerospace power in furtherance of national interests. Air power has become a preferred medium for the launch of offensive operations as it offers the advantage of inter-continental range, short-notice employment, high speed of delivery and the ability to provide precision strikes providing assured, clean, swift, calibrated, varied and flexible response for strategic-operational-tactical agility to achieve strategic goals.

The air power will be required to dominate the Tactical Battle Area (TBA), providing comprehensive Air Defence (AD), air superiority over the hostile air environment, enhanced cyber-electronic capabilities to aid Effect Based Operations (EBOs), furthermore, undertaking multi-domain options spreading from conventional to nuclear operations and kinetic to non-kinetic strikes along with responding to natural calamities, Out of Area Contingency (OOAC) and delivering results in the scenario of No War No Peace (NWNP). The increased focus on network-centric operations calls for increased utilisation of space-based assets in all operational domains of land, sea and air. Especially in the case of air power the increased dependency on space-based assets has given the term "aerospace power," an adage in recent times.

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The changing nature of warfare all over the world suggests that air power combined with space assets is taking the front seat. The trend suggests most of the advanced militaries around the world are trying to converge traditional air dominance elements with space support elements, as in the case of China, an idea which is bolstered by the introduction of the PLA Strategic Support Force (PLASSF) in 2015. The US has already operationalised its 8th uniformed service branch the US Space

Command under its Department of Air Force, other countries also have got a similar setup in recent years as France has the French Space Command as a formation of the French Air and Space Force. In a comparable format, the Russian Aerospace Forces combine its space and air arm.

China, in this case, has undertaken one of the most significant defence reforms in recent times which included giving priority to expanding its Navy and Air Force to enhance its influence beyond the borders while cutting down a significant number of troops in the PLA Ground Forces (Chinese Army). The PLA Air Force, Navy, Rocket Force and Strategic Support Force (PLASSF) now make up more than half of the Chinese military overtaking the PLAGF, which has traditionally been the dominant service.

China's high-end white papers have often emphasised the idea of integrating air and space power. The 2013 edition of the Science of Military Strategy of China states that "the People's Liberation Army Air Force (PLAAF) is accelerating its modernization and transformation from an aviation force into an integrated air and space force, from a mechanized air force into an informatized air force, and from a supporting air force into a strategic leading force."

Air Commodore Jasjit Singh in his book *Defence from The Skies* (New Delhi: KW Publishers 2007) had presciently articulated, "with no dividing line between air and space, it is indeed a continuum of the third dimension above the earth surface; growing economy, trade expansion and commercial interests will necessitate the pursuance of the aerospace continuum in our national interest. Military operations in the future will increasingly use this continuum to further national security." Furthermore, realising the need of the future, the IADN was founded in 2012 with a focus on the term "aerospace" rather than "air power" or other related terms.

Aerospace power as an element of national power provides multiple options to the nation in the emerging battlespace. In order to exploit the capabilities offered by modern air power to dominate the battlespace, the utilisation of space-based assets is a prerequisite. Increasing utilisation of 'space' in the operational domains of land, sea and air has made space a common enabler, as per the IAF's updated doctrine. The air and near space domain are increasingly a continuum for the IAF due to the high dependency on ISR, navigation, imagery, targeting, meteorology, communication, operational networks, command and control, enhanced AD responsibilities etc. It would not be wrong to say that, aerospace power has emerged as a key enabler of national power.



## **AIR POWER IS STILL THE LINCHPIN OF AEROSPACE POWER**

Aerospace power combines air and space power but space assets are themselves limited and sometimes are available in scarcity, the satellites follow predetermined paths and effective data relay are dependent on various factors. Although of immense value but space assets complement air power, and the prime objective for any air force still remains the ability to project firepower to achieve strategic goals.

The importance of air power in present and future warfare is well known. Air power is an integral part of the country's defence capabilities and plays an important role in making-up a country's deterrence against potential adversaries. However, it is of great concern that India's fighter squadron strength is dropping, primarily due to India's inability to develop a productive aviation industry in the country which in turn has been reducing India's clout in the domain of air power.

The Air Force is down to less than 30 fighter squadrons strength against the sanctioned strength of 42 squadrons to face a two-front conflict. The IAF has witnessed significant delays in introducing new fighters and phasing out the old fighters in the required timeframe. The four remaining MiG 21 squadrons are to be



retired with the Light Combat Aircraft (LCA) Mk 1A expected to enter service only by 2024, the Air Force could see a further dip in squadron numbers. It is also worth mentioning that the idea of having 42 fighter squadrons in inventory as optimal strength of the IAF is against the 'wish list' of 60 squadrons to face a two-front war.

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The PLAAF on the other hand has forecasted that it will have about 2000 fighter aircraft in its inventory by 2030 with the majority of them would be 4th generation category. This may also include its 5th-generation fighters such as the J-20 and J-31. Some analysts believe that China can deploy no more than 300-400 aircraft on the Tibetan plateau with infrastructure upgradation in 10-15 years from now. The General Aviation Development Plan (2021-2035) was released on 02 February 2023 in which China announced to build of 59 new airports and 300 helipads in Tibet Autonomous Region (TAR) by 2035.

Pakistan shall operate some 400 aircraft in the inventory in the next 10-15 years. Going by planned inductions, the IAF itself admits that it cannot reach the sanctioned strength of 42 fighter squadrons in the next 10-15 years and the force will remain at 35 squadrons, as per the statement given by Air Chief Marshal V.R. Chaudhari on the eve of Air Force Day, 2021.

Air Marshal Anil Chopra (Retd.) notes that with fast-depleting squadrons, the IAF will require 500 fighter aircraft of the fourth-generation ++ category. He suggests that a good mix could be around 200 LCA Tejas Mk 1A, 125 twin-engine Medium Multi-Role Combat Aircraft (MMRCA) class, ideally already selected Rafale. The remaining nearly

175 aircraft should be single-engine MMRCA class, much cheaper than the Rafale such as the Tejas Mk 2.

To face a short intense war, the IAF is preparing for maximum uptime of its equipment with a minimum turnaround time between missions to maximise the strike with given aircraft numbers. The clear emphasis is to make the aircraft more effective for each mission they undertake. The up-gradation of combat aircraft is a continuous process to maintain the fleet's operational relevance.

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## NEED FOR INNOVATION IN AIR POWER



It is not just about numbers but increasing technological gaps. China is closing the technology gap with the West and Russia; India cannot afford to lag behind. Technical parity is an important feature of deterrence against potential adversaries which must be maintained to ensure the Balance of Power (BOP). India needs to work on next-generation technologies in the defence sector and develop systems which can be called game-changer on the battlefield.

China's military industry's main focus is on achieving technologies in the field of hypersonic missiles, Directed Energy Weapons (DEWs), and quantum and electromagnetic domains. The future system will have to counter adversaries equipped with next-generation advanced Electronic Warfare (EW) suits with integrated Self-protection, supported by Integrated Air Defence Systems (IADS) with sophisticated detection capabilities, DEWs, hypersonic missiles with long range engagement capabilities, sophisticated cyber-attack capabilities and Anti Satellite weapons (ASAT), especially the soft-kill ASAT systems.

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Therefore, India must focus on getting innovation in air power. It must promote the development of technologies like SWARM drones, remotely piloted airborne vehicles with Man and Unmanned Teaming (MUM-T), satellite soft-kill techniques and technologies such as quantum radar, Aerial lasers as a priority project. Efforts should be made in achieving high-end technologies by developing a high-quality scientific ecosystem in the country. This also calls for reforms and encouragement in the Research and Development (R&D) sector of the country which can directly impact innovation in the defence sector. Through better Civil-military Integration (CMI) the overall ecosystem of education and research prevailing in the country should be improved.

Today, Aeronautical Development Agency (ADA), Hindustan Aeronautical Limited (HAL) and Gas Turbine Research Establishment (GTRE) the public sector companies

which can be considered as precursors of India's aeronautics sector have not been able to provide indigenous fighter aircraft in a worthy timeframe. The reality is that while the world is moving to develop a 6th Generation fighter, India is still not able to develop an effective 4th Generation fighter. China's aviation industry has advanced to produce large transport aircraft; modern force multipliers, four plus to fifth generation fighters incorporating low observable technologies; modern reconnaissance and attack UAVs in very large numbers, long-range Radars and diversified PGMs for variety of roles. Possibly, the only area where China has to achieve self-sufficiency is high-performance aircraft engines.



Maj Gen. Mrinal Suman (Retd.), an expert in defence procurement procedures and offsets, rightly notes that the HAL is suffering from proverbial lethargy, self-righteous complacency and gross inefficiency. India needs holistic reforms in making a sound aerospace industry in the country. Many experts like Air Marshal M. Matheswaram (Retd.) point out that HAL should be dissolved into different firms for i.e. all Bengaluru divisions could be one firm, then the radar and avionics in Hyderabad, the Nashik unit and the engine unit in Koraput must all be different companies.



However, such drastic changes may not be suitable for the present time especially when India under the aegis of DRDO, ADA, HAL and other sister PSUs is undertaking a number of important aircraft projects. The HAL itself is working on about seven known-advance versions of the Tejas including a wingman concept besides AMCA and the new HLFT-24. These organisations in past have not handled so many projects altogether, this goes without mentioning the number of helicopters, UCAVs, UAVs, and other platforms under development. Therefore, such harsh measures might impact the further development of important projects especially when these changes don't guarantee outcomes in the short and medium term.

There were various reasons for the LCA Tejas Mk1 delay and one of them was the lack of an empowered committee to keep a tap on such crucial projects which led to disoriented work culture. The prevailing work culture ridden by unaccountability and lack of work incentives across the Defence PSUs needs to be looked after. The HAL, ADA and sister PSUs require strengthening organizations from within for i.e. modern project management techniques, setting-up of accountability, providing greater autonomy to the management, sound Human Resources policies like changing appraisal policies based on meritocracy rather than seniority, skilfully neutralising the labour unions and establishing better labour relations, rewarding exceptional thinking in the organisation which shall promote innovation, sourcing quality on the job training sessions, ensuring wages which are comparable to what the private sector provides among others.

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There is also a recommendation to let IAF head these agencies which will get sound management skills in these organisations. The establishment of the National Aeronautical Commission (NAC) has also been recommended under the Prime Minister's Office which can help the government to provide a roadmap and assist in the development of an international niche in the aerospace industry of India by stipulating the efforts of several organisations. This goes without saying that India requires significant investment and cooperation with like-minded countries in order to develop its indigenous aviation industry and maintain a quality edge over the adversaries in the region.

## AEROSPACE POWER AND INTEGRATION WITH SISTER SERVICES



Under the new chair of Chief of Defence Staff (CDS) India has finally kicked off the actual groundwork for creating four Integrated Theatre Commands which include Maritime Theatre Command, Air Defence Command and two land-based commands for combating emerging threats besides various other initiatives to get better integration among the forces but the IAF opposition towards integrated commands is understandable, especially when IAF is increasingly focusing on releasing India's aerospace power.

Keeping evolving threats in view, the IAF cannot limit its resources to certain geographical commands. The idea of integrated commands doesn't suit the requirements of India being an aerospace power. We are already short of fighter squadrons, and far away from achieving the desired strength of 42 fighter squadrons. Therefore, at this juncture, the division of air force resources as part of the integration drive will lead to sub-optimal force projection on both fronts rather in the backdrop of reduced numbers of fighter squadrons the objective should be to utilize the maximum out of the existing pooled resources rather bifurcating them under different commands.

Moreover, some experts believe that the delineation of the IAF Area of Responsibility (AoR) based on certain integrated commands shall eventually lead to a reduction of operational space available to the IAF. The IAF by nature does centralised planning for allocating roles, missions, tasks and resources therefore exceptions shall be required for IAF. Consider the fact that China in the year 2015 announced the creation of the Western Theatre Command (WTC) as one of the 5 theatre commands; as a matter of fact, China's WTC AoR is larger than that of the main Indian landmass. Therefore, it is still advisable that to get real integration among the armed forces, India should adopt only those changes which suit it in light of the peculiar geography, terrain, threat perception, resources and technological threshold.



Former Air Chief Marshal and COSC Arup Raha once rightly pointed out that “the 21st century belongs to aerospace power.” Moving beyond network-centricity, the future awaits the convergence of more air-space offensive elements in actual battles to be fought. Therefore, the IAF need to propose better ways of integrating with the rest of the services rather than allowing delimiting its resources based on a land-oriented understanding of geography. **[End]**

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