

# Indian Air Force in the 21st Century: Challenges and Opportunities

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## Introduction

I am indeed privileged to address this gathering and share my perspectives on 'IAF in the 21st Century: Challenges and Opportunities'. I propose to begin with a recap of the environment and then go on to discuss threat perceptions, nature of conflicts, role of aerospace power, the IAF, its modernisation, challenges and future opportunities.

History shows us that the global environment continually changes; sometimes in a predictable and evolutionary manner and at others in a random or revolutionary way. National institutions must reflect current realities, contemporary systems and technologies. It's a continuous process of change and adaptation that is particularly necessary for the Armed Forces.

## The Environment

### Global

One of the defining characteristics of the contemporary global geopolitical environment is that a nation's power is increasingly determined by its economic might and technological prowess, rather than by its military strength. Though interdependent, the most fundamental is

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economic strength, without which, none of the other indices of power can be created or sustained. At the same time economic growth is not guaranteed without the protective cover of military power, in what is referred to as its 'peace dividend'.

Popular phrases that describe today's world are interdependence, global village, flat world etc. Certainly, there is heightened interaction and cross-pollination in every sphere. This interdependence leads to a 'balancing of interests'; instead of 'balance of power'; and the politics of 'confrontation' has been replaced to a large extent by the more nuanced – 'competition and cooperation'.

## **Asia and India**

Indeed, Asia is the current power-house and every major power has presence and high stakes here. Asian countries have greater influence around the world as well and military capabilities are now substantial on the continent. The region is also witness to conflicts & instabilities, as peoples attempt to reconfigure their settings, the reverberations of which are felt around the world. It is also a region of nuclear proliferation and increasingly, the cradle and playground of terrorism.

India is situated in a turbulent part of the continent. Its size, resources, capabilities and growth also endow it with power, visibility, influence and responsibility for a greater role in regional affairs.

## **Threat Perceptions**

So what is the impact on our security and threat perceptions? Territorial disputes still linger, our adversaries are acquiring ever greater military capabilities. Cross-border terrorism and internal security challenges persist. At the same time trade and energy security add to our considerations and are a potential source of conflict. This encourages an outward orientation, which is good.

Ideological divisions in the modern world still exist, but in other forms, such as democracies vs autocracies or fundamentalists vs the secular. These strains and tendencies exist within and outside our country too and impact our security calculus; turning into militant aspirations, that challenge national integrity. These have in the past sought to re-draw national boundaries and many still abound, even drawing covert support from outside the country. If we were to include the proliferation of weapons of mass destruction then we collectively face a very serious threat indeed. Meeting these challenges requires understanding, as well as careful handling. Invariably, in these situations, one finds the lines between policing and military operations blurred.

Yet another area of concern for us, is ethnic Indian population, residing in other parts of the world, which at times may need protection and support. There have been instances of this in the past. On the flip-side, migrant populations have changed the demographic character of our border states and impacted their polity, with attendant security connotations. We are all aware that non-traditional threats create crisis situations that in the end require the military's organisational capabilities and technical support. Keeping the peace is yet another important international commitment for Indian Armed Forces.

There is no longer the comfortable immunity from problems in some distant part of the globe. This entwining of interests and effects can work both ways and nations that anticipate and act have the advantage. It is not easy for a single nation to ensure peace and stability for itself, on its own. This encourages, indeed demands international cooperation. This realisation or compulsion is very visible the world over. India's international cooperation too has considerably increased, translating into increased engagement in all spheres, including military exchanges and interactions. The role of military diplomacy has also been enhanced. The significance of collective security and cooperative organisations has increased over time. India too seeks increased and active part in cooperative mechanisms, though joining collective security organisations is not our policy. An associated challenge sometimes is

to prevent from being subsumed by a more prolific and larger friend and retain independence.

On the whole, India is faced with the full ‘spectrum of threats’ from nuclear confrontation, through conventional war; to conflicts limited in area, scope or objectives; to the lower end friction, such as insurgencies, terrorism etc. Moreover, India needs to be prepared for the escalation of conflict from limited upto nuclear. The spectrum has also acquired a complexity and technological sophistication, making it prudent and necessary to move away from a ‘threat-based preparation’, to a more accommodative and flexible – ‘capability-based approach’. This would help lessen the uncertainty and unpredictability, because capabilities could then be readily tailored to suit the challenge at hand.

### **Nature of Conflict**

While, the probabilities of total wars and extensive mobilisations may have reduced, India still must be prepared for a full-fledged and conventional conflict. Nuclear power-play has increased in the region and impacts postures and strategies. In a more integrated and interdependent world, the spillover of conflict in the neighbourhood and its negative global consequences makes it everybody’s concern. While there would be supporters for either party, the sum of international pressure would be to end conflict. Moreover, the battle spaces are now transparent to the public, and legalities cannot be ignored. Therefore, limited, but high-tech wars of high intensity are more likely. Aerospace power has a distinct advantage in such a scenario. Determining the objectives and the end-state in a limited war is critical, but poses dilemmas. Perceptions matter too. The Indian politico-military leadership must continually work for clarity in military objectives and desired end-states.

While the future is uncertain, wars will be multi-dimensional, requiring an inter-disciplinary approach and the marshalling of all organs of national power. Military power is a critical component of national power, without which, as history bears out, progress is possible only up

to the point where it clashes with the interests of another stronger nation. Often, assumptions of conflicts and military capabilities are based on the classical war scenario. However, the IAF recognises that complex military challenges require different force constructs, for different situations, ranging from highly mobile and effective conventional forces, to 'rapid - reaction joint special-forces'. It is here that Air Power could provide the crucial edge. Clearly, future conflicts are likely to be short and sharp; more challenging & unpredictable, requiring a capability for assured, clean, swift, calibrated, varied and flexible responses and a transportability of national power in all forms.

### **Aerospace Power**

Of all forms of military power, it is aerospace power that intrinsically possesses the characteristics that enable such responses. I am by no means lessening the import of other forms of military power, yet modern aerospace capabilities have as much, or perhaps greater impact than what maritime power did for colonising nations in the past. Unlike the latter, whose applicability is determined by a country's geographic location; and the land forces, whose shape and size are determined by relations with neighbours, size of the country and internal security compulsions; aerospace power has a more universal applicability. That is why even armies and navies strive to assimilate organic aerospace capabilities.

Recent technological developments, including the synergy of air & space, have enhanced aerospace force unprecedentedly, making it astonishingly reliable, effective, clean and responsive and the 'preferred instrument', in most situations of peace or war. It has enabled effects-based operations, made simpler parallel operations and creates strategic effects with a small footprint. Aerospace power is empowering and futuristic and easily lends its strengths and capabilities to other disciplines. In the Indian context, all forms of military power are necessary and important, however, strategic aerospace power offers newer options, both for our northern concerns, as well as for our outward orientations.

I wish to highlight that aerospace power is inherently flexible and its application is not constrained by geographical areas. It can easily be assigned to any task on priority to attain the objectives – current or overall. IAF's doctrines and plans are founded accordingly. I mention this as some believe that air power doctrines are rigid and unaccommodative. Debates have taken place on 'Counter Air Operations' (the so-called air war) vs 'Counter Surface Force Operations'. It has been said that the IAF attributes less importance to the latter. But contrary to perception in some quarters, a large part of IAF's effort in past conflicts has been in support of the surface battle. Our current plans too, allocate a sizeable portion of air effort towards CSFO.

## **The IAF**

### **Evolution and Status**

Lets take a brief look at the IAF, its Evolution & Status, Role and Goals. From Counter-Insurgency in its early years, to Army cooperation in WW-II, the IAF was a tactical force. Today, it is a strategic force – powerful, professional and proven. Though the transition to strategic capability has been slow in coming, the process must be sustained, if we are to effectively influence events within India's strategic boundaries.

In its 76th year, the IAF with its fine combination of Air Warriors, machines and ethos has proved itself time and again. Status of the Force and strength of the economy have boosted our International Defence Cooperation, including assistance to friendly air forces. Trans-continental reach has enabled exercises with friendly Air Forces on all Continents, which is an excellent way to train, assimilate best practices and strengthen bonds of friendship. The IAF is also a sought-after contributor to UNPKO. Currently, we have four highly acclaimed missions in the Congo & Sudan. The IAF also remains at the forefront of the Nation's HA / DR missions. IAF's uniqueness lies in its rich all-terrain experience and its diverse inventory. Its capability and reach have enhanced significantly in the last decade.

## Roles

Given our situation, concerns and aspirations, a strong and comprehensive aerospace capability is inescapable. The IAF's roles can be described as Deterrence, Punishment, Protection, Projection and Peace-time roles. It will be readily apparent, that India needs its air force to execute all of these. The IAF must be a strong 'deterrent', in a tough neighbourhood. Implicit in the deterrence is the ability for swift, calibrated, but effective 'punishment'. Our deterrence currently includes the nuclear dimension. The IAF's primary and traditional role is 'protection' or Air Defence, the scope of which will expand as do our interests and reach.

A benign presence, or assistance to friendly nations in distress, is a 'projection' of interests that IAF would be expected to execute. This requires long-range presence, persistence, 'forward-basing arrangements' etc. Perhaps the most visible demonstration and utility are 'Peace-time' applications – both internal and external. They range from airlift and surveillance, to possible offensive action. Military diplomacy is yet another aspect that has increased in recent years yielding handsome friendship dividends. Indeed, IAF today is adequately suited and structured to execute these roles, should the need arise.

## Goal

If we look at the way the IAF must evolve and compare it to any other evolving air force; and the path charted by the advanced air forces – there are essential similarities. In fact, but for minor variations, we are on a globally recognised growth path. So, depending upon the circumstances, threat perceptions and resources, it is the scope and pace of growth of the Air Force that essentially remain to be managed.

Clearly, the IAF must be equipped for long-reach, persistence, all-weather, precision, air dominance, networked and space-enabled force, capabilities. I am aware that not many air forces have such capabilities, but the IAF, among the leading air forces of the world, can, with the

right infusion of technology and training, attain such status. IAF is sensitive to the many competing demands on the nation and doesn't seek the 'best and now', but requisite capability, in time to keep ahead of our adversaries. 'Requisite Capability, Well in Time; Right People, Well Organised; Assured Performance' is a phrase that sums up our goal and our emphasis.

## **Modernisation of the IAF**

Though we are a fairly balanced force – we also have shortages, reducing force-levels and gaps in our inventory, which are being addressed with all urgency and governmental support. IAF's modernisation plan, aims to sustain and enhance its operational potential and consolidate the specified force levels through judicious and cost-effective replacements and upgradation of existing resources. It is a gradual, but transformational modernisation. The approach is three-pronged – preserve upgrade and acquire. All fleets, including transport and helicopters, with residual life, are being upgraded to contemporary standards; so also is operational and maintenance infrastructure and logistic tools. The planned acquisitions are across-the-board and include platforms, weapons, sensors and equipment; spread over the next 10-15 years.

To run through some of our programmes, the MiG-27 and Jaguar upgrades are almost done; the MiG 29, Mirage 2000 are being negotiated and the IL-76, AN-32 and the helicopter fleets will follow. Capabilities of UAVs will also be enhanced. Airfield and maintenance infrastructure are also being enhanced in a phased manner.

The response to RFP for the MMRCA is expected soon. The Hawk AJTs have been inducted. The first AWACS will be with us this year end. Additional Dorniers, Boeings and upgraded Cheetah will soon join the fleet. The contract for C-130Js has already been signed and contracts will soon be signed for Mi-17 1Vs, ALHs, armed ALHs and additional FRA. The 1st LCA Sqn may be operational in IOC configuration by 2010. IAF also seeks new helicopters to replace the Chetaks and a new heavy-lift heptr. Inter-Government Agreements have been signed for

the 5th Generation Fighter and Medium Transport Aircraft with the Russian Govt.

Air defence will be significantly strengthened with modern weapon-systems and sensors, including the AWACS & Aerostats. Integration of civil radars will commence this year, for gap-free surveillance of the entire Indian airspace. Force-multipliers, air dominance fighters and a converged, secure 'Combat Communications Network' – including the IACCS and later the ODL – will fundamentally alter the IAF's Air Defence doctrine. For effective command & control, extended reach and to reduce the sensors-to-shooter loop, we are laying due emphasis on Networks and Space, which are essential 'next steps'.

## **Challenges**

### **The Hardware – Technological Challenges**

I now turn to the challenges facing the IAF. I am aware that in the challenges lie seeds of opportunity and thus how we address them will qualify our future. Technology is at the core of an air force – acquiring and assimilating it is our primary challenge. The lack of it curtails national options, impacting postures and doctrines. Denial and selective availability of technology are all enmeshed in international relations. As long as operationally feasible, the IAF supports the national quest for indigenisation. We recommend acquisition of core-technologies and core-competencies and developing emerging technologies. We also recommend a collaborative and participative approach – of partnerships between users, DRDO, the Industry, the Government and foreign vendors. In these multiple partnerships, we believe that the user must be the captain. We strongly support the Government's endeavour to transform our current 'buyer-seller' relationships to joint-ventures, co-development and co-production.

### **Maintenance Challenges**

While our response to technological challenges will determine the 'shape' of things to come, maintenance challenges determine how long

they last and their cost-effectiveness. 'Maintainability', which includes logistical issues, is therefore, crucial. IAF is proactive on this and has energised interaction with vendors and entered into 'long-term spares and repair contracts'. We have also put our materials management and equipment accounting on-line.

## **The People and Organisation**

While hardware is important, it is converted into capabilities by people. Aerospace power requires highly-skilled and impeccably trained personnel. Also, in aviation, optimum performance usually lies close to safety margins, which brings in the concern of costs – both in human and material terms. Attracting quality youth, training and retaining them is another of IAF's challenges. Inculcating qualities of leadership and innovativeness and ushering in meritocracy and productivity are important on our agenda. However, the expanding civil aviation sector exerts a huge 'pull' on this resource and we are doing our best to blend personal aspirations with organisational compulsions. We need Government support to make this happen. Updating of skills is an associated challenge, for which international exposure has been very useful. But in the long run we might need an Air University. Again, if our manning is adequate, we would be able to send our people on sabbaticals of higher learning.

As the hardware changes, new capacities and capabilities are generated that sometimes radically alter the way we do business. And it is hard to do things differently with the old processes, interfaces and organisational structures. Keeping pace and adapting to the changes, as an organisation, is another challenge.

## **Future Opportunities**

### **Shape of Things to Come**

I now turn to future opportunities. The most obvious and significant opportunity is already before us. I refer to the modernisation plan.

Ideally, modernisation should be evolutionary and continuous. Yet, for a variety of reasons the IAF has in the past modernised in spurts, often as a reaction to circumstances. Today, the IAF is in throes of a most comprehensive modernisation, as I described earlier. We call it transformational, for it will change everything dramatically. Being based on long-term perspective plans, most of it is already crystallised. Yet, a lot remains to be determined; many new capabilities are still short of the decision stage. At this juncture, if we are able to synchronise these plans with national security objectives, we would really have utilised this opportunity well. From that arises another opportunity that must be seized and that is the formal enunciation of long-term national security objectives, strategies, as well as technology roadmap and indigenisation strategies.

Much also depends upon the way aerospace power will develop in the future. Beyond the MMRCA and FGFA, with their 40 year 'lives', we are at 2060. It is not easy to guess the shape of aerospace power then. Would the accent shift to unmanned flight, to missiles; or would 'air' be more of 'space'. Technological advances are sure to revolutionise military affairs in future too. Despite the unpredictabilities, it is certain that the need for 'application and transportability' of national power – hard and soft – and thus for aerospace power, with enhanced fundamentals, would remain. Nations that lack it will seek it, as also will non-state agencies. Aerospace power is bound to proliferate. We also expect aerospace power to permeate the national security apparatus more completely, including for homeland security. IAF foresees greater specialisation; tailored capabilities for each occasion; an increased dependence on unmanned vehicles; greater accent on force enhancers; particularly the intangible ones, such as quality of people and their skills.

Networking and assimilation of space, both interdependent, are already the way forward and can tilt the balance considerably. A quiet 'space race' is the current reality and weaponisation, a distinct possibility. Perhaps more than any other, it is air power that is most significantly enhanced by the integration of space-enabled capabilities, for there are essential similarities. Evolving into an aerospace force is thus a

logical progression. But, it is getting crowded up there and we need to act fast. Certainly, 'space' empowers all, and the IAF supports tri-service initiatives. Yet, any fledgling capability requires residing in an appropriate 'parent capability'. Air Power, or the IAF, are the closest such 'capability', or organisation suitable to host and nurture 'military space'. India's rising status and acceptability are an opportunity for us to push for creating an adequate military space capability.

Since IAF requires a comprehensive capability, its future in the long-term, will largely mirror the future of aerospace power itself. Though this path is invariably influenced by leading nations, India and countries like it, must be selective and seek creative variations, both in terms of hardware and doctrine.

## **Outward Orientation**

I have made mention of India's outward orientation and IAF's part in it. We find that our international interactions are increasing. Leading nations want to engage us and probably seek to include us in their calculations. Smaller nations look up to us for support, assistance and training. UN commitments are also considerable. We could ignore these opportunities, or we could use them to build Indian influence, generate goodwill and reap multiple dividends.

## **Synergies**

I now turn to synergies and jointness, which the IAF is convinced is the way forward. Just as every tool has a place in the toolbox, every discipline too has its own niche. At the edges of our competencies in complex tasks we often confront impossibilities or failure. If we traverse the boundaries of our discipline into neighbouring or related ones, we can, in concert with them, achieve our aims. In other words, there are other organs of national power and we must learn to use them and interface with them effectively. Such synergy creates desired effects, perhaps at lesser cost and in quicker time. This calls for wisdom, knowledge of

other disciplines and lack of parochialism. The future also brings with it the opportunity for creating synergies and national capabilities.

I feel, therefore, that the trick lies in perfecting internal core-competencies, identifying complimentary capabilities in other organisations, developing effective interfaces and training to create and employ a new, enhanced hybrid. We are convinced that such 'jointness' is the way forward and that core competencies of each Service, indeed of all organs of national power, must be synergised to generate the required effect and capability. A capability-based approach from development to employment will encourage an inter-disciplinary integration and the coming together of all organs of national power. At the end, it is people that make an institution or system work. The best ones can be rendered ineffective for want of skills and commitment and vice-versa. Essentially, we believe jointness and synergy have less to do with new structures and ownership, but depends upon joint thinkers, planning, capability creations, as well as joint training and execution. Perhaps it is better to grow in an evolutionary manner.

Similarly, it is also imperative that military and civil aviation integrate, to take advantage of each others' capacities, for better efficiency, cost-effectiveness and for greater options. We have already made available 19 of our front-line air fields for civil air traffic and also allowed transit through Air Force controlled air space, to save time and fuel. IAF has also proposed the 'flexible use of air space'; and the process for integration of civil and AF radars has begun.

Beyond generating national synergies, aerospace technologies are so expensive, cutting-edge and hard to develop, that I dare say, our quest of these increasingly encourages joint-ventures and sharing of knowledge & resources between nations, and accord opportunity to forge international synergies.

## **Conclusion**

Considerable changes are taking place in the global and regional scenario and in our neighbourhood. Old issues persist, while newer concerns are

added. The role of military power has increased, as security concerns spread beyond national boundaries. Aerospace power is futuristic and increasingly utilitarian. The IAF has come a long way and has demonstrated its professionalism and the world has acknowledged it. A strong and professional IAF can contribute to national options and to peace and stability, not only within the country but also within the region. It is a considered opinion that the IAF, with its current capability and plans has the potential to make a very significant impact on the postures we adopt in the future. IAF must therefore grow in step with nation. 