



# Centre for Air Power Studies (CAPS)

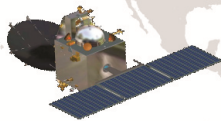
Forum for National Security Studies (FNSS)

## Report



# Centre for Air Power Studies

*7<sup>th</sup> 'Jumbo' Majumdar International Conference*



## Comprehensive Security: Role of Aerospace Power



February 3-4, 2016

Conference Hall,  
Air Force Auditorium

### Inaugural Session

- Air Marshal **Vinod Patney**, SYSM PVSM AVSM VrC (Retd) Director General, CAPS, welcomed the guests and initiated the proceedings of the two day seminar by paying tribute to the IAF icon, Wg Cdr **Karun Krishna Majumdar**; as the seminar is being conducted annually in his memory.
- Technological progress in terms of aircraft has taken a huge leap in the past few decades, however, the need for clear thinking and strategic agility are the ever unchanged ingredients of any topical thought process. It is in this context the seminar is aptly conceptualised, such that issues of national security and aerospace power could be deliberated upon.



- The Vice Chief of Air Staff, Air Marshal **B S Dhanoa**, PVSM, AVSM, YSM, VM, ADC began the inaugural address by complementing CAPS for its unique and sustained contribution in promoting awareness in the aerospace domain and organising seminars on contemporary issues pertaining to national security.
- Among other roles, airpower today encompasses a range of humanitarian initiatives also. The recent evacuation of Indian population from the warzones such as Yemen and the handling of the natural calamity in Nepal encapsulates the HADR operations that the IAF has carried out in the past five years, and is evident proof that airpower's role has moved beyond being just a guarantor of deterrence in a conventional war.
- Despite the unprecedented success of the Indian Air Force's air campaign in the 1971 war and the Kargil conflict there still exist apprehensions with regard to our conventional deterrence as a result of the slow pace of modernisation with respect to our adversaries.
- Capabilities with regards to sub-conventional warfare need to be strengthened by employing the concept of joint military operations of the three services; since airpower alone may not deter the ever-growing threats.
- Investment in key capabilities such as precision strike, long range beyond visual range air-to-air missile capabilities, airbase infrastructure and indigenisation of low to medium technological capabilities is required.



## Session I: Comprehensive Security: An Endless Horizon?

**Chairman** : Shri **Kanwal Sibal**, Former Foreign Secretary

### Speakers:

Strategic Relations: The economic link : Dr **Sanjaya Baru**  
 : Hon. Senior Fellow, Centre for Policy Research

Diplomatic Relations: An imperative for Security : **Amb Meera Shankar**  
 : Former Ambassador to USA

Outer Space in National Security : **Wg Cdr KK Nair**  
 : Research Fellow, CAPS

- Comprehensive security is a priority to overcome new challenges and needs huge financial undertaking. Till date no country, not even the US despite its stature, has the capacity to attain a comprehensive security since it cannot completely insulate itself from attacks such as nuclear threats and terrorist attacks.
- There exists a distinction between strategic and economic relations, wherein there is a need for strong political ties in order to build strategic linkages that would further reinforce bilateral relations.
- Strategic ties also needs strong diplomatic relations along with strong economic and defence ties.
- The policy of economic engagement has been aggressively adopted by China to extend its spheres of influence around its vicinity and globally. China is using economic engagement as a policy to create co-dependence and hence creating inter-dependence with various nations.
- Today, China through its economic engagement with all of India's neighbours as well as its maritime neighbours, is posing a major challenge for India. China, through its trading relations, has created dependencies and inter-dependencies.
- Despite this global reality of China increasing its sphere of influence close to India's vicinity, the shift in India's policy has been slow to counter this growing challenge.

- The economic liberalisation of 1991 that caused a significant shift in India's policy should not be restrained to the fall out of the economic crisis, since it also had a strategic connotation – enabling national security through economic inter-dependency.
- Three dimensions exist that help define or give an indication of bilateral relations: firstly, government to government; secondly, business to business and thirdly, people to people.
- Based on the three indicators it is found that India-US bilateral relations come on top in India's list since it fulfils all the three dimensions.
- It is essential to realise that Japan helps complement India's needs and vice-versa as they share India's strategic interests and hence can become India's most strategic partner.
- Convergence of interest for both the countries lies with the China problem. Therefore, India needs to partner with Japan since this could become a long term partnership. However, there exists a strong pro-China lobby in Japan mainly for the continuity of business ties, hence; India-Japan relations have not achieved their full potential.
- Economic interest helps in defining strategic interest which is achieved through the creation of inter-dependency. This creates insulation that enables greater dependence and security.
- Comprehensive security, in which dependency is caused from economic engagement, also has military and defence as intrinsic parts and which cannot be ignored. Therefore, there is the need for the deployment of equipment in order to create insulation against external threats.
- There is the need for capacity – building which includes both defensive and offensive, in order to counter against new threats such as cyber and space – by strengthening defence production capacity and enabling joint military operations of the three services.
- Need for fast tracking indigenous production capacity since imports of defence equipment adds only to the security but does not add value to the economy of the country.
- The Indian economy has reached some kind of plateau with poor growth in manufacturing and stagnation in the agricultural sector. For Indian economy to become more robust there is a need for an overall growth in all the three sectors through creation of proper infrastructure, investment in research and development as well as policies that promote and create an enabling eco-system.

- There is the need to seek new willing strategic partners based on shared interest however, it is not possible in today's environment to have partners who would fulfil all the parameters, hence should look where there is a convergence of interests and build partnerships upon it.
- Japan fits the bill for India's strategic partner, however, relations with Japan are still not very strong even though it would be imperative to have a strong and comprehensive engagement with it and need to build consensus towards this end.
- Also, create a situation of dependencies rather than inter-dependencies if necessary as long as those engagements bring out mutual benefits. Within South Asia, India has been able to create inter-dependencies through its infrastructural initiatives such as hydro projects in Bhutan, road linkages through BCIM projects and so on.
- In today's global scenario, competition between great powers is increasing, however, there has also been huge cooperation between the great powers because of the vested interests caused by inter-linkages. India needs to use all kinds of military and economic engagement through its diplomatic channel in order to become a balancer in the region.
- National power of a state comprises of its economic power, military power –contributed by the Army, Navy and Air Force – and knowledge power – with science, education and technology being a subset of knowledge power.
- India's space capability is a strong enabler towards its comprehensive security as it enhances these three components of national power.
- Space technology is today's part and parcel of national development and therefore, investments globally have witnessed a consistent rise despite events such as the global recession.
- Since 2008 to 2013 all BRIC countries have witnessed a large growth rate in space investments, unlike the period prior to 2013 where major investment was made by the OECD countries, indicating that the centre of global power is shifting towards Asia, namely India and China. India's ISRO has also witnessed a constant growth in investments.
- This has led to the emergence of the geo-politics of space where the more the number of satellites in space the more security it creates for a nation, with the new trend being

towards satellites with dual-use capabilities, providing civilian as well as military assistance.

- India is today a major player in the international space market with its PSLV having a high success rate along with it being very affordable in comparison to other space launchers available in the international market.
- India has also made major inroads with regards to space exploration which would be essential in order to discover new space resources, as fossil materials on Earth continue to decline. However, India being a signatory to the “Moon Treaty” continues to abide by the principle for peaceful use of space and is not in favour of weaponization of space.
- Therefore, use of space technologies for national security by fostering food security, national disaster management, and so on – use of space technology not as a weapon of mass destruction but as a weapon of mass development.
- India has good space capabilities in place and should not jeopardise its position among space faring nations by conducting ASAT kinetic kill testing.

## Session II: New Security Variables

### Chairman

Shri **Jayadeva Ranade**, President, Centre for  
China Analysis and Strategy

### Speakers:

Technological Asymmetry: The galloping  
variable

Air Vice Marshal **D Choudhury**, VM VSM,  
AOC COBRA Group

Climate Change: As a security threat

Shri **Chandrashekhar Dasgupta**, Former  
Ambassador to the European Union and  
China

Demographic challenge for a young India

Amb **Sheel Kant Sharma**, Former Secretary  
General SAARC & Distinguished Fellow,  
CAPS

- Technology within aerospace power is a galloping variable; its importance has not been fully realised. Indian foreign policy is set in a tough neighbourhood, with its presence among states that belong to 30 of the most fragile states in the world. Combined with this is the rise of China that aims at expanding its influence in the region.
- Geography dictates foreign policy. In this context, to achieve its aspirations, the use of aerospace power is to be leveraged by India. Aerospace power is inherently technology intensive. There exists salience of technology in achieving comprehensive security.
- Technological asymmetry in this context needs to be addressed. Critical variables such as cyber capabilities' imbalance could become vulnerability. In the future, an aircraft should be able to conduct network centric warfare in enemy territory. For this, newer technologies need to be incorporated.
- The way ahead is envisaged as building up a sound and indigenous base. In the 21<sup>st</sup> century aerospace power is vital to comprehensive security, for this a galloping variable of technological asymmetry needs to be addressed by India.
- Future threats to comprehensive security would take new forms such as environment degradation and migration. There is a blurring of the traditional concept of national security.
- Climate Change is now identified as a valid threat to human security; however, it is being discussed at the UNSC that looks at traditional security by limited number of stakeholders. Instead, the UN General Assembly is an appropriate platform for such discussions as it has the membership of every State.
- In this context the analysis of non-traditional threats to security are being abused. One of the threats caused by Climate Change is the Arctic hotspot scenario leading to the Polar ice cap in the Arctic shifting. It is a threat because it has the potential to modify geography and thus can affect the distribution of natural resources such as water etc.
- Climate Change affecting the Polar ice melting may lead to the creation of new water ways; this would further lead to new maritime partners in order to access the natural resources in the Polar Regions. This can result in overlapping of territorial claims over areas and a possibility for new conflict may arise.
- Fresh water shortage has the potential for conflicts between countries, especially in the Asian region in the future. These, however, may be gross exaggerations by the Western

scholars as newer technological application (desalinisation techniques) can be utilised to best manage the perceived conflict scenarios due to shortages of water. Countries may also want to divert their attention to the crops that require less water. Water wars, however, can be imagined in a scenario wherein the downstream state is more militarily powerful than the upstream state.

- Climate Change could be viewed as a threat multiplier in the aforementioned scenario. However, it is doubted that it will make a significant contribution in a direct threat perception of traditional national security.
- Similarly, arising out of the theme of non-traditional security threats, the challenge of demography cannot be overlooked. The population of the country is exploding at the decadal rate of 17.6% annually, the majority of which is under the age group of 35 years. Each year as many as 12 million job seekers are added against 30% of new job opportunities, leaving 8.4 million youth jobless. The employability of the country remains at only 30%. Additionally, among the growing youth population, 420 million remain illiterate out of 600 million.
- This severely impacts the cohesion of society by directly affecting ideology, polity and identity. These figures indicate an increasing possibility of youth questioning the legitimacy, authority and justice of the system itself.
- Planning for the growing population is required. Questions such as the quality of leadership for youth need to be answered. Additionally, an accommodation of their aspirations needs to be assessed. In this context, top down policies such as MGNREGA, right to food, education and promotion of startups ought to be implemented with generous funding and efficiency.

### Session III: Comprehensive Security: The techno-military angle

**Chairman** : Air Marshal **PK Mehra**, PVSM AVSM VM (Retd)  
Former AOC-in-C, SWAC

#### Speakers:

Information Asymmetry: A Game  
changer : Colonel **David W Olander**  
Chief, Cyber Operations Division, Headquarters



	Pacific Air Forces
Information Collection: Technology to the rescue	Mr <b>Luc Chabod</b> : Director Mission Systems and Sensors Architecture, Thales Systemes Aeroportes (TSA)
Impact of Digital Media on Military Leadership	: Air Vice Marshal <b>Rajeev Hora</b> Commandant ASTE

- Information warfare is today's reality; however, to be used effectively, it needs to be analyzed in a time bound manner. There is also the need to have the right leadership in order to tackle today's digitalized world that has become more people centric through various social media.
- Information asymmetry is a game changer as it can provide asymmetry advantage. However, there is also the need to carry forward the information, analyse it in order to achieve the desired goal.
- Beyond just information there is also the need to attain the right information at the right time to enable the asymmetry advantage. Therefore, it is the management of huge data that equals to knowledge which along with the right experience and wisdom provides the leadership with superior decision making capacity, thereby creating an asymmetric advantage over the adversary.
- Furthermore, this explosion of information due to the growth of the cyber domain; enables the sharing of data and information across various enterprises. This also provides various challenges as it is subjected to various covert cyber activities involved in seeking information, with the inherent danger of compromising various military operations.
- There is also the problem of information overload as a result of deep inter linkages that could become one of the major downsides of this huge data inflow.
- This information asymmetry could be used efficiently by having a proper understanding of today's strategic environment based on proper analysis. Furthermore, there is a need to use the information by enabling inter-governmental partnership such as promoting joint service integration and collaboration with all concerned entities for faster analysis in order to adapt to the ever changing environment.

- Information collection is essential before carrying out any military operations. Sensors such as radars and electronic warfare systems are strong multipliers of information technology as they further enable early situational awareness. Both are key sub-systems in any combat aircraft for accurate information collection.
- There is a need for new technologies such as advanced computing through new algorithms to further enable radar's capacity in order to track and detect targets, furthering the multiplier effect in information gathering.
- However, for sensors such as radars to achieve their full potential in creating situational awareness, there is a need for newer technologies such as special high powered antennas to enable more precision target detection – there is a move for the development of super-sensors.
- Therefore, in the future, there is a need to develop integrated as well as longer range detection capabilities which would provide real time information to engage time-sensitive targets during operations.
- There is already a move towards providing more coverage and protection such as jammers and further digitalization in order to provide higher capabilities and protection.
- In today's world there is a need for sensor cooperation between entities and since development of various sensors is a long term approach it must be planned out well in advance.
- Growth of digital media has enabled rapid information delivery, thereby shrinking the globe; however, it has also enabled the emergence of the grey area, leading to trust deficit. Digital media by its very nature cannot be contained, as any information that has been digitalized becomes open to the public domain.
- Therefore, organizational leadership needs to counter the adverse effects of digitalization.
- Investment of technology in knowledge processing has led to information overload and this leads to inefficiency amongst the leaders in making decisions. Thus, it becomes essential for a proper flow of this information – in order to enable the fight against new military challenges such as terror.
- With information becoming freely available to every individual it has caused a huge revolution in the conduct of military affairs.

## Session IV: Application of Aerospace Power: the final cog

**Chairman** : Air Marshal **Vinod Patney**, SYSM PVSM AVSM VrC (Retd),  
Director General, Centre for Air Power Studies

### Speakers:

Hybrid Warfare: Role of Air Power : Gp Capt **S Dhankar** VM, Head of Faculty, Strategic Studies and International Relation, College of Air Warfare

Hypersonics: Future of Kinetic Fire Power? : Gp Capt **AjeyLele**(Retd), Institute for Defence Studies and Analyses

- Hybrid warfare is rapidly evolving and in this front, the global war on terror brings varied lessons for future warfare. The role of air power in meeting the emerging hybrid warfare is increasing and airpower in the recent past has gone through fantastic technological transformations.
- The nature of the threat is also evolving with the introduction of new application of weapons like ASBM and the advancement of sensor technology leading to the ability for night operations.
- Asymmetric warfare (irregular, unconventional) is on the rise, particularly after the rise of Islamic fundamentalism. Also, the characteristics of the new asymmetric warfare are getting more localised to that specific region.
- In the present century, the theatre of war is shifting to Asia and new unconventional warfare methods like cyber, bio, psychological and chemical warfare are on the rise.
- The irregular armies are getting stronger by the day and the infusion of modern and advanced technology is making them even stronger.
- India has been fighting a long unconventional war without involving air power. Hence, this war needs to be fought at all levels like diplomatic, economic, military and information to get better results.
- There is also a need to be pro-active and responsive as the enemy is acquiring better firepower and is becoming better organised and motivated.

- Air power has advanced from ISR to RSTA with ISTAR assets, but there are limits to the application of air power. So there is a need to apply hybrid war concepts to deal with new threats like ideology.
- In future, the operational control should be centralised while it should be decentralised at the execution level to deal with the newly emerging hybrid warfare.
- There is the need for the upgradation to higher speeds, from sub-sonic to supersonic to hypersonic. The 1998 escape of Osama Bin Laden from a Tomahawk cruise missile attack could be attributed to the sub-sonic speed of the missile which gave him sufficient time to leave the target area.
- The slower speeds of weapons give sufficient reaction time to the adversary for his manoeuvre to defend himself; this can be addressed by increasing the speed of the strike system.
- Anything above Mach 5 is considered hypersonic and at this speed, the sheer kinetic energy the weapon gains are sufficient to cause damage to any point target. The primary technological problem in upgrading to hypersonic speed is providing the system with sufficient thermal protection and also maintaining the orientation of the aircraft at such high speeds.
- The two methods to achieve hypersonic speeds are being tried out by some countries involved in hypersonic propulsion research like United States, Russia, China and India; one, is using a scram jet engine and the other is opting for a ballistic missile mounted glide vehicle. As far as India is concerned, efforts are underway to develop a reusable hypersonic version of the Brahmos cruise missile. The key advantage provided by such high speed is it ensures penetration of advanced enemy defence systems.
- Many of the concepts involving hypersonic speed systems are already underway like kinetic kill vehicles used in ASAT tests, tungsten rods (Project Thor) shot from space deployed systems, and magnetic rail guns.
- All these developments are related to aerospace and hence a need arises to rethink the ways to fight in future as space might become the future high ground for battle and it might itself become a battle ground. In this, hypersonic weapons are emerging as the disruptive technology. But the challenges do remain in terms of technology, cost, political decision and investment of industries.

- A question also arises whether these technologies would serve the purpose? There is also a need for India to speed up the development of this technology as there are possibilities that in future advanced countries who have got this technology might attempt to ban it. Hypersonic technology will emerge as a game changer in future and the concept of space deterrence is emerging.

### Closing Session

**Keynote Address :** Air Marshal **RKS Bhadauria**, AVSM VM Deputy Chief of the Air Staff

- The Air Marshal largely spoke about the modernisation programmes of the Indian Air Force (IAF) since it is very important for the force to always have the ability to respond as and when required. Hence, perspective planning is being carried out continuously.
- He then highlighted that Airpower can provide rapidity and flexibility and has the ability for rapid escalation and de-escalation of conflict.
- A short brief was given on the future upgradation and procurement plans of the Indian Air Force.
- The Air Marshal appreciated the role of CAPS and its efforts in organising seminars and conferences on Aerospace issues.

**Closing Remarks:** Air Marshal **Vinod Patney**, SYSM PVSM AVSM VrC (Retd), Director General, Centre for Air Power Studies

The DG, CAPS mentioned the rapid evolution of technology and the need to catch up with technological advancement that has already happened. It is also necessary to focus on how to train for fighting a modern battle with advanced weapon systems. He further emphasized that old methods do not become extinct and hence, there would be some level of continuity. Lastly, he extended his gratitude and appreciation to all the participants and CAPS faculty members.

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