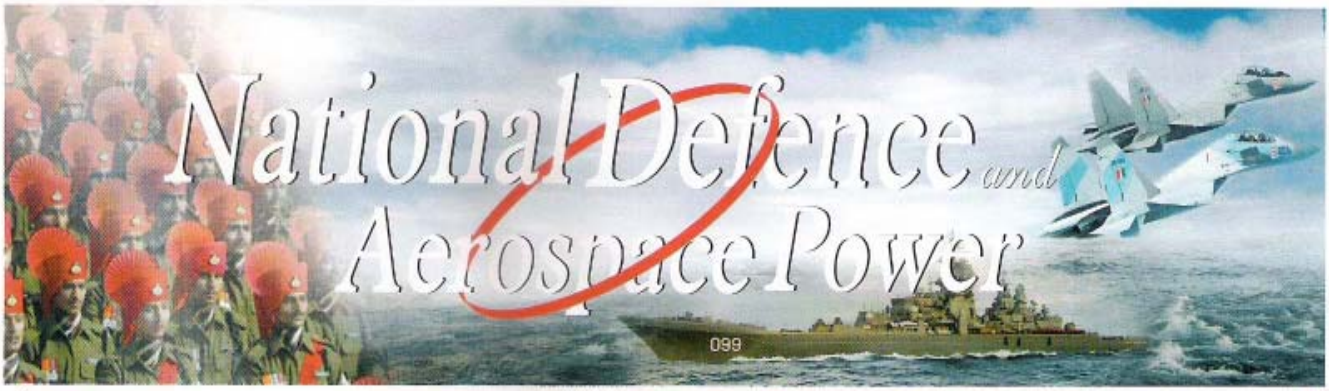

Centre for Air Power Studies ISSUE BRIEF

07\09 31 March 2009

INDIA'S ARMY AVIATION: REVITALISATION AND OPTIMISATION

*Lt Col R Ghosh**

Indian Army is in the process of replacing the ageing 1970s-vintage Chetak and Cheetah helicopters as it modernises and expands its Army Aviation Corps (AAC) to meet current and future requirements. Notwithstanding traditional impediments to expansion and development, the issue is, twenty years hence, will the AAC with the expected profile be comparable and considered at par with other armies. It may well be remembered that army aviation in India has the largest number of helicopters among the three services, and as such has a performance to attain in modern and fourth generation warfare.

Key issues which may require their share of attention during the current expansion phase of army aviation and overall modernisation of the army are:

- Current trends in army aviation with respect to operational, technological and organisational practices.
- Future of army aviation in modern wars and in fourth generation warfare.
- Lessons that can be drawn from past and ongoing conflicts and their adaptation in our context.

Notwithstanding traditional impediments to expansion and development, the issue is, twenty years hence, will the AAC with the expected profile be comparable and considered at par with other armies.

Operational Trends: Standalone capacity of army aviation notwithstanding, the surveillance/ strike effort in Iraq have urged ground commanders to seek more precise conventional strikes with less likely collateral damage. This has developed into integration of Unmanned Aerial Vehicles with army (and air force) aviation operations and could well lead to further inclusion of Micro Aerial Vehicles in the not too distant future. It has not only reduced loiter time across the spectrum of tasks and missions but also reduced the footprint of all other elements in the predicted combat area. It has therefore been possible to move quickly to a common fighting ground station from an air-ground coordination.

Although we are in the cusp of fully understanding how to get 'persistent stare' by the way of managing different packages — manned and unmanned, tactical level integration is no doubt expanding the number and type of forces in response but also achieving immensely in terms of violence containment, and consequent reduced casualties. The increased rate of casualties in the first two months of 2009 in Afghanistan has however been due to use of more number of Improvised Explosive Devices and fewer direct attacks have been attempted by the jihadis.[1]

Integration is the kind of element which has called for capabilities beyond the individual resources of any particular arm. Dispensing with the need for long pre-request and decision times for integral air effort or additional layers of approval where minutes matter during the modern operations are being called for currently. It is believed to be of paramount importance for the commanders of infantry to understand operation control of not only their own units but also of attached and non-attached aviation.

After attempting to combat the Afghan *mujaheedin* with an army aviation designed to defeat NATO countries, recent Russian military thinking reflect a much stronger emphasis on the unique requirements necessitated by mountainous terrain, and in turn relevant to us keeping the Himalayas and high altitude terrain in perspective. They have been able to conduct and expedite reinforcements and other logistic operations to key areas over otherwise extremely difficult or impassable terrain.

Armed scout/reconnaissance helicopters operating up to medium altitude and hovering out of ground effect at 6,000 feet with primary role in reconnaissance with most targets detected are being engaged by other platforms. Weapons are being employed for self defence or against targets of opportunity, when the situation dictates rapid actionable response.

Technological Advances : Rapid development in sensor and information technology is rapidly transforming ISR (Intelligence,

* *Lt Col R Ghosh is a Research Fellow at the Centre for Air Power Studies, New Delhi.*

Surveillance and Reconnaissance) capabilities leading to greater effect-based operations. Reduced pilot workload, increased lift, better protection and enhanced survivability figure prominently in the technological trends. The upgrades look into features fly-by-wire flight controls, full authority digital engine controllers, enhanced cockpit displays while adding more horsepower and allowing additional lift during external lift (sling load) operations.[2]

Flying under the cover of darkness has become the preferred mode of operation, and as a result Night Vision Systems, both Night Vision Goggles and Forward Looking Infrared systems, are fast becoming commonplace requirements. The use of actual aircraft is constrained by safety, environmental and energy requirement concerns.[3] Thus, with technological advances it is becoming exceedingly practical to utilise aircraft simulators to train certain critical skills.

High cost of purchase, operative and maintenance cost favours the utility of fixed-wing aircraft and has no doubt increased the usage by Army Aviation (AA). Communication, troop carrying and photography missions are routine application for such fixed-wing assets. The reviews of tilt rotor V-22 Osprey aircraft were encouraging till weighed against its weaknesses regarding slow descent, limited protection, maneuverability and a bill of $100 million per unit.[4]

A broad look at the security environment will also reveal that challenges in future will be ambiguous and engulfed in countering terrorism and internal security predicaments. Army aviation will become more relevant in all types of future operations and the emphasis will then hinge on specialised roles.

Organisational Approaches: Future AA will become a modular, capabilities-based manoeuvre arm, optimised for the joint fight with a shortened logistics tail, moving to restructure into modular, multifunctional aviation brigades. Majority of Army aviation support restructuring has already moved from corps to division level.

Both China and Pakistan seems to have tailored their AAC on limited combat capability, with emphasis on utility and transport support requirements rather than combat firepower. The ratio of holding transport/support/utility helicopters to attack versions is 1:7 in case of China, and 1:5 in case of Pakistan.[5] This has been influenced by mountainous terrain and imperatives for rapid response though influenced by interventions in the Gulf, there have been thoughts on enhancement of attack helicopter support in near future.

Future of AA in Modern War and Fourth Generation Warfare

Optimising the AAC is in the backdrop of some key influencing factors like the emerging macro trend in expansion of the battle-space; the sort of war India may have to fight over the next two decades and commitments along disputed borders across the high-altitude terrain. A broad look at the security environment will also reveal that challenges in future will be ambiguous and engulfed in countering terrorism and internal security predicaments. Army aviation will become more relevant in all types of future operations and the emphasis will then hinge on specialised roles.

Better battle-space targeting and attention is the scarcest resource in any operation. Nothing can substitute for human intelligence sources on the ground but the *persistent look* from the air can mitigate harm by seeing threats in advance. This may seem like wasted effort for aviation, but with a proper approach, these allow commanders to begin working their way up successfully. Neutralisation of approximately 2,400 bomb planters and capture of some 141 without a single casualty on friendly forces in Afghanistan and Iraq, have substantiated the focus on this decentralised option towards result oriented response of manned-unmanned team.[6]

Urban terrain offers greater opportunity for defence and cover, and looks likely to be the arena for the battles of the 21st century. The dense air defence over this environment has necessitated tactical data links over voice control. Ground based air defence batteries and aircraft now exchange digital information sufficiently and rapidly to fight the air, land and sea battle. The multitude and capability of air defence systems to detect and down low flying aircraft seems to have achieved phenomenal magnitude. However, management of dense air space will remain a complex challenge.

While survivability will be requirement for any moment, a high level of attrition may seem a reality. During Operation Iraqi Freedom 2003, over Karbala, 32 AH-64D Longbow were attacked in a classic ambush, by the Iraqi Medina armoured division. The outcome was significant when nearly all aircraft were hit by ground fire. The United States (US) army has also lost more than 120 helicopters in the 'war on terror,' about 25 percent of them due to enemy engagements resulting in 172 deaths, or about 5.5 percent of total American deaths since the conflict began in March 2003.[7]

Attack helicopters were designed in anti-tank roles which would counteract any overwhelming numeric superiority of armour on the battlefield. They were also to perform infantry support role. Our strategy to counter armour is not with attack helicopters in particular given a favourable combat ratio. In mountainous terrain the entry, route and exit of such aircraft can be predicted with fair degree of accuracy because valleys are followed and the dangers

increase in any attempt to be close to the mountains for camouflage.

Future battles can see unison of irregulars with conventional forces.[8] Therefore, low and slow flying operations over hostile terrain against an adversary which cannot be predicted in strength, location and weapons will tend to prove highly unpredictable both in terms of success and survivability. Presently, ratios of maintenance in man hours to flight hours are often 3.5 to 4.5. This will tend to get shortened due to the intensity of operations that would prevail. Parts will have to be replaced well before expected failure and this brings in additional cost.

The cost of helicopters both in terms of purchase price and subsequent operational cost are increasing geometrically with size. As a management issue in cost and utilisation, over 95% of the civil helicopters in use worldwide are "light." Also, the light military rotorcraft is expected to dominate the world at least till 2017.[9] To offset budgetary imperatives and economic considerations a mix of light and medium-lift helicopters with self-protection firepower will be measuring up to the needs for both mobility and integral firepower from the third dimension.

The country will continue to rely on Special Forces (SF) of the three Services to tackle the threat from terrorists. AAC can enhance the capability of SF and develop interoperability with the other three services, and National Security Guards where required.

In a network-based environment on account of the system-spanning information processing and transmission, AA will also be able to optimise its support by:

- Immediate representation of the current including the army aviation-specific situation information
- Integrated transmission and easy processing of relevant messages and data pertaining to tasks and missions
- Integrated connection of aviation bases in the information network of the army, resulting in an immediate data exchange before, during and after missions
- Computer-aided operation and mission planning resulting in resource optimisation
- Standardised data formats and exchange mechanisms ensuring interoperability in joint operations

Lessons and Requirement in Context

The performance measures for AA will depend on the extent to which it is equipped and operates in terms of platforms, technology, training and maintenance development measures. All of these incorporate the essentials of rapid mobility and therefore incorporation. The incremental path being taken by AA is likely to yield results when the upgrades substantially build a comparative tactical air mobility capability. There have been valuable lessons pertaining to effective use of helicopters for diverse operational tasks in air mobility and assault operations, and convoy security. Increased emphasis on dismounted operations and improved movement techniques; accepting innovative small unit independent action have been key to winning in any environment. We would not prefer to follow the US for variety of reasons but the lesson to be drawn is that the current capability has been a process of transition since 1965.[10]

Countering terrorism and managing internal security have become a reality for the Armed Forces. "Every combat arms unit should have a limited, yet focused capability to meet such challenges,"[11] as expressed by General Deepak Kapoor, Chief of Army Staff. The country will continue to rely on Special Forces (SF) of the three Services to tackle the threat from terrorists. AAC can enhance the capability of SF and develop interoperability with the other three services, and National Security Guards where required. The Indian Army modernisation and expansion plan had envisaged a dedicated aviation wing for the SF way back in 2001. An internal exercise to examine various proposals from different agencies to get the maximum advantage seemed to have truncated the effort.[12]

AA is working on several materiel changes to its current and future aviation platforms. By far, the focus has been on acquiring platforms to replace the aging fleet as has been stated earlier. These costly acquisitions are expected to perform for a minimum two to three decades with suitable upgradation. Upgrades and key modifications are required to incorporate army digital net-centric connectivity. Optical recognition,[13] beyond and non line of sight communications are key areas which will determine the way AA is able to deliver in future. Self-protection suite, observation and targeting systems to include high definition imaging turrets, enhanced day and night capable helmet mounted displays, and night vision goggles are inevitable requirements. Coherence and terminal support by the integral air arm will necessarily translate into an autonomous link between network acquisition and interoperability not only with the other ground elements but also with the Indian Air Force.

Low cost – low maintenance fixed wing aircraft operating with troops have their advantages. Operations from the field imply having to be concerned with tactical dispersion, camouflage, enemy situation, assembly area security, ground to ground as well as ground to air communications issues, and maintaining aircraft from a field environment. Factors that contribute to the operational attractiveness of these aircraft are associated with airbase infrastructure and potential threats near advance landing grounds where several existing ones will need activation and some additional ones created.

Multi-track training programs may require to be formulated where within each individual aircraft qualification course;

there is a hierarchy of required skills, levels of simulation and individual training aids. As advanced electronics and systems packages get incorporated the work-load on the aircrew increases and demand for additional expertise catapults. So, either a new discipline of aircrew needs consideration or present methods of specialised training reworked to achieve the desired level of proficiency.

AA is undergoing one of the most significant initiatives in its history rather than a state of flux as visualised by many. It is an extremely crucial and exciting time as it tackles numerous challenges in its transformation. Its capability to restructure, leverage technological improvements in current and future systems will allow the army to respond better in a more effective and sustainable manner.

The command and control structure of AA should be able to furnish the prerequisites of participation in rapid response and small unit operations. Tendency to adapt present structures in conventional mode to evolving challenges tends to provide only linear improvements to an organisation. Brigade-centric operations are focused on responsiveness and increased depth in joint capabilities which can be supported with modular framework of the integral air arm. Modular building blocks have been capable of providing both mobility and additional combative power down to company-based operations.

The attack variant of helicopter denotes that element of airpower, application of which must find origins in proven outcome. Losses in Iraq and Afghanistan, notwithstanding, operations in close proximity of civilian population with application of massive fire support from air with routine accuracy standards will almost certainly carry a baggage of uncalled for collateral damage. It is a different matter for Pakistan which can use their gun ships and artillery within their own territory as freely and announce success.[14] However, there exists the case for providing aerial armed reconnaissance with capability for lifting small teams.

Aviation logistics system has fielded the automation that is allowing commanders to see the logistics demands and set conditions for success. It should now be able to cope with the demands on its system 24 hours a day, 7 days a week, and have the agility and flexibility to plug into, and unplug from, a dedicated logistics network. This becomes more sustainable with the introduction of modular maintenance package. It eliminates the ills of centralised and multiple level structures.

In summary, AA is undergoing one of the most significant initiatives in its history rather than a state of flux as visualised by many. It is an extremely crucial and exciting time as it tackles numerous challenges in its transformation. Its capability to restructure, leverage technological improvements in current and future systems will allow the army to respond better in a more effective and sustainable manner. Areas of special focus and structures have certainly been given due thought and action initiated in highly professional manner but the workable recommendations have to be deliberated more deeply to complete the ambit of integral aviation support to the army.

Notes:

[1] CBS News Interactive: About Afghanistan "2 Months Into 2009, Deaths Spike In Afghanistan" , at http:// cbs3.com /national/afghanistan.us.troops.2.947151.html

[2] http://www.tectrends.com/ tectrends/ news/urn:newsml :prnewswire.com :20090325:NE88996:1.html

[3] Flying over urban terrain is imposed with a host of restrictions. It is expected that once the oil prices begin their upward inevitable spiral within two decades from now, their would be necessary restrictions on training flying hours.

[4] Bradley S.Klapper, "Marines in Iraq give Osprey solid Reviews, " http:// www.militarytimes.com/news/2008/10/ap_osprey

[5] *The Military Balance 2009*, (London: Routledge, 2009), p383 & p 354.

[6] Kris Osborn, "U.S. Aviators, UAVs Team Up Against IEDs" , *Defense News*, 21 Jan 08, p 1&9.

[7] http://defense-update.com/newscast/0207/analysis/analysis-100207.htm

[8] "Pak Taliban pledge to join forces in fight against India" , at http:// www.indianexpress.com/news/pak-taliban-pledge-to-join-forces-in-fight-against-india/393825/0

[9] Projection of Forecast International, a Connecticut based evaluation firm. At, http://defense-update.com/features/2008/november/151108_light_military_helicopters.htm

[10] The first airmobile division was fielded in 1965 in the U.S.

[11] http://www.expressindia.com/latest-news/Paratroopers-will-meet-NSG-manpower-needs-Army-chief/410661/

[12] Saikat Datta, "Army to focus on modernisation", at http://www.indian express.com/=19909

[13] Computer based vision algorithm to detect movement.

[14] 26 Militants where claimed to have been killed by Pakistan troops using gunships and artillery. BBC World News, broadcast on March 28, 2009.

Centre for Air Power Studies

The Centre for Air Power Studies (CAPS) is an independant, non-profit think tank that undertakes and promotes policy related research, study and discussion on defence and military issues, trends, and development in air power and space for civil and military purposes, as also related issues of national security. The Centre is headed by Air Cmde Jasjit Singh, AVSM, VrC, VM (Retd) Centre for Air Power Studies.

P-284, Arjan Path, Subrota Park, New Delhi 110010
Tel: +91 11 25699130/32, Fax: +91 11 25682533

Editor: Ms Shalini Chawla e-mail: shalini@aerospaceindia.org