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power in the future, in terms of its defence as well as the pursuit of its foreign policy goals.

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This is another perspective on the evolving thinking on aerospace power, this time from Group Captain **Sanjeev Bedi**, a distinguished combat pilot and a practising air warrior of the Indian Air Force. He has situated his arguments for a strategic role for the IAF in the coming years to enable both the optimum exploitation of existing capabilities and building appropriate ones for the future.

4. ELECTRONIC WARFARE IN THE 21ST CENTURY 47

Over the decades, electronic warfare has been occupying a dominant position in warfare. Some have even labelled it as the "fourth dimension" of war. Wing Commander **Sanjay Poduval** spells out the likely trends in this crucial area of military capability during the coming years and identifies some areas where it may again prove crucial in the outcome of war.

5. MODERNISATION OF THE PAKISTAN AIR FORCE 75

It is clear that Pakistan's army rulers have been paying special attention to the modernisation of the Pakistan Air Force and Ms **Shalini Chawla** takes an objective and fresh approach at the highest priority accorded by the army-led regime in the renewed modernisation of the Pakistan Air Force, especially since Pakistan's defeat in the Kargil War in the summer of 1999. She also concludes that the offensive strategy found in the past Pakistani military posture and action is likely to remain dominant. The PAF leadership has also become more vocal publicly

in arguing for further build-up of the force and the need for aggressive action.

6. INSIDE THE LABYRINTH: NATO'S MISSION IN AFGHANISTAN AND CONTINUING RELEVANCE OF PAKISTAN

History tells us that those who ignore the lessons of history are condemned to suffer the adverse consequences of that mistake. NATO's deployment and operations in Afghanistan since the highly successful US military campaign leading to the dramatic victory and "regime change" nearly seven years ago, and its failure so far to succeed points to the lessons of history. Shri **Shelly Johny**, our young scholar, summarises the labyrinth into which NATO has led itself, ignoring some fundamental factors that clearly impinge on the situation from the very beginning. With the resurgence of the Taliban, the freedom and sanctuary that Al Qaeda has come to acquire, and the negative impact on Pakistan's own security as the major "outcomes," it is important to consider the short-and long term implications of these operations.

7. SURVIVABILITY OF THE ARSENAL: THE ESSENCE OF SUCCESSFUL NUCLEAR DETERRENCE

Nuclear deterrence credibility over the past six decades has come to rest heavily on the concept of "second strike" capability. This itself has also included the process of building huge arsenals as part of the strategy to ensure second strike success. However, the issue of survivability, implicit in the existing nuclear strategies has rarely addressed the issue of survivability of the nuclear arsenal directly. Dr **Manpreet Sethi**

addresses this deficit in the context of survivability being even more critical for countries like India that rely on the doctrine of credible minimum deterrence and the strategy of "no first use."

8. PLANNING FOR LEGITIMACY: A JOINT OPERATIONAL APPROACH TO PUBLIC AFFAIRS

Major **Tadd Sholtis** has argued that legitimacy in public affairs about military operations in modern times is far more important than the credibility of those operations. He concludes that this requires further steps and "if air force leaders understand that communicating legitimacy is a necessary step in possessing the legitimacy required to fight and win, our leaders must take action now to better organise, train and equip PA (public affairs) forces to deliver the goods."

EDITOR'S NOTE

There is a new global trend of eminent policy-makers of the past focussing on the need for the United States to take the lead in global nuclear disarmament. Well known Cold Warriors like Dr. Henry Kissinger have been publicly advocating the approach. In order to bring the Indian perspective into the emerging dialogue, our sister think-tank, the Centre for Strategic and International Studies (with no connection to the famous Washington-based major think-tank) organised an international conference in collaboration with the Indian Council of World Affairs on June 9-10 on the theme of "Toward a Nuclear Weapon Free World" which also commemorated the 20th anniversary of the comprehensive Action Plan proposed by (then) Prime Minister Rajiv Gandhi. We found enthusiastic support from the international experts and the government.

In his inaugural address, Prime Minister Manmohan Singh spelt out the policy of the government for future action in the following words, "India is ready to add its own weight and voice to the global debate on nuclear disarmament with a view to crafting such a consensus on disarmament and non-proliferation."

Global nuclear disarmament, of course, is a complex issue. The very term "disarmament" means different things to different people and implies innumerable actions ranging from winding down existing arsenals to non-proliferation and yet promoting nuclear technology for peaceful purposes, especially energy, in a world of impending climate change and global warming. The process would obviously take a long time. The dominant view of the conference—already named as the "New Delhi Conference"—was that India as a nuclear weapon state is in a unique position to actually take the lead in the evolving global discussions and debate and in concrete terms expressed the hope that a Working Group would be formed to soberly go into specific areas that need to be addressed. The Centre for Air Power Studies hopes to encourage the process under its project on nuclear security.

INDIAN AIR FORCE IN THE DECADES AHEAD

F.H. MAJOR

Air Marshal Subroto Mukerjee enjoys an iconic status in the country, as most pioneers do. For the air force, however, he is much more than that, because most of what we are today is founded upon his vision and leadership. He is also held in high esteem for his personal attention to the welfare of those placed in his charge. His untimely demise, 47 years ago on November 8, was a great loss to the nation. We remember him today, when the Indian Air Force (IAF) has completed its 75th year and India its 60th. Appropriately, the subject for discussion is "IAF in the Decades Ahead."

Armed forces and air forces are instruments of national power and do reflect, though sometimes with a delay, national policies, interests, threat perceptions and responses; also the country's level of technology and economic status. Formed in 1932 in British India, the IAF was meagrely equipped and performed counter-insurgency roles in tribal areas. This role expanded in World War II, as the Japanese threat loomed large, but it remained essentially a tactical and 'counter surface-force'. Strategic air power, though necessary at that stage also, was the domain of the Royal Air Force (RAF). The colonial masters may not have wanted us to have a more potent capability. Post-independence acquisitions mainly followed technological advances, no doubt, goaded and moulded by the Pakistani and Chinese threats. Gradually, we acquired the necessary capabilities to execute the envisaged roles. Costs and insularity were a constraint in the past.

* Inaugural address by the Chief of the Air Staff, **Air Chief Marshal F.H. Major**, PVSM, AVSM, SC, VM, ADC, at the 4th Subroto Mukerjee Seminar organised by CAPS at India Habitat Centre, New Delhi, November 17, 2007.

Armed forces and air forces are instruments of national power.

Today, India is economically sound and our interests spread way beyond national boundaries. You can see that reflected in the IAF, which now has a 'trans-continental capability', is a strategic force and is gradually progressing towards 'air dominance'. India's international dealings have increased manifold and defence cooperation has followed in step.

The future shape of the IAF depends on a lot of factors, which include global and regional geo-political-cum-security scenarios, the likely nature of future wars, our threat perceptions and the role of aerospace power in meeting these challenges. The future also depends on our ability to overcome challenges that lie ahead. Therefore, we have to crystal-gaze in an orderly manner and I can see that the sequence of talks in the seminar covers these aspects.

THE GEO-POLITICAL ENVIRONMENT

There are greater interdependencies in today's world, where growth and well-being are not possible beyond a point, without international cooperation. The phrase 'cooperation and competition' best describes the global power-play. Economic and technological preeminence indicate national power, more than military power; which is why there are many new actors on the stage. In fact, the world is characterised by changing power equations. There are new friends and opportunities, and new adversaries too. All of this throws up military challenges and those that anticipate and act in time will have the advantage.

Asia is the new engine of global growth and centre of power. Booming economies have spurred rapid development and military capabilities. The region is also one of conflicts and instabilities, as peoples attempt to determine their destinies. South Asia mirrors all the concerns of the continent and India is situated in perhaps this most turbulent part of Asia. But even as our territorial disputes linger, we have newer responsibilities for a greater role. We will require political will, flexibility, speed of decision-making and more national power.

NEW THREATS AND NATURE OF WARFARE

The spectrum of threats is also much wider, with an increase in asymmetric warfare and low-intensity conflict at one end and nuclear threat at the other. Terrorism has evolved and is both decentralised and more sophisticated. The whole spectrum continues to acquire greater technological sophistication. Combating non-traditional threats needs military assistance and keeping peace is an important commitment of the armed forces. Trade and energy security considerations add to our security concerns, necessitating a change in our strategic outlook and also accentuating the role of aerospace power.

It is said, that in the last 3,500 years, there have been only 270 years of peace—mankind has fought 14,500 wars. There is a lesson here. The nature of wars has changed with the capability of weapons, which enable more focussed objectives. Strategies have evolved from attrition to manoeuvre, to parallel and effects-based operations. The objectives have changed from annihilation to persuasion. The next war may not conform to patterns of even the more recent conflicts and we may not be able to accurately predict the reason, scope, level and geographical extent of any future conflict, which might be conventional or nuclear; short duration or not; one front or more. Air power has made a significant difference to war-waging strategies and military objectives; consequently, to the very nature of warfare. But only more recently, thanks to technology, has it really begun to deliver on its theoretical promises.

Our interests spread way beyond national boundaries. You can see that reflected in the IAF, which now has a 'trans-continental capability', is a strategic force and is gradually progressing towards 'air dominance'.

Wars will invariably be influenced by international equations and battle-spaces will be transparent to the public. Legalities, therefore, cannot be ignored. Demands on the military in future will be far more challenging, requiring responses that are swift, flexible, calibrated and varied.

India needs its air force to be able to deter or punish, to protect or project national interests and execute its hugely increased peace-time roles.

NEED FOR AEROSPACE POWER

Aerospace power fits the bill just so perfectly and has assumed an ever-expanding role in national security. Unlike maritime power, whose applicability is determined by geographic location, and armies, whose size and composition are determined by relations with neighbours, size of the country and internal security compulsions, aerospace power has a more universal applicability. It has a huge impact on the everyday lives of people; as also on international relations and economic activity. It is, therefore, the 'preferred tool' for all conveniences and contingencies. It empowers the future.

Premised on 'cutting-edge' technology, its reliability and effectiveness hinge upon it. It is astonishingly reliable, effective, clean and responsive. It enables effects-based and parallel operations and can create strategic effects. Not all air forces have such capabilities, but the IAF, already among the leading air forces of the world, can, with the appropriate infusion of technology and training.

IAF VISION-2020

India needs its air force to be able to deter or punish, to protect or project national interests and execute its hugely increased peace-time roles. We, therefore, need comprehensive capabilities. The IAF is poised on the threshold of a transformational modernisation. But if we look at the way the IAF must evolve in the next two decades and compare it to any other evolving air force, there are essential similarities. Since aerospace power is premised on technology, which in turn is driven by operational needs, all air forces tend to envision a similar future. In fact, but for minor variations, we are on a globally recognised aerospace path. Depending upon the circumstances, threat perceptions and resources, it is only the scope and pace of growth that remain to be determined. Vision is a description of desired end-state, though the 'current emphasis' sometimes appropriates the status of 'vision'. However, the required shape of

the IAF in the next 20 years is easily apparent, needing no visionary to surmise, or any slogan to encapsulate it.

I would venture to state that the IAF must be equipped for long-reach, persistence, all-weather, precision, networked and space-enabled force capabilities. It must be of appropriate size and ultimately deliver on its promise of deter, punish, protect, project, or peace-assist, where, when and to the extent necessary. This implies hardware, organisation and people. The hardware must be well-chosen and procured in time; the organisation adaptive and well-interfaced; the people competent, motivated and well-trained. Our broad vision or mission statement, therefore, would be: "Requisite Capability, achieved Well in Time; with the Right People, who are Well Trained and Organised; for Assured Performance'. However, I am more interested in actioning this "Action Plan".

CHALLENGES-2020

Hardware, organisation and people make up the edifice of aerospace power. In a changing environment, these very elements also throw up challenges. Since I used the phrase Vision-2020, I must also dwell on "Challenges-2020". Hardware is at the core of an air force. Accessing the necessary technology is, therefore, the primary challenge. We do have a 'technology gap' and that can curtail national options. We must identify and pursue core-technologies with the maximum potential. We must also develop core-competencies in important industrial and engineering disciplines. It is also imperative to identify emerging technologies and develop them to secure a lead in niche areas. The indigenous aerospace industry needs a boost, through a collaborative and participative approach, which must include R&D, the industry, private enterprise and the IAF.

> **The IAF must be equipped for long-reach, persistence, all-weather, precision, networked and space-enabled force capabilities.**

Quite evidently, aerospace power requires very highly-skilled and impeccably trained personnel. Is there enough of the 'right stuff' to choose from and would they be willing to take up the challenge? Keeping the force updated on skills is an

Keeping the force updated on skills is an associated challenge, for it often requires a reorientation of mindsets, entrenched beliefs and ways of working.

associated challenge, for it often requires a reorientation of mindsets, entrenched beliefs and ways of working. We feel that the solution lies in continued international exposure and encouraging 'thinking air warriors'.

As the hardware changes, new capacities and capabilities are generated, which sometimes radically alter the way we do business. And we can't do it differently with old processes and organisational structures. An adaptive organisation is, therefore, another important objective for us.

AEROSPACE POWER AND IAF-2050

All that I have referred to so far is easy to surmise, for it is part of the working day for many of us—pegged as it is to 2020 or 2025. Our perspective plans reach out to that period and things are fairly concrete. Beyond the medium multi-role combact aircraft (MMRCA) and fifth generation fighter aircraft (FGFA), with their 40-year 'lives', we are looking at 2060. It is not easy to guess the shape of aerospace power in 2050 and beyond. Would the accent shift to unmanned flight, to missiles; or would 'air' be more of 'space'. Technology advances have in the past revolutionised military affairs and it is bound to happen again. The global environment will almost certainly metamorphose, altering equations and threat perceptions dramatically. Moreover, leading nations will have a greater say in the direction of technology development. The second-tier nations usually end up following the trail-blazers. What should be our long-term objectives? Ladies and gentlemen, these issues defy simplistic answers.

However, despite the uncertainties, the need for 'application and transportability' of national power and, thus, for aerospace power, in some shape, would remain. Nations that lack it, will seek it, as will non-state agencies. Aerospace power, both civil and military, is bound to proliferate and leading nations will endeavour to stay ahead. Technologically, aerospace power will seek to enhance its fundamentals in order to extend its reach, persistence, accuracy,

lethality, all-weather and lift capabilities; as well as situational awareness, survivability, command and control.

There will be a greater need for specialisation and for having an appropriate tool or capability for each occasion. One can foresee an increased dependence on unmanned aerial vehicles (UAVs) and unmanned combat aerial vehicles (UCAVs). There is bound to be greater accent on force-multipliers and force-enhancers. Of these, the intangible force-multipliers, such as the quality of people, their morale, their training and, of course, the organisational structures will assume critical importance. Aerospace power will find increasing applications in homeland security and in tackling asymmetric forces with faint footprints.

There is also bound to be greater networking and assimilation of space, perhaps even weaponisation of space. Networks extend reach and influence and energise command, control and communications (C3I). Space also endows global reach, surveillance and reconnaissance. Networks and space are interdependent —they are the glue that binds air operations, making them aerospace operations. Indeed, and irrefutably, the accepted logical progression for any modern air force the world over is to evolve into an aerospace force.

The intangible force-multipliers, such as the quality of people, their morale, their training and, of course, the organisational structures will assume critical importance.

Another area of focus in the years ahead would be on inter-disciplinary synergy, among the armed forces, with civil aviation and with other organs of national power. While the limelight is stolen by weapon systems, unless due importance is given to airfield and maintenance support infrastructure, we could never realise our true potential. We must also support indigenous R&D and industry, towards our common quest for technology and self-reliance. The doctrines would naturally evolve to keep pace with the changes.

It is risky business to predict international relations, but they do have a major impact on military force-structures. The global nature of many threats encourages international cooperation. Smaller nations have little choice but to

We must be able to provide the nation with the options it needs.

subscribe to a larger security umbrella. Developing aerospace power is also impossible without international cooperation. I dare say the future will see enhanced international defence cooperation in differing shapes.

CONCLUSION

In the end, I would state that building and nurturing aerospace power, on account of its costs, technology and implications cannot but be a national endeavour, requiring the commitment of the government, civil society, industry, scientific community and, of course, the air force. We cannot succeed on our own. But we must be able to provide the nation with the options it needs. The choices we make will determine India's power and the shape of its aerospace capabilities. It is indeed an exciting phase. We do have reason to be satisfied; but the journey is long and requires dedication, motivation, team work, a common goal, a good dose of patriotism and patience.

FORCE STRUCTURING AND DOCTRINES OF THE IAF

BHASHYAM KASTURI

Air power has truly been transformed in this century. Not only is air power today really aerospace power but, in an era of technology intensive military affairs, air power has begun to give military commanders the reach to project a nation's power far beyond its shores. Therefore, it is possible for air forces to reach different parts of the world with air-to-air refuelling, as well as operate from terrains away from home bases. The example of the Indian Air Force (IAF) flying to destinations in Alaska, with air-to-air refuelling, for an exercise with the US Air Force, is a sign of the changing times.

The probability of future conventional wars being short, swift and intense has necessitated a shift in focus of the land battle to manoeuvre warfare. The air-land doctrine stresses on the fundamental shift away from the attrition style of warfare to one where the air force makes a significant contribution to the success of battle. It progressively recognises that the inherent flexibility, variety and reach of air power make it a prime contributor to the future war.

Despite the rapid advances in technology and its impact on combat capability, it is not easy to take advantage of the revolution in military affairs (RMA). This is so because of the prohibitive costs involved and for a capital intensive force like the IAF, it is only more so. The IAF is today at the crossroads. With less than its authorised strength of squadrons, it is battling a problem of ageing aircraft, pilots leaving the service for more lucrative private jobs and the need to reorient itself to fight future wars. The problem the IAF is facing today

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The air force is trying to carve a niche for itself as an independent strategic entity with aerospace capabilities.

has been before it for several decades, but has really come to a head now. Issues such as phasing out of the MiG-21s, the need to modernise other MiG variants and the need to keep up with falling force levels have been dealt with before, but within the force, the crunch is being felt now.

It is necessary to contextualise these and other issues keeping in mind the need to replenish aircraft, weapons and other equipment as the IAF gets ready to fight the wars of the future. While the air-land battle doctrine is still in vogue and the cold start doctrine has become the doctrine of the Indian Army, the air force is trying to carve a niche for itself as an independent strategic entity with aerospace capabilities, at a time when force levels do not lend themselves for operational confidence. That is precisely why it is so necessary to study the operational doctrines and force structuring of the air force in order to posit the future.

THE IAF'S DOCTRINE

The 1995 Air Power Doctrine (APD) provides the main roadmap to ensure that the IAF remains a viable deterrent against its principal potential adversaries. The doctrine lays emphasis on certain fundamental issues, including the need to accord offensive air operations the same priority as air defence, the acceptance of a reduction in force levels, but compensated by an increase in technology levels, emphasis on the acquisition of force multipliers and improvements in command, control, communications, computers, intelligence (C4I) structures, plus a revamped, modernised air defence and communications network.

There are four issues of importance underlying the doctrine. All four are interlinked and attempts have been made by the IAF to move forward on all fronts.

- According offensive air operations the same priority as air defence.
- Acceptance of a reduction in force levels, compensated by an increase in the levels of technology.
- Emphasis on the acquisition of force multipliers.

- Improvements in C4I structures and a revamped, modernised air defence and communication network.[1]

This doctrine revolves around the primacy of air power in 'shaping' the battlefield.

In the middle of 2007, the IAF reportedly decided to reformulate its doctrine, keeping in mind the need to transform itself into an aerospace power with "potent strategic reach." This doctrine revolves around the primacy of air power in 'shaping' the battlefield. Obviously, the IAF has been influenced by the US-led attacks in Afghanistan and Iraq, which saw "smart bombs" like high-accuracy JDAMs (joint direct attack munitions) being used in all-weather conditions.[2]

Though the IAF was the first among the three Services to come out with a doctrine in 1997, it has become necessary to update its plans since globally the employment of air power has seen considerable change. Additionally, the IAF has inducted a wide array of sophisticated technologies since then. The earlier doctrine, for instance, was written when the IAF did not have mid-air refuelling aircraft like IL-78s or long-range air dominance fighters like Sukhoi-30MKIs. The already considerable 3,200-km range of the Sukhois can be more than doubled with in-flight refuelling by IL-78 tankers, configuring strategic capabilities.

Moreover, the new doctrine also factors in the valuable experience gained, especially in beyond visual range (BVR) combat, during joint exercises conducted with more technologically-advanced air forces like the US and French in recent years. The utilisation of space as a medium for 'real-time' military communications and reconnaissance missions, ballistic missile defences and delivery of precision-guided munitions through satellite signals should also be part of the new doctrine.

A new cold start doctrine for the Indian Army marked a break from the fundamentally defensive orientation of the Indian military.

The April 2004 announcement of a new cold

1. R.Chattopadhyay, "The Indian Air Force: Flying into the 21st Century," *Bharat Rakshak Monitor*, vol. 3(1), July-August 2000, available at http://www.bharat-rakshak.com/MONITOR/ISSUE3-1/chatto.html.
2. Rajat Pandit, "IAF Plans War Doctrine to Expand 'Strategic Reach'," *The Times of India*, August 2, 2007, available at http://timesofindia.indiatimes.com/IAF_plans_doctrine_to_expand_strategic_reach/articleshow/2249654.cms

To be restricted in operations is anathema for the IAF, for air power can operate over a very wide area.

start doctrine for the Indian Army marked a break from the fundamentally defensive orientation of the Indian military. For the first time, a doctrine was evolved which required combined arms operations jointly with the IAF. The timing of the doctrine was also significant because India was just beginning to find its roots for integrated warfare at the institutional level, with the creation of the Integrated Defence Staff. This combined with the belief that cold start, with its integrated battle groups, could become a tri-Service doctrine, is really at the heart of the inter-Service quarrel, if one may call it that, over priorities and roles, both independent and joint.

The two Services have very different views of how joint operations should be conducted. In essence, the army believes that modern wars are best fought under a unified command, where a single commander controls unified formations from all three Services. The air force, on the other hand, believes that the different Services should coordinate their plans but fight the war separately, in order to achieve integrated political and military objectives.[3]

According to the IAF, assigning air force units by geographic command would lead to cause a gross underutilisation of air power. To be restricted in operations is anathema for the IAF, for air power can operate over a very wide area. In comparison, army formations are usually assigned a clearly defined and relatively limited operational area. Likewise, strike targets are defined very differently for the air force, and limiting a squadron of multi-role combat aircraft for close air support or air cover places artificial and unacceptable constraints on employment of air power. Worse, it nullifies the IAF's considerable numerical and qualitative advantages over the Pakistan Air Force (PAF) by allowing it to concentrate in a spatially limited theatre of operations.

Given this fundamental difference in approach, it is but natural that the actual conduct of war in the subcontinent continues to suffer from a lack of coordination. Opposition to "integrated battle groups" and the command structure for

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3. Dr Subhash Kapila, "India's New 'Cold Start' War Doctrine Strategically Reviewed," South Asia Analysis Group, Paper no. 991, 4.5.2004. http://www.southasiaanalysis.org/papers10/paper991.html.

conducting integrated operations currently creates obstacles to evolving joint doctrines for the forces. Whatever be the merits of the arguments, it stands to reason that evolution of joint doctrines for operations is a necessity, but there is no reason not to aspire for aerospace power within that overall framework.

In March 2008, the armed forces carried out Exercise Brazen Chariots, an exercise which revalidated the existing air-land battle situation in a joint and synergistic setting. As far as the IAF was concerned, it needed to integrate its air-lift capabilities to paradrop special forces and paratroopers with heavy combat and logistic loads. During the exercise, fighters, transport aircraft and helicopters, including SU-30, MiG-21, MiG-27, IL-76, Mi-17 and MI-35, unleashed a variety of weapons on simulated targets like artillery gun positions, company defended localities, communication nodes, logistics camps and armoured depots. Essentially, it brought home to observers that these exercises were joint to the extent that one force was willing to support the other in the larger battlefield.[4] But what happens when air power is to be used differently or is to operate independently?

One has to visualise the IAF operating on its own to gain air superiority.

One has to visualise the IAF operating on its own to gain air superiority, engaging enemy targets deep within his territory and, in the worst case scenario, taking out his nuclear assets. This, combined with space assets that will give tracking and targeting capability that is currently available only to the US, means the IAF will be required to operate on a scale far beyond its present abilities.

It is, therefore, appropriate to take a relook at the IAF experience in terms of threats and operational roles. The Indian armed forces are ready to fight a one and a half front war, with the IAF providing close air support, offensive air support and deep strike roles. In a nuclear environment, it is assumed that the IAF could be used for a possible first strike, even though our commitment is to a no-first strike doctrine. The other option in a conventional war would be to engage in a preemptive strike to take out the enemy's nuclear capability,

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4. Y. I. Patel, "Dig Vijay to Divya Astra: A Paradigm Shift in the Indian Army's Doctrine," available at: http://www.bharat-rakshak.com/LANDFORCES/index.php?page=shop.browse&category_id=324 &option =com_virtuemart&Itemid=26&vmcchk=1&Itemid=26

What eventually happened is that the IAF adapted to the task and used resources accordingly, in the end demonstrating the Indian genius for adaptability.

command and control and electronic warfare (EW) assets and the like. Past experience with air operations indicates sufficient capability for attrition warfare and for close air support. A look at the Kargil conflict will inform us of the current capabilities of the IAF.

THE ROLE OF THE IAF IN KARGIL

The IAF in 1999 had a brief but unique operational experience in the Kargil sector of Jammu & Kashmir (J&K), providing it with real-life opportunities to evaluate its strengths and limitations and to acquire expertise in the operation of precision guided munitions (PGM) and deploy beyond visual range (BVR) missiles under combat conditions. The early loss of aircraft in combat immediately exposed it to the dangers of a man-portable air defence systems (MANPADS) environment.[5]

Kargil had several interesting highlights. First, there was the issue of whether or not to apply air power. Added to this was the question of whether to cross the Line of Control (LoC), if required operationally. The other issue arising from the application of air power was the intensity of its use. Just like the Indian Army, the IAF was as much in the dark in terms of who and what the opposition was. Therefore, the question of what resources to allocate to such high altitude air warfare did generate considerable debate. What eventually happened was that the IAF adapted to the task and used resources accordingly, in the end demonstrating the Indian genius for adaptability.[6]

The Kargil action provided the IAF with a unique environment to fine tune its operating skills. The IAF launched PGMs for the first time with Mirage 2000s, while MiG-27s and MiG-23 BNs carried out devastating attacks

Battlefield interdiction was found to be of greater utility than close air support in the mountains.

5. Air Commodore Jasjit Singh, "The IAF: Realities of the 21st Century, *Vayu Aerospace Review*," January-February 2005, issue no. 1, available at http://www.vayuaerospace.in/Selected_articles/Vayu%20special/iafin21cent.htm
6. Ved Shenag, "The Kargil Operations - 1999, Operation Safed Sagar," available at:
http://www.bharat-rakshak.com/IAF/History/Kargil/Shenag.html.

against enemy command nodes and logistics. The Mirage 2000s, equipped with Litening pods, took out enemy positions atop high mountains with pinpoint accuracy, and infrared (IR) seekers tracked ground targets from 15 km out and then released weapons at about 6 km, holding the lasers onto targets which allowed them to remain well outside the envelope of enemy air defences.[7]

The conflict also exposed some limitations of the attacking aircraft and tactics. In particular, battlefield interdiction was found to be of greater utility than close air support in the mountains, while it was quickly learnt that general lack of counter-measures (chaff/flare dispensers) across the IAF fleet contributed significantly to the early losses. Until Kargil, only the MiG-23 BNs, some Jaguars and a handful of MiG-27s were fitted with automated counter-measures (in addition to the air defence types). Upgrading the self-defence and jamming capabilities of the rest of the attack aircraft fleet assumed a sense of urgency and base repair depots took on the task of integrating chaff/flare dispensers.

The Kargil experience was an important training ground for the IAF, for the force had never actually operated in the high altitudes. Inadequate attention to this aspect, despite the lessons of the Soviet experience in Afghanistan and, much earlier, the operations by the IAF in Jammu and Kashmir in 1947-48, is a reminder of the constant need to keep the learning curve in mind. Further, the lack of counter-measures against ground fire led to the initial losses, but subsequently, the force modified its tactics and equipment to perform interdiction and battlefield attrition of a high quality. The experience of Kargil had important lessons, both strategic and tactical, and it remains to be seen how effectively the force will move towards the next conflict, keeping in mind the need to prepare itself for all contingencies.

FORCE LEVELS

The IAF currently has over 60 air bases grouped under the five Air Commands (apart from the Training Command and Maintenance Command). There are a number of newer air bases being built as well, in line with India's strategic doctrine.[8] The majority of the strike bases are under the Western and South-

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7. Chattopadhyay, n.1.
8. See Indian Air Force, http://en.wikipedia.org/wiki/Indian_Air_Force.

Over the years, the IAF has accepted that the increased costs of maintaining a modern and effective air force necessitate a reduction in quantitative levels.

Western Air Command, followed by the Eastern Air Command, giving an indication of the threat perception. Given the increasing importance of maritime security and the IAF's extended reach with the SU-30s, there is a need to increase the number of bases in the south, as also in the Andaman and Nicobar Islands.

Over the years, the IAF has accepted that the increased costs of maintaining a modern and effective air force necessitate a reduction in quantitative levels. Therefore, even though the IAF is not at its authorised strength of 39 squadrons, it is not too worried. What is bothering the IAF is the delay in filling the already existing gaps in aircraft, force multipliers and missiles, so essential to make up for the lack of numbers.

There has been a delay in preparing the ground for the acquisition of 126 new multi-role combat aircraft, and this will lead to the first lot of these fighters being delivered only by 2012 at the earliest. By then, the IAF would have retired many more squadrons of MiG-21s, which constitute the bulk of its combat fleet, and 40 more MiG-27s.

To counter the sharp fall in numbers, the IAF has upgraded 125 MiG-21 'Bisons' and 100 each of the MiG-27MLs and Jaguars with new avionics, weapon systems and life-extension refits. And now, after signing a Rs 3,840 crore deal with Russia to upgrade its 69 MiG-29s by 2011, the IAF is looking for a similar package for its 51 Mirage-2000s with France.

The MiG-21 Bis-UPG (or MiG-21 Bison as the IAF calls it) upgrade programme is underway. The IAF's second-generation fighter types—the MiG-29 and Mirage 2000—will see intensive avionics upgrades as well as the ability for some of the MiG-29s being equipped for air refuelling. The multi-role capability and very high serviceability of the Mirage 2000 (close to 90 per cent), led the IAF to order an additional ten aircraft. The Sukhoi Su-30 MKI is the most important combat aircraft programme currently underway. The licensed production of this combat aircraft began in 2004 and will be completed by 2017.

The first Su-30MKs were converted to the MKI configuration when the 32 Su-30 MKIs built in Russia were delivered.

The MiG-27 M remains the backbone of the IAF's tactical strike force, equipping some six squadrons plus. Five squadrons of Jaguars form the deep penetration strike element now being complemented by the Sukhoi Su-30MKI, which has a far greater radius of action. The MiG-27s and Jaguars are expected to remain in service until 2020 and keeping this in mind, a comprehensive sensor and electronic warfare upgrade programme has been initiated. The IAF's commitment to keeping the Jaguar in service for at least two more decades was reaffirmed by its decision to order additional batches of the aircraft. The new Jaguars are to DARIN II standard and have much enhanced precision strike capability than the early batches, also incorporating the much-needed autopilot.

Given the range of threats faced and the fact that the assets of the IAF are dwindling, it does make the task of allocating roles more difficult.

In addition to fulfilling overland strike duties, the IAF is tasked with providing tactical air support to the navy. One maritime squadron of Jaguars has been specifically earmarked for this role on the western coast and is equipped with a mix of Sea Eagle-armed Jaguar IS and IMs. Additionally, the IAF has tasked a MiG-27 squadron to cover the eastern sea board, to operate in conjunction with the navy's own air assets, including Sea Harriers and Tu-142s.[9]

The IAF is also using a variety of unmanned aircraft for reconnaissance. In 2004, the IAF ordered three Phalcon airborne early warning radars from Israel, which is considered to be the most advanced airborne early warning and control (AEW&C) system in the world, before the introduction of the American-made Wedgetail. The air force will use the three newly-acquired Il-76 as a platform for these radars. Prior to 2006, the IAF used to operate the MiG-25R for high altitude reconnaissance. The MiG-25, in service since the late 1980s, were decommissioned in 2006. The IAF also used the Canberra aircraft for reconnaissance and photoreconnaissance missions during the Kargil conflict. The air force also has a

9. Singh, n.5.

The air force mix of aircraft, weapons and equipment since 1947 indicates that the primary task is air defence and close air support.

huge complement of transport aircraft and helicopters which perform a variety of roles that help round off the mission of the IAF in all its aspects.

Given the range of threats faced and the fact that the assets of the IAF are dwindling, it does make the task of allocating roles more difficult. In 1947, it had some six and a half squadrons, which slowly rose to 25 by the end of the Fifties although the planners had reckoned on a 20-squadron force as early as in 1951. It was only after the 1962 Sino-Indian conflict that a 45-squadron force was mooted. But even today, the IAF continues to have an inventory plan of some 39 combat squadrons, actual numbers being smaller.[10]

The IAF has already phased out about half a dozen of its MiG series of combat squadrons in the past couple of years—the latest phase out being an MiG-23MF squadron in March 2008. Consequently, the present strength of the IAF fighter squadrons is down to about 30 from 39, which was declared as a minimum requirement a couple of years ago by the then chief of air staff. Pakistan fields about 18 fighter squadrons, or about two-third of what India has. Given China's vastly expanded, and upgraded, capabilities on the other side of our frontiers, this is a tricky situation for the air force.[11]

What the IAF has been able to do is periodically replace available equipment, usually of Soviet/Russian origin. This has had an adverse effect on the IAF's combat capability and, more importantly, its doctrine and thinking. Short-range aircraft have meant that the IAF could play only a subordinate and supportive role. Most of its strike aircraft had limited range and its interceptors little endurance, as the same type of aircraft was used for both the tasks. The MiG-21 aircraft, which was essentially a high level interceptor designed to stop the B-52 bombers during the Cold War, became the mainstay of the IAF. The Hunters,

10. Air Chief Marshal A. Y. Tipnis, "Indian Air Force 2020: Perspective Planning - An Essential Requirement," *Security Research Review*, vol., (1) 2, available at: http://www.bharat-rakshak.com/SRR/Volume12/tipnis.html
11. Singh, n.5.

Mysteres, Gnats, S-22s, and later even the MiG-23/27 class of strike aircraft were essentially short on range and armament carriage.

It was only with the induction of the Jaguar and later the Mirage-2000 multi-role fighters, that the IAF addressed these shortcomings. This inventory shows an enduring obsession with the Pakistani threat and an unplanned and unchecked multiplicity of types. The IAF has continued to emphasise air defence while hoping to get the best out of the existing rudimentary multi-role capability of these aircraft for strike missions. As a result, both the strike and air superiority missions have suffered. Air defence accounted for some 45 per cent of the air effort in the 1971 War. It would be easy to see the adverse effect of such massive defensive effort on the IAF's throw-weight or offensive capability.[12]

The air force mix of aircraft, weapons and equipment since 1947 indicates that the primary task is air defence and close air support. Support to the army has been a major task of the air force. It is to be seen whether for the IAF, with its new doctrine and aim to evolve into a aerospace power, it will be possible to get into an offensive air situation and ensure gaining air superiority in a future war. That sort of capability requires a large amount of weapons and electronics fit onto existing platforms that will provide combat capabilities that can be simultaneously used on the battlefield.

Attention has to be paid to fighting future wars in all three spectrums of conflict. This requires analysis of the technology factor in helping air power in fighting future wars.

The primary task of the IAF is defence against Pakistan. For this purpose, there are a number of airfields within striking range of our western neighbour. But the new era of technology and tactics requires a reorientation of strategies keeping in mind the needs of an integrated battlefield, possible preemptive first strike, and the need to win air superiority. Supporting the ground troops in an air-land battle situation is going to remain a part of the mainstay of the IAF's operations in the future, but the aerospace dimension cannot be ignored.

There are many ways of looking at the IAF, but in the present context, it seems

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12. Tipnis, n.10.

At the minimum, this would require building up of force levels to 45-odd combat squadrons.

to be most appropriate to analyse the force as it is today—look at the medium term posture and then posit long-term force structures. Given the resources constraints faced by the armed forces in general, and the IAF being a capital intensive force, the issue of resource allocation will remain a constant factor now and later.

As seen above, the IAF is today faced with the following problems:

- Falling force levels.
- Ageing aircraft and equipment.
- Inadequate modernisation of assets to meet interim battlefield requirements.
- As in the case of the other two forces, delays in acquisition of aircraft and platforms that affect capability in all spheres of combat.
- Attention to be paid to fighting future wars in all three spectrums of conflict. This requires analysis of the technology factor in helping air power in fighting future wars.

Currently, the IAF has the capability to engage in all aspects of air combat and support ground troops. It also has a limited but valuable capability to deliver a portion of India's nuclear deterrent, as and when required. Its force mix has the ability to operate well within Pakistan, but has limited engagement capability deep within China. With the Su-30, it is possible to cover a large area of the subcontinent, including the maritime sphere, but it is as indication of the necessity of inducting more such aircraft if the force is to transit into the future digital battlefield. What this means is that the IAF needs more aircraft with the range and capability of the Su-30.

In the medium term, while the force grapples with new acquisitions and ensures that their induction is done as effectively as possible, there is also a need to identify sources of technology that will help battlefield situations in all spheres of combat. The RMA affords several cost-effective options, several of them already in the pipeline, to increase combat capability without an actual increase in numbers. In terms of actual accretion of numbers, the planned

induction of 126 medium multi-role combat aircraft (MMRCA) is a step in the interim to fill force gaps and to increase combat capability, given the need to keep pace with technology. But one must remember that the MMRCA will not arrive before 2012 in adequate numbers to make up for depleting force levels.

The final aspect is to focus on the long-term force levels required in the context of the changes taking place across the frontiers and the tasks and missions of the IAF having increased manifold. At the minimum, this would require building up of force levels to 45-odd combat squadrons, in the knowledge that that 'earliest' could be 20 years or more away.

One must keep in mind that more aircraft will have finished their design life by this time, with a negative impact on force levels which would be difficult to compensate with currently known acquisition programmes. For example, the six squadrons of the upgraded MiG-21 (Bison) would need to be replaced in another 10-15 years, while the fully operational light combat aircraft (LCA) would barely enter service by that time. So the long-term acquisition plans of the IAF would have to be put in place beginning now.

FUTURE OPTIONS

There are twin options for the IAF as it looks to the future. First, maintenance of existing force levels by upgradation of all aircraft and equipment. This is happening in the case of the MiG-21 and other aircraft. But these upgrades will only last for a decade or so and then it will be time to replace all these aircraft. Upgradation also means an enhancement of maintenance facilities. With the Russian aircraft in the inventory, India, fortunately, has the infrastructure, but with aircraft of other origin, this facility is not there.

The second option, as is also being currently attempted, is to equip the force with a number of platforms that are capable of force multiplier effects. For instance, upgradation of all aircraft in the inventory with air-to-air refuelling probes is a step in the direction of increasing endurance. The Su-30 MKI is presently the only aircraft in the inventory that is capable of long-range penetration strikes. More of these aircraft are required for a variety of roles, ranging from air superiority to maritime strike.

The air force wants to reduce the inventory in its combat jet arsenal to three aircraft systems only.

The air force wants to reduce the inventory in its combat jet arsenal to three aircraft systems only, and over the next few years, it plans to use the Tejas as the LCA, the new MMRCAs as the medium combat aircraft (MCA) and the 35-tonne SU30-MKIs as the heavy combat aircraft (HCA). The SU30-MKI is a near fifth generation fighter giving the IAF substantial strategic reach, and although this aircraft is still in the process of acquisition, future upgrades for it are already being planned to ensure that it retains 'its cutting edge' over the coming decades.[13]

The combat experience and force structures of the IAF indicate a defensive-offensive doctrine of air warfare, largely dedicated to tactical air support and achieving air superiority in the battlefield. In the past, the IAF played a largely supportive role, with little to show for its strategic capabilities. During the Kargil War in 1999, there was an effort to engage in battlefield interdiction, and earlier in 1988, the IAF demonstrated its airlift capabilities during Operation Cactus.

Providing close air support and carrying out ground strikes at both the forward edge of the battle area (FEBA) and deep penetration remain the principal tasks of the IAF also. But the latter is really a concept for Pakistan-centric operations. Our force structures can probably gain air superiority in a limited area in cold start conditions, but this capability has to be augmented along with quick integration with other military assets. Combined operations with geographic co-location of assets may be a necessity in the future as warfare heads towards more integration and optimum use of resources.

While air defence has been a primary role for the air force, future wars suggest that we will have to take the war into enemy territory. Even though during Kargil, the IAF was not allowed to cross the LoC, it is suggestive of the operational terrain that sometimes the air force had to engage targets on the borderline. This requires accuracy of a high level and Operation Safed Sagar (the name given to the IAF's operations during Kargil) is a tribute to the training and

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13. Remarks of the Air Chief, Marshal Fali Major in "Single Vendor To Win Air Force MRCA Contract: Air Force Chief," 1.7.2007, available at: http://www.india-defence.com/reports/3385

innovative capabilities of the force in that it managed to fulfil its role within the given constraints.

Assume that future wars will be short in duration, and intense. Also assume that given the internal security dimension of an ongoing proxy war with Pakistan, it is likely that the IAF will have to engage with the unseen enemy. Can we visualise a role for the air force in combating terrorism in J&K? We can definitely see a role for the IAF in combating Naxalism in several parts of India. Employment of air assets in combating insurgencies and against terrorist infrastructure is likely to be a part of the future roles of the force. But the exact dimension of this role will have to be defined in conventional terms before assets are deployed in this direction. But one must realise that the IAF has been created to fight wars and it has to prepare itself for future wars, where the attacker will have the initiative.

Therefore, the IAF has to adopt an offensive-defensive posture that is capable of taking war into the enemy's territory and dominating the air space over the battlefield area. This requires force structures to be integrated with user-friendly sensors and electronic systems. In terms of overall strength,

While air defence has been a primary role for the air force, future wars suggest that we will have to take the war into enemy territory.

needed for strike roles, the IAF will need at least one squadron or one and a half for every army division. If, of the 34 divisions, some 20 are fielded in war, the IAF would need at least 30 squadrons to support them.[14] Current squadron strength is inadequate in this sense. Not only are the aircraft old, their capabilities are also limited. With air-land battle being the call of the day, the IAF will have to operate in tandem, firstly, with the army and, to a lesser extent, with the navy. Combat capability has to be extended to all weather and all terrain capability.

Presently, the IAF is down to just about 30-32 squadrons, with many more older MiG variants lined up for progressive retirement. Even with new acquisitions, India will only have 35.5 fighter squadrons by the end of the 11th Five-Year Plan (2012), and 37.5 squadrons by end of the 12th Plan. Though the IAF is inducting

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14. Bhashyam Kasturi, "The IAF: Search for a Doctrine," *Defence Today*, August 1994, pp. 104-105.

The former IAF chief warned the government that "unless immediate steps are taken to arrest the reduction in the IAF's force levels, the nation will, for the first time in its history, lose the conventional military edge over Pakistan."

advanced multi-role fighters such as the Sukhoi-30MKIs and force multipliers like IL-78 mid-air refuellers and 'Phalcon' AWACS, numbers do matter in the ultimate analysis.

It is interesting to note that the former IAF chief, Air Chief Marshal S.P. Tyagi, even warned the government that "unless immediate steps are taken to arrest the reduction in the IAF's force levels, the nation will, for the first time in its history, lose the conventional military edge over Pakistan."[15] Even though the strength of IAF combat squadrons has temporarily fallen below the authorised level, the IAF needs to project its demand for the future in the light of the increasingly dominant role it would have to play. While technology and weapon-load carrying capacity of the present/future front-line force will offset to some extent the actual numbers of aircraft required, given the multiplicity of roles and the vast extent of frontiers to be covered, a strength of 40-45 combat squadrons is considered necessary by 2020. Unless there is a drastic change in our processing methodology, this is indeed a challenging goal for the next 15 years.[16]

It is possible to identify some key areas of attention for the IAF. A first priority is optimising force capability and levels. A second aspect relates to the gaps in the existing air defence system and the need for a review, keeping in mind the nuclear and terrorist environment. Given the increasing emphasis on systems rather than platforms, it is necessary for the IAF to pay greater attention to research and development (R&D) and force structuring in the area of PGMs, cruise missiles, unmanned aerial vehicles (UAVs) and unmanned combat aerial vehicles (UCAVs), C4I/BM/T/BDA systems, night-all-weather and BVR warfare capabilities, training and combat simulation. An integrated approach to

15. Rajiv Singh, "The IAF's MRCA Contract: A Three Way Shoot-out," March 27, 2007, available at: http://www.domain-b.com/aero/20070327_mrca_contract.htm
16. Tipnis, n.10. The former air chief seeks a 50-55 squadron force by 2020. Given the present rate of inductions, this seems possible. But it seems more realistic to seek a 45 squadron force with adequate force multipliers and force projection capabilities.

information warfare is also needed as the issue is multi-layered and far more complex today than ever before.

At another level, it seems rational for the IAF to search for capabilities that will give it reach, interoperability and yet ensure safety, within the given constraints. It is worth, therefore, flagging the focus areas of capability building for the IAF in the future:

- Power projection capability.
- Deep strike capability.
- Airlift capability.
- Nuclear deterrence.

With the aim of achieving aerospace status, the force needs a perspective plan for the next 25 years on how this transformation is actually going to take place. That is an issue of separate study and not dealt with here. But, by and large, the quandary in terms of resources and actual acquisitions and the time taken for these reflect the basic problem faced by the IAF.

CONCLUSION

As the IAF begins its operations in the new century, it is faced with a dilemma. This relates to how to face the future in terms of limited resource allocation, but with an ever increasing need to enhance combat capability. This requires money and a detailed plan for acquisition that is spread over the next 50 years, keeping in mind future threats and opportunities. One may well argue that it is no use to plan that far ahead in a budgetary situation that does not look beyond one year. But the lesson that we learn is to plan ahead now so that we are not caught unawares in the future.

STRATEGIC ROLE OF AIR POWER

SANJEEV BEDI

The most decisive victory is of no value if a nation is bled while gaining it. More potent and economical form of warfare is disarmament through paralysis rather than destruction through annihilation.

—Liddel Hart

There is a need to understand the meaning of the oft used word "strategic". But we must keep in mind the context in which it is used. Initially, during the 1920s - 1940s, "strategic" in air doctrine meant the pure offensive of the bomber against the enemy's heartland to achieve quick, swift victory which avoided the carnage of defensive trench warfare. Post-World War II, as the world got divided in the two blocs led by two superpowers, "strategic" mostly meant bombers with intercontinental range, carrying nuclear weapons. Ballistic missiles with nuclear warheads also came in this category from the 1950s onwards. So "strategic" referred to ranges of 5,000 km plus and nuclear weapons in large kilo ton (KT) or mega ton (MT) capacities.

The Vietnam War saw B-52 strategic bombers unleashing up to 30 ton bombs in each sortie for supporting troops in close air support, that is, in a tactical role. In 1982, eight Israeli F-16 aircraft attacked the Osirak nuclear reactor near Baghdad with 1,000 kg bombs each and totally destroyed the facility. It set back Iraq's quest for nuclear weapons at least by a decade. So while Cold War bombers were being used for tactical air support, the tactical aircraft ,using tactical weapons, achieved

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"Strategic" mostly meant bombers with intercontinental range, carrying nuclear weapons.

results that were totally strategic in nature. During World War II, it took 1,000 bombers, with 9,000 aircrew , dropping nearly 2,000 ton of bombs to destroy a target. During the Gulf War of 1991, one F-117 carrying 2 ton bombs could destroy a target with greater assurance in one sortie.[1] Thus, a tactical aircraft with tactical weapons was achieving a far greater effect than the 1,000 bomber raid of World War II.

This has blurred the earlier distinction between "strategic" and "tactical". What is the future like? Today, one B-2 bomber of the US Air Force (USAF) carries 80 bombs of 500 lb each. It can attack 80 separate targets, each with extreme precision, achieving the desired effect. In a few years, its capacity will be 200 small diameter bombs (SDB) able to attack 200 targets in one sortie. This 135 kg SDB, filled with much better explosives, will give the same effect as an earlier 500 kg bomb. An SU-30 aircraft could easily carry 32 precision bombs in each sortie and attack 32 separate targets with great precision. So, in today's warfare, the strategic connotation is no longer related either to the very long range of bombers or nukes as weapons, but to the effects that are produced at the target end. The aircraft type and the size of bomb are no longer primary considerations.[2]

EVOLUTION OF STRATEGIC AIR POWER

The use of the expression "air power" was first recorded in H.G. Wells' novel *The War in the Air,* in 1908. However, according to Professor Tony Mason, the official birthday of air power has arbitrarily been selected as **1893**, when a Major Fullerton of the British Army had presented a paper to a meeting of army engineers in Chicago in which he prophesised that the impact of aeronautics foreshadowed "as great a revolution in the art of war as the discovery of gun power," that "future wars may well start with a great air battle," that "the arrival over the enemy capital will probably conclude the campaign" and that, "command of the air would be an essential prerequisite for all land and air

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1. Richard T. Reynolds,"Heart of The Storm–The Genesis of The Air Campaign Against Iraq," p. 107.
2. A.K. Tiwary, "IAF-The Strategic Force of Choice," *Indian Defence Review*, September 2007.

warfare." This date has been selected in preference to 1803 when the first airship company was formed in France; or 1883, when Albert Robida envisaged a sudden crushing air strike in his *War of the Twentieth Century*; or 1903, that marked the first heavier than air machine flight by the Wright Brothers.

While the 19th century may well be credited with the conceptual visualisation of air power, it was the epic heavier than air machine flight by the Wright Brothers in 1903, which was the first concrete step in the fulfilment of the vision. By 1909, aircraft had been inducted into military service. **The first official record of the use of aircraft in actual combat was made in 1911 by the Italians in the Libyan campaign when Captain Moizo and De Rada, flying in a military bi-plane Forman, spotted an Arab encampment and proceeded to drop hand carried bombs on them.**

In today's warfare, the strategic connotation is no longer related either to the very long range of bombers or nukes as weapons, but to the effects that are produced at the target end.

Britain was amongst the pioneers in developing its air power. The Royal Flying Corps (RFC) with its military and naval wings was established in 1912. Inter-Service rivalry soon surfaced, and by 1914, despite opposition by Churchill, the Royal Navy unilaterally broke away from RFC and established its own Royal Naval Air Service (RNAS), under the direct control of the British Admiralty. At the outbreak of World War I, RFC and RNAS, thus, formed two separate bodies under the aegis of the British Army and Navy respectively. In the meanwhile, Germany, France and the USA had also developed their air corps as a part of their land forces.[3]

At the outbreak of World War I in 1914, military aviation consisted of light wooden bi/tri planes with maximum speeds of under 100 mph and very limited load carrying capacity. Their roles were initially restricted to reconnaissance and artillery observations.

July 1917 marked a watershed in air power's history when German Gotha bombers raided London. The damage again was more psychological than real as

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3. Tony Mason, *Air Power, A Centennial Appraisal*, Chapter. 1.

the images of H.G. Wells' destruction from the skies appeared to become a reality. As a direct result of these attacks, Britain established what amounted to a strategic bombing unit in France, known as the Independent Force, to conduct reprisal raids against the German homeland. The concept of strategic bombing, whose mission was made independent of support to surface forces, was born. This action sowed the seeds of a new Service. The Royal Air Force (RAF), independent of the Royal Army and Royal Navy, was established in 1918.[4]

World War I ended in 1918. During the war, all subsequent roles of air power had either been established or attempted,[5] and the doctrines of command of air and support to surface forces had been firmly established. For the surface forces, roles such as close air support, transport support, reconnaissance, interdiction, artillery spotting, anti-submarine warfare, convoy escort, search and rescue and maritime strikes become vital contributors to the existing land and maritime strategies. Historian Lee Kennett aptly summed the progress made by air power during World War I when he wrote, "While the role of air weapon in the Great War was a modest one, the role of the Great War in the rise of air power was anything but modest."

Giulio Douhet, an Italian military officer was one of the earliest advocates of air power. He had taken part in the air action in the Libyan campaign in Tripoli in 1911-12. An ardent supporter of the strategic bombing concept and the military superiority of air power over other forms of warfare, he served in World War I, organising Italy's bombing campaign. For publicly criticising the Italian high command as being responsible for Italy's aerial weaknesses, he was court-martialled and jailed. He was released when his theories were proven correct by the defeat of the Italians by the Austrian Air Force at Caporetto. He was later recalled and promoted to brigadier general's rank in 1921. In 1922, he was appointed head of Italy's aviation programme by Benito Mussolini.[6] His book, *Command of the Air* was first published in 1921 and a revised version came out in 1927. It was regarded as a classic by early air power theorists and had a major impact on the shaping and development of air power, especially in the USA and

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4. Mason, Ibid.
5. Ibid.
6. Giulio Douhet (article from the internet).

Britain. He argued that command of the air should be the first objective during war, and having achieved it, subsequent bombing of industrialised and population centres would be so disruptive and destructive that the enemy would be forced to sue for peace. He maintained that control of the air, followed by strategic bombing, could win a war independent of land and sea power. Douhet is regarded as the father of air power.

The next air power advocate to emerge during and after World War I was Gen Trenchard, the first commander of the RAF. Trenchard believed in the offensive role of air power and was convinced that the primary mission of air power was to decimate the enemy through aerial bombardment. He strongly advocated the need to devote maximum resources to air power development, for the main danger in future would come from the air. He argued that by denying the enemy the capability to conduct a strategic bombing campaign against oneself and by conducting one against him, air power would lead to the enemy's capitulation. He was convinced that unless control of the air was established, armies and navies would become powerless, and that the days of big ships were past—they could no longer operate in the face of air power. As the chief of staff of the world's first independent air force, Gen Trenchard's thinking was to have a major impact on the RAF's force composition and performance during World War II.

The third key air power advocate to emerge during the post-World War I era was an American, Billy Mitchell. He is the most famous and controversial figure in American air power history. The son of a wealthy Wisconsin senator, he enlisted as a private during the Spanish American War and quickly gained a commission due to the intervention of his father. He had an outstanding war record and after challenging tours of Philippines and Alaska, Mitchell was assigned to the Army General Staff, at the time its youngest member. He became interested in aviation and its possibilities. In 1916, at the age of 38, he took private flying lessons. Arriving at France in 1917 as part of the American contingent, he quickly took charge and began preparations for the American air units that were to follow. By the end of World War I, Billy Mitchell was the top US airman. He returned to the USA in 1919 and immediately became a very strong advocate of air power. Mitchell was greatly influenced by Douhet's theories. He was

Mitchell postulated the potency of air power in any future conflict and that air power would be the most decisive element in any future conflict.

appointed the deputy chief of the Air Service. In this capacity, his relations with his superiors continued to sour as he began to attack both the War and Navy Departments for being insufficiently far-sighted regarding air power. When Mitchell suggested that US air power could better defend the nation's coasts from attacks by warships than US sea power, a controversy developed as to whether an airplane could sink a battleship. Live tests were conducted in June/July 1921 and September 1921. Mitchell's bombers sank three captured German vessels and an obsolete USS *Alabama* in the first trial and sent two more obsolete US vessels to the bottom of the sea in the next one.

The success of the bombing trials encouraged the advocates of air power to press for a separate air arm but the Army General Staff remained convinced that air power on its own could not win a war and, at best, it had an important but supporting role. Mitchell became increasingly critical of his superiors and began to go public in his criticism of the high command. His actions could no longer be tolerated and in December 1925, he was found guilty before a court martial of violating the 96th Articles of War and was suspended from duty for five years. Mitchell resigned in 1926.

In conformity with Douhet's and Trenchard's theories, Mitchell postulated the potency of air power in any future conflict and that air power would be the most decisive element in any future conflict. He also advocated that strategic bombing could on its own defeat the enemy.

Douhet, Trenchard and Mitchell were passionate advocates of air power, perhaps too passionate, and all three seem to have overstated their case. While a majority of their theories and prophecies have come true, their claim that air power alone could win a war has yet to be proved. They seriously failed to visualise the defensive warfare against air threat in the form of fighter aircraft and ground defences, which could and did reduce the impact of air power, especially in the strategic bombing role. They also grossly underestimated the

continued requirement of naval and land forces and the people's will to resist aerial bombardment.

The role of air power during World War II can be summed up in two quotes, one by Winston Churchill and the other by Professor Tony Mason. While speaking at the Massachusetts Institute of Technology in 1949, Churchill had commented: "For good or ill, air mastery is today the supreme expression of military power. And fleets and armies, however necessary and important, must accept subordinate rank. This is a memorable milestone in the march of man."[7] Professor Tony Mason in his book *Air Power - A Centennial Appraisal*, states: "Air power had been peripheral between 1914 and 1918. In the Second World War it dominated most theatres, and in at least two, was decisive."[8]

If the Korean and Vietnam Wars had brought out the inadequacies of air power, the Arab/Israeli Wars of 1967 and 1973 again demonstrated its dominance in a conventional war. In both these conflicts, air power played a major role. In 1967, having won the command of the air on the very first day through preemptive offensive counter-air operations, the Israeli Air Force (IsAF) brought to bear such effective bombardment on the Arab land forces that it became relatively simple for the Israeli Army to defeat them. Even in 1973, air power was dominant. The IsAF's inability to win the command of the air initially cost them dearly but in the later stages, through the

> **For good or ill, air mastery is today the supreme expression of military power. And fleets and armies, however necessary and important, must accept subordinate rank.**

substantial technical and logistical support of the USA, the IsAF succeeded in neutralising the Arab air defence network. From then onward, support to their land forces helped turn a likely defeat into victory. By the time a ceasefire was declared, Israel had gained the upper hand in the conflict.

Essentially, a one-day campaign, the Bekaa Valley operation was planned by Israel to take out all the air defence units in the valley in a single coordinated air

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7. Mason, n.3.
8. Mason, Ibid.

In terms of the evolution of air power, the Bekaa Valley campaign was a generation ahead.

assault. The presence of Syrian SA-6 units in the east of Bekaa Valley was constraining the IsAF's contribution when the Israeli Defence Forces (IDF) had launched Operation Peace in Galilee in 1982. These units had to be taken out. The IsAF painstakingly plotted the position of every SA-6 unit in the valley. On October 9, 1982, Israeli long-range artillery and surface-to-surface missiles engaged the Syrian missile batteries. The IsAF aircraft followed up with aerial attacks, using free fall bombs and anti-radiation missiles. When the Syrian Air Force rose to defend the air defence complex, the IsAF's F-15 and F16 fighters, equipped with the most modern air-to-air missiles, airborne radars and electronic warfare package, massacred them. This was the most one-sided air victory in the history of air power. In terms of the evolution of air power, the Bekaa Valley campaign was a generation ahead.[9] This campaign is relevant because it was a harbinger of how the next air battle would be fought. The Gulf War of 1990-91 was to demonstrate the same philosophy on a much larger scale. Dr James A. Mowbray has correctly concluded, "Technology helped to win the fastest, lowest casualty, almost devastatingly destructive one-sided war in recorded history. Air Force capabilities had come of age." Col Warden, the architect of the Desert Storm air campaign, has elaborated the technological advancement made by air power further by saying, "To have a 90 percent probability of putting one bomb on a target of the size of a normal room, in World War II, it needed 9,000 bombs or over 1,000 B-17 sorties—which meant putting 10,000 men at risk over the target. An F-117 class aircraft will achieve the same probability in a single sortie." Between World War II and the Gulf War, bombing accuracy had registered a 1,000 per cent increase.

In the Gulf War, air power demonstrated its ability to strike at the strategic heart of a country with maximum precision and minimum collateral damage and casualties. It proved beyond any shadow of doubt that air power has become an integral component of modern warfare. Professor R.A. Mason has very rightly observed, "The Gulf War marked the apotheosis of twentieth century air power."

9. Ibid.

STRATEGIC DEVELOPMENT OF IAF

The Indian Air Force (IAF) came formally into existence on October 8, 1932, the day the Air Force Act became operative. In the last three quarters of the century, the IAF has grown from the "army cooperation" role into a strategic force. The British never envisaged a strategic role for the IAF. However, the IAF was instrumental in creating a strategic effect by blocking the advance of the Japanese Army in Burma. In recognition of the crucial role played by the IAF, King George VI conferred it the prefix "Royal" in 1945. This prefix was dropped in 1950 after India became a republic.

During the Indo-Pak War of 1947, the IAF conducted airlift operations from Safdarjang, then known as Willingdon airfield, to Srinagar airfield starting at 09:30 hours IST on October 27. This was the most instrumental action of the war as it provided crucial support to the Indian Army in pushing the invaders out. In 1962, during the Indo-China conflict, the IAF provided the much needed logistics support to the Indian Army fighting in some of the most trying environment. Without essential air support, the Indian Army faced overwhelming odds in their fight against well trained Chinese troops. The Indian leadership grounded the IAF for the majority of the war, fearing that if the IAF attacked the Chinese forces, the PLA Air Force (PLAAF) would retaliate on Indian cities[10] (a feeling based on utter lack of information). This was the only time post-independence when the full potential of the IAF was not utilised, resulting in national humiliation in a conflict. Soon after, the Indian government, learning from its mistakes, began a vigorous campaign to expand the IAF. An emergency flying scheme was started in Delhi, Madras, Kanpur, Nagpur, Patiala and Adampur and more than 1,000 cadets received primary flying training by 1964. The IAF's strength was increased from 28,000 officers and men in 1961 to

> **In the Gulf War, air power demonstrated its ability to strike at the strategic heart of a country with maximum precision and minimum collateral damage and casualties.**

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10. Information obtained from www.answers .com/topic/Indian-air-force/topic/Indian-air-force, accessed on Naovember 11, 2007

This was the only time post -independence when the full potential of the IAF was not utilised, resulting in national humiliation in a conflict.

100,000 officers and men by 1964. By 1965, the IAF had also added newly bought An-12B and C-119G transport aircraft to its fleet.[11]

In 1965, India and Pakistan went to war over Kashmir for the second time. The Indo-Pakistan War of 1965 tested the strength of the Indian Air Force to its full limit. The Indian Air Force was successful in bombarding several Pakistani airfields, military installations and ammunition depots deep inside Pakistani territory and provided crucial air cover to the Indian Army. During the war, the IAF carried out more than 4,073 combat sorties, compared to the Pakistan Air Force's (PAF's) total of 2,279 sorties. The IAF helicopters proved to be highly useful in logistics and rescue efforts (Med Evac).

During the Indo-Pak War of 1971, Pakistani armour, accompanied by infantry, moved towards Longewala, the Indian border outpost. The post was defended by only one company of infantry soldiers. Commencing at daybreak, the IAF provided critical close air support from AF Station, Jaisalmer, and knocked out 37 out of the 45 tanks. This prevented loss of significant territory in the desert, a significant strategic effect. In East Pakistan too, the IAF flew more than 4,000 sorties, causing extensive damage to airfields, infrastructure, aircraft and the war waging potential. The vital air cover provided to the Indian Army assisted in rapid advances. Entire brigade strengths were heli-lifted over the river Meghna, allowing the Indian Army to continue their advance in spite of stiff resistance at Ashuganj, where the retreating Pakistan Army blew up the bridge (also known as the heli-bridge over the Meghna). The IAF airdropped Para Bn Gp 130 in the now famous Tangail airdrop. The operation involved An-12, C-119s, 2 Caribous and Dakotas from 11 and 48 Sqns. In total, about 1,000 troops were airdropped.

On the morning of December 14, a message was intercepted by Indian intelligence about a high-level meeting of the civilian administration in East Pakistan, and a decision was made to mount an attack. Within 15 minutes of interception of the message, a strike was launched against Dhaka. Armed with

11. Ibid.

tourist guide maps of the city, four MiG 21s of No. 28 Sqn hit the Governor's House with 57mm rockets, ripping the massive roof of the main hall and turning the building into a smouldering wreck. The Governor of East Pakistan, Mr. A .H. Malik, resigned then and there, renouncing all ties with the West Pakistani administration, to take refuge at the Red Cross Centre in Dhaka. The entire Cabinet resigned even though more than 90,000 Pakistani troops were available to defend Dhaka. This was a clear indication that tactical actions by air power have significant strategic influence.

During the Kargil War with Pakistan, the Indian Air Force is said to have proved the decisive force in accelerating the end of the conflict. It successfully provided considerable air cover for Indian troops fighting against Pakistani soldiers. In spite of losing two fighter aircraft and one helicopter, the IAF, by using innovative tactics and precision weapons, was instrumental in evicting the invaders.

> **The ability of air power to reach, disrupt or possibly destroy an opponent's strategic or operational centre of gravity suggests that air power is inherently capable of military action with strategic effect.**

STRATEGIC ROLE OF AIR POWER

The ability of air power to reach, disrupt or possibly destroy an opponent's strategic or operational centre of gravity suggests that air power is inherently capable of military action with strategic effect. That effect may be created through independent distinct action or through joint or multinational activity operating in conjunction with other forces. Throughout the history of air power, air platforms and their associated weapon systems have been able to carry the fight to the enemy.

Two air power theorists from the USAF, Cols Warden and Boyd have propounded path breaking theories of paralysing the enemy by strategic application of air power.[12] While Boyd talks of paralysing the enemy

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12. John Boyd and John Warden, "Air Power's Quest for Strategic Paralysis; Fadok," a thesis presented to the School for Advanced Air Power Studies, Maxwell AF Base, February 1995.

Air power is the premier instrument of strategic coercion today.

psychologically and weakening his will to fight, Warden emphasises the need to physically paralyse the adversary by attacking leadership, infrastructure, communication links and fielded forces as part of his now famous "Five Ring Theory" based on Clausewitz's centres of gravity, which formed the heart of the air campaign in Operation Desert Storm. While the strategic air campaign that aims at paralysis is based on the overwhelming asymmetry the US forces are likely to enjoy in any conflict scenario, it is important for policy and strategy planners in India too to understand the tremendous advantages of creating asymmetry[13] vis-à-vis potential adversaries by building up a potent strategic air capability that is built around technology, force multipliers and multi-theatre capability. The strategic roles in which air power could possibly be employed are discussed hereafter.

Political Signalling

Air power has the ability to consistently provide the dominance of the battlespace with the utilisation of manned as well as unmanned airborne platforms that can stay on station for long durations of time. This ability can transmit clear signals to any enemy, thereby dissuading him from any misadventure. These signals may be transmitted in terms of raised alert status, extensive surveillance activities and deployment of combat forces at critical operational locations.

Strategic Coercion

Coercion is the ability to deter another party from performing a hostile action or compelling an enemy performing such an action to cease doing so. Three examples are the rice bombing of Jaffna in 1987 which demonstrated India's ability to intervene in a crisis situation in its neighbourhood and forced Sri Lanka to sign the Indo-Sri Lankan agreement; Operation Deliberate Force in 1995 by the North

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13. Jasjit Singh, "Strategic Framework for Defence Planners: Air Power in The 21st Century," paper presented at the Aero India 1998 Seminar.

Atlantic Treaty Organisation (NATO) air power to force Bosnian Serbs to remove heavy weapons from designated exclusion zones; and Operation Allied Force, to change the thinking of President Milosovic of Yugoslavia. At display in these cases were air power's inherent characteristics of reach, speed, responsiveness and lethality (in the Yugoslavian example), to achieve strategic objectives of a nation/group of nations, when employed in a coercive role. Without doubt, air power is the premier instrument of strategic coercion today.

Conflict Prevention

The existence of credible deterrence can truly prevent war or any conflict. In case deterrence fails, there should be sufficient offensive capability to thwart any misadventure. Conflict prevention is the critical strategic role of an air force, essentially by possessing strategic deterrence capability. The existence of threat available in deterrence must be obvious to the enemy. Deterrence has a psychological element and in addition to the availability of credible forces, can be strengthened by resolute policy, demonstrated military capability, the will to use force and a readiness to escalate, should deterrence fail.

The primary task of the air force is to gain and maintain "command of the air"

Strategic Bombing

The notion that the strategic employment of air power is inextricably linked to bombing and bombardment is derived from historical experience. The purpose of the strategic employment of air power is to create strategic effect on the identified target set. This effect will be in support of the defined strategic aim but may not be part of a theatre campaign. In April 1986, exasperated by terrorist actions supposedly backed by the Libyan President, Col Qaddafi, the Reagan Administration authorised a retaliatory night air attack. For Operation El Dorado Canyon, a joint US Navy (USN) and US Air Force (USAF) force was mounted against terrorist and airfield targets in Libya. The Libyans boasted of an air force of 500 aircraft and a formidable ground environment bristling with

integrated surface-to-air missile (SAM) sites, armed mainly with Soviet missiles and radar guided anti-aircraft guns. The system was operated under the direction of 3,000 Soviet technicians. At 2.00 am local time on April 15, the coordinated raids of the USN and USAF swept into Libya to hit their targets The attack lasted for thirteen minutes, and cost the Americans the loss of one F-111 crew, but caused considerable damage to the Libyans.

Battlespace Domination

The primary task of the air force is to gain and maintain "command of the air". If this is achieved, the resultant air supremacy will allow the land, sea and air operations to continue without enemy air interference. This was amply demonstrated in 1971, when the IAF gained command of the air over East Pakistan within the first 48 hours. Thereafter, the ground forces were able to move at a faster pace towards Dhaka. It was also possible to mount heliborne operations and launch airborne operations of a brigade group by using transport aircraft. All this would not have been possible without first achieving air supremacy.

"Command of the air" has to be gained by fighting for it. With an opponent who has the state-of-the-art aircraft and weapons, combined with quality training and high morale, it would be a struggle for survival by each side. Therefore, in peace-time, it is imperative that the nation provides the best possible weapon systems, training and high class leadership which is truly professional, motivated and dedicated.[14]

Psychological Operations (PSYOPS)

PSY OPS played a significant role in operations such as Operation Enduring Freedom, in which air-mobility missions delivered humanitarian rations while, at the same time, air-combat sorties struck militarily significant targets in other parts of Afghanistan. Furthermore, during Operation Iraqi Freedom, Coalition forces dropped both leaflets and ordnance to prompt enemy soldiers to surrender. They also broadcast messages to them over their own radio systems. These transmissions had the complementary effect of denying the Iraqis use of their own radios. Air,

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194. Air Cmde N.B. Singh, *Air Power in the New Millennium*, Chapter 9.

space, and information power are all psychological instruments that can influence an adversary's perception, behaviour, and morale. For this reason, USAF PSY OP activities serve as an integral part of air operations planning and targeting processes, rather than as mere adjuncts. US aircraft, by their dynamic presence and actions, transmit an unmistakable psychological message to most adversaries. The mere threat or presence of superior aircraft can ground an enemy's air force, demoralise his army and civilian population, or promote stability. In the Kosovo operations, Lt Gen Short intended to generate functional and psychological effects targeted directly at Slobodan Milosevic.[15] The IAF certainly needs to formulate appropriate doctrines and procure suitable equipment to conduct PSY OPS at all levels of any conflict.

Strategic Airlift

The strategic airlift capability of a nation will govern to a large extent its armed forces' ability to respond. The airlift of troops by the IAF from Delhi to Srinagar to combat the Pakistani intruders was instrumental in

The strategic airlift capability of a nation will govern to a large extent its armed forces' ability to respond.

saving two-third of Kashmir, including Srinagar. The airlift operations conducted by the IAF during Oeration Meghdoot resulted in the initiative being with Indian troops. This manifested in the Indian Army taking control of two-third of the highest battlefield in the world while the Pakistan Army was still preparing to launch operations. The IAF employed transport aircraft and helicopters to transport troops and stores, as well as airdrop supplies to the high altitude locations.[16] On the night of November 3, 1988, the Indian Air Force airlifted a parachute battalion group from Agra and flew them non-stop over 2,000 km (1,240 miles) to Maldives. The Indian paratroopers landed at Hulule and secured the airfield and restored the government rule at Male within hours.[17] The performance of the IAF in numerous humanitarian

15. John A. Tirpak, "Short's View of The Air Campaign," *Air Force Magazine*, September 1999, available at www.afa.org/magazine/watch/html
16. n.10.
17. Ibid.

The future leadership would need to develop a strategic outlook that develops unconventional responses to various threats across the spectrum, ranging from terror strikes to conflicts under the nuclear threshold.

missions at home and abroad is worth a special mention. This includes providing relief to Indonesia and Sri Lanka during the tsunami and to the US in the aftermath of Hurricane Katrina. Evacuating the Indian civilians from the Gulf countries during 1990-91 is another example. The need of the hour for the IAF today is to procure transport aircraft and helicopters to build and enhance its medium lift capability.

Out of Area Contingencies

The ability of air power to engage strategic targets with minimum collateral damage, maximum effect and "shape the battlefield" for swift operation by airborne assault or amphibious attack, has made it a preferred option in swift out of country conflict resolution, the likes of which was achieved in Kosovo. Even when it comes to humanitarian intervention, it is the strategic mobility assets of air power that can make a substantial difference, whether it is during natural calamity or evacuation of population from conflict torn areas. India's increasing "footprint" in the area means that it is only a matter of time before its influence spreads into Africa, the Central Asian Republics and Southeast Asia where it will continue to compete with China for resources and markets.[18]

Credible Deterrence

Modern air power has become an instant instrument of projecting power in the great depth with surprise and concentration of firepower which is highly discriminating and precise and, therefore, avoids collateral damage. It can target the nerve centre of the enemy very effectively and thereby paralyse his command, control and communication system, bringing enemy military

18. Kapil Kak, "India-China Relations: An Overview," *Air Power*, vol. 3, Monsoon, 2006.

operations to a halt. The credibility of deterrence provided by modern air power, supported by high technology systems like airborne warning and control system (AWACS), joint surveillance target attack radar system (J-STARS), electronic warfare (EW) systems and precision guided weapons is extremely high. A modern air power in being could provide a credible deterrence without resorting to the weapons of mass destruction.

Low Intensity Conflict

We need to develop strategies to exploit the inherent capabilities of air power—speed and reach—in low intensity conflicts, by swift induction of troops in the affected areas by air, and air surveillance of large tracts of land in mountainous regions.

TRAINING REQUIREMENTS

The IAF today is a strategic force with reach, precision, capability for air dominance and is transforming itself into a networked aerospace force. There is an urgent need for us to start thinking strategic and thereafter to train for the same. Perhaps the weakest area that afflicts the IAF today is the inadequacy of training infrastructure, specially for the non-officer cadres. A fighting force equipped with the most sophisticated aircraft, smart weapon systems, complex sensors, space-based surveillance and reconnaissance systems, and a network-centric environment needs to be supported by an equally advanced and sophisticated training environment with computer-based training systems, elaborate simulation devices for all disciplines, automated distance learning and evaluation systems, all designed to train for the next war and not the last one. The future leadership would need to develop a strategic outlook that develops unconventional responses to various threats across the spectrum ranging from terror strikes to conflicts under the nuclear threshold. The present training pattern in the IAF for various branches is heavily tilted towards tactical orientation, and is defensive in nature owing to our reactive doctrines. The path ahead is not to drastically change our training methodology but to train continuously in strategic roles.

We must start our thinking by assuming we can do everything with air power, not by assuming that it can only do what it did in the past.

We need to continue training with a few foreign air forces with simulation of contingencies, be it bilateral or multilateral. Simulated target systems need to be realistic in nature rather than "pin and circles," as existent today. We need to create strategic task forces which are kept current and have centralised decision-making, independent component commanders and decentralised execution. The leaders need to be visionaries, analysts, theorists and strategic practitioners. Hence, there is a need to shift the focus during the growth of the officer in service. The levels of intellectual capability and education need to be enhanced rather than remaining busy with fire-fighting and crisis management most of the time. The need to posess better awareness of the global situation in general and of South Asia in particular cannot be overemphasised.

CONCLUSION

Air power is inherently strategic in nature but for the optimum exploitation of its attributes, the practitioners need to be absolutely clear as to what effect the application of air power will have in different scenarios. Air power needs to be dovetailed into a nation's international policy-making process as an effective instrument of diplomacy. For this, national leaders and civil servants in the decision-making chain need to be educated by air power exponents about the potential that it possesses as a national instrument of peace and power. The short period of history since the advent of air power provides us with enough examples as proof of this. While looking into acquiring the capabilities that would maximise the true potential of air power, we should not lose sight of the vital aspects of support systems and human resources, without which air power only becomes mere hardware and not an effective national instrument of power. Col John Warden of the USAF, who was instrumental in designing the four-phase campaign of the Allied forces in the 1991 Gulf War says *"Real exploitation of air power's potential can only come through making assumptions that it can do*

something we thought it couldn't do...We must start our thinking by assuming we can do everything with air power, not by assuming that it can only do what it did in the past." Therefore, planners and executioners of air power need to think and look ahead and plan for the changing nature of warfare. They need to continuously think about what role air power will play in any future conflict, and plan and train for the optimum exploitation of this vital instrument of war.

ELECTRONIC WARFARE
IN THE 21ST CENTURY

SANJAY PODUVAL

Victory smiles upon those who anticipate the changes in the character of war, not upon those who wait to adapt themselves after changes occur.

—Giulio Douhet

The electromagnetic (EM) spectrum has increasingly emerged as the invisible weapon in war. Those who have learnt to exploit and appreciate its strengths and weaknesses have always emerged victors. Little did the pioneers of the radio beams know the effect these invisible weapons would have in future conflicts. Formidable as they are, the military use of the electromagnetic spectrum is a "necessary evil" much like friction and gravity, at times, unwanted, but one cannot actually do without them. Electronic warfare (EW) is the control of the EM spectrum which implies unhindered use by friendly forces and, at the same time, denial of its use by the adversaries.

EW has introduced another dimension in war. From its humble beginnings of interception of communications in the second Boer War, it has constantly changed the way wars have been waged through its period of evolution. It has by no means reached the end of its evolution, and in the future, it will be fought more in intangible spaces to gain information dominance before shifting its focus to the more conventional means of attacks. All this because warfare is now changing from platform-centricity to net-centricity, as evident in the recent conflicts.

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EW has introduced another dimension in war.

THE EARLY YEARS

Gugliemo Marconi developed the first wireless telecommunication set in 1901, and by 1905, the wireless sets had sufficiently advanced to be used in ships for long range communications. These sets were basic in nature and vulnerable to electronic espionage and started to impact command and control. A classic example of this was seen in the years preceding World War I. The French intercepted a long message transmitted to the German ambassador in Paris from the German foreign minister containing a declaration of war to be delivered to the French government. The French, who had already decrypted the code in which the message was sent, not only intercepted the dispatch but so garbled its contents that the German ambassador could at first make nothing of it, while the French gained valuable time to prepare.

The advent of radars in World War II extended the eyes of the war-fighter well into the enemy territory. The radar incidentally is not an instrument of EW; rather, it is one of the main targets of EW. During World War II, both the Allied and Axis powers extensively used electronic warfare, or what Winston Churchill called the "Battle of the Beams" to jam or deceive radar or navigation systems. The forerunners of electronic counter-measures were the jamming and deceptive tactics of the British against the navigational system of the Germans early in World War II. The Germans developed the successful Lorenz navigation system for landing at night or in poor visibility conditions and later adapted it for night bombing operations. The "blind bombing system" practically razed the city of Coventry. The British countered this with a system called MEACON (Masking Beacon). German planes attempting to get their bearing, received signals from the MEACON and obtained either no bearing or the wrong bearing. On several occasions, German planes were completely lost and landed on British airfields or bombed unpopulated areas instead of assigned cities[1].

Later, electronic warfare helped in providing the battlefield commander with vital tactical intelligence. The importance of electronic warfare was particularly

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1. Mario de Archangelis, *Electronic Warfare Wars* (New Delhi: Ritana Books, 1996).

demonstrated at the battle of Gazala-Bir Hacheim (Tobruk)[2], in June 1942. In the battle which followed, Gen Rommel not only knew of British plans and of their numerical superiority in a general way, he also knew—thanks to his signal intelligence company—exactly where the British fighting units were deployed. World War II saw the birth of electronic counter-measures (ECM) and electronic counter-counter measures (ECCM), and electronic warfare started to influence technology. The focus of operations now was to intercept communication or deceive and destroy radars and their associated systems by carrying out SEAD (suppression of enemy air defence) and DEAD (destruction of enemy air defence) operations.[3] Control of the electromagnetic spectrum had assumed significance similar to command of the air, whereas in World War I actual brute force was used to subdue the enemy forces.

The Vietnam War of 1965 witnessed a boom in EW. It saw for the first time the appearance of Soviet missiles on the battlefields of Southeast Asia, signalling that the radars had acquired 'teeth' and had just become more potent. Electronic support measure (ESM) and signal intelligence (SIGINT) missions were extensively flown to detect the weaknesses of this system. This war also saw the introduction of unmanned aerial vehicles (UAVs) in combat in the form of the Teledyne Firebee which clocked over 3,000 hours over Vietnam in reconnaissance and electronic intelligence (ELINT) missions[4]. Radar warning receivers (RWRs) dovetailed with Shrike anti-radiation missiles (ARMs), which were primarily targeted against the Fansong radar of the surface-to-air missile (SAM) II system were also introduced. In 1971, realising the importance of EW, the Grumman EA-6 Prowler specially designed for EW was inducted into service.

The amazing victory of the Israelis over the Syrians in the Bekaa Valley conflict in June 1982 once again emphasised the fact that EW had entirely changed the way wars were fought and won. The innovative employment of UAVs in this conflict took EW to another level. UAVs were used for continuous surveillance and were actually tracking newly deployed SAM sites. UAVs since

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2. Air Vice Marshal J.P.R. Browne and Wg Cdr M.T. Thurbon, *Electronic Warfare*, Vol IV (New Delhi: Ritana Books).
3. SEAD and DEAD operations *per se* are not a part of EW, they definitely are a consequence of it.
4. Hank Basham, "RPV'S Make the Difference", http://www.airpower.maxwell.af.mil/airchronicles/aureview/1974/jan-feb/basham.html

then been employed in a number of roles such as jamming of radars, for target acquisition and designation, as decoys, etc. It brought to the fore the utility of these platforms for the dull, dirty and dangerous missions.

The logical next step was arming the UAVs, which actually was the result of lessons learnt during the North Atlantic Treaty Organisation (NATO) air campaign in Yugoslavia in 1999. The Predator UAV, in the course of the campaign, located many military targets but by the time the aircraft arrived on location, the targets were already gone[5]. After successful tests with the Hellfire-C laser-guided missile in February 2001, the armed Predator was successfully used by the Central Intelligence Agency (CIA) to destroy a vehicle carrying Al Qaeda operatives in Yemen on November 3, 2002. Since then, armed with Hellfire-C missiles, these UAVs have been used in Operations Enduring Freedom and Iraqi Freedom for efficient SEAD/DEAD operations[6].

Another important step in the journey of EW was the emergence of stealth. This was prompted by the increasing capability of SAMs, shooting down of the U-2 and a need to penetrate the radar cover undetected. Low observable technology applied to combat aircraft has allowed them to operate with relative impunity against sophisticated air defence (AD) with the aid of electronic warfare assets. The impact of stealth was realised in the 1991 Gulf War in which the F117-A stealth fighter flew over 40 per cent of the Allies' strategic bombing raids in more than 1,300 sorties, delivering more than 2,000 tons of ordnance without the loss of a single plane. They flew at the 'comfortable' medium and high altitudes beyond the range of ground based weapon systems—not one was even fired upon as the revolutionary plane flew into the aviation history books. In spite of its heavy use, the F-117 had a mission capable rate of 85.8 per cent for the war—4 per cent higher than in peace-time.[7]

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5. John McHale, "Unmanned Aircraft Armed and Dangerous," http://mae.pennnet.com/articles/ article_display.cfm?Section=ARCHI&C=Feat&ARTICLE_ID=191669&KEYWORDS=UAV&p=32 .
6. Chelsea Emery, Reuters, "Unmanned-Flight Technology Takes Off," ,http://www.usatoday.com/tech/news/ techinnovations/2003-11-17-drone-flight_x.htm
7. From "White Paper - Air Force Performance in Desert Storm, Department of the Air Force, April 1991," http://www.pbs.org/wgbh/pages/frontline/gulf/appendix/whitepaper.html .

PRESENT DAY EW: WHAT IS DIFFERENT?
Conflicts since the Gulf War witnessed a growing integration of command, control intelligence, surveillance and reconnaissance assets. In the future, less expensive, more capable, lighter sensors will support networking on the battlefield. This will be possible mainly

> **The armed forces of the future will see the deployment of new types of weapons systems and architectures.**

due to the breakthroughs in micro and nanotechnologies which promise compact systems having greater potential. The incredible advances made in the miniaturisation of increasingly 'intelligent' electronic equipment in the military technology revolution allow ends to be matched with means.[8]

The armed forces of the future will see the deployment of new types of weapon systems and architectures. To achieve this, not only do we have 'intelligent' [global positioning system (GPS), laser-guided] munitions capable of 'localised' strikes of great depth, satellites capable of detecting and disseminating information of the smallest of targets, increasingly powerful electronic data and communications systems, we also have non-lethal weapons designed to paralyse men without killing them and incapacitate their equipment in the form of the active denial system (ADS) and directed energy weapons.[9]

Military is Changing
Commanders today at all levels can count on operating "24/7" on the global stage before a live camera that never blinks. This changed environment has a profound effect on how strategic leaders make their decisions and direct their commands. The impact of this kind of media coverage has been dubbed as "the CNN effect."[10]

Precision Strikes. The military now places a lot of emphasis on precision strikes i.e. the importance of bringing minimal forces in "harm's way," and

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8. Maurice Najman "Developing the Weapons of the 21st Century," http://mondediplo.com/1998/02/13warfare
9. "Tuning Up The Heat: High-Power Microwave Weapons," *Jane's Navy International*, vol. 112, issue2, March 2007, p. 39 and http://www.irconnect.com/noc/press/pages/news_releases.mhtml?d=89438
10. The term "the CNN effect" represents the collective impact of all real-time news coverage. Margaret H. Belknap, "The CNN Effect: Strategic Enabler or Operational Risk?" http://www.encyclopedia.com/doc/1G1-91564618.html

In the conduct of operations, it is more cost-effective to cause functional paralysis rather than complete physical destruction of the target.

precision targeting to destroy or neutralise only those elements involved in war- fighting. Rapid strides in technology in the second half of the 20th century have significantly enhanced the reach potency and precision of air power. Where only 20 per cent of the bombs fell within 1,000 feet of the target, today circular errors of probability (CEPs) have reduced to a few feet, as were seen in the decisive operations in the Gulf War 1991, Kosovo Operations 1999 and Iraqi Freedom 2003. Therefore, with regard to technology, the trend has been dominated by the use of precision guided munitions (PGMs) which are highly dependent on precise intelligence. They not only hit their targets, lowering the level of effort and minimising collateral damage, they also reduce capabilities that must be deployed. This has been enabled due to advances in satellite guidance and communications, computerised flight control systems and sensor technology.

Effects-Based Operations. In the conduct of operations, it is more cost-effective to cause functional paralysis rather than complete physical destruction of the target. The earlier war strategies were based more on annihilation and attrition, with the aim to render the enemy's armed forces ineffective. The same effect can be obtained quickly and in a more lucrative manner with fewer casualties following the effects-based operations (EBO) approach. An EBO is one where operations against the enemy systems are planned, executed and assessed in order to achieve specific effects that contribute directly to the desired military and political outcomes. In the future, the swiftness with which campaign objectives are achieved, minimum collateral damage and least casualties in executing campaign plans will play a crucial role in planning operations. It is in this region that information dominance, networking and EW will play a major role and achieve far better results since the outcomes hinge on focussed and accurate targeting.

Threats are Changing
The traditional concept of national security has undergone considerable changes.

Traditional combat techniques, accepted rules of engagement and concepts of firepower and manoeuvre are fast yielding to more unconventional forms that are aimed at neutralising force and weapon superiorities. The military has now got to deal with semi-conventional wars[11]: a state fighting a terrorist organisation which too is armed like a modern army. These non-state actors are difficult to target because they attack from within buildings in densely populated areas.

Today's non-state actors are sophisticated and, in many cases, less tied to conventional means of warfare. The United States is spending $500 million apiece for stealth bombers; a terrorist's stealth bomber is a car with a bomb in the trunk—a car that looks like every other car.

Another area which is an attractive asymmetrical target to non-state actors is the network of various elements of power. Networks are pervasive, throughout almost every domain of both our civilian and military sectors, and have commensurately evolved into critical vulnerable points. At the most fundamental level, networking aims to accelerate engagement cycles and operational tempo at all levels of a war-fighting system. As a result, they are attractive asymmetric targets to adversaries who do not have force equality in the traditional sense.[12] The networked command, control, communications, computers, information, surveillance, reconnaissance (C4ISR) infrastructure that connects tactical, operational and strategic nodes is only as secure as its weakest link.

> **Networks are pervasive, throughout almost every domain of both our civilian and military sectors, and have commensurately evolved into critical vulnerable points.**

Technology is Changing

Technology leadership is shifting from the military to the civilian sector. The internet which began as a Cold War military technology in the 1960 to provide a reliable means of communication (even in the face of a nuclear strike) is now more

11. Jasjit Singh, "Interpreting the Lebanon War of 2006," *Air Power*, vol. 1, no.2, Winter 2006, p. 33.
12. Carl D. Porter, *Network-Cenric Warfare: Transforming the US Army* (Carlisle Barracks: US Army War College).

There are few geographical boundaries in the information infrastructure.

widely spread in the civilian sector. So is the case with networking and communication. This is because the technologies are simple, inexpensive and readily available and also due to the fact that the civilian sector is economically more lucrative and widespread. GPS too was initially conceived for the military, but over the years, though still managed by the US Department of Defence (DoD), it is more widespread in the commercial sector.

Information technology has also changed warfare, not in degree, but in kind, so that victory will increasingly go to combatants who manoeuvre bits faster than their adversaries. Perhaps the biggest effect of the changing technology on warfare will be the elimination of the concept of a front. Evidence that this revolution has already occurred is available from the recent Gulf Wars: smart weapons turned Saddam's strength (concentrated troops and tanks) into liabilities. Fortifications will tie armies down to fixed locations, making them sitting ducks for smart bombs, enabling adversaries to destroy the troops with precision-guided weapons.

Though easier said than done, cheap cyber weapons (e.g. computer viruses) can neutralise expensive kinetic weapons (e.g. missile defences) which are highly dependent on a networked system. The ability to collect, communicate, process and protect information is the most important factor defining military power today. In September 2001, the Al Qaeda used the global telecommunications net to coordinate successful attacks by small, stealthy groups who triumphed through information superiority (knowing more about their targets than their targets knew about them).

Geography is Changing

There are few geographical boundaries in the information infrastructure. According to Berkowitz, a senior RAND analyst, if fronts persist at all, they will live in cyberspace where info-warriors battle not over turf, but over control of routers, operating systems and firewalls. They only need to be connected to the cyberspace. The military can no longer create and control the battlespace as was

traditionally done.

Time magazine of December 2005 carried an article titled "Long Distance Warriors" which described how USAF pilots, at the Nellis air force base outside Las Vegas, controlled the predator UAV flying over Iraq and Afghanistan at a distance greater than 11,000 km. In another instance, a Predator UAV tracked and killed fleeing insurgents who had attacked a US base in Iraq.[13] Target access points are, therefore, changing and may not be in geographical proximity to the target. Warfare is becoming increasingly network-centric.

Militarisation of Space

The offensive capability of space-based assets came to the fore when they provided target intelligence, secure communications, weather forecasting, GPS assisted navigation and all-weather precision targeting in the Gulf War 1991. Space today provides a cost-effective means to accomplish war-time missions in a technically superior manner and provides an effective means for obtaining information at a rapid rate. Space warfare involves dominating the "high ground" of space to deny its advantages to the adversary and to use it to implement one's

> **The existing systems will see tremendous improvements in their capability and designs due to developments in the field of micro and nanotechnologies.**

own command, control, communications, navigation, reconnaissance, air defence, missile defence, warning, all weather precision targeting and weather forecasting. Space assets have become a key to the future digitalisation of the battlefield from where some of the fog and friction of war will be removed for the side dominating space.

THE FUTURE

The existing systems will see tremendous improvements in their capability and designs. This will be possible mainly due to developments in the field of micro and nanotechnologies. Miniaturisation will result in an unprecedented level of

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13. n.6, p. 3, and Sally B. Donnelly, "Long Distance Warriors," December 2005, http://www.time.com/time/magazine/article/0,9171,1137653,00.html.

Protection against infrared guided weapons is the highest priority need in electronic attack and is an important deficiency that prevents efficient execution of operations at present.

integration—for example, the integrating of the radar warning receiver with the counter-measure dispensing system, making it into a single unit. Such integration will not only reduce the volume and power requirements but will also shorten the response time.

There will also be greater emphasis given to the development of counter-measures against infrared (IR) homing missiles, new age communication technology, radar-based systems, net-centric operations and space-based assets, as discussed below.

Infrared-Guided Weapons

Infrared weapons pose a serious and growing threat to forces and platforms in the air, on land and at sea. Inexpensive, portable missiles can be launched with ease and effectiveness against all airborne combatants. The threat of long range infrared guided anti-ship missiles is equally great, and formidable in both at-sea and littoral scenarios. Land combat vehicles are similarly threatened by frontal and top-attack munitions guided by infrared and multi-spectral seekers. Protection against infrared guided weapons is the highest priority need in electronic attack and is an important deficiency that prevents efficient execution of operations at present. The ever-increasing effectiveness of electronic warfare and the advent of anti-radiation missiles create the need for covert, radar silent operations. Therefore, sensors are required which are virtually immune to jamming, undetectable and yet capable of detecting targets at reasonable ranges. Infrared search and track (IRST) and electro-optical distributed aperture (EODAS) systems are being developed to automatically sense, alert the pilot and deploy adequate counter-measures to mislead or misdirect the missiles with or without his intervention as in the case of F-22 and F-35.[14]

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14. Ron Sherman, 'F-35 Electronic Warfare Suite: More Than Self-Protection,' http://www.aviationtoday.com/av/categories/military/845.html

Radar-Based Systems

Modern missiles travel at higher speeds, lower altitudes and have a smaller radar cross-section. These radar-based systems are becoming increasingly complex, adaptive to the environment, and difficult to intercept. They use a combination of homing methods to strike a target. This results in shorter reaction times and requires improved combat sub-system integration and greater automation for a proper response. New techniques are being developed to counter targeting and surveillance radars to deny acquisition of targets and, therefore, suppress subsequent active and passive homing threats. The development and induction of active electronically scanned array (AESA) radars is a step in this direction. These radars are programmed to act as transmitters, receivers, or radars.[15] The AESA system can work not only as a powerful radar, but can also do different tasks in parallel, such as a radar warning receiver, or jammer. The technologies for the development of millimetre wave (MMW) radars, ultrawide band (UWB) radars and spectral imaging systems such as hyper-spectral imaging (HSI) and multi-spectral imaging (MSI), which are under different stages of development, offer a range of possibilities for covert and silent operations.

The people's war of the past was conducted in tangible space but information wafare, in addition to occurring in tangibl space, is conducted even more in intangible space.

New Communication Technology

Another area of concern for electronic attack (EA) is the rapid development and adoption of new communications technology which has created deficiencies in the ability of forces to exploit and selectively disrupt these modern signals. Cellular and personal communications systems used by civilians and hostile forces and high-capacity digital, multi-channel networks associated with distributed information systems, pose particularly difficult technical challenges.[16] The ability

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15. V.K. Thakur, "Active Electronically Steered Array (AESA) Airborne Radar," http://kuku.sawf.org/Emerging+Technologies/2667.aspx

16 "Joint Warfighting Science And Technology Plan," http://www.wslweb.org/docs/dstp2000/jwstppdf/13-EW.pdf

The ability to deny an opponent reliable use of his C4ISR systems is a critical aspect of electronic attack.

to detect, analyse, exploit and disrupt these signals is fundamental to the conduct of operations. In the context of EA, jamming transmitters and antennas used for command, control and communications (C3) signals require improvements in precise modulation selection and modulator control, linearity, efficiency, output power, and directivity.

Information Technology

Besides being used in the conventional manner, EW in the future will be more information-based, relying heavily on space and networking which is the crux of the discussion to follow. Conventional tactics effectively fused with space-based assets and high speed networks providing information superiority/dominance over the adversary will be crucial to victory in future conflicts.

The people's war of the past was conducted in tangible space, but information warfare, in addition to occurring in tangible space on the ground, at sea, and in the air, is conducted even more in intangible space, such as in electromagnetic fields. It is not only a battlefield in which guns and bombs proliferate, but also a "computer battlefield" in sheltered laboratories and control rooms.

The key technologies in information warfare are remote-sensing, communications and computer technologies. Key information weapons include precision-guided weapon systems, electronic warfare weapon systems as well as C4ISR (command, control, communications, computers, intelligence, surveillance and reconnaissance) which form the central nervous system and the network which interconnects all the components. These hardware and software items are necessary and essential to adapt to, and achieve victory in, information warfare.

One of the main steps, and something many nations are now trying to implement in becoming an efficient military at waging information warfare is bringing all branches of the military into an information network. Vital information and real-time communication may be shared on the network. One example of how much information dictates the waging of war in this

information age is the surprise attack on Libya by the United States in 1986.[17] Before the attack, 18 electronic-warfare aircraft were sent to Libya to engage in powerful interference. Fighter aircraft were then sent to launch counter-radiation guided missiles to destroy Libya's air defence radar stations and, finally, fighter aircraft were sent to launch precision-guided bombs to attack five important targets. The information offensives in this raid included:

(a) Information reconnaissance to gain information on the targets of the raid and to study the targets in detail.

(b) Electronic interference to paralyse the opponent's communications and blind the opponent's air defence guided missiles.

(c) Information suppression by using counter-radiation guided missiles to destroy air defence radar stations.

(d) Information attack by using precision-guided warheads to attack pre-set targets.

During the Gulf War, the information offensives of the multinational forces were even more representative. In addition to the four types listed above, at least the following should be added i.e. extensive information operations were planned (but not executed) against the computer systems of Iraq's air

The combat personnel are not only the warriors who charge enemy lines for face-to-face struggles, but sometimes are the operating technical personnel who sit before computers and instruments.

defence system and stealth aircraft were used to launch precision-guided bombs against the communications buildings and command centres, to achieve information suppression. Therefore, the ability to deny an opponent reliable use of his C4ISR systems is a critical aspect of an electronic attack because it prevents the adversary from operating freely in the battlespace.

One must not forget that electronic warfare is conducted by the people against the people. The combat personnel are not only the warriors who charge enemy lines for face-to-face struggles, but sometimes are the operating technical personnel who sit before computers and instruments. They stand at the first line

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17. Operation El Dorado Canyon, http://www.globalsecurity.org/military/ops/el_dorado_canyon.htm

The growing importance of IT in warfare will also change the way intelligence agencies support conventional conflicts.

in electronic warfare and in the resistance against C4I systems. Combat personnel must, therefore, be familiar with the technical and operational aspects of the weapons and equipment in their hands and must be very well trained in their operation. They must be able to understand accurately the combat plan and resolutely and flexibly utilise weapons and equipment to wipe out the enemy.

The wars of tomorrow will increasingly be fought in cyberspace. Thus, intelligence services will need an increasing proportion of tech-savvy talent to track, target and defend against adversaries' information technology (IT) capabilities. Cyber-wars will be played out on landscapes of commercial IT; intelligence agencies will need new alliances with the private sector, akin to existing relationships between nation-states, and they will have to confront awkward problems such as: performing intelligence preparation of cyber battlefields; assessing capabilities and intentions of adversaries whose info-weapons and defences are invisible; deciding whether there is any distinction between cyber defence and cyber intelligence; and determining who in the national security establishment should perform functions that straddle the offensive, defensive and intelligence missions of the uniformed services and intelligence agencies.

The growing importance of IT in warfare will also change the way intelligence agencies support conventional conflicts. New technology will collect real-time intelligence for fast-changing tactical engagements, but the communications systems available at present are far too slow for disseminating these high-tech indications and warnings. Faster means of delivering—and protecting—raw collection are being devised, so that real-time intelligence can be sent directly to shooters without detouring through multiple echelons of military intelligence analysts. Super-high-speed free-space laser communications links will be the technological cornerstone of future military satellite communications. The new transformational satellite communications system of the US—better

known as TSAT—will feature 10-gigabit-per-second laser cross links between satellites, and between satellites and high-altitude manned and unmanned aircraft. To overcome the inability of lasers to operate reliably through the low-earth atmosphere (because of clouds, precipitation, dust and other obscurants), TSAT's data links to ground stations will be extremely high frequency (EHF) RF links able to move data as quickly as 2 gigabits per second. The eight-satellite TSAT constellation is to be fully operational in 2016.[18] A 1-gigabyte image from a space-based radar satellite would take 88 minutes to move over MILSTAR II[19], while on a TSAT it would take less than a second. In addition, TSAT will enable as many as 1,500 combat vehicles on the move to transit data, a capability not available at present. According to Berkowitz, future wars will not be won by having more troops, weapons and territory than an opponent, but by having more bits of information. The digital revolution has started occupying the centre-stage.

Network-Centric Operations

Network-centric operations are mostly about the application of various digital-electronic technologies to military roles and missions. In the past 20 years, many astounding technological advancements in radars, directed energy, communication, space exploitation, miniaturisation, data processing, etc have taken place, which have not only influenced every aspect of our lives but also altered the means of waging wars. Warfare can now be more efficient and effective. The integration of all these factors has essentially led to network-centric warfare (NCW). Networking is a mechanism which improves operational tempo by accelerating the observation-orientation phases of Boyd's observation-orientation-decision-action loop. This is achieved by providing a mechanism to rapidly gather and distribute targeting information and rapidly issue directives. A high speed network permits error

The faster we can gather, distribute, analyse and understand information, the faster we can decide, how and when to act in combat.

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18. John Keller, "Optical Links are Key to Next-Generation Military Communications Satellite," http://mae.pennnet.com/articles/article_display.cfm?article_id=202216
19. MILSTAR-II is the tactical and strategic multi-service satellite system designed to provide survivable communications for US forces worldwide.

The increasing dependence of societies and military forces on advance information networks creates new vulnerabilities.

free transmission in a fraction of the time required for voice transmission, and permits transfer of a wide range of data formats. The faster we can gather, distribute, analyse and understand information, the faster we can decide, how and when to act in combat. The audacious second attempt on April 7, 2003, to decapitate the Iraqi leadership, amply demonstrates this. The strike was especially noteworthy for the way it saw information on the whereabouts of the Iraqi dictator, which emerged at very short notice, transmitted rapidly to Allied air planners and then to the B-1B. "We confirmed the coordinates and then it took about 12 minutes to fly to the target and release the weapons," said Lt Col Frank Swan, the weapons systems officer on the aircraft. The crew had previously been tasked with attacking an airfield in western Iraq.[20] This short-duration 'sensor-to-shooter loop' is a key component of 'net-centric warfare': the ability to transmit, receive and view data in real-time across the spectrum. Net-centric warfare was practised in an embryonic capacity in Afghanistan and honed in Iraq – as the B-1B mission demonstrated.

Networking has its greatest gains in combat effect during battlefield strike and close air support operations, especially against highly mobile and fleeting ground targets. In such an environment, where the opponent is continuously on the move, networking can produce spectacular gains since the bottleneck limiting force capability which lay in the flow of targeting information to strike aircraft is effectively removed. The deciding factor in the first Gulf War was the ability of US forces to fight effectively at night. This advantage multiplied in Operation Iraqi Freedom and the conflict in Afghanistan. It was possible because of better and more reliable communication systems and networks. Battlefield elements of the future – tanks, aircraft, ships, and soldiers – all will be nodes within one large networked force. General Dynamics and Lockheed Martin are designing and demonstrating technologies for a network-centric force on the move.[21] The aim is

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20. "What Went Right?," *Jane's Defence Weekly*, April 30, 2003, http://www.oft.osd.mil/library/library_files/article_63_Jane.doc.
21. United States Army Signal Centre, http://www.fas.org/man/dod-101/sys/land/win-t.htm.

to provide war-fighters a secure, high-bandwidth, wireless communications network that will provide soldiers access to critical battlefield information, seamless connectivity and security across a host of platforms and points of presence. It will encompass intelligence, surveillance and reconnaissance systems, as well as 'netted' (integrated) weapons, future combat systems along with cell-phone systems for individual soldiers.

The increasing dependence of societies and military forces on advance information networks creates new vulnerabilities through means such as computer network attack and directed energy weapons. The inherent implication here is that the universal nature of networked systems is in and of itself one of the key vulnerabilities. Provision of digital wireless connectivity between combat platforms is a major technical challenge which cannot be understated. While civilian networking of computers can largely rely on cabled links, be they copper or optical fibres, with wireless connectivity as an adjunct, in a military environment centred on moving platforms and field deployed bases, wireless connectivity is the central means of carrying information and the area most vulnerable to interference.

The fact that military networks and civilian networks co-mingle provides another set of vulnerabilities which must be addressed, for example, during Operation Iraqi Freedom, US and Coalition forces reportedly did not execute any computer network attacks against Iraqi systems, even though comprehensive information operations (IO) plans were prepared in advance US officials may have rejected launching a planned cyber attack against Iraqi financial computers because Iraq's banking network is connected to the financial communications network also located in Europe. Consequently, according to Pentagon sources, an information operations attack directed at Iraq might also have brought down banks and ATM machines located in parts of Europe.[22]

EW in SPACE
Militaries all over the world increasingly depend on space systems for various

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22. Charles Smith, "U.S. Information Warriors Wrestle with New Weapons," NewsMax.com, March 13, 2003 http://www.newsmax.com/archives/articles/2003/3/12/134712.shtml .

Space is emerging, as a distinct warfare area of its own. The effect may be to so dominate an adversary before the conflict starts as to make the conflict unnecessary.

force enhancements and application functions. Space force plays an increasingly critical role in providing situational awareness (e.g. global communications, early warning, precise navigation, imagery, signal intelligence, timely and accurate missile warning, weather and ISR, etc) to military forces. Therefore, space power is a vital element which provides the ability to be persuasive in peace, decisive in conflict and preeminent in any form of combat. Space systems are very extremely important to military operations and it is unrealistic to imagine that they will never become targets. The trend towards increased dependency creates both opportunities and vulnerabilities in future crises and conflicts. Just as land dominance, sea control and air superiority have become critical elements, space superiority is emerging as an essential element of battlefield success and future warfare. As space systems become lucrative targets, there will be a critical need to develop robust capability to ensure space superiority—just as they have been for land, sea and air dimensions. Historically, military forces have evolved to protect national interests and investments. During this early part of the 21st century, space power has all the makings of evolving into another and equal (to land, sea and air) medium of warfare. Likewise, space forces will emerge to protect these commercial and military assets.

In the future, comprehensive plans will be laid out to achieve space superiority throughout the range of military operations to beat these space-based defences. Satellites are the main focus of military space activities. Over 800 satellites orbit the earth, many of which have military uses, from reconnaissance to guiding weapons. They are increasingly used to provide direct support for military operations: for instance, during the 2003 Iraq War, 68 per cent of munitions were satellite guided (up from 10 per cent in the 1991 Iraq War). Space assets have become a key feature in the digitalisation of the battlefield where some of the fog and friction of war is removed for the side dominating space.

Space is emerging, as a distinct warfare area of its own. The effect may be to so dominate an adversary before the conflict starts as to make the conflict unnecessary, something Sun Tzu advocated nearly 2,500 years ago. Owing to the strategic importance of satellites in space, EW in space is aimed at jamming , sabotaging and destroying satellites to gain information dominance in future conflicts. The sphere of action of EW in space is not limited to anti-satellite operations but also has tremendous potential applications in:

- Detection, tracking and destruction of ballistic missiles.
- Misdirecting or hijacking UAVs, especially those linked via satellites.
- Disruption of global positioning systems.[23]

Space plays an important role in the C4I framework, therefore, limiting the adversary's use of space and precluding him from influencing friendly space systems is crucial to maintaining situational awareness because of the critical advantages it provides. There are various ways of disrupting satellite operations. They are mainly ground-based and include: jamming i.e. interrupting communication links between satellites and ground stations[24] by 'drowning out' the signal with a more powerful 'fake' signal or by targeting ground stations via physical attacks or computer hacking. Ground stations are considered more vulnerable than satellites themselves.

> **One of the recognised weaknesses of GPS is its susceptibility to jamming.**

Several other techniques are possible although there is no evidence they have ever been used (except in tests):

- Low power lasers can disrupt satellite sensors and, according to some reports, over 30 countries may have this capability, although this figure is hard to verify.
- Nuclear weapons explosions in space: in 1962, the US high altitude nuclear detonation resulted in high radiation levels, destroying seven satellites within months.

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23. These programmes were called Suter 1 and Suter 2, and were tested during Joint Expeditionary Forces Experiments held at Nellis Air Force Base in 2000 and 2002. David Fulghum, "Sneak Attack," *Aviation Week & Space Technology*, June 28, 2004, p. 34.
24. "Chinese Lasers Blind US Satelites," http://politics.slashdot.org/article.pl?sid=06/09/28/126207.

Owing to its strategic significance, say Chinese aerospace experts, space electronic warfare has become the most important way to gain information dominance in future wars.

● Use of ground or air-launched missiles: during the Cold War, both the US and Russia developed missiles for this purpose.[25] The Chinese also demonstrated this capability in January 2007.

In Operation Iraqi Freedom, commercial satellites provided 80 per cent of US data, compared with only 45 per cent in Operation Desert Storm in the early 1990s. Therefore, some commercial satellites perform a dual role. Many commercial satellites have only one ground station, leaving them particularly vulnerable. Military systems are usually better protected than commercial satellites, but the latter are increasingly used for military purposes.

Today, most forces use GPS for navigation and there is an increasing trend towards using GPS guided weapon systems. Most of the expensive, cruise-type missiles in the US inventory such as the Tomahawk, conventional air-launched cruise missile (CALCM), and some land-attack versions of the Harpoon missile employ GPS for navigation purposes. One of the recognised weaknesses of GPS is its susceptibility to jamming. The GPS signals from the satellite arrive at the user's GPS receiver at a very low level, so the jammer has the advantage of being, say, half a mile away. Hence, it doesn't take much power to completely swamp the GPS signal in the receiver.[26] It has been shown that even low power GPS jammers are capable of jamming an array of sophisticated military equipment. These jammers are cheap and easy to manufacture which could render the GPS receivers ineffective, or worse still, cause serious damage by spoofing the system to receive wrong information and thereby directing the weapons to places unintended by the user. Electronic warfare in space will be focussed in overcoming these drawbacks by providing assured and secure down link frequencies.

25. "Military Uses of Space," http://www.parliament.uk/documents/upload/postpn273.pdf
26. Michael Puttré, "GPS Weapons are Transforming the Air-Ground Battle," http://www.mputtre.com/id17.html.

THE CHINA FACTOR AND IMPLICATIONS FOR INDIA

China: EW Developments

China is in the process of upgrading its EW capability through technology acquisition, reverse engineering and indigenous research and development. China views EW as a fourth dimension of ground, naval and air combat. It currently is engaged in an extensive programme to upgrade its EW technology equipment and training. The current inventory of EW equipment includes a combination of the 1950s to 1980s vintage technologies. China is seeking to procure state-of-the-art intercept, direction finding and jamming equipment. For this, it has established close commercial ties with electronic companies in numerous foreign countries.[27]

Owing to its strategic significance, say Chinese aerospace experts, space electronic warfare — aimed at jamming, sabotaging and destroying satellites — has become the most important way to gain information dominance in future wars. Chinese experts in space EW note that the counter-jamming capabilities of radar systems have been continuously advancing. The air-space battlefield is said to be the quintessential battlefield for information counter-attack. EW satellites, travelling in geostationary orbits or 300-1,000 km orbits can conduct electronic reconnaissance and jamming in wide areas. EW aircraft in flight can execute high-intensity electronic killing of enemy long-range radar stations, command centres, and communications centres to paralyse their command capabilities and disable their firing systems. They can also directly launch anti-radiation missiles to totally destroy the enemy.

Given China's current level of progress in laser technology, it is reasonable to assume that Beijing would develop a weapon that could destroy satellites in the future.

According to Chinese military scientists, high-powered microwave weapons have triggered "a new revolution in electronic warfare systems and technology."

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27. "Future Military Capabilities and Strategy of the People's Republic of China," http://www.fas.org/news/china/1998/981100-prc-dod.htm#5

Not only are they compatible for creating integrated systems with radar for low-power detection, target tracking and jamming, but their power can also be rapidly increased for destruction of targets and for inflicting damage on the electronic equipment of enemy targets. These weapons portend extremely wide applications extending to aeronautic, astronautic, warship, and battlefield weaponry. According to China, rapid advances are being made in the US' HPM and high energy laser weapons with some of them already entering applications stages. China may already possess the capability to damage, under specific conditions, optical sensors on satellites that are very vulnerable to damage by lasers. However, given China's current level of progress in laser technology, it is reasonable to assume that Beijing would develop a weapon that could destroy satellites in the future.[28]

China reportedly has considerable and growing capabilities for developing information technology and networks. Chinese officials state that future military plans call for China to focus on developing "new-concept" weapons, such as electromagnetic pulse (EMP) systems for jamming adversary networks and new satellites for establishing a unique GPS network for the Chinese military.[29] China has also networked its forces using the European "Galileo" space-based global positioning system. China's military thinkers believe that the first wave of warfare will develop from firepower attack and electromagnetic attack to satellite paralysis.[30]

Implications for India

The future battlefield milieu, with its devastating weapons, surveillance equipment, dynamic tactics and highly mobile and dispersed forces, will demand state-of-the art command and control architecture. In such an environment, the time available to the commander for decision-making is decreasing while the complexity and volume of information and penalties for error are increasing.

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28. Source Jane's Defence at http://www.aeronautics.ru/archive/research_literature/aviation_articles/ Janes/topics/plasma_stealth/Directed%20Energy%20Weapons%20and%20Sensors.pdf.

29. Mary C. Fitzgerald, "China Plans to Control Space and Win the Coming Information War," *Armed Forces Journal,* November 2005, p. 40.

30. Mary C. FitzGerald, "China's Military Modernization and its Impact on the United States and the Asia-Pacific," http://www.hudson.org/files/publications/07_03_29_30_fitzgerald_statement.pdf.

Effective command and control is an essential ingredient of all operations, in both peace and in war. The emerging command and control systems are valuable assets for managing the entire battlespace, with the emphasis shifting from platform-centric operations to network-centric operations, which are emerging as significant force multipliers. The concept of network-centric operations is an important one if we are to expand our tactical capabilities to a significant extent. In order to exploit the full potential of our surface, submarine and airborne platforms, it would be ideal to have these elements networked. It will then be possible to have a complete picture of what each of our platforms can detect by means of their electronic warfare devices, conveyed through the medium of satellites. However, the complexity and cost of such networking is extremely high since it would require a high degree of networking among satellites, platforms, weapon systems, command and control centres and also the interoperability of various systems. This is a huge task and may not actually be required in the near future in our context. But of immediate importance would be to integrate various systems within a Service, operating in a theatre. Difficulties notwithstanding, net-centricity is imperative because it enables the capability of geographically dispersed forces to operate as one integrated force.

The need to provide balanced wideband, narrowband and protected communication systems to a broad range of users across diverse mission areas can be effectively met by a satellite-based network. Satellite communication and navigation services will form the backbone of this desired ability to conduct operations in both peace and war during the coming years. The satellite-based communication network should be capable of supporting joint C4ISR and providing effective back-up as an overlay network to terrestrial communication, mobile communication and maritime communication requirements of the Services in all kinds of environments, including the nuclear.

The Indian Air Force (IAF) is on its way to establishing the Integrated Air Command and Control System (IACCS) in a phased manner. This system will have the capability to integrate the air situation picture, received in real-time, from ground-based as well as airborne sensors, and would be available to the IAF commanders to initiate, monitor and control tactical air defence actions

The C4ISR system should have physical and electronic security, survivability and adequate redundancy so that C4ISR and network-centric operations (NCO) systems are protected against deliberate or inadvertent, unauthorised acquisition; disclosure, manipulation; loss or modification of sensitive information.

against any hostile intruder in our air space.[31]

India currently has in orbit three dual-purpose satellites—CARTOSAT-I, CARTOSAT-II and the technical experiment satellite—that are used by the country's space agency and the military. The plan envisages the linking of the airborne warning and control system (AWACS) (when procured), aerostat radars and low-level transportable radars of the IAF with them.[32]

Secure communication and networking are undoubtedly going to play very important strategic and tactical roles, not just in electronic warfare but also in conventional battles and wars, as the US led wars in Afghanistan and Iraq have amply demonstrated. In line with this thinking, the Indian Army commissioned the Dhruva Satellite Communications Network in September 2006. This state-of-the-art secure

satellite network has the world's highest V-SAT (very small aperture terminal) which is integrated with the Eastern Theatre Satellite Network, one of the densest satellite communication networks within the country. During the commissioning of the network, the Signal Officer-in-Chief Lt Gen Davinder Kumar, VSM and Bar, stated that operational necessity, self-reliance, security and information assurance were the keys to provisioning of this high end technology, fully secure satellite communication network for the army. The network has been integrated with the army's terrestrial network to increase its range and efficacy with a view to meet the challenges of the digital battlefield of tomorrow.[33]

Elements like fighter aircraft squadrons, radars, Command Headquarters along with the existing Air Defence Ground Environment System (ADGES),

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31. "Integrated Air Defence System," http://164.100.24.208/lsq/quest.asp?qref=16570.
32. "Aerospace Command," http://www.domain-b.com/aero/June/2007/20070611_military.htm.
33. "Satellite Network for the Indian Army," http://www.expresscomputeronline.com/20060918/market12.shtml.

communications networks, etc are being modernised with asynchronous transfer mode (ATM) technology using fibre optic media.[34]

In the era of information warfare, net wars, cyber warfare and the nuclear backdrop, C4ISR systems should have physical and electronic security, survivability and adequate redundancy so that C4ISR and network-centric operations (NCO) systems are protected against deliberate or inadvertent, unauthorised acquisition; disclosure, manipulation; loss or

Although radar and communications systems remain the key targets of EW, systems such as the GPS, network links, etc have emerged as important objectives to an EW campaign.

modification of sensitive information. The low cost of entry (for example, a laptop connected to the internet), and the ability to operate anonymously, are factors that make cyberspace an area for asymmetrical operations for potential adversaries. Countries like China, Russia, Cuba, Iran, Iraq, Libya, North Korea, and several non-state terrorist groups are reportedly developing such capabilities. In case of a local breach of network security, there should also be a provision for dynamic allocation of computing resources while, at the same time, isolating the affected system. In its quest towards becoming a network enabled force by 2009, the Indian Army is developing a computer emergency repair team[35] which is tasked with analysing computer intrusion incidents and providing solutions for such problems.

While Chinese military experts have applauded the "brilliant" performance of the US GPS in recent high-tech military operations, they continue to clarify its inevitable "Achilles' Heel" because the low altitudes of the GPS satellites and low power requirements of their receiver sets make them susceptible to interference, jamming or spoofing.[36] This is an aspect which is widely acknowledged, therefore, suitable standby/redundant systems must be incorporated to ensure smooth operations under these conditions. The Chinese

34. Ravi Shekhar Pandey, "Communication In Defense: Securing The Frontiers," http://www.domain-b.com/aero/June/2007/20070611_military.htm
35. Lt Gen Davinder Kumar, Signal Officer-in-Chief, Indian Army, "Information Warriors," http://mod.nic.in/samachar/feb15-06/h3.htm
36. FitzGerald, n.30.

anti-satellite (ASAT) test signalled that satellites in space are no longer safe. The vulnerability of space-based assets is only going to increase after the US shot down their uncontrolled spy satellite before it entered the earth's atmosphere.

Therefore, we must be wary of putting all our eggs in one basket. In view of this, India is already on the way to develop its own navigation system GAGAN (GPS and geo augmented navigation) for the civil aviation and Indian Regional Navigation System (IRNSS). India has also signed the GLONASS (Global Navigational Satellite System) agreement with Russia which is an alternative to the US GPS. Another thought is to enter into collaboration with other friendly countries to use a common satellite system for a variety of purposes. This would in some measure restrain any country from disrupting satellite services since it would affect others as well.

CONCLUSION

EW has been important ever since military forces first began using radios and radar. It is the form of electromagnetic attack that is generally associated with the jamming of sensors, command and control, or communications systems that use the electromagnetic spectrum. Although radar and communications systems remain the key targets of EW, systems such as the GPS, network links, etc have emerged as important objectives to an EW campaign.

The proliferation of new sensor and communication technologies in recent years has been so profound that warfare has now transcended from being terrestrial to outer space. Satellites are playing an increasingly important role in achieving information dominance. Space power in the future will play a very major role in deciding the outcome of conflicts. Security of space-based assets will, therefore, have to be accorded the highest priority.

The synergistic employment of space-based assets and robust networking for information dominance will be important elements of success in future conflicts. Disruption of any one of these by hard kill or soft kill will have far-reaching effects on the outcome of operations. Moreover, the fantastic rates of increase in the ability to collect, process, classify and disseminate information to an ever-growing number of targets within an increasingly wide geographical radius at speeds that

are hard to imagine implies that these information systems will be the targets of attack and there is a perpetual risk that the "weak signals" (those that count) could disappear in a "growing background noise." Adequate precautions against these are best taken during the design and implementation stages.

The war front, in the conventional sense, no longer exists. It is fluid and scattered. Therefore, the essential factor for success in the future will increasingly lie in the ability to provide secure links between the soldiers and commanders and the ability to increase the information gap between allies and adversaries.

MODERNISATION OF THE PAKISTAN AIR FORCE

SHALINI CHAWLA

It is my strong conviction that offensive application of air power is what can yield positive results in a war.

—Air Chief Marshal Mushaf Ali Mir,
CAS, Pakistan Air Force, 2002.[1]

Pakistan has been on an arms acquisition spree to rapidly modernise its air force since the Kargil War, accelerating the process during the last five years. Significantly, Pakistan's arms acquisitions since the Kargil War have been exclusively centred on modernisation and build-up of the air force and aerial maritime strike capabilities of the navy. This has to be viewed in the context of the reality that the army in Pakistan, which has ruled the country for most of its existence, and has been in direct control since 1999, calls the shots in military priorities and modernisation. Pakistan has acquired some land systems, but they have been restricted to heavy artillery. The United States has become Pakistan's major arms supplier since 9/11 and Pakistan has once again become its "frontline state". However, Pakistan has made aggressive efforts to diversify the sources of weapons supply in the last five years. China and Pakistan have entered into joint defence projects, adding to the import and production of the Pakistan Air Force (PAF) and the navy.

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1. Interview, *Asian Defence Journal*, 9/2002, pp.28-29.

The dominant military lobby in Pakistan has aggressively propagated the Indian threat within Pakistan

This paper attempts to study the modernisation of the PAF in recent years and its impact on strategy. It does not cover the nuclear and missile capabilities of Pakistan.

Pakistan's military capability and the military build-up have been shaped by its relationship with the United States and support from China. The last 60 years have seen fluctuations in Pakistan's military capability development owing to Pakistan's relationship with the United States. The main suppliers to Pakistan have been the US and China. France and Turkey have been important partners in supporting the PAF's existing fleet of Mirages. To get an understanding of Pakistan's military capability, it is essential to look into the objectives behind the military build-up.

BASIC OBJECTIVES SHAPING PAKISTAN'S MILITARY CAPABILITY

Security concerns have always dominated the minds of Pakistan's leadership. Pervez Iqbal Cheema believes in "three possible roads to peace and security—disarmament, arms control and armament." According to him, "Most Third World countries view the first as idealistic, arms control as somewhat more pragmatic, and armament as necessary and realistic."[2] Pakistan has looked at arms procurement to satisfy its security concerns. The perceived threat perception from India, the strategic developments on the border with Afghanistan and the emerging technologies, have been the dominant factors contributing to the sources and kinds of arms procurement by the nation. The basic objectives shaping arms acquisitions of Pakistan are as follows:

1. Right from its creation, Pakistan has been highly suspicious of India and the adversarial relationship with India has played a major role in the formation of its threat perception. The commonly accepted notion is that India, with its hegemonic ambitions, would dominate the South Asian region. The dominant military lobby in Pakistan has aggressively propagated the Indian threat

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2. Pervez Iqbal Cheema, "Arms Procurement in Pakistan: Balancing the Needs for Quality, Self-Reliance and Diversity of Supply," in Eric Arnett, ed., *Military Capacity and the the Risk of War- China, India, Pakistan and Iran* (SIPRI, Oxford University Press, 1997), p. 148.

within Pakistan to legitimise Pakistan's high defence spending, and on the international front to support the acquisition of high technology weaponry. This also interacts with, and promotes, the military's special and dominant role in the country's power structure.

2. Pakistan has been constantly engaged in the battle of matching India's conventional military superiority. The strategic aims, as brought out in the Pakistani writings, are: "to strengthen national power; to prevent open aggression by India; to induce India to modify its goals, strategies, tactics and operations; to attain a position of security or, if possible, dominance, which would enhance the role of other (non-military) means of conflict; to promote and capitalise on advances in technology in order to reach parity or superiority in military power."[3]

3. Pakistan has relied more on high technology weapons to seek competitive military advantage. The perceived military threat from India, which Pakistan considers as an "intelligent and implacable enemy,"[4] has shaped Pakistan's decision to acquire and maintain technological superiority. "Pakistan must have a counter system for every Indian system, either to defend or to deter through the threat of riposte. If access to foreign aid is not assured, Pakistan needs to develop and keep a technology base sufficient to allow it to generate counter-systems to any new weapons the enemy might acquire through import or indigenous development."[5]

Pakistan has believed in offensive aggressive strategies and has had a deep-rooted belief that by going on the offensive, smaller size forces in history have won wars against bigger enemies.

The desire to acquire high technology weapons has been very strong in the Pakistan military and the alliance with the United States has provided Pakistan with opportunities to acquire high technology weapons. Pakistan

3. Ross Masood Husain, "Threat Perception and Military Planning in Pakistan; The Impact of Technology, Doctrine and Arms Control," Eric Arnett, ed., Ibid., p. 130.
4. See Husain, Ibid.
5. Ibid., p. 131.

believes that acquisition of high technology weapons would boost the morale and capability of the air force and, hence, improvement of the technological base and acquisition of advanced weaponry is vital for victory in war.[6]

4. Pakistan has believed in offensive, aggressive strategies and has had a deep-rooted belief that by going on the offensive, smaller size forces in history have won wars against bigger enemies. All the four wars which Pakistan has fought with India (in 1947-48, 1965, 1971 and 1999), have been initiated by Pakistan. The war in 1971 was caused by Pakistan's internal instability. But the actual war was initiated by Pakistan with a preemptive air strike against Indian Air Force bases on December 3. In addition, it adopted the offensive route for its covert war through terrorism in Jammu and Kashmir (J&K) since 1988 (besides that in Punjab in 1983-93).

5. Pakistan has relied heavily on the strategy of offensive action and, thus, the acquisitions of high technology weapons are sought to support this strategy. Compared to its unwillingness or inability to support its ground offensive during the Kargil War, the PAF chief clearly emphasised the offensive orientation of the air force three years later when he stated:

It is my strong conviction that offensive application of air power is what can yield positive results in a war. In a scenario where one is placed against an adversary not only larger in size but also enjoying a considerable technological edge, offensive and innovative application of air power can pay required dividends. To this end, we have trained accordingly. The PAF has always given top priority to bold offensive planning and our performance was thus clearly visible in the last two wars

- Air Chief Marshal Mushaf Ali Mir, Chief of Air Staff, Pakistan Air Force.[7]

6. External military support (with even short-term arms additions as in the case of one squadron of F-104 Starfighter aircraft from Jordon in 1971, besides extensive support from Iran, Iraq, etc in 1965) has been a major element in Pakistan's arms acquisitions.[8]

6. See Sobia Nisar, "The Pakistan Air Force," at http://www.defencejournal.com/2001/august/airforce.htm
7. Interview, *Asian Defence Journal*, 9/2002, pp. 28-29.
8. Pervez Iqbal Cheema, *The Armed Forces of Pakistan* (Oxford: Oxford University Press, 2002), p. 164.

BACKGROUND OF THE MODERNISATION OF THE PAF

Modernisation of the PAF in the 1950s

During the early decades, Pakistan acquired arms mainly from the USA (for high-technology systems) and China (for low cost but efficient systems) and a small proportion

By the year 1957, Pakistan was receiving a massive amount of sophisticated military equipment, training and economic aid.

contributed by France. In fact, the massive US arms aid to Pakistan in the late 1950s provided it with both the incentive to initiate the 1965 War as well as demonstrated the philosophy of high technology weapons providing a competitive advantage against India. India was, in any case, saddled at that time with obsolete systems being employed after the war in 1962. The classic case was the shooting down of the first four Vampire vintage aircraft by a combination of F-104 Starfighters and F-86 Sabres on the opening day of the war, forcing India to withdraw these older fighters from combat, thus, reducing the quantitative advantage that India was supposed to enjoy.

A mutual defence assistance agreement signed on May 19, 1954, between the US and Pakistan was the first formal bilateral security commitment between the two countries and also provided the legal basis to the US military assistance.[9] Following this, in the same year, US officials presented a secret *aide-memoiré* boosting the military aid to $50 million with specific programme goals. The *aide-memoiré* committed Washington to equip "4 army infantry and 1.5 armoured divisions, to provide modern aircraft for 6 air force squadrons, and to supply 12 vessels for the navy. The estimated cost of this programme was $171 million."[10]

Pakistan entered into the Southeast Asia Treaty Organisation (SEATO) in 1955 and the Baghdad Pact, renamed the Central Treaty Organisation (CENTO), after Iraq left the pact in 1956, ostensibly joining the chain erected by the United States around the Soviet Union and its then military-ideological ally, China, to check the spread of Communism.[11] This resulted in a robust inflow of military

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9. Dennis Kux, *The United States and Pakistan, 1947-2000* (Oxford: Oxford University Press, 2001), p. 67.
10. Kux, Ibid., p.69.
11. Shahid Javed Burki, *Historical Dictionary of Pakistan* (New Delhi: Vision Books, 2003) p. 337.

Pakistan received interest free economic aid and also a significant amount of free weapons from China.

and economic aid for Pakistan. Being a member of these two security alliances provided Pakistan a stronger claim on US resources and the US also benefited with the regular interaction between the Pakistani civilian and military officials and their counterparts from the other member countries. In this process, the US acquired a larger stake in its Pakistan relationship.[12]

By the year 1957, Pakistan was receiving a massive amount of sophisticated military equipment, training and economic aid. The inflow from Washington included sophisticated Patton main battle tanks, modern artillery, Howitzers, F-86 jet fighter squadrons, F-104 Starfighter supersonic interceptors, air-to-air missiles, submarines (the first submarine to be introduced into the Indian Ocean by a developing country, as indeed was the F-104 supersonic interceptor) and state-of-the-art radar, communications and transportation equipment. Further, a qualitative boost came from the military training by the US military teams and also in the US military schools for the Pakistan Army.[13] The US military also provided assistance in setting up intelligence and special operations facilities creating the Special Services Group (SSG) which was used to unsuccessfully try and capture Indian airfields in the 1965 War. While Pakistan failed to win the war in 1965, its military nevertheless projected it as a victory, especially in the air, and the thirst for high-technology systems intensified.

Affiliation with China
But even as the 1965 War was getting underway, Pakistan sent its recently retired Air Chief, Air Marshal Asghar Khan, to China to seek aircraft and weapon systems to meet Pakistan's "dire needs."[14] Pakistan's need for different sources was complemented with Zulfikar's Ali Bhutto's approach which believed in maintaining relations with all the major powers whose interest lay in South and West Asia. Unlike Field Marshal Ayub Khan, Bhutto's diplomatic policy brought

12. Kux, n.9, p. 74.
13. Kux, Ibid., pp. 86-87.
14. Asghar Khan, *The First Round: Indo-Pakistan War 1965* (New Delhi: Vikas, 1979).

Pakistan closer to Beijing and Pakistan entered into several economic and military cooperation agreements with China. Pakistan received interest free economic aid and also a significant amount of free weapons from China and became the only non-Communist Third World country to receive generous assistance from it.[15] The Chinese F-6 entered the PAF's inventory in 1966 followed by other systems. Chinese military assistance came in not only in the form of arms but also development of the indigenous facilities for defence production in Pakistan [the F-6 Rebuild Factory (F-6RF) at Kamra was set up with Chinese assistance].

Indigenous defence production was focussed to progress towards self-reliance and, more importantly, to revitalise the PAF in the 1970s.

1965 Arms Embargo and PAF Acquisitions in the Late 1960s and 1970s

The United States arms embargo followed by the 1965 Indo-Pakistan War led to withdrawal of US military assistance and also the suspension of US equipment to Pakistan. Pakistan was compelled to look into alternate options and, thus, it turned to China, North Korea, Germany, Italy and France for military aid. In the late 1960s, Pakistan received MiG-19 fighters from China, apart from the substantive infantry equipment. France supplied a few Mirage aircraft and even the Soviet Union provided Pakistan Mi-8 helicopters.

In the 1970s, although US equipment was not available for Pakistan, modernisation of the PAF was kept up with the help of Chinese equipment on one side and the French equipment on the other. China supplied 115 F-6 fighters between 1971 and 1981. France supplied 72 Mirages between 1971-83. Some air defence equipment like the F-104A fighters and helicopters was bought from Jordan and the UK.

Indigenous defence production was focussed to progress towards self-reliance and, more importantly, to revitalise the PAF in the 1970s. Rebuilding factories for Mirages and F-6 planes and the production facility for MIF-17

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15. Ayesha Siddiqua-Agha, *Pakistan's Arms Procurement and Military Buildup*, 1979-99 (New York: Palgrave, 2001), p. 105.

During the 1980s, the focus of arms procurement was on strengthening the PAF.

trainers were set up. Apart from this, "the Air Defence System was modernised by inducting the latest radars linked with computerised data processing and display equipment.'[16]

The Arms Pipeline Reopens in the 1980s

The Soviet invasion of Afghanistan in December 1979 led to the Americans' review of their South Asian policy and, consequently, Pakistan entered into a new engagement with the US. Pakistan was declared a "frontline state" and in return received massive military aid. Gen Zia-ul-Haq managed to negotiate an elaborate military and security-related aid package of $3.2 billion. The US military assistance programme included the sale of 40 F-16 Falcon multi-role combat aircraft, one of the most advanced military aircraft in the world at that time. Pakistan also received attack helicopters and second-hand destroyers.[17]

The second US package worth $4.02 billon commenced in 1987 but was suspended because of the US arms embargo in 1990 due to Pakistan crossing the "red line" to acquire nuclear weapons capability.

Chinese weapons, being cheaper, continued to hold a significant share in the Pakistani inventory. Although arms from China were technologically not as superior as those from the West, they were capable systems, were affordable and provided quantity to boost Pakistan's military powers. In fact, by the early 1980s, China had provided Pakistan with roughly about 65 per cent of its aircraft.[18]

During the 1980s, the focus of arms procurement was on strengthening the PAF. Pakistan had lost the last two wars and believed that effective air defence would give them leverage in future offensive operations against India. One of the lessons learnt from the last two wars was that an efficient air force would be important in providing close-battle support to the ground forces.[19] According to

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16. Shafi, "50 Years of the Pakistan Air Force," September 7, 1997, as cited in Cheema, n.8, p. 111.
17. Rodney W. Jones, "The Military and Security in Pakistan," in Craig Baxter,ed., *Zia's Pakistan, Politics and Stability in a Frontline State* (Lahore: Vanguard, 1985), p. 83.
18. Cheema, n.8, p. 164.
19. Siddiqua-Agha, n.15, p.139. The largest share of the American military aid (the first package) was used for the air force. Out of the military component of $1.6 billion, $1.2 billion was spent on the acquisition of 40 F-16 aircraft.

the strategic thinkers in Pakistan, the acquisition of the F-16s proved vital for the morale of not only the PAF but for the nation as a whole. And the modern aircraft was viewed as a technological acquisition guarding the territorial integrity of Pakistan.[20] Thus, the Pakistani military leadership, in their second deal with Washington, sought 70 F-16s, aiming to raise the inventory to 110 high performance multi-role combat aircraft. During the 1980s, Pakistan also made an unsuccessful attempt to acquire the airborne early warning (AEW) system from the US which, if successful, would have dramatically increased the air force's combat capability.

China (besides France) continued to be a major source of PAF weapons and this increased after the US arms embargo in 1990. About 90 A-5s were obtained in 1983-84 for the price of $1 million per aircraft. Procurement of around 95 F-7 series aircraft was done, adding to the quantitative element in the PAF.[21]

Despite the US sanctions, low GDP and a collapsed democratic structure, Pakistan tried hard to acquire the air force equipment.

PAF Modernisation from 1990-2007

The then Chief of Air Staff of the Pakistan Air Force, Air Chief Marshal Kaleem Saadat, last year had stated in an interview to *Jane's Defence Weekly*, "When US sanctions were imposed in 1990, both the PAF and the Indian Air Force were second-generation air forces. No real-time surveillance capability, no air-to-air refuelling capability, no airborne early warning capability, no beyond-visual-range-capability, no stand-off weapon capability. However, after 13 years of sanctions, India had all the above and Pakistan had none until about three or four years ago. This is the gap....We have to bridge this gap in the manner that we can deny the advantage that our neighbour has...."[22]

American military and economic aid came to a halt following the sanctions in 1990. The sanctions were highly damaging in nature as they not only suspended the US military aid and assistance but the procurement of essential spares was

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20. Siddiqua Agha, Ibid., p. 161.
21. Ibid.,p. 144.
22. Robert Karniol, " Pakistan-Plugging the Gaps," *Jane's Defence Weekly*, March 20, 2006.

also blocked. Intensive lobbying by Pakistan resulted in some relief under the Brown Amendment passed in 1995. The amendment permitted taking possession of the military equipment frozen in the United States, with the exception of nuclear capable F-16 combat aircraft.[23] Pakistan had paid for 28 F-16s, which were manufactured against the 1987 order of 110. But following the sanctions, the F-16s were not supplied.[24] These sanctions actually impacted the PAF's capability and created confusion in the PAF planning and procurement regarding the replacement of these aircraft. The post-nuclear test sanctions further hampered Pakistan's weapons supply as the United States persuaded the other G-7 countries to impose similar sanctions.

The decade of the 1990s was a setback for PAF modernisation due to the American sanctions and also Pakistan's crippling economy. Economic growth recorded a steep decline and Pakistan was under severe pressure from the international financial institutions to cut down the spending on defence. Despite the US sanctions, low gross domestic product (GDP) and a collapsed democratic structure, Pakistan tried hard to acquire the air force equipment. In 1990, 50 Mirage 3 (as indicated in Table 2) were acquired from Australia for a paltry sum of $28 million, along with engines and spares.[25]

In the 1990s, Pakistan, with its nationalist ego boosted by the nuclear weapons tests (which it also believed would deter India from any robust response), launched the war in the Kargil sector of Jammu and Kasmir (J&K) in early 1999. This misadventure not only led to its defeat but triggered the return of the army in control of the country, displacing the elected government in the coup of October 12, 1999. With the emergence of the military regime, another set of democracy related sanctions was imposed on Pakistan, laying further restrictions on acquiring high technology weapons from the West. The result was China's preeminence in Pakistan's arms import.

Sino-Pakistan defence collaboration flourished under the umbrella of the US sanctions and, in the process, the two nations entered into deals for the co-

23. For details, see Kux, n.9.
24. The United States government tried to help dispose off these aircraft to Indonesia to help Pakistan recover the money. But owing to the economic crisis of 1997 in Southeast Asia, it was unsuccessful.
25. Siddiqua-Agha, n.15, p. 145. These aircraft were retired from the RAAF and most of them had about a hundred flying hours remaining on their airframes.

development of a fourth generation fighter aircraft, the JF-17 (earlier called the FC-1); the K-8 jet trainer had earlier been jointly produced. China delivered two joint fighter (JF-17) Thunder advanced jets to the PAF in March 2007 for flight tests and evaluation. The JF-17 is designated to be a low cost combat aircraft to meet the tactical and strategic requirements of the PAF with the reduced reliance of Pakistan on imports. The JF-17 is co-developed by Pakistan and China and is being built by China's Chengdu Aircraft Industry Corporation (CAC) and Pakistan Aeronautical Complex (PAC). There have been reports that the design was developed by the MiG complex in Russia and transferred to China after the Russian Air Force cancelled procurements. Pakistan has also increased its initial target of buying 150 JF-17s to acquiring up to 250 aircraft.[26] This represents a quantum jump in the Pakistani aircraft industry. The PAC in Kamra will commence manufacturing the JF-17 in 2008, and with this, Pakistan will join the exclusive club of the few nations manufacturing fighter aircraft. Pakistan is also positioning itself to buy up to two squadrons of Chinese J-10 which, along with the JF-17, would form the backbone of the PAF, according to the Pakistan Air Force chief.[27] China has also confirmed the sale of six ship-based medium size Z 9C helicopters to the Pakistan Navy.[28]

Pakistan has also entered into the procurement of airborne early warning systems from Sweden and China.

Pakistan has also initiated the procurement of airborne early warning systems from Sweden and China. In 2005, Pakistan entered into a deal with Sweden for the purchase of 7 SAAB-2000 turboprop aircraft equipped with Erieye airborne early warning and control (AEW&C) systems.[29] The negotiations for the purchase of Chinese built airborne early warning aircraft are also on. Reportedly, Pakistan is acquiring an unspecified number of Chinese FT-2000 missiles to counter India's early warning capabilities.[30]

26. Interview, Pakistan's Chief of Air Staff, Air Chief Marshal Tanvir Mahmood Ahmed, April 4, 2007, *Jane's Defence Weekly*, p. 34.
27. Ibid.
28. *The Military Balance 2005-2006, IISS* (London: Taylor and Francis, 2005) p. 230.
29. For details see, Atul Kumar Singh, "AWACS: the Pivot of Aerospace Power," *Air Power*, vol. 2 no.1, Spring 2007 (January-March), pp. 107-138.
30. "FT-2000" *Missile Defence Systems*, at http://www.missilethreat.com/missiledefensesystems/id.20/system_detail.asp

The arms deliveries to Pakistan from the US in the period of 1999-2006 alone amount to $ 4,600 million.

With the uncertainty related to the inflow of the US equipment owing to the experience in the past, Pakistan has been aggressive in diversifying its sources of weapons supply. A deal for the purchase of 40 Mirage interceptor/ground attack aircraft from Turkey was finalised in 2004. The aircraft will be used as spares for the PAF's existing fleet of Mirages. A joint venture for the production of unmanned aerial vehicles (UAVs) is also in the pipeline as indicated during the visit of Turkish Defence Minister M. Vecdi Gonul to Pakistan.[31]

PAF Acquisitions from the United States During 2002-2007
The US weapons sales to Pakistan were restarted following Pakistan's role as the chief ally in the global war against terrorism, which led to the removal of US sanctions on Pakistan. Pakistan's alliance with the United States post 9/11 helped the recovery of Pakistan's economy and opened the long desired supplies of defence equipment from Washington. The Pentagon reports indicate that the foreign military sales agreements with Pakistan were estimated at $344 million in FY2003-2004, growing to $492 million in FY2005 alone.

The initial US supplies to Pakistan consisted of items like UH-II utility helicopters, VHF/UHF aircraft radios, air traffic control radars, night vision equipment and other equipment and support systems, including intelligence gathering devices. High technology weapons and equipment from the United Sates include two F-16s which Pakistan received in 2005, which will be followed by 54 more F-16s (36 F-16 A&B + 18 F-16 C&D)[32]. Pakistan, reportedly has an option to go for additional 18 F-16s in the coming years. Pakistan has been extremely keen to acquire the F-16s, partly because of political/psychological reasons and partly because it has been familiar with multi-role combat aircraft since the early 1980s. The issue apparently has been the cost and the level of upgradation of the aircraft which Pakistan would receive. Pakistan would aim to

31. *The Military Balance 2004-2005, IISS* (London: Oxford University Press, 2004), p. 311.
32. *The Military Balance 2007, IISS* (London: Routledge, 2007), p. 330.

Table 1				
Pakistan Defence Expenditure Statistics				
	Defex (bn. Rs.)	GDP (current prices, bn. Rs.)	Defex/ GDP (%)	Defex/ Federal Govt Exp (%)
1998-99	143.471	2,960.000	4.32	23.66
1999-2K	150.440	3,562.020	4.22	22.11
2000-01	133.500	3,876.025	3.44	19.30
2001-02	151.600	4,095.212	3.70	23.37
2002-03	159.700	4,481.412	3.56	22.61
2003-04	180.536	5,250.527	3.44	23.97
2004-05	216.258	6,203.889	3.48	23.55
2005-06	*223.501	–	4.30	20.35
2006-07	*250.000	–	4.50	–
2007-08	275.000	–	–	–

* Budget Estimates
Source : "Trends in Defence Spending", *Jasjit Singh, Asian Defence Review 2006*, (New Delhi: Knowledge World, 2006) pp. 87-88. *The Military Balance 2007, IISS* (London: Routledge, 2007)

achieve its original plan of 110 F-16s in its inventory, but much more capable ones.

On the naval aviation front, Pakistan received the first P-3C Orion maritime patrol aircraft in 2007 and the deliveries are likely to extend till 2010. Pakistan's non-North Atlantic Treaty Organisation (NATO) ally status allows the sale of used US weapons well below their depreciated value. (For example, the F-16s supplied to Pakistan in 2005 with the original unit acquisition value of $16.2 million have been transferred at a current unit value of $ 6.48million. The eight P-3 aircraft was delivered free of cost to Pakistan in 2006.)

The Pentagon had also notified Congress about a possible sale to Pakistan of three surplus P-3 aircraft along with Hawkeye 2000 airborne early warning systems. The Pentagon estimated the value of such a sale at as high as $855 million. It said Pakistan intends to use the aircraft with the E-2C Hawkeye

33. "US Sale of Airborne Early Warning System To Pakistan Possible," DefenceNews.com.

Table 2				
Pakistan's Major Arms Acquisitions During 1990-2007				
Supplier/ Licenser	No. ordered/ delivered	Weapon designation	Weapon description	Year(s) of delivery
Australia	50	Mirage 3	Fighter	1990-92
Britain	3	3 Lynx HAS- 3	ASW helicopters	1994-96
China	40	F-7P	Combat aircraft	1993
	6	K-8	Trainer aircraft	1994
	20	Armoured combat vehicles		1995
	75-100	K-8	Fighter/trainer aircraft	2000-08
	40	F-7 MG	Fighter aircraft	2001
	44	F-7 PG aircraft	Combat aircraft	2001-02
	3	Type-347G	Fire control radar	1997-2001
	150	FC-1/JF-17	Multi-role combat aircraft	China-Pak JV, delivery possibly starting 2006
	6	A-5	Combat aircraft	2003
	2	Type-347G	Fire control radar	2004
		PL-12/SD-10	BVR AAM	Year of order-2004
	64	FM-80/HQ-7	SAM	Year of order-2005
		PL-12/SD-10	BVR AAM	Year of order-2004
France	4	SA316 Alouette III	Helicopters	1994
	3	Breguet Atlantique-1	MPA and strike aircraft	1996

Supplier/ Licenser	No. ordered/ delivered	Weapon designation	Weapon description	Year(s) of delivery
	8	Upgraded Mirage-IIID/V	Combat aircraft	1999
	48	Mirage IIID/5	Combat aircraft	1998-2000
	11	Mirage V	Combat aircraft	2000-02
	96	F-17P	AS torpedo	1999-2004
Italy	192	Grifo radar	Combat aircraft fire control radar (for Mirage and F-17/7 combat aircraft)	2000-2004
	4	Galileo Falco	UAV	2006
Netherlands	5	Fokker F27-200	Aircraft	1994-96
Sweden	7	Saab-2000 AEW	AEW&C aircraft	2009
USA	3	P-3C (update 2.75)	Orion maritime reconnaissance and strike aircraft	1996-97
	28	Harpoon	Anti-ship missiles for the P-3C Orions	1996-97
	10	Bell-209/AH-IS	Helicopters	1997
	6	S-70/UH-60 Blackhawk	Helicopter	2003-04
	26	Bell-412EP	Helicopters	2004
	6	C-130E Hercules*	Transport aircraft	2004
	40	Bell-205/ UH-1 H	Helicopter	2004
	40	Bell-209/AH-1F*	Combat helicopter	2004
	19	T-37 B*	Aircraft	2003
	8	P-3C*	MP and strike aircraft	Year of order 2005

Supplier/ Licenser	No. ordered/ delivered	Weapon designation	Weapon description	Year(s) of delivery
	2	F-16 A*	Multi-role combat aircraft	2005
	7	C-130E Hercules	Transport aircraft Ex-RAAF	2005
	54	F-16 (36 F-16 A&B+18 F-16 C&D)	Multi-role combat aircraft	2007
	6	AN/TPS-77	Air surveillance radar	Year of order-2005
	6	L-88 LASS	Air surveillance radar	Year of order-2003

* US Excess Defence Equipment which is normally transferred at a price of less than 10 per cent of the original. For example, the cost of each F-16 is a little over $6 million.
Source: Based on Stockholm International Peace Research Institute, *Yearbook* (issues of various years) (New York: Oxford University Press) and Pakistan's major arms imports, as cited in Jasjit Singh, "Trends in Defence Expenditure," *Asian Strategic Review*, 1998-99 (New Delhi: Institute for Defence Studies and Analyses, 1999), SIPRI 2002, 2004, 2005, United Nations Register of Conventional Arms for various years and Defence Security Cooperation Agency at, http://www.dsca.mil; "Update on Pakistan C-130E Acquisitions," *Air Forces*, January 2006, p.22, *The Military Balance 2007,IISS* (London: Routledge, 2007)

airborne early warning system.[33] The US sales and the military aid to Pakistan has gone up significantly in the last five years and, thus, is contributing to the modernisation process of the PAF.

It is interesting to note that the arms deliveries to Pakistan from the US in the period 1999-2006 alone amount to $ 4,600 million (USD)[34] at an average of $575 million per annum. The arms transfer agreements between Pakistan and the United States have projected a rapid escalation in the last seven years. The total value of US arms transfer agreements with Pakistan in 1999-2002 was estimated at $2,800 million (current USD), with Pakistan ranking number ten among the list of recipients. In the succeeding years, 2003-2006, the value of arms transfer agreements amounted to $8,100 million (current USD), shifting Pakistan to number three in the list of the recipients. And in 2006 alone, the value of the arms

34. Richard F. Grimmett, *CRS Report for Congress*, "Conventioanl Arms Transfers to Developing Nations, 1999-2006," September 26, 2007, p. 71.

transfer agreements was calculated at $5,100 million (current USD) making Pakistan the number one recipient of the US arms transfer agreements.[35] Pakistan has received $11 billion aid since 9/11 from the United States alone and, according to the CSIS Report August 2007, only 15 per cent has been spent on economic development.

Pakistan has received $11 billion aid since 9/11 from the United States alone and only 15 per cent has been spent on economic development.

PAKISTAN'S DEFENCE EXPENDITURE

In order to get a deeper understanding of the military acquisitions of Pakistan, it would be useful to look into the trend in the overall defence spending of Pakistan in the last ten years.

Pakistan's macro-economic indicators depicted a downfall and the economy was in the doldrums by the end of the 1990s. International pressures during this period laid strict restrictions on any increase in the defence budget. The terrorist attacks in the USA on 9/11 altered the dynamics of government financing in Pakistan. The defence expenditure in the last five years has been hovering at a rate of around 3.5 per cent of the GDP. The lower percentage of defence spending, as compared to previous decades, can be attributed to the number of factors. Firstly, strict conditionalities from the International Monetary Fund (IMF) did not allow the defence budget to rise. Secondly, since the 1990s, nearly 70-80 per cent of Pakistan's weapons and equipment have been acquired from China at lower cost and friendship prices. This has helped to contain the defence expenditure at a lower level, averaging 5 per cent of the GDP during the 1990s. Thirdly, the defence budget as a percentage of GDP remained low due to significant growth in the GDP figures in the last five years. Pakistan's GDP currently (in the last five years) stands at approximately 7 per cent on an average, as compared to 2.5 in the late 1990s. Lastly, and most importantly, post 9/11, the inflow of US military assistance has been in the form of supply of modern defence equipment, training of the Pakistan military and also modernisation of Pakistani facilities and bases being used by the

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35. Grimnett, Ibid., pp 62-63.

The US assistance and the excess defence articles alone amount to 14.1 per cent of the Pakistan defence budget (not reflected in the budget).

US since September 11, 2001. Thus, even though the official figures state the defence expenditure at 3.8 per cent, the actual resources being spent on defence are much more.

US assistance to Pakistan has grown rapidly post 9/11. The FMF (foreign military financing) for Pakistan which stood at $ 75.0 million went up to $ 297 million in the fiscal year 2007 and is estimated to be $ 300 million in the fiscal year 2008. The figures for other security-related aid for Pakistan were $ 32 million in the fiscal year 2003 and have gone up to $ 102 million in the year 2006.[36]

Taking into account the figures for the last six years from FY 2002-2007, the total US security assistance to Pakistan amounts to $ 1,685 million. The total EDA (excess defence articles)[37] for the FY 2002-06 five-year period amounts to $120.5 million.[38] Pakistan's officially stated defence budget for the same period stands at $ 12,785 million. Thus, the US assistance and the excess defence articles alone amount to 14.1 per cent of the Pakistan defence budget (not reflected in the budget).

If the Coalition support funds are added to the total US security related aid and also the sale of the EDA for FY 2002-2007, it would amount to 58.8 per cent of the total defence budget of Pakistan Thus, Pakistan's estimated actual defence spending is much higher than the officially announced figures. However, it is interesting to note that according to reliable Pakistani sources, the defence expenditure figures do not include the costs of acquisitions of major weapon systems.[39] The major weapon acquisitions are funded from extra-budgetary sources. In the last six years, Pakistan has received enough resources to finance the PAF modernisation process.

36. K. Alan Kronstadt, CRS Report for Congress , "Pakistan-US Relations," Updated January 11, 2008.
37. EDA are normally made available to US allies, hence, Pakistan was declared one within the framework of old agreements (of the 1950s) and the more recent declaration making Pakistan a major non-NATO ally. Weapons sold to Pakistan under this dispensation are well below even their depreciated value. The current market value would obviously be much higher.
38. Calculation based on the figures provided by the Defence Security and Cooperation Agency, Department of Defence , United States of America.
39. Air Marshal A. Rashid Shaikh, PAF (Retd), " Security and Development: Hobson's Choice," *Defence Journal*, vol.XXI, May-June 1996,p.13, as cited in Jasjit Singh, ed., " Trends in Defence Expenditure," *Asian Strategic Review 1998-99* (Delhi: Knowledge World, 1999), p. 75.

Pakistan's growing defence cooperation with China and support from the United States has been a major factor contributing in the modernisation of the PAF in the last six years. The US sanctions in the 1960s and then in the 1990s not only gave space for Chinese and French defence equipment in the Pakistani market but also Pakistan made concerted efforts towards defence production which has provided an exposure to the Pakistan defence industry in the international market. The defence exports are estimated to increase to $1 billion in the next 10 years. The Chinese K-8 is under production at the Pakistan Aeronautical Complex. The assembly of the JF-17 is being done in Pakistan and the defence planners believe that Pakistan should be able to undertake the complete production by 2009. The Grifo-7 radar designed to improve air-to-air and air-to-ground performance, is produced with the objective of equipping 46 F-7 PG aircraft with the radar, together with approximately 45 Mirage IIIOs.[40]

If past experience is any indication, Pakistan's overall national and military philosophy and culture tilt heavily towards an offensive and aggressive strategy.

PAF STRATEGY

Since 9/11 Pakistan has received $11 billion in assistance from the US. It has been assessed that 85 per cent of this—that is, $9.35 billion— was devoted to military modernisation (working out to an average of US$ 1.56 billion annually). In 2006, Pakistan topped the list in global arms agreements for arms acquisitions amounting to $5.1 billion. Given all indications, the bulk of this procurement programme would boost Pakistan Air Force modernisation, as indeed has been the trend since 1999. What does this massive modernisation signify for the doctrine and strategy that the PAF can be expected to follow in future?

If past experience is any indication, Pakistan's overall national and military philosophy and culture tilt heavily toward an offensive and aggressive strategy. Pakistan initiated the 1947 War but could not manage aggressive use of the air

40. See Shalini Chawla, " Defence Production in Pakistan", in Air Commodore Jasjit Singh, ed., *Asian Defence Review 2007* (New Delhi: Knowledge World, 2007), pp. 33-64.

force mainly due to two factors: firstly, unavailability of the appropriate equipment to counter India; and, secondly, the whole operation in 1947 was carried on under the name of a "tribal revolt" which provided Pakistan little leverage to use the offensive strike capabilities. There are also indications that the PAF (as also the IAF) was restrained by the British.[41]

The 1965 War was again a planned covert war followed by overt offensive aggression by Pakistan. What is the factual record? The following stand out with respect to the 1965 War:

(a) Joint plans — The PAF plans for "surprise attacks" on IAF bases was made out more than two months earlier.[42]

(b) The PAF fully activated, in full force, over Chhamb sector to cover the armour offensive on September 1. The IAF lost four Vampires as a consequence.

(c) The PAF followed up with preemptive air strikes on IAF bases on September 6 as per the June 29 plan.

(d) The PAF claimed to have won the air superiority and dominated the war, shooting down much more IAF aircraft than it lost. The PAF also claimed to have destroyed large number of IAF aircraft on the ground.

In 1971, Pakistan initiated the war on December 3 with preemptive strikes on IAF air bases hoping to damage and destroy aircraft and infrastructure as as much possible through the air offensive. However, it appears to have held back from serious counter-air operations which remained targeted against Indian forward bases. This was part of the grand military strategy to execute what came to be called the great "Tikka Offensive" to launch two strike corps in a *blitzkrieg* into India covered by the Pakistan Air Force. Attacks on Indian forward airfields were aimed at reducing/neutralising IAF capabilities to interfere with the offensive.[43] In the event, the great offensive never got off the ground.[44] The PAF also kept asking the army if a ground offensive further south in Rajasthan (Jaisalmer sector) was planned so that they could provide the necessary air effort by activating the Jacobabad airfields, but Army HQ kept denying any plans.

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41. See C. Das Gupta, *War and Diplomacy in Kashmir* (New Delhi: Sage Publications, 2002).
42. B.C. Chakravorty, *History of the Indo-Pak War 1965* (New Delhi: Ministry of Defence, Governemnt of India, 1992) unpublished, p. 246.
43. *The Story of the Pakistan Air Force* (Islamabad: Shaheen Foundation, 1988).
44. Jasjit Singh, *Defence From the Skies* (New Delhi: Knowledge World, 2007).

Thus, the armour offensive came to be destroyed by the IAF at Longewela.

Pakistan, in the 1965 War, miscalculated the Indian response. Indian retaliation came as a surprise to Pakistan in the 1965 War and also in the 1971 War. According to Air Commodore Jasjit Singh, "It was the impact of the performance by the Indian Air Force which strongly discouraged the Pakistani offensive. Pakistani strategy has been sound but they have failed to take into account how the enemy would react."[45]

The PAF must first achieve a high degree of air superiority over the land battle areas, and it must be equipped to do this effectively.

The second factor which can be traced for the PAF restricting itself, has been lack of understanding of its role by the Pakistan Army. Air Marshal Asghar Khan said in the 1960s:

> It is true that the PAF's primary role, in essence, is to assist the army in every possible way to achieve its objectives. But in order to do this, the PAF must first achieve a high degree of air superiority over the land battle areas, and it must be equipped to do this effectively. The army seldom understood or recognized this precondition.[46]

The Kargil War in 1999 was once again an attempt by the Pakistani military leaders to capture more Indian territory and Pakistan launched a military aggression across the well-established and mutually accepted LoC. The Pakistan Army lost over 1,200 fighting men in the 42-day war and suffered a humiliating defeat but did not use its air force to support its army that had been launched across the border. This aspect has never been adequately explained. Although, superiority of the IAF would have been a deterrent to the PAF, it is also possible that the Pakistan Army leadership wanted to keep pretending that the fighters across the Line of Control (LoC) were "Mujahideen" freedom fighters. Pakistan's purchases in the last 6-7 years reflect the military's realisation that strengthening

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45. Discussion at the Centre for Air Power Studies, New Delhi, November 2, 2007.
46. n.43, p. 93.

The PAF has been engaged in a massive modernisation since 1990 (boosted after 9/11) both qualitatively and quantitatively.

the PAF's capabilities and the maritime aerial strike capabilities was critical.[47] Pakistan has aspired for, and, to a great extent, relied on, the United States' air weapon system in their military planning.

To sum up, the following conclusions can be drawn based on the publicly known information and analysis of trends in the current phase of modernisation of the PAF:

1. The PAF has been engaged in a massive modernisation since 1990 (boosted after 9/11) both qualitatively and quantitatively.

2. The thinking, writing and arms procurement in Pakistan indicate the historical consistency of approach to military capability—that is, the desire and efforts to acquire high technology arms to take the initiative to compensate for asymmetry in numbers and increase options for offensive strategy.

3. Consistent demands for high technology weapons clearly indicate the modernisation of the PAF and naval air, even more than the army (under the army rule) and navy, which implies that they expect the air force to play a major role in any future conflict.[48]

4. Modernisation of the PAF during the past six years is aimed at increasing its offensive capability.

In the end, we must ask this question: did the Pakistan Air Force offensive strategy and aggressive operations lead to success? Contrary to many myths created, the clear answer is no! However, that would require a separate paper.

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47. See Jasjit Singh, "Kargil Echo in Pak Purchases," *The Indian Express*, November 28, 2004.
48. It is useful to note here that China also seeks to fight and win the next war through "command of the air." See *China's National Defence 2004*, White Paper, December 2004.

INSIDE THE LABYRINTH: NATO'S MISSION IN AFGHANISTAN AND THE CONTINUING RELEVANCE OF PAKISTAN

SHELLY JOHNY

An impression that is being created by recent media reports about Afghanistan is that the North Atlantic Treaty Organisation's (NATO's) military campaign is failing in meeting its objectives while the political influence of the Taliban has spread to a larger portion of the country in comparison to previous years. If this is the case, there is an urgent need to look at the repercussions on the region of a total failure of NATO's mission, and its withdrawal. The states surrounding Afghanistan share ethnic and cultural ties with that country and can be affected by the political instability that will follow in the wake of a NATO withdrawal. As is well known, there have been historical precedents like the situation when the Soviet withdrawal from Afghanistan helped fuel conflicts in Kashmir, Central Asia and Chechnya. What makes the possibility of an onset of a total breakdown in Afghanistan dangerous this time is the situation in Pakistan. Since 2001, Pakistan has witnessed growing 'Talibanisation' in two of its major provinces, continuing ethnic insurgency in Balochistan, clashes between Islamist militants and security forces and the assassination of a former prime minister. These events have threatened to tear the country apart. This paper will look at the major trends in the NATO military campaign in Afghanistan and will try to understand the reasons for its ineffectiveness. It will finally look at the possible implications of a NATO withdrawal from the region. An important element that will be explored in this paper is the enhanced relevance of Pakistan in Afghan affairs since 2001.

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It is clear by now that because the US did not accord any strategic importance to Afghanistan in the post-1990s period, it had no clear strategy while going into that country.

THE POLITICS OF NATO'S INTERVENTION IN AFGHANISTAN

What makes the conflict in Afghanistan different from the one in Iraq is that while the latter began with a joint intervention by the US and Britain, the Afghan invasion was conducted by the US without any major help from any other Western power. It is very clear that the invasion of Afghanistan was conducted in reaction to the 2001 terrorist attacks in America and not because of any larger strategic interests. One of the major reasons for the US support to the Taliban in the 1990s was the possibility of gaining access to the Central Asian energy resources. But the continuing conflict and instability in Afghanistan led to the abandonment of that option. The enormity of the present situation in Afghanistan must be understood from the fact that it is for the first time that the US has asked NATO to assume huge responsibilities in a conflict situation that it initiated by itself. It is clear by now that because the US did not accord any strategic importance to Afghanistan in the post-1990s period, it had no clear strategy while going into that country, and the complexity of the situation was understood only at a later point of time.

From the perspectives of the European NATO members, political pressure from Washington alone could not have led them to undertake a major operation outside the European theatre for the first time in the history of the alliance. Europe was faced with a global 'war on terror' which was led by the US and termed by the American leadership as an ideological contest between Western democratic values and Islamist fundamentalism. European leaders also felt the need to act lest Europe becomes sidelined in world affairs and the need for a NATO alliance in the 21st century is questioned. This must also be seen in a context where many of the European countries are facing a

European leaders also felt the need to act lest Europe becomes sidelined in world affairs.

burgeoning Muslim population and resultant political and social problems due to the encounter between two very different value systems. The tide of terrorist attacks in Europe since the 'war on terror' was declared must have also pushed European leaders to take a decision in favour of a NATO mission in Afghanistan. While it is not possible to recount the exact series of events that led to NATO's intervention in Afghanistan, the NATO summit at Prague in 2002 was the turning point when member countries envisioned a role for the alliance outside the NATO Treaty area for the first time.[1]

The International Security Assistance Force (ISAF), a UN mandated multinational force in Afghanistan which was initially led by NATO members Britain, Turkey, Germany and the Netherlands, was placed under the command of NATO in 2003.[2] From October 2006, the ISAF began operating in all parts of Afghanistan.[3] While NATO assumed command of the ISAF, the nature of deployment of troops by individual NATO member nations reflected differences in the way they looked at the mission in Afghanistan. Deployments came along with what is termed as 'national caveats' whereby each NATO

The Afghan mission has begun to create political differences between NATO members.

member decided on the number of troops to be stationed, the area in which they are to be deployed, and the nature of their duties. The United States, Britain, Canada and the Netherlands are the main countries involved in counter-insurgency operations against the Taliban in the south and east of Afghanistan.[4] Germany, France, Italy, Spain and Greece are deployed in more stable areas and are not involved in combating the insurgency.[5] The Afghan mission has begun to create political differences between NATO members. Recently, Canada stated that it would withdraw its troops early next year unless NATO sends reinforcements of at least 1,000 troops to support its mission in the south. Poland has agreed to commit more troops and helicopters to assist Canadian soldiers.

1. http://www.nato.int/docu/review/2003/issue2/english/art3.html
2. www.un.org/sc/ctc/sm2003/nato_contribution.doc
3. http://www.nato.int/issues/isaf/index.html
4. http://news.bbc.co.uk/2/hi/south_asia/7227663.stm
5. http://news.bbc.co.uk/2/hi/south_asia/7233971.stm

Drawbacks in US military strategy occurred because of an inability to understand the true nature of the conflict.

The US has promised to send an extra 3,000 marines. Germany rejected a US appeal to send more troops to Afghanistan.[6] The Germans, who are stationed in the north, insisted that continuity of their mission is necessary to build up on successes achieved in that part of the country.[7]

Besides such differences between NATO allies, the resurgence of the Taliban in recent months has also created an impression that the NATO mission is faltering. In 2007, it was reported that the area under Taliban influence had grown by around four times more than that in 2006.[8] These developments have created complications between Western countries like Britain and the Afghan government. In December, 2007, the British ambassador to Afghanistan was asked to explain why a man working for the British was talking to the Taliban. President Hamid Karzai told journalists that British troops had made things worse in Helmand province.[9] Lord Paddy Ashdown was rejected as the UN envoy to Afghanistan by Karzai.[10] A growing realisation that the Taliban and Al Qaeda cannot be completely defeated by the US and NATO has led to calls by several senior Afghan leaders for opening up talks with 'moderate' elements in the Taliban. Afghanistan is proving to be a difficult mission for NATO and its success or failure can have a tremendous impact on the credibility of NATO in other parts of the world, including Europe. The ISAF was modelled on the precept that counter-insurgency and reconstruction must proceed simultaneously in order to stabilise the situation in Afghanistan. Therefore, drawbacks in the strategy on both fronts have led to weakening of the effectiveness of US and NATO military and reconstruction efforts in that country.

6. n. 4.
7. http://www.canada.com/reginaleaderpost/news/world/story.html?id=6cdb1112-cc54-4786-acd2-91fa5f625a98&k=73088
8. http://www.cfr.org/publication/15259/cordesman.html?breadcrumb=%2Fregion%2F280%2Fafghanistan
9. http://news.bbc.co.uk/2/hi/south_asia/7231083.stm
10. http://news.bbc.co.uk/2/hi/africa/7219156.stm

INSURGENCY AND COUNTER-INSURGENCY

US and NATO Military Strategy and Tactics

Drawbacks in US military strategy and tactics have weakened the efforts to defeat the insurgency. It has been argued that the drawbacks have occurred because of an inability to understand the true nature of the conflict. Once the Taliban collapsed, it had ceased to become a conventional enemy. As the war became unconventional, the US response became more conventional. There was need for a shift from attrition warfare to manoeuvre warfare. The military theoretician Edward Luttwak has noted that all armed forces combine elements of attrition warfare and manoeuvre warfare. The closer a military is to attrition warfare, the more inward the focus. Internal administration and operations receive the most attention, and the organisation is much less responsive to the external environment comprising the enemy, the terrain and the specific phenomenon of any one particular conflict. On the other hand, manoeuvre warfare is more externally focussed. Studying the enemy, identifying his weaknesses, and configuring one's own capabilities to exploit those weaknesses

> While the chain of command was advantageous for unconventional warfare before the collapse of the Taliban, it became more conventional when the need was exactly the opposite.

achieves victory. Special forces are an effective tool for fighting manoeuvre style warfare if properly used. The attrition style warfare of the US which includes heavy aerial bombardment has been criticised as it has resulted in civilian casualties which, in turn, has antagonised the population and contributed to swelling the ranks of the insurgents.[11] It is the strategy of the insurgents to drag the US military into attrition style warfare by deliberately fighting in villages and thereby provoking air strikes and casualties. As it is a part of the Pashtun tribal code for the male relatives of a Pashtun warrior killed in battle to take revenge,

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11. Hy. S. Rothstein, *Afghanistan and the Troubled Future of Unconventional Warfare* (New Delhi: Manas Publications, 2006), pp. xiv-3.

the Taliban is not lacking in recruits.[12]

While the chain of command was advantageous for unconventional warfare before the collapse of the Taliban, it became more conventional when the need was exactly the opposite. The ever increasing size of the military command and control system in Afghanistan has created delays in getting permission for special forces operations. In this manner, the initiative is lost to the insurgents. The focus on attrition has resulted in less attention on providing security to the local population. Intelligence is the principal source of information on insurgents. But the lack of safety and assurance about the fact that the insurgents are losing has prevented the population from providing intelligence. The lack of unity of effort among the government agencies further increases the problem. Wave after wave of Coalition forces from different units and organisations invade the villages and towns of Afghans in pursuit of the same objectives, earning the displeasure of the population. There are also differences in the approach of the US Army units and the special forces. While both forces were involved in Operation Mountain Sweep in August 2002, the US Army's lack of awareness about the local culture resulted in the loss of whatever the special forces had achieved in the previous six months in terms of counter-insurgency and intelligence operations.[13] Most of the US troops are not well trained in cultural awareness and even fewer can speak elementary Pashto. Reliance on Tajik interpreters has caused further miscommunication.[14]

The anti-Taliban military operations by US/NATO forces have also contributed to Pashtun disaffection against the Kabul government. The Northern Alliance is suspected of diverting attacks against Pashtun rivals by providing false information in the name of combating the Taliban. The US Air Force has bombed Pashtun villages and convoys wrongly identified by US allies as harbouring Al Qaeda and Taliban elements. The mistrust of US intentions has revitalised the support for the Taliban among the Pashtuns.[15] Rather than an

12. Thomas H. Johnson and M. Chris Mason, "Understanding the Taliban and Insurgency in Afghanistan," *Orbis*, vol. 51, no. 1, (Winter 2007), pp. 87-88.
13. Rothstein, n. 11, pp. 13-141.
14. Johnson and Mason, n. 12, p. 87.
15. Kathy Ganon, *I is for Infidel: From Holy War to Holy Terror: 18 Years Inside Afghanistan* (New York: Public Affairs, 2005), p. 114.

increase in the special forces component, most of the special forces soldiers were soon pulled out of Afghanistan to serve in Iraq. There has also been a downsizing in vital air assets like helicopters. US troops in the southern parts of Afghanistan are forced to respond to minor Taliban attacks in Humvees. With an average overland speed of 5-10 miles an hour over rocky terrain, Taliban insurgents are long gone before the US forces arrive. In the case of Afghanistan, the United States and NATO have committed the least amount of troops for any peace-keeping mission since World War II. The ratios of peace-keepers to citizens in the missions in Bosnia and Kosovo were better than in Afghanistan.[16] The US' handing over the security of southern provinces to NATO has increased doubts about America's commitment to Afghanistan.[17]

Military Strategy and Tactics of the Taliban/Al Qaeda Combine
The war waged by the US against the Taliban in the fall of 2001 was an unequal one as a rudimentary militia was pitted against the most technologically advanced armed force that the world had ever seen. Faced with a combination of US air power, US Special Forces and the Northern Alliance ground troops, the Taliban government quickly crumbled. The remnants of the Taliban and Al Qaeda fled into the mountains on the

Almost six years later, the US and its NATO allies are facing a deadly insurgency campaign by a resurgent Taliban.

Afghanistan-Pakistan border. It was then believed that the US and its allies had assumed effective control of Afghanistan. Almost six years later, the US and its NATO allies are facing a deadly insurgency campaign by a resurgent Taliban. In order to understand the present insurgency, it is important to accept the fact that the war had not ended with the fall of Kabul to the Northern Alliance. Sporadic action by the insurgents against the US forces, separate from major US initiated campaigns like Operation Anaconda, had continued even after the main Taliban force had been decimated. Examples of such attempts include the attack on a US

16. Ganon, Ibid., pp. 83-84.
17. Seth G. Jones, "Averting Failure in Afghanistan," *Survival*, vol. 48, no. 1, Spring, 2006, p. 111.

helicopter near Gardez, capital of Paktia province, and the rocket attack on Khost air base which was held by US troops. Both these attacks took place in March 2002, and the first incident resulted in the death of six US soldiers.[18]

It is understandable that the frequency of attacks against US and NATO troops has increased in the past two or three years. The Taliban needed time to regroup, gain new recruits to replace those who were killed and develop base camps in a sanctuary away from the main area of fighting. Three main insurgent groups are fighting the Coalition forces. They are the Taliban, the Hizb-i-Islami led by Gulbuddin Hekmatyar and, finally, the foreign *jihadists* or Islamist radicals under the Al Qaeda. The insurgency is divided into civilian support, the underground, guerrillas and front commanders. The civilian support includes individuals who assist the guerrillas by acquiring supplies, conducting intelligence campaigns, operating medical facilities, recruiting new guerrillas or supporters, operating the communications system and acquiring and maintaining equipment. The underground includes the insurgency's political and financial support network.

The guerrillas are the armed insurgents who conduct the military and paramilitary operations. The front commanders provide strategic command while tactical and operational control is given to the guerrilla units. The main front commanders include Gulbuddin Hekmatyar and Mullah Muhammad Omar. The foreign Islamist radicals are also organised like the other insurgents with the smaller units having tactical and operational autonomy while taking strategic guidance from senior Al Qaeda commanders. While most Taliban and Hizb-i-Islami insurgents are part-time fighters and have civilian jobs by day, the foreign Islamist radicals are professional fighters. Though the foreign fighters are much better equipped, trained and motivated than other insurgents, they have not always been tactically competent.[19]

The insurgency led by the Taliban has adapted according to changing conditions. While most of the insurgent attacks were conducted against Coalition forces in 2002 and 2003, the present attacks target Afghan civilians and personnel

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18. Sreedhar, "The Taliban-al-Qaida after One Year of War," *Aakrosh*, vol. 5, no. 17, October, 2002, pp. 57-62.
19. Ganon, n. 15, pp. 116-117.

from non-government organisations (NGOs). This can be attributed to an increase in US forces from 10,000 in 2003 to nearly 20,000 by 2005. This has prompted the insurgents to go for softer targets.[20] In order to cripple the Afghan government, the Al Qaeda made an attempt to assassinate President Hamid Karzai[21] and have assassinated Cabinet ministers.[22] In 2004, US and Coalition forces noted a change in the size of the guerrilla units, from large bands of up to a hundred fighters to much smaller units of less than ten. This has enabled the guerrillas to evade detection by Coalition forces and allowed them to blend into the population when necessary.[23] But in 2006, it was noticed that there was again a change from hit-and-run tactics by small groups of guerrillas to frontal assaults on government security posts by groups of more than 100 fighters.[24] This shows that insurgent tactics are flexible and adapt to changing conditions.

The insurgents have used tactics used by the Mujahideen forces against Soviet and Democratic Republic of Afghanistan Army forces during the Afghan War of the 1980s. The insurgent groups have left the population centres to US and Afghan forces, operate from rural areas, distribute propaganda to the local population and opposition forces and threaten and intimidate the local population.[25] Most of

The insurgents have used tactics used by the Mujahideen forces during the Afghan War of the 1980s.

the insurgent attacks take place in the south and east of Afghanistan in Nangarhar, Paktia, Paktika, Khost and other provinces.[26] Taliban insurgents who operate in the southern Afghan provinces of Kandahar, Oruzgan, Helmand and Zabol have significant support networks in such Pakistani provinces as Balochistan and the Federally Administered Tribal Areas. The Taliban have regained a lot of area in the south and east that had been lost to Coalition troops.[27]

The increasing expertise of radical Islamist groups in conducting insurgency

20. Ganon, Ibid., p. 113.
21. Rothstein, n. 11, p. 164.
22. Sreedhar, *Afghanistan in Transition* (New Delhi: Indian Council of World Affairs, 2003), p. 11.
23. Ganon, n. 15, p. 117.
24. Johnson and Mason, n. 12, p. 81
25. Ganon, n. 15, p. 118.
26. Ganon, Ibid., p. 114
27. Johnson and Mason, n. 12, p. 81.

operations is having its impact on the conflict in Afghanistan. Before 2001, the Al Qaeda and other radical Islamist groups had not got an opportunity to play a major role in any insurgency. It is now understood that the impact of radical foreign Islamists (who are otherwise known as the 'Arab-Afghans') on the ground operations during the Afghan War of the 1980s was minimal. At best, they provided a few recruits for the various conflicts like Kashmir, Tajikistan, Bosnia and Chechnya during the course of the 1990s. Their specialisation was suicide bombing operations like the ones that were conducted in East Africa in 1998 and the dramatic September 11, 2001, attacks in the US. But the Iraq conflict after the 2003 US invasion saw the coming of age of the Al Qaeda. The Al Qaeda in Iraq has gained plenty of expertise in conducting attacks against US troops. It is now understood that these skills are being passed on to the insurgents fighting in Afghanistan. Afghan insurgent groups are using this assistance to construct increasingly sophisticated improvised explosive devices (IEDs), including remote control detonators. There are Al Qaeda-run training facilities and IED factories in such places as North and South Waziristan. There is also evidence that a small number of Pakistani and Afghan militants have received training in Iraq.[28] The insurgents usually slip behind NATO frontlines and set off these roadside bombs.[29]

Another effective device that is used by the insurgents is the 'TV bomb', first developed by Iraqi groups. It is a shaped-charge mechanism that can be hidden under a bush or debris on a roadside and set off by remote control from more than 300 metres away. A major tactic of the insurgents is suicide bombing which was not the norm in Afghanistan. This tactic has been used in major cities like Kandahar and Kabul. It is believed that suicide bombing was adopted by the Afghan insurgents after they learned about its effectiveness through videos of suicide attacks conducted in Iraq which were widely available in the Pashtun areas of Afghanistan and Pakistan[30]. The number of suicide attacks increased from one in 2002 to two in 2003, six in 2004 and 21 in 2005. There were over 100 suicide attacks in Afghanistan in 2006, more than the total committed in the

28. Ganon, n, 15, p. 21.
29. http://news.bbc.co.uk/2/hi/south_asia/6237290.stm
30. Brian Glyn Williams, "Suicide Bombings in Afghanistan," *Jane's Islamic Affairs Analyst*, September, 2006, p. 7.

entire history of the country. Suicide attacks allow insurgents to achieve maximum impact with minimal resources. Such attacks have increased the level of insecurity among the Afghan population. This has caused some Afghans to question the government's ability to protect them.[31] The insurgents also threaten the local population and warn them about providing support to the US troops. The insurgents have also conducted beheadings of prisoners similar to the ones in Iraq in order to terrorise foreigners and the local population.[32]

THE AFGHAN ECONOMY AND RECONSTRUCTION EFFORTS

Afghanistan has been ravaged by incessant war for more than 30 years. This has resulted in the complete destruction of the Afghan economy. Besides the war against the Soviets, the civil war between the various Mujahideen factions has taken a heavy toll on the socio-economic life of the Afghans and whatever was left of the infrastructure after the Soviet withdrawal. After the Soviets withdrew, Afghanistan ceased to be of strategic interest to the superpowers and the wider international community. Rather than improve the situation, Afghanistan's neighbours and regional powers added fuel to the fire by supporting the various warlord militias in order to protect their own interests. Besides the weapons provided and abandoned by the two superpowers, a continuous supply of weapons by external players contributed to the massive loss of life and destruction of property in Afghanistan. Therefore, it can be said that the new Afghan government and the US were trying to rebuild an economy that had seen no growth since the late 1970s. This task has become all the more difficult because of the nature of the relationship that exists between the socio-economic conditions and the continuing instability. Growth of the economy is necessary for millions of Afghans to resume a normal life resulting in the stabilisation of the political environment. But building the Afghan economy has become a complicated task as the existing commercial activities are of an illegal nature that profit from continuing instability. An example of this is the Taliban agreement to ban poppy cultivation in 2000 which adversely affected the Afghan economy in

31. Ganon, n. 15, pp. 22-23.
32. Hekmat Karzai, "Strengthening Security in Contemporary Afghanistan: Coping with the Taliban," in Robert I. Rotberg, ed., *Building a New Afghanistan* (Cambridge, Massachusetts: World Peace Foundation, 2007), p. 65.

In the post-2001 period, poppy cultivation rose from 74,045 hectares in 2002 to 131,000 hectares in 2004.

2001 as there were no seeds or fertilisers available to grow alternative crops.[33]

The Drug and Weapons Trade

The drug trade has long been associated with continuing instability in Afghanistan as it is a source of revenue for warlords, insurgents and criminal organisations. The high profit from the sale of drugs is used to buy new weapons and provide wages to the members of the different militias. Before the Taliban banned the growing of poppy, there was more reconstruction going on in Kandahar, the place where most of the poppy was grown, than in other parts of Afghanistan because of profits from the trade. Though the Taliban wanted to ban poppy cultivation as soon as they captured Kandahar, they were worried about earning the displeasure of the local population. In turn, the Taliban derived income from this activity by taxing the opium farmers. The opium production of Afghanistan had rivalled that of Burma and production grew further as the Taliban's control extended over other parts of Afghanistan. While Pakistan was the major centre for heroin production during the 1980s, the centre for poppy cultivation shifted to Afghanistan after the Taliban came to power because of a crackdown in Pakistan on the drug trade. Laboratories for refining opium into heroin which were located in Pakistan were shifted to Afghanistan. Pakistan, on the other hand, became a major transport route for the Taliban's heroin exports during the late 1990s.[34]

In the post-2001 period, poppy cultivation rose from 74,045 hectares in 2002 to 131,000 hectares in 2004, and then dipped slightly to 104,000 in 2005. The income of Afghan opium farmers and traffickers is equivalent to roughly 40 per cent of the gross domestic product (GDP) of the country. Afghanistan's share of opium production is also 87 per cent of the world total. The number of provinces where opium poppy is cultivated increased from 18 in 1999 to all 32 in 2005.[35] Heroin processing-laboratories have also reappeared in

33. Ahmed Rashid, *Taliban: The Story of the Afghan Warlords* (London: Pan Books, 2001), p. xii.
34. Rashid, Ibid., pp. 118-122.
35. Jones, n. 17, p. 115.

Afghanistan.[36] Another lucrative illegal commercial activity is the weapons trade. There are reports that Northern Alliance militias have sold new weapons to the Taliban through arms dealers as they get little in return for surrendering weapons to the central government and the US/NATO forces. There is a significant rise in the price of weapons in the arms bazaars in northern Afghanistan when the Taliban conducts its spring offensives in the south and east. The weapons traders stick to circuitous routes while transporting the weapons to avoid inspections by NATO and US troops. The arms dealers prefer the Taliban as they pay a higher price for weapons than others like Baloch militants and sectarian outfits.[37] The attempts to stop these illegal commercial activities depend a lot on the success of the reconstruction programme of the US and its ability to create a viable economy.

US Reconstruction Programme

Since 2001, US and NATO forces have conducted a range of civic-action operations to provide assistance to the government and population. These activities include training, equipping and advising the Afghan security forces. Assistance is also provided for police, fire, rescue and disaster preparedness and response missions. Afghan civil agencies have also been provided assistance by the Coalition forces. The United States and NATO also established provincial reconstruction teams (PRTs) under US and NATO command. Each team of 60-100 personnel comprises civil affairs units, special operations forces, force protection units, psychological operations personnel and civilians. The PRTs have helped build health clinics, schools, government buildings and other infrastructure in major Afghan cities. They are a key part of the counter-insurgency campaign in winning indigenous support, extending the authority of the central government and helping facilitate development and reconstruction.[38] PRT teams have been led by different countries including New Zealand, Lithuania, Germany, Italy, Canada, Great Britain, Netherlands and Spain.[39] There

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36. Kimberly Marten, "Warlordism in Comparative Perspective," *International Security*, vol. 31, no. 3, Winter, 2006/07, p. 44.
37. Maqbool Ahmed, "Awash in Weapons," *Herald,* vol 38, no. 3, March, 2007, pp. 70-71.
38. Rothstein, n. 17, pp. 118-119.
39. Jones, n. 11, p. 116.

Even after the fall of the Taliban, foreign countries continue to provide aid to the different warlords.

are 25 NATO PRTs in different parts of Afghanistan.[40] The main aim of the PRTs is to build a secure environment in which normal political and economic activities can be conducted. By this yardstick, the reconstruction efforts have been criticised because of several shortcomings.

Because of the cultural and ethnic diversity in Afghanistan, the experiences of the various PRTs in dealing with the local population have been very varied. These cultural variations have posed enormous challenges to the PRTs. For example, PRTs operating in the Persian speaking areas in the north have found it relatively easier to conduct their work as Persian is an easy language to learn as compared to the south where Pashto, a language difficult to master, is more common.[41] The number of people allotted for the PRTs is insufficient for the actual requirements. The present ratio is one PRT in Pashtun areas for every one million Pashtuns. In 2005, the entire province of Paktika had only a handful of buildings, fewer than a dozen high school graduates, and no telephones or paved roads. There were two clinics which were not sufficiently equipped and two doctors. Due to manpower shortages, the PRT in Paktika and seven others have been disbanded.[42] The lack of permanent security allows criminals, warlords, and insurgents to reclaim areas once the PRTs have moved from their operational areas.[43]

For the Afghan government, to maintain permanent security there should be sufficient numbers of Afghan National Army soldiers and Afghan National Police officers. The current number of Afghan National Army soldiers is not enough to maintain security. The biggest shortfall is in the number of police officers and this has an adverse impact on attempts to maintain law and order.[44] There have also been gun-battles between Afghan National Police and Afghan National Army forces. Another major problem is the absence of a viable justice

40. www.nato.int/docu/review/2007/issue3/english/art2.html
41. www.nato.int/docu/review/2007/issue3/english/art2.html
42. Johnson and Mason, n. 12, p. 85-86.
43. Rothstein, n. 11, p. 116.
44. Jones, n. 17, pp. 119.

system. No major drug traffickers or warlords have been prosecuted in Afghanistan. Warlord commanders who control the areas vacated by the Taliban have authority over some local courts. Factional control of courts has led to intimidation of centrally appointed judges. Widespread corruption also reduces the effectiveness of the justice system.

The continuing influence of the warlords also hampers attempts to stabilise the situation. The warlords of the Northern Alliance have significant influence in both politics and commerce throughout much of Afghanistan. The warlord militias extract customs and tolls at unofficial checkpoints and dominate the trucking industry, thereby, having an important share in the profits generated by the cross-border transit trade, the second most lucrative commercial enterprise after the opium trade. The militias are also responsible for grabbing land in the environs of Kabul and elsewhere in the country.[45] Though warlords like Herat Governor Ismail Khan and Kandahar Governor Gul Agha were removed from their positions, it has had little impact on the influence of the different warlords. Even after the fall of the Taliban, foreign countries continue to provide aid to the different warlords.[46] The amount of aid that the US is providing to Afghanistan is also much less

There has not been a sea-change in the Pakistani military establishment's game plan of gaining strategic depth in Afghanistan.

compared to the effort in Iraq. Without taking into account the biggest reconstruction project undertaken which is the repaving of the Kabul to Kandahar road, annual US aid to Afghanistan over the last five years has averaged just $13 per Afghan. The United States spent more money every 72 hours on the war in Iraq than it spent on Afghan reconstruction in 2007.[47]

PAKISTAN: THE KEY TO AFGHANISTAN

The withdrawal of Pakistani support for the Taliban and President Pervez Musharraf's support for the US invasion and occupation of Afghanistan created

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45. Marten, n. 36, pp. 55-56.
46. Marten, Ibid., pp. 114-116.
47. Johson and Mason, n. 12, p. 85.

The Pakistani strategy is to eliminate the presence of Al Qaeda and other foreign militants of mainly Central Asian or Arab origin and not act against the Taliban insurgents.

the impression that Pakistan has finally ended its support for radical Islamist groups. In reality, there has not been a sea-change in the Pakistani military establishment's game plan of gaining strategic depth in Afghanistan to counter India in the region. Pakistani support for the Taliban continues in a much more covert manner than before. Also, the links that exist between radical Islamist groups and the Pakistani military-intelligence establishment is a legacy that has lasted for more than 25 years and has become sufficiently institutionalised. Pakistan's volte face after 2001 was a ploy to secure the rule of the military regime. In the course of the present insurgency in Afghanistan, the Pakistan military and the Inter-Services Intelligence (ISI), the Pakistani intelligence agency, provide a wide variety of support to the Taliban. Pakistan's ISI has reportedly provided weapons and ammunition to the Taliban and helped in training Taliban and other Afghan insurgents. The ISI is also suspected of providing intelligence to Taliban forces about the location and movement of Afghan and US led Coalition forces, which has undermined several anti-Taliban military operations.[48]

The Military Campaign in the NWFP and FATA
Currently, the Pakistani military is engaged in a military campaign against tribes in the Northwest Frontier Province (NWFP) and Federally Administered Tribal Areas (FATA) who provide shelter to the Taliban. Almost 70,000 Pakistani troops are involved in this campaign.[49] The Pakistani strategy is to eliminate the presence of Al Qaeda and other foreign militants of mainly Central Asian or Arab origin and not act against the Taliban insurgents who mostly comprise Pashtuns from the Afghan-Pakistan border regions.[50] This is because taking action against the Taliban insurgents who are much more in number is likely to

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48. Seth G. Jones, "Pakistan's Dangerous Game," *Survival*, vol. 49, no. 1, p. 18, Spring, 2007, p. 18.
49. Jones, Ibid., p. 19
50. Husain Haqqani, "Pakistan and the Islamists," *Current History*, vol. 106, no. 699, April, 2007, p. 147.

create a wave of anti-government sentiment in the region and can result in a major revolt. But the present strategy is not likely to work as the links between the Pakistani-Afghan Islamists and the foreign radicals run too deep and an attack on one will be considered as a threat to the interests of the other.

Also, another factor that works against the success of these operations is the nature of the political administration in this area and its geographical terrain. The NWFP, populated by the Pashtun ethnic community, includes territories which are termed as FATA. Though technically a part of the NWFP, FATA has its own customary form of government based on the Pashtunwali, the Pashtun code of honour. The Pashtun tribal chieftains are responsible for maintaining law and order in these areas.[51] This practice has continued even after the formation of the state of Pakistan till the present time. The writ of the Pakistani government does not run in FATA.

The failure to create effective state control over these regions since the creation of Pakistan has become most obvious in the post-2001 period. One witnesses the spectacle of the Pakistani authorities trying to negotiate with, and persuade, the tribes not to provide shelter

The border regions of Pakistan and Afghanistan have become safe havens for Taliban and Al Qaeda members who fled from Afghanistan.

to the foreign fighters. Even such efforts have borne little fruit as the frequent ceasefires have been broken by abrupt clashes between the security forces and tribal militias, making it much harder to achieve the main goal. The mountainous terrain of the region has also hampered the efforts of the Pakistani military as it makes it very difficult for large military forces to navigate and easier for the insurgents to hide in.[52]

The bulk of the current military operations are conducted by the Frontier Corps which is composed of tribal militias taken from within the region and regular army units. This has resulted in the slackening of the morale of the government forces as military operations can result in intra-tribal warfare which

51. Rizwan Hussein, *Pakistan and the Emergence of Islamic Militancy in Afghanistan* (Hampshire: Ashgate Publishing Ltd., 2005), p. 34.
52. Jones, n. 48, p. 24.

A generation of Afghans grew up in refugee camps with little understanding about Pashtun tribal traditions.

can continue for generations. Finally, the fact that certain elements in the military and the intelligence establishment continue to support the Taliban has not helped matters. The militants have increasingly resorted to suicide attacks against military convoys and even kidnapping of soldiers active in the area. It is noticeable that retaliatory attacks for the government crackdown on the Lal Masjid in Islamabad took place in the NWFP as most Lal Masjid cadres were from that region.[53]

Because of these reasons, the border regions of Pakistan and Afghanistan have become safe havens for Taliban and Al Qaeda members who fled from Afghanistan. Since 2001, there have increasingly been attempts to impose a Taliban-inspired Islamisation programme in the NWFP region by the Pakistani allies of the Taliban. Many vigilante groups have come up in the tribal areas calling themselves 'Taliban' although they have no direct links with the Taliban militia in Afghanistan. They have carried out their own campaign to enforce their version of a religious moral code. Post-2001, the NWFP and Balochistan have emerged as the focal point of efforts by the Taliban to conduct military operations against the US led Coalition forces in Afghanistan and spread their ideology within Pakistan. By establishing a sanctuary in Pakistan, which entails established infrastructures and base areas, it has become difficult to defeat the Taliban insurgency.[54] Many of the top Taliban leadership are believed to be based at Quetta in Balochistan.

Taliban and the Pakistani Islamist Parties
It is not just the Taliban's ability to muster the loyalty of the tribes in the NWFP that has helped it sustain its insurgency in Afghanistan. Its close ties with Pakistani Islamist parties and wider *jihadi* networks have helped it to draw financial and ideological support from other parts of Pakistan and the wider

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53. Ghaffar Ali Khan, "Cloning the Masjid," *Herald*,vol. 38, no. 8, August, 2007, p. 43.
54. Jones, n. 48, p. 24.

Islamic world. In the post-2001 period, assistance by Pakistani Islamist parties to the Taliban and Al Qaeda has continued by various means. This assistance has come in the form of funds collected as *zakat* (the tithe) at mosques in Pakistan, Afghanistan and the larger Muslim world. *Jihadi* funding also comes from wealthy Muslims abroad, especially from Gulf states such as the United Arab Emirates, Saudi Arabia and Qatar.

It is reported that Al Qaeda personnel have met with wealthy Arab businessmen during the Tablighi Jamaat annual meeting in Raiwind, Pakistan, which attracts one of the largest concentration of Muslims after the Hajj.[55] The Muttahida Majlis-e-Amal (MMA), a coalition of religious political parties and movements like the Jamaat-i-Islami and the two factions of the Jamiat-i-Ulema-i-Islam which had come to power in the NWFP and Balochistan in 2002, are also a source of support for the Taliban. The MMA, though composed of Pakistani organisations, has more or less become the political face of the Taliban against the Musharraf government and the US occupation of Afghanistan. Before the bad showing in the recent Parliament elections, the alliance had tried to enforce Taliban type restrictions in the provinces in which it had political control.

If a total Western withdrawal takes place from Afghanistan, a civil war is bound to break out between the various ethnic communities.

As stated earlier, most of the Taliban leadership and cadre were educated in Deobandi-Wahhabi oriented *madrassas*. A generation of Afghans grew up in refugee camps with little understanding about Pashtun tribal traditions. They favoured the *Shariah* or Islamic law more than the Pashtunwali. Their goal of establishing an Islamic theocracy helped them to forge strong links with Pakistani Islamist organisations and radical Islamist groups in the wider Muslim world. At the same time, their kinship ties with the Pashtun tribes in Pakistan helped them to gain sanctuary in that country in the post-2001 period. Therefore, it can be said that the multiple identities of the Taliban have helped them to gain the support of a wide array of forces in Pakistan and sustain their insurgency in Afghanistan.

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55. Jones, Ibid., p. 25.

It would be in the interests of the Taliban and fundamentalist Islamist parties in Pakistan to gain considerable influence in Pakistan rather than take complete control.

RAMIFICATIONS

As far as Afghanistan is concerned, it is important to foresee the consequences of an American and NATO withdrawal from that country as it can have a huge impact on the wider region and might set in motion a series of events that will be hard to control. The growing strength of the insurgency is not good news for the US and NATO. Success in Afghanistan is vital for the West, as a withdrawal from Afghanistan can severely hurt the credibility of the world's most powerful military alliance. The differences of opinion among NATO members over the issue of contributing further troops and the regions to which they should be sent can actually hasten a NATO withdrawal. While it is often stated that the US has tremendous influence over NATO and its European members, it should be accepted that it does not have complete control over decisions taken by the governments of influential member states in Western Europe. In fact, by not contributing more to NATO's mission, countries like Germany and Italy have placed themselves in a position where they can decide on NATO's future in Afghanistan, unlike Britain and Canada which seem to be running out of options.

The future also seems to be bleak for American forces stationed in the Afghan theatre as a NATO withdrawal would mean facing the brunt of the insurgency and simultaneously managing reconstruction efforts which are so vital for stabilising the country. Domestic pressure for withdrawal is bound to grow in the US if NATO leaves Afghanistan. Moreover, the US will find it hard to stabilise two conflict zones at the same time. In such circumstances, America will be forced to choose between Iraq and Afghanistan and focus efforts in one area, while severely cutting back on troops and resources in the other. The overall trend of US aid and funding to Afghanistan points to a preference for Iraq where the Americans have made huge commercial investments in its energy sector. If a total Western withdrawal takes place from Afghanistan, a civil war is bound to break out between the various ethnic communities.

There is a temptation to compare the Karzai regime with that of Najibullah. It is predicted that withdrawal of American support would result in the government of Hamid Karzai meeting the same fate as Najibullah's government which did not survive for long after Soviet troops withdrew. But it must be kept in mind that the Afghan Mujahideen against Soviet occupation and its beneficiaries included the militias of the different ethnic communities in Afghanistan. Karzai's government is supported not just by the US but also by the major non-Pashtun ethnic communities. Therefore, the ensuing conflict would in some ways resemble the civil war that took place after the Mujahideen took over Kabul in 1992. But, again, the similarity ends here. Even that conflict, though it caused massive destruction, was more or less controlled by 2001 when the Taliban captured almost 90 per cent of the country with effective Pakistani backing.

Pakistan is not as prone to an Islamist takeover as popularly believed.

Even after a Western withdrawal from Afghanistan, there would be international, especially US, pressure on Pakistan not to get involved in a civil war in Afghanistan. As a result, no clear winner might emerge and the conflict is bound to be long lasting and more destructive. The Taliban, Al Qaeda and radical Islamist groups can fight an insurgency effectively only in the Pashtun dominated areas of southern and eastern Afghanistan. They cannot fight an insurgency in the north which is dominated by non-Pashtun ethnic communities like the Tajiks and the Uzbeks. During the 1990s, the Taliban took over these territories by bribing local commanders or by using Pakistani conventional military strength. Pakistani military personnel manned the battle tanks and flew fighters for the Taliban. Without conventional superiority, the Taliban cannot take control of the whole of Afghanistan and such capabilities can be provided only by the Pakistani military. It is in the interests of radical Islamist groups present in the Pashtun tribal areas of the Pak-Afghan border to gain access to the borders of Central Asia as these groups include members of the Islamic Movement of Uzbekistan (IMU) led by Tahir Yuldshev.[56]

56. V. Nagendra Rao, "Religious Extremism in Central Asia," in V. Nagendra Rao and Mohammad Monir Alam, eds., *Central Asia: Present Challenges and Future Prospects* (New Delhi: Knowledge World, 2005), p. 107.

The counter-insurgency campaign in Afghanistan should be about winning the trust and confidence of the people living in the conflict zones rather than merely assuring the destruction of the Taliban and the Al Qaeda.

Taking these factors into consideration, it would be in the interests of the Taliban and fundamentalist Islamist parties in Pakistan to gain considerable influence in Pakistan rather than take complete control of that country in order to ensure Pakistani military commitment in Afghanistan. A complete Islamist revolution in Pakistan on the lines of Iran is not possible because of the differences that exist between Sunni and Shia Islam. While Shia Islam has a hierarchical structure with different ranks of clerics, Sunni Islam has no organised clergy system, making it difficult for the various Sunni clerics to accept the leadership of one supreme theocratic leader. Also, in Pakistan there are differences between traditional religious clerics and the leaders of Islamist political parties who have considerable political influence but are not theologically qualified. In Iran, this difference was not that obvious as Ayatollah Khomeini was accepted as an Ayatollah Ozma or Grand Ayatollah. Another factor that complicates the possibility of an Iran-style revolution in Pakistan is the existence of several sects and various schools of thought and movements within those sects as opposed to Iran where the majority believe in Ithna Ashari Islam or Twelver Shia Islam. There are not just disagreements but even violent conflicts between Sunnis, Shias and Ahmadiyyas. Within Sunnis, there are differences between the Deobandi and Barelvi movements.

If a Western withdrawal takes place from Afghanistan, there is considerable risk for Pakistan as the Taliban and radical Islamist groups can concentrate their efforts in the latter country in order to attain their objectives. Presently, only the NWFP and Balochistan are thought to be under the threat of radical Islam. Punjab and Sindh are more stable because of the presence of effective state authority. But this does not mean that radical Islamist groups are not present in these provinces. The Jamaat-i-Islami, Lashkar-e-Tayebba and the various Sunni-Shia sectarian militant outfits like the Sipahi-i-Sahaba and the Lashkar-i-Jhangvi

have considerable influence in these areas.[57] As mentioned earlier, rather than a complete takeover, the Islamists will look to regain their influence in the decision-making process which they had lost in the post-2001 period. These efforts will extend over a longer period of time as dramatic changes in Pakistan have made the task of the Islamists much harder. Attacks targeting the army and the ISI headquarters have sensitised the military establishment to the dangers of radical Islamists.[58] There is also the possibility of US rollback of vital economic aid to Pakistan if the military decides to intervene in a major way in Afghanistan. Because of the sheer diversity that exists in Pakistani society, its political culture and the strength of its government institutions, Pakistan is not as prone to an Islamist takeover as popularly believed. Nevertheless, events in Afghanistan can have a huge impact on the situation in Pakistan.

THE WAY OUT

Within Afghanistan, there is a need to build bridges between the various ethnic communities who have been isolated from each other not just by geography but also because of the strategic interests of outside powers. The creation of dependencies between these communities by establishing commercial relations cutting across ethnic divides can go a long way in creating a necessity for peace. During such attempts, the interests of any one community cannot be sidelined as in the case of the Pashtuns who are not given adequate representation in the government. This can prevent elements like the Taliban and warlord militias from assuming the role of the protector of their respective communities. There is also the necessity to terminate the linkages that exist between the Afghan economy and the conflict. A new economy that can prosper only in a stabilised environment should be created in the place of the old one.

Neighbouring countries should be prevented from providing support to any of the various Afghan factions. The counter-insurgency campaign in Afghanistan should be about winning the trust and confidence of the people living in the conflict zones rather than merely assuring the destruction of the Taliban and the

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57. Seyyed Vali Reza Nasr, "The Rise of Sunni Militancy in Pakistan: The Changing Role of Islamism and the Ulama in Society and Politics," *Modern Asian Studies*, vol. 34, no. 1, February 2000, p. 177
58. William Dalrymple, "On the Long Road to Freedom, Finally," *Tehelka*, vol 5, no. 9, March, 2008, p. 29.

Al Qaeda. There is a need for a deliberate attempt to revive the traditional and tolerant form of Islam that has been always practised in Afghanistan to make up for the extremist indoctrination of a generation of Afghans in Pakistan. As the nature of the problems that confront Afghanistan is complex, there is a need for a much larger commitment by the US and the international community to restore peace in the country. All said and done, the solution to the Afghan problem lies in Pakistan as it has been the source of most of the troubles affecting the region.

Presently, Pakistan is facing pressure from the US to crack down on radical Islamist groups. But a campaign against religious extremism has to be fought on various fronts. The withdrawal of the state from areas like education and public health helped Islamist organisations to step into the vacuum and provide these services, thereby winning recruits and sympathisers to their cause. Pakistan is receiving substantial aid from the United States for its role in the 'war on terror'. But this aid must be connected to the state's success in providing health and education services to the population. It is not just enough that more schools and hospitals are built. The curriculum in the education system is heavily influenced by strong Islamist content and anti-India propaganda. Pakistan must face pressure in the same manner as Saudi Arabia to reform its education system. More attention should be given to the long neglected Federally Administered Tribal Areas. At the present moment, it is difficult for the Pakistani state to enforce its control over those regions as the Pashtun tribes have enjoyed autonomy for a long period of time. It is going to take time for the government to exercise its control over these areas and there is a need for patience and tact. The above mentioned efforts like spreading health and education facilities must target the FATA as it is likely to produce better results than a military campaign which will be fiercely resisted.

The fact that the tribes are in control over a certain area does not naturally mean that shelter would be provided to the foreign radical Islamist groups. Tribal and clan loyalties and traditions are anathema to fundamentalist Islamist principles. This has resulted in clashes wherever the two have come into contact. In Anbar and Diyala provinces in Iraq, the Sunni tribes have organised themselves against the Al Qaeda. Within the FATA, clashes were reported

between the South Waziristan militants led by Maulavi Nazir and radical Islamist Uzbeks of the Islamist Movement of Uzbekistan led by Tahir Yuldshev.[59] Further clashes have been reported in North Waziristan between the tribal leader Gul Bahudur and the followers of

Without the complete cooperation of Pakistan, the present efforts in Afghanistan cannot bear fruit.

the Iraqi national, Abu Okash.[60] The state must exploit such differences between the foreign Islamist radicals and tribal militants. Most important of all, there should be better coordination between efforts in Afghanistan and Pakistan. The US bombings of Pashtun villages on the Pakistani side of the border, presumably without warning the Pakistani government, has reinforced impressions in the tribal regions that the state has lost the ability and authority to assert its sovereignty.[61] This will complicate efforts to fight the Taliban insurgency in these areas. A settlement of the Pak-Afghan border dispute can go a long way in building trust and cooperation on both sides. This can lead to the establishment of stronger links between the security establishments of both sides to effectively combat insurgency, terrorism and smuggling of weapons and drugs. Unlike any other time in the past, greater cooperation between the two neighbours is essential now as the future of both countries is at stake.

CONCLUSION

The challenge for the Greek hero Theseus was not merely killing the Minotaur, a creature that was part bull and part man. It included navigating himself through the complex maze-like construction called the labyrinth which was the dwelling place of the Minotaur. Theseus managed to find his way back with the help of his lover, Ariadne, who gave him a ball of thread so that he could retrace his path. When the US and later NATO intervened in Afghanistan, it is doubtful if they ever realised that the labyrinth included not just Afghanistan but also Pakistan. The two countries cannot be seen in isolation as they belong to a single geo-political complex. The land inhabited by the Pashtun tribes on both sides of

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59. Shafiq Ahmed, "The Jihad Within," *Herald*, vol. 38, no. 4, April, 2007, p. 92.
60. Ahmed, Ibid., p. 93.
61. Ismail Khan, "Settled no More," *Herald*, vol. 38, no. 7, July, 2007, p. 71.

the border is what links the destinies of both countries. Because of the linkages that bind Pakistan and Afghanistan, solutions to the problems faced by the two countries can be seen only in a unified manner. These linkages extend from the socio-cultural to the commercial.

The factors that led to the emergence of the Taliban exist even today and strong steps must be taken to decrease their relevance in the society and politics of Afghanistan. While US and NATO efforts to bring peace in Afghanistan are continuing, a much larger commitment than the present is needed to stabilise the situation. Without the complete cooperation of Pakistan, the present efforts in Afghanistan cannot bear fruit. There is an urgent need to reverse the Islamist programme initiated by Zia-ul-Haq in Pakistan, the consequences of which have affected the entire region. Pakistan must be given a clear understanding that its attempts to achieve parity with India will not be tolerated any longer and that it has to bring under control not just the foreign Islamist extremists but also the indigenous militants operating in its territory. It must also be persuaded to meet all its responsibilities as a state, provide the necessary services to its population and establish effective governance in areas like FATA. While one does not know if the term 'exit-strategy' was derived from the myth of the Minotaur, it is clear that NATO and the US need a better understanding of the complexities involved in the Afghan conflict and must formulate a more effective strategy than is currently being pursued.

SURVIVABILITY OF THE ARSENAL: THE ESSENCE OF SUCCESSFUL NUCLEAR DETERRENCE

MANPREET SETHI

Existential nuclear deterrence is derived from the basic reality of the existence of nuclear weapons—irrespective of their yield or numbers[1]. The mere fact that there is some sort of nuclear capability that can impose a cost far higher than the value of the benefit sought is believed to be enough to deter. Deterrence practised by North Korea (DPRK) against the USA is an example of this. Through the conduct of a nuclear test in October 2006, however imperfect or unreliable, Pyongyang has managed to inject a seed of doubt and uncertainty in the mind of Washington, thereby raising the risks, complicating US calculations, and constraining its actions. Existential deterrence suffices in the case of DPRK for two reasons: one, because it seeks to deter the United States, a country that is perceived to have a low damage tolerance threshold; and, secondly, because from the American perspective, the stakes in any conflict with DPRK would never be high enough to justify any loss, however limited, that America could suffer from DPRK's nuclear use. Therefore, for Pyongyang, the power of mere suggestion of presence of

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1. There are several interpretations of the term "existential deterrence". Its first use is attributed to McGeorge Bundy who opined that as "as long as each side has thermonuclear weapons that could be used against the opponent, even after the strongest possible pre-emptive attack, existential deterrence is strong..." But there are other versions of the term, such as by Marc Trachtenberg that premise it on "the mere existence of nuclear forces," which is enough to create a fear of escalation that must always be factored into political calculations. Still others like Devin T. Hagerty suggest that existential deterrence works even in the absence of openly acknowledged nuclear forces, as long as the adversaries believe that the opponent has nuclear forces. The term as used in this paper leans closer to Trachtenberg's definition of existential deterrence. Bundy's definition of the term, in the view of the author, corresponds better to credible nuclear deterrence as used in this article.

nuclear weapons is good enough to impose deterrence.

None of the other nuclear deterrence relationships, however, has been satisfied with existential deterrence, except in the very early years after the acquisition of the nuclear capability. Thereafter, each one of them has built, or at least aspired to make, deterrence more credible and stable by developing capabilities, establishing systems, adopting procedures, and evolving organisations that are capable of mounting convincing threats of assured nuclear use, if it ever became necessary. The attempt has been to ensure that chances of deterrence breakdown, or the possibilities of use of nuclear weapons are minimised, if not completely obviated, by communicating to the adversary that there are capabilities and strategies in place that would not only prevent him from achieving his objective, but also cost him dear.

The imposition and sustenance of this type of nuclear deterrence, one that is credible and stable, in contrast to merely existential, is particularly important for a country like India that has territorial conflicts with its eastern and western neighbours, both of which are nuclear armed. Given the almost pedestrian possibility of 'routine' border skirmishes escalating to nuclear exchange as a result of deliberate choice, accident, or miscalculation, reliance on the mere psychological assurance of existential deterrence cannot be enough to prevent deterrence breakdown. Therefore, enhancing the credibility of deterrence in order to make it more stable, and, hence, less prone to meltdown, is the basic endeavour of India's nuclear strategy. This is sought through the extrapolation of a lucid nuclear doctrine that clearly identifies a narrow, political role for India's nuclear weapons through the establishment of a precise command and control system that minimises risk of nuclear exchange due to miscalculation or unauthorised use; and by ensuring assured retaliation in case of a nuclear attack in order to compel the adversary to well calculate the dangers of his nuclear use.

The strategy of assured retaliation seeks to impose deterrence by punishment. The credibility of deterrence in this case is predicated on the communication of the absolute certainty that nuclear use by the adversary would be met with retaliation that would cause damage of the kind that the adversary would find unacceptable. For this to happen, an essential prerequisite is the existence of sufficient amount of

nuclear capability. In the case of a first use doctrine, a nation would have the option to choose what to target and how much. But even then, for deterrence to function even after the first use, it becomes contingent upon the country undertaking the first strike, which it hopes would be sufficiently degrading if not completely disarming, to ensure that it can make survivable a sufficient capability even after absorbing a counter-strike. This implies making the nuclear arsenal capable of avoiding, repelling, or withstanding an attack in order to be available for a second strike. The first strike, however expansive or weak, can hope to deter a counter-strike only if it is adequately supported by the ability to conduct another wave of retaliatory strikes that would wreak even further damage on the adversary. The US realised this as Soviet nuclear forces grew, adding to their worries of the vulnerability of their nuclear missiles and bomber bases to a Soviet first strike. This threatened to degrade their ability to mount massive retaliation to cause assured destruction because of the possibility that not much might survive a Soviet first strike. This affected the credibility of the threat of punishment because if the forces that were to carry out the act of punishment were not going to survive, then the threat lost credibility.

> **If forces that were to carry out the act of punishment were not going to survive, then the threat lost credibility.**

In order to buttress deterrence in this situation, emphasis came to be placed on building a second strike capability or the capacity to survive an attack sufficiently to deliver devastating retaliation. Three approaches were adopted to achieve this objective. One, the US went into an overdrive of vertical proliferation, believing that the more the numbers in the nuclear arsenal, the greater the chances of their survival. The folly of this approach was either not evident, or ignored, in the arms race that ensued between the superpowers. Secondly, greater priority came to be accorded to the technical systems necessary for launch on warning (LOW) postures so that in case of a detection of a nuclear attack, the response would be automatic, ensuring, thereby, that the arsenal would not be destroyed before it launched itself. The third approach to making the nuclear weapons survivable was to secure their storage sites and launch platforms. Hence, the shift to silos and

A country with a first use nuclear doctrine found deterrence to be credible only when supported by a second strike capability.

mobile delivery vehicles, including submarines capable of launching nuclear missiles. Owing to these measures, a US Congress study was able to conclude in 1978 that the US could count on having 4,900 thermonuclear warheads after a surprise Soviet attack. If the Americans had warning of that attack, about 7,500 warheads could be made to survive and be ready for retaliation. This was expected to give the US the capacity to destroy 90 per cent of the Soviet military targets, 80 per cent of its industrial targets, all government installations and 90 million people. This was assumed to be a credible second-strike capability.

As is evident from the above experience, a country with a first use nuclear doctrine found deterrence to be credible only when supported by a second strike capability (drawing lessons from this nuclear history, Pakistan is engaged in building such a capability) that could assure the nation that a sufficient amount of nuclear capability would survive even after the first nuclear attack. The logic behind this was to not only eliminate or degrade or dilute a retaliatory counter-strike but also further deter it by suggesting that the first user would still have enough to cause further damage even after the adversary's retaliation.

If credibility of deterrence in the case of a first use doctrine relies on the ability to ensure survivability of sufficient retaliatory capability to undertake a second strike, this is even more critical in the case of a no first use doctrine (NFU). In fact, once a country has committed itself to NFU, attention and energies need to automatically shift to making the nuclear arsenal survivable. What exactly does this entail? Which are the specific elements of the nuclear arsenal that need to be made survivable? How best can survivability be ensured? How much of the arsenal must be made survivable? This chapter takes an in-depth look at these survivability challenges in the context of India's nuclear strategy.

WHAT SHOULD BE MADE SURVIVABLE?
The success of a counter-strike nuclear strategy is based on the communication of a clear message that any use of nuclear weapons would trigger assured

punitive retaliation to cause "unacceptable damage" upon the attacker. If this message has been conveyed and understood properly, then it should be assumed that the aggressor would want to strike and neutralise those Indian capabilities that would enable India to mount a counter-strike. In other words, it would seek to disarm India through a disarming strike before India is able to retaliate. In order to accomplish this, the adversary would attempt to hit at one or both of two kinds of targets. One of these would be the country's nuclear forces such as missile launch silos, submarine and bomber bases, command and control nodes, etc., in order to degrade the retaliatory capability. The other target would be the nation's political will to retaliate. The aggressor would seek to disarm the country of this by undertaking counter-value strikes in the hope that the politico-psychological impact of nuclear attacks on population centres could paralyse the leadership into inaction, thereby reducing the chances of retaliation.

However, if the credibility of deterrence is to rest on the certainty of retribution, then India needs to make these very elements survivable to ensure that it is not possible for the aggressor to degrade its capability to retaliate even after a devastating first strike. Rather, the signals to the adversary must convey that the chances of his being able to carry out either a disarming or decapitating strike against India are close to zero, thereby disabusing him of any notion of a "splendid first strike." However splendid the strike might be, in keeping with the adversary's capabilities, it would nevertheless not be able to guarantee destruction of India's retaliatory wherewithal. Such a perception of survivability would significantly enhance the credibility of deterrence not only by reining in the adversary's temptation for a first strike, but also by tilting the balance in favour of non-use of nuclear weapons.

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For the above to translate into reality, however, measures towards increasing the survivability of the nuclear arsenal must be pursued in a systematic and planned manner. But this first calls for an identification of components that need to be made survivable. In fact, it must be understood that survivability challenges extend beyond merely keeping nuclear attack assets such as warheads or their delivery systems safe from attack. Of course, the atomic bomb is at the heart of the matter and must survive for 'nuclear' retaliation to be mounted. In fact, as and when international commitments such as the Fissile Material Cut-off Treaty (FMCT) constrain quantitative additions to the nuclear stockpile, guarding the available warheads will become even more critical. But survivability of the bomb alone cannot suffice.

Credible deterrence demands the survivability of other enabling mechanisms and supporting structures too. In fact, the nuclear weapon or its delivery mechanism would mean little in the absence of an alive and able decision-maker at whatever level, in a clearly defined chain of succession, a command and control system that provides relevant inputs to the decision-maker, and a communication network that carries the decision right down to the man in the field who is to execute the launch, besides providing him accurate targeting coordinates and other supporting logistic elements. Most importantly, inherent in this entire process is the survival of the will to undertake retaliation. This, in fact, is the most critical element because the others would be meaningless if the national will to retaliate does not survive a nuclear attack. And yet, its survival is the most difficult to ensure, given its intangible nature. Of course, as is explained in the following section, certain specific measures can enhance the chances of survival of all components of the nuclear arsenal, including political will. However, while mathematical modelling can help calculate the chances of survival of other components, nothing can guarantee, or even exactly assess, the survival of political will. Fortunately, though, this applies equally to the adversary since he cannot calculate the response of the leadership with any certainty either. Pakistan, for instance, has miscalculated on this count in the past wars, and especially in the case of Kargil, it assumed that a caretaker government would not have the will or the gumption to take any decisive action against the

Pakistani soldiers in the guise of Mujahideen. A strong belief in the martial superiority of its own nationals has often prompted Islamabad to undertake military adventures that have gone awry. However, an ill-conceived nuclear misadventure would cost both the countries dear. Pakistan does not have the capability to undertake a disarming first strike against India and it must not assume that New Delhi would not retaliate. Because such an assumption would spell catastrophe for the region.

HOW TO ENSURE SURVIVABILITY?

There are several ways by which to enhance survivability of the various constituents of the nuclear arsenal. Every nation makes its choices based on different considerations. However, while information on the exact *modus operandi* of ensuring survivability would naturally be classified, it is important that the adversary be made well cognisant of the fact that steps are being taken to this effect. Communication of this resolve through the right kind of signalling is critical for enhancing deterrence.

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Survivability requires, instead, a more intelligent approach that optimally mixes survival measures such as secrecy, deception, dispersion, concealment, mobility and defences. The determination of how much to conceal and where, or what to make mobile and how, and what to geographically disperse must be made on a considered assessment of the adversary's and own strengths and vulnerabilities. This co-relation will become clearer as several options of survivability, based on their costs and benefits, are examined in the following paragraphs.

Secrecy

Limiting access to information about the extent and location of nuclear attack assets by keeping low the number of people, and hiding their identity is one of

If secrecy is a passive measure to maximise survivability, deception is a more active method to deliberately mislead the adversary.

the simpler and cheaper ways to ensure survivability. In fact, this tactic has been employed in every nuclear weapon state to foment perceptions without revealing actual facts on several matters nuclear.

In the case of India, the culture of secrecy has deep, historical roots, given that the 'wise ones' were never amenable to easily sharing their knowledge with others. The bureaucratic system developed by the British, and as it exists today, is also given to functioning with a high level of secrecy. Most scientific and defence organisations too work on a 'need to know' principle. While this mode of functioning can hamper the development of a more formal and institutionalised system for managing the nuclear deterrent, it nevertheless enhances its security because not everyone has sufficient information about the constitution, position, or disposition of the nuclear arsenal. This has its advantages, as was explained by Ashley Tellis[2],

> Since the entire organisational structure places a premium on extreme secrecy... potential adversary has to reckon with the prospect that there could always be some further strategic capabilities or technical resources held in reserve... unknown even to those few individuals otherwise thought to possess 'perfect' knowledge about the status and disposition of India's distributed strategic assets.

Thus, through a high level of secrecy, where the number of people in the nuclear loop is deliberately limited, India seeks to deny its adversaries the information they would need to perfect their targeting strategies for a devastating first nuclear strike.

Deception

If secrecy is a passive measure to maximise survivability, deception is a more active method to deliberately mislead the adversary. This may be done through

2. Ashley Tellis, *India's Emerging Nuclear Posture: Between Recessed Deterrent and Ready Arsenal* (Santa Monica: RAND, 2001), p 422.

wilfull communication of false information or deliberate ambiguity through contradictory statements. For instance, Soviet President Brezhenev contributed to the myth of a 'missile gap' in favour of the USSR when he made the statement that his country was producing missiles like sausages, even though the reality was very different. Besides, verbal misinformation, deception may also be practised by building dummy missiles or launch and storage sites in order to multiply targets and reduce the adversary's chances of being able to hit all, or even all the correct, targets.

While India has largely resorted to secrecy rather than deception in nuclear affairs, the production of dummy missiles or launch sites would be an effective and relatively cheaper way of ensuring survivability, especially of delivery vehicles. Presenting several targets to the adversary would sufficiently complicate his calculations to deter first use since he could never be sure that enough would not survive for retaliation.

Hardening

Shielding physical structures through use of special materials able to withstand nuclear attack is another way of ensuring the survival of critical assets. It amounts to increasing the ability of structures, systems and components to tolerate exposure to the effects of a nuclear detonation such as air blast, ground shock, electro-magnetic pulse (EMP), heat, pressure, and radiation. In an effective and widely prevalent use of this method during the 1960s and 1970s, the superpowers constructed hardened silos to keep their land-based nuclear forces (missiles and aircraft) safe from an attack. However, two technological developments have since reduced the efficacy of silos. Firstly, modern space-based systems have the capability to expose the position of silos for easy targeting; and, secondly, the development of precision munitions and earth penetrating weapons has eroded the survival chances of nuclear assets in a silo.

In the case of India, however, silos have certain advantages and

Shielding physical structures through use of special materials able to withstand nuclear attack is another way of ensuring the survival of critical assets.

disadvantages. For instance, given that neither Pakistan nor China yet has adequate space-based capabilities for accurate targeting, or even very reliable accurate missiles or earth penetrating weapons, hardened silos or storage in deep caves or tunnels remains an option for the near future. But, it must also be realised that Chinese missiles are rapidly moving towards greater accuracy through global positioning system (GPS) enabled systems. Given their focus on enhancing national military space capabilities, their ability to target silos would improve dramatically in the coming years. Meanwhile, silos are expensive and difficult to build, given the need for special materials and other considerations. It involves hardening not only the physical outer structure but also constructing the exact spaces for hosting nuclear assets in such a manner that even individual components can absorb violent ground motion. While the Department of Energy (DAE) and Defence Research and Development Organisation (DRDO), as custodians of nuclear weapons, are believed to already have specially constructed sites for storage of nuclear warheads, silos for delivery systems maintained with the military missile units would have to be specially constructed with suspension devices that can support ground motion and are made of materials hardened enough to withstand the effects of a nuclear blast. Power supplies, communication and launch control electronic hardware of the delivery vehicle would also have to be protected against thermal effects, ionospheric disruptions and radiation effects.

The location of silos would also have to be carefully considered on the basis of the range of adversary missiles/aircraft as well as proximity to own launch sites for quick reconstitution of retaliatory forces. Even though the NFU strategy reduces the pressure of immediate retaliation, unnecessary loss of time would not only raise the risks of another wave of nuclear strikes but could also adversely affect own resolve to counter-strike as international pressure to show restraint mounts, and news on the extent of damage flows in. The latter issue and its impact on decision-making are addressed in some detail in the section on preparation of resolve.

Besides silos for housing attack assets, one other major component of the nuclear arsenal that could be considered for placing in hardened structures in

times of crisis is the National Command Authority (NCA) and the National Command Post (NCP), as well as their alternates. The NCA is the decision-making body comprising the prime minister and other Cabinet ministers who are tasked with the responsibility of authorising nuclear use. The NCP, meanwhile, is a robust communication centre with the ability to receive information and disseminate it. Gen Sundarji distinguished the two as, "If NCA is the brain, NCP is the nervous system, including the sensory functions"[3]. Obviously, the survival of both is essential for retaliation, and to ensure their continued existence and ability to function, these command, control and communication nodes could be shifted to hardened, buried, deep underground bunkers. This facility would have equally hardened communication systems to other nodal points in the nuclear command chain. Obviously, technical, technological and financial complexities would be involved in constructing the facility and even more so in deeply burying the entire information distribution network over long distances. However, none of these challenges is insurmountable if the efficacy of such a structure is certain. The problem lies in the fact that as the accuracy and lethality of adversary

If dummies were also added to the actual, mobile forces, it would further complicate the targeting requirements of the adversary.

missiles and weapons improve, the advantage of such hardened structures would rapidly erode. In view of this, what should be India's approach to using 'hardening' as a survival measure?

Obviously, depending only on hardened structures cannot be possible given their cost, complexity and vulnerabilities that would only increase over time. In the case of those components of the arsenal that cannot be easily made mobile, silos could present a viable option. But for delivery vehicles that are road or rail mobile, or even national command and control structures, deep buried, hardened structures need not be the preferred choice. Mobility, therefore, is another significant survival measure that must be carefully examined.

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3. Gen K. Sundarji, *The Blind Men of Hindoostan* (New Delhi: UBSPD, 1993), p. 89.

Mobility

One way of circumventing the vulnerability of nuclear assets in silos is to make them mobile. If these were frequently moved around on an elaborate road and rail network, it would be impossible for the adversary to constantly monitor and accurately target these forces. This, of course, would require making the nuclear assets smaller, missiles based on solid fuel and automated to the extent possible. If dummies were also added to the actual, mobile forces, it would further complicate the targeting requirements of the adversary and, thereby, enhance deterrence because he could never be sure of the numbers of real forces that would survive his first strike.

However, two parameters could constrain the extent of mobility: firstly, the ability to reconstitute forces quickly after attack. If the assets are too widely dispersed, it might prove to be logistically difficult to quickly bring them together for retaliatory launches. This, nevertheless, is not an insurmountable challenge and can be overcome through thorough pre-planning in peace-time and conduct of periodic simulation exercises to understand and overcome limitations; the second constraint on mobility is imposed by communication lines. Unless these are secure, hardened and sufficiently redundant, it could cripple the retaliatory system by the sheer inability of mobile units that have survived a first attack to link up with one another or the NCA. Therefore, degradation of communication systems could prove to be a particular point of vulnerability, and adequate attention must be paid to make these survivable so that the benefits of mobility of forces can be maximised.

Besides nuclear attack assets, making the NCA/NCP mobile, either on an airborne platform or on land transportable vehicles is also worthy of consideration in the Indian context, given the vulnerabilities mentioned earlier of deep buried, hardened, command posts. With the acquisition of the airborne warning and control system (AWACS) platform and with aerial refuelling capabilities, India does have the capacity of making the command post airborne in crisis situations. This may not be dismissed as preposterous because unlike the immediate mental link with American 24-hour air readiness, in the case of India, it would not be necessary to maintain such a facility on constant alert. It would only amount to

configuring a command force that would be available for such functions, as and when necessary, and for occasional exercises to maintain the capability. Similarly, on land, India's extensive rail and road network offers an option of a safe haven for the command authority to function from. It could be intelligently and safely knitted into the larger civilian network, though there would be a requirement for specially constructed camouflaged vehicles (whether rail bogies or road carriers) that can cater for sufficient reserves of power to run complex data and communication systems, sufficient fuel for adequate movement, and other logistic requirements to ensure independence of movement. Air, rail or road mobility could offer relatively less expensive and more readily available options for providing survivability of the NCA/NCP. Pre-planning with adequate forethought can equip these options with greater redundancy at much lower costs and levels of complexity, thereby ensuring a sanctuary for the national leadership to survive an attack, assess the damage, contemplate retaliatory options and order a counter-strike.

Historically, every state with nuclear weapons has used air delivery as the first option because of its ready availability.

Dispersion

There are two ways of exercising dispersion of nuclear assets in order to ensure their survival. One of these is to geographically distribute capabilities/systems over several locations in such a way that no complete strategic systems exist as transparent targets during normal peace-time deployments. In fact, that is the state in which the Indian nuclear doctrine mandates the forces be maintained. Weapon cores, weapon assemblies, missiles, and their launch vehicles are all maintained at different sites, to be brought together as "fully employable forces" only in case of a crisis. This proffers the obvious advantage of multiplying targets to complicate adversary calculations. As was explained by Gen Sundarji, "It is not just a question of [finding] 'needles in haystacks' but parts of many needles in many haystacks which might be brought together when required within hours to days, to form full needles in yet many more different haystacks."[4] Of course, this kind of dispersion does pose the

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4. Gen K. Sundarji, "Indian Nuclear Doctrine -I: Notions of Deterrence," *Indian Express*, November 25, 1994. Part II of this article appeared in the same paper of November 26, 1994.

challenge of timely and effective reconstitution of the nuclear force after a nuclear attack has been suffered. It would call for elaborate planning and coordination among different agencies to remain networked in order to be able to mount retaliation within a reasonable time-frame.

The second mode of dispersion is to spread the nuclear assets over a range of delivery platforms. Historically, every state with nuclear weapons has used air delivery as the first option because of its ready availability. However, given the restricted range of aircraft and their limited penetration capabilities in a dense air defence environment, missiles—land-based and sea-based—have evolved as the preferred option. Of course, air-launched, supersonic cruise missiles like the Brahmos and its follow-on systems offer a credible option. While mobility is an important aspect of land-based missiles, the highest level of survivability is, nevertheless, believed to lie in placing nuclear tipped missiles with sufficient ranges on nuclear powered submarines (SSBNs). Indeed, every nuclear weapon state (NWS) has aimed for a triad of nuclear forces, and countries that have, over the years, in deference to their changing threat perceptions, given up some nuclear delivery platforms, have still maintained submarine-launched ballistic missiles (SLBMs) for their high survivability quotient. For instance, the UK presently maintains its nuclear forces only on its four submarines and France too maintains a dyad in the SLBM and air delivery platforms.

In the case of India, the nuclear doctrine provides for the constitution of a triad. Given the security scenario in the neighbourhood, the eventual induction of the SLBMs could indeed provide a higher guarantee of survivability. However, there are a few issues that must be examined with regard to sea-based deterrence. Firstly, given the large Indian landmass and the gigantic inland road and rail network that could be effectively used for mobile missiles with adequate ranges, could their survivability not be ensured on land any better than it could be at sea? In a situation of fast improving anti-submarine warfare (ASW) capabilities, are SSBNs that would be carrying concentrated clusters of strategic capabilities [at least 12-16 MIRVed (multiple independent reentry vehicle) missiles equalling 96 warheads] more or less risk prone? Of course, SSBNs are also most vulnerable when in port since they are difficult to hide. Moreover,

given that there are not too many Indian ports that could host the SSBNs, their targeting should be relatively simple. Above all, the sea-based leg of the triad does pose challenges of command, control, and communication, as well as those of delegation of authority. Unlike land-based nuclear capabilities that can be maintained in a distributed form, a sea-based deterrent pre-supposes complete systems on board at sea. Once this leg of the triad becomes operational, which should be some time in a decade or so, it would call for the development of technological and organisational arrangements to cater for chances of an accidental or unauthorised launch of a nuclear weapon from the sea. Even more than operational issues, once an SSBN force is ready, India will have to take the critical decision of graduating from the present posture where the civilian leadership exercises complete control over nuclear assets to one wherein custody of a number of nuclear weapons would reside with uniformed personnel even in peace-time. This transition from what Ashley Tellis describes as a "force in being" to a "ready arsenal" would bring its own sets of implications for India's nuclear strategy and civil-military relations.

However, notwithstanding the above mentioned problem areas of sea-based deterrence, it still offers enough advantages that do not allow it to be dismissed as a viable and effective option for enhancing survivability. In fact, the mere fact that all

The first of these is developing, and rigorous testing, of missiles with adequate ranges that would enable SSBNs to stay out of harm's way.

NWS perceive greatest survivability in this leg of the triad is not without reason. Indeed, for a peninsular nation like India, the vast seas around it do provide large areas where SSBNs could remain hidden with a significant nuclear arsenal for long periods of time to mount retaliation, if and when necessary. In fact, the credibility of a counter-strike is ensured once an adversary knows that a fully armed SSBN is out at sea. To some extent, it makes counter-strike almost automatic, thereby asserting the certainty of retaliation. In any other situation, the first user could hope that international pressure or lack of domestic political resolve might ward off a nuclear response. But with SSBNs, harbouring such a

The deployment of air and missile defences around critical points is another way to ensure survivability.

hope would be foolish.

As far as other issues such as vulnerability in port or problems of command, control, comunications (C3) are concerned, these are not insurmountable challenges and the Indian Navy is engaged in resolving them. For instance, it is planned to have three SSBNs by 2015, of which one would be kept in reserve while two remain out at sea by rotation[5], thereby reducing chances of their being caught in port. Similarly, the possibility of unauthorised use of the weapon is resolved through electronic locks on weapons that can be operated by more than one person. In order to further ensure the survivability of SSBNs, some other precautions will also have to be worked at. The first of these is developing, and rigorous testing, of missiles with adequate ranges that would enable SSBNs to stay out of harm's way. The farther they would be from the adversary's coast to launch their own weapons, the greater would be the chances of their survival. As of now, the Indian advanced technology vehicle (ATV) would be equipped with a solid-fuelled 750 km range SLBM. But the DRDO has plans to equip the SSBNs with the extended range Agni III of 5,000 km. Secondly, development of adequate anti-ASW capabilities would be critical. Making the submarine as silent as possible and equipping it with some stealth features would certainly help, and efforts need to continue in these directions. At the same time, particular attention needs to be paid towards hardening the shore-based communication centres of the SSBNs because these are points of vulnerability.

Finally, it may be said that despite some vulnerabilities, sea-based deterrence certainly has the greatest chance of being survivable and providing the most credible deterrence through the right kind of power projection. And since deterrence is essentially a mind game, India will have to invest in some minimum level of sea-based nuclear capability as part of its credible minimum deterrence.

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5. Sandeep Unnithan, "The Secret Undersea Weapon," *India Today*, January 28 2008, p.52.

Active Defences

The deployment of air and missile defences around critical points is another way to ensure survivability by intercepting incoming missiles or air attacks before they hit the target. Limited missile defences were used during the Cold War years for increasing survivability of land-based assets. However, to maintain vulnerability for mutual assured destruction, ballistic missile defence (BMD) was allowed only on a limited number of sites. After the abrogation of the Anti-Ballistic Missile (ABM) Treaty, this restriction has been lifted and the US is now engaged in deploying a multi-layered highly advanced national missile defence to eventually provide protection to the entire American landmass. This is envisaged through the establishment of an elaborate network of radars and interceptors at different sites within the country and outside. Obviously, such a system is technologically challenging as well as politically destabilising.

China, over the last decade, has concentrated on developing effective counter-measures to defeat a far more sophisticated BMD of the US.

The consideration of missile defence for India, from the perspective of survivability, needs to be examined here. Theoretically, of course, there can be no denying that a system that can intercept incoming enemy missiles and neutralise them before they hit the target, ensures the survival of what they are meant to protect. However, there can be little guarantee that every incoming missile will be intercepted in time. The financial and technological costs and complexities are not of any small dimension. These, in fact, are exacerbated by the more demanding geographical constraints and the more advanced capabilities with adversaries that an Indian BMD system must cater for in contrast to the situation of the USA. In fact, simple counter-measures can be used to defeat BMD and it is relevant to point out that in the Indian case, this is especially important since China, over the last decade, has concentrated on developing effective counter-measures to defeat a far more sophisticated BMD of the US.

In recent months, the DRDO has conducted some successful interceptions

Political will is the least tangible component of the nuclear arsenal and there can be no predictions on how it would react during nuclear war.

that have raised interest and confidence in the technology. Intelligently complemented with some imported systems, BMD could offer some enhancement of survivability for deterrence. However, its utility must be carefully tailored to the Indian security environment. For example, since survivability of retaliatory forces is a prerequisite for assured retaliation, erecting point or area defences over some types of nuclear assets such as over early warning systems, air bases for nuclear capable aircraft, command posts, submarine communication centres, nuclear production facilities, launch or storage sites in cases where mobility is not enabled, must be considered. But it would be unnecessary as well as unfeasible to opt for missile defences over cities. Of course, erection of BMD over critical points suffers from the disadvantage of exposing them to the adversary and, thus, subverting the advantage of concealment or deception. Yet, at the same time, erection of defences also injects uncertainty into the mind of the adversary and does complicate his targeting calculations and can be used to that extent.

Preparation of Resolve

Raising awareness and exposing decision-makers to simulated exercises in which escalation to the nuclear level is envisaged could be some of the preparatory tasks towards ensuring survival of the will for retaliation. As has been mentioned earlier, political will is the least tangible component of the nuclear arsenal and there can be no predictions on how it would react during nuclear war. For instance, the news of a very high level of damage could affect the decision-maker in two ways: on the one hand, it could send him into a state of shock and lead to action paralysis; on the other hand, it could also lead to immense anger and immediate action. Low damage tolerance of a nuclear attack could also make the decision-maker more susceptible to external pressures and constrain the scope of action. The location of attack could also influence the mental frame of the

decision-maker. An isolated nuclear attack on an air base, or a surface ship out at sea, or in a remote desert army unit would, in all certainty, would affect the decision- maker differently from a situation in which the adversary has mounted multiple counter-force attacks coupled with some counter-value ones too. Contrary to the proposal of the group of nuclear experts and the National Security Advisory Board, the Indian nuclear doctrine clearly mandates massive retaliation in both cases. But would the leadership be able to make the difficult decision, or have the necessary wherewithal in terms of informed people around to proffer advice to arrive quickly at a response that is equally able to meet the requirements of domestic expectations, international pressures and, at the same time, most importantly, send the necessary message to the adversary? The last criterion, in fact, is critical because this response would determine the credibility of deterrence for the future. Of course, the nature of response would have immediate implications for the country, but it would also influence perceptions for the future. In this context, it becomes extremely important to educate the political leaders about the intricacies of nuclear deterrence since they are the prime decision-makers in the Indian system and also need to convey credible nuclear signals in peace-time and war.

The key to credible deterrence through punitive retaliation lies in understanding and arriving at an approximate figure that must survive.

It is obvious that survivability is achievable through a number of measures. The challenge lies in making the right choices based on the most relevant parameters. The first of these must be an assessment of the adversary's intelligence, reconnaissance, surveillance, target acquisition and strike capabilities. For instance, in order to evade better human intelligence skills of the adversary, it would be necessary to maintain a high level of secrecy on information of assets and their locations, capabilities, etc. Compartmentalisation of information within the government, armed forces and even strategic organisations would be necessary, besides elaborate and sophisticated personnel reliability programmes in every establishment and at every level. On the other

China, even with a small nuclear arsenal, is able to effectively deter the thousands of weapons in the American nuclear armoury.

hand, a higher adversarial capability of surveillance would entail greater emphasis on deception and mobility. Or, the capability of the adversary to conduct effective electronic warfare would imply placing greater emphasis on making own communication networks more secure and redundant.

HOW MUCH TO MAKE SURVIVABLE?

In any kind of a first strike mounted by the adversary, a certain amount of attrition of the nuclear forces would be expected. However, the key to credible deterrence through punitive retaliation lies in understanding and arriving at an approximate figure that must survive. This, in turn, has to be a function of a considered assessment of how much would be required to impose an unacceptable level of punishment on the adversary. At least, that much has to be made absolutely survivable. However, the assessment of the damage threshold of the adversary is a complicated calculation. During the days of superpower rivalry, the US had arrived at a complicated number of destruction, that of 50 per cent of the Soviet population, and 25 per cent of its military and industry would be perceived as unacceptable to the USSR. But, seen in retrospect, this is today considered a horrendous over-assessment. With modern levels of development, it is assumed that countries would have lower damage tolerance thresholds. The greater role of public opinion enabled by an explosion in information and the media clearly indicates a weaker stomach for damage to life and property. However, in the case of India, three essential parameters, as described below, can be used to assess how much must be made absolutely survivable for assured retaliation.

Assessment of Unacceptable Damage

The first parameter that can help assess how much must definitely survive with India is the calculation of what would constitute 'unacceptable damage' for the adversary. Therefore, the stakes must be understood and considered from the

point of view of the adversary. Obviously, this cannot be an easy task. However, certain educated guesstimates can be made on the basis of the following factors.

Socio-Political System of the Country

 This would have a deep impact on how decisions are taken in the country. A high level of democratic openness of society, a large number of stakeholders in decision-making, and freedom of the media can cast a constraining influence on an adventurous political leadership. In contrast, a system that is autocratic, shows little respect for public opinion, restricts and controls information dissemination and does not depend on others for its legitimacy would be more prone to taking nuclear risks. In the latter case, the level of damage that the nation would be willing to absorb would be much higher than in the case of the former. This is amply proved by the fact that China, even with a small nuclear arsenal, is able to effectively deter the thousands of weapons in the American nuclear armoury. This is because

A revisionist power is more damage tolerant compared to a status quo nation.

the socio-political system of the US cannot sustain damage to itself. It has a low damage tolerance threshold, low enough for China to threaten even with its relatively limited capabilities. For India, however, the situation is the exact opposite. Its deterrence has to be imposed upon a nation (China) that has a high limit of damage acceptability, in which the decision-making is confined to a very small number, and where the media is highly controlled. Therefore, there are no players in the system that can place limits on damage tolerance.

Strategic Culture

The propensity for undertaking and absorbing military casualties is also influenced by the overall strategic culture of the nation. This, in turn, is significantly influenced by the country's historical experiences of war. A country that has a self-image of having been wronged in a war or having been deprived of something perceived as its own would be more acceptable to

An economically more developed country is normally expected to have a lower damage tolerance threshold.

bearing damage or 'costs' for righting the past action. Also, a revisionist power is more damage tolerant compared to a status quo nation. In the case of India, Pakistan and China are both revisionist and, hence, logically should be expected to be ready to bear more damage.

Issue at Stake

The level of acceptability of damage is also influenced by the value a nation places upon the issue at stake. Of course, it could well be argued that nothing can be valuable enough to merit the kind of destruction that a nuclear exchange would bring. By this logic then, the possession of Kashmir could not be worthwhile for Pakistan if it meant the loss of the rest of the nation, especially the Punjab. Or that China would not want to lose Beijing in exchange for gaining Arunachal Pradesh. However, nuclear use would seem acceptable in case the country was pushed into a corner and had to use it as a weapon of last resort.

Level of Economic Development

An economically more developed country is normally expected to have a lower damage tolerance threshold. This is because an impoverished country in any case has less to lose and is, therefore, willing to accept more damage. It is for this reason that it is assumed that China of today has more to lose and, hence, would be less willing to suffer damage to the level of development that it has got habituated to. As the level of economic development increases, nations become more attached to a certain way of living and, hence, develop a weaker tolerance level for any loss of their comfort zone. Those that have nothing to lose are more acceptable of even higher levels of damage.

Reliability of Own Arsenal

The second parameter on the basis of which the quantum of arsenal survival can be assessed is the reliability of own nuclear warheads and delivery vehicles. The

higher the reliability that the missile would be able to carry the nuclear weapon to the desired target, and that the weapon would explode to provide the expected yield, the less need be the amount that needs to survive. More reliable systems can infuse greater confidence that whatever survives would be able to do the necessary damage and there would be less requirement for building redundancies into calculation of numbers. However, reliability needs to be established at various levels. For instance, missile reliability should imply the ready availability of a deliverable missile at a given moment in time. It cannot include missiles that are under repair or maintenance or not ready for immediate action. Communication reliability would have to stem from the quick and efficient dissemination of orders to launch. Launch reliability would require that the missile lifts off when so ordered. Booster reliability would entail their igniting in time to send off the missile. Also, having done that, the boosters must also ensure separation reliability so that they can disengage from the missile in flight instead of hanging on to it and interfering with its ballistic flight. Thereafter, penetration reliability must assure that the missile would be able to home in on the pre-determined target. Lastly, detonation reliability would imply the absolute certainty that the warhead explodes over the target and provides the correct yield to inflict the kind of damage that was considered necessary. Therefore, through a considered calculation of these combined individual reliabilities, it could be established as to how much of the arsenal a nation must make survivable.

Ensuring the survivability of the nuclear arsenal, therefore, in this scheme of things, is the most critical basis for establishing and sustaining credible deterrence.

Purpose of Own Nuclear Weapons
The last essential parameter that can be used to decide how much must survive the adversary's first use of a nuclear weapon would be the purpose of one's own nuclear retaliation. Is it to wreak punishment on the first user for his act? Or, is it to bring about total destruction of the adversary as a form of revenge? In the

case of the former, the survivability requirements can be less stringent than in the case of the latter. Imposing punishment could be possible with the use of a few fission weapons in counter-value mode. Of course, this is affected by the adversary's determination of how it perceives its own damage. But, in the case of most modern societies, and given the densities of populations in the region that India inhabits, even a score of nuclear weapons could bring untold destruction of life and property. On the other hand, if the purpose of the nuclear arsenal is to completely decimate the first user, then obviously more would need to be made survivable.

Given the purpose of the Indian nuclear weapon, as established in the country's nuclear doctrine, it exists to impose deterrence. As has been reiterated several times, the nuclear weapon is perceived as a political tool to ward off nuclear blackmail or coercion. Therefore, India does not visualise any situation in which the weapon could actually be used for war-fighting. However, in order to keep it that way, it becomes important to make the necessary arrangements and convey to the adversary that the country is ready for any kind of deterrence breakdown. Ensuring the survivability of the nuclear arsenal, therefore, in this scheme of things, is the most critical basis for establishing and sustaining credible deterrence.

PLANNING FOR LEGITIMACY: A JOINT OPERATIONAL APPROACH TO PUBLIC AFFAIRS

TADD SHOLTIS

Ask a typical group or wing commander what public affairs (PA) should seek to provide him or her in a contingency, and the answer may be something like "keeping the media off my back" or, worse yet, a list of "nice-to-haves" like hometown news releases, newsletters or photo support. With the current level of training provided to the PA personnel serving these commanders, PA airmen themselves may be hard pressed to provide a better answer. Current or emerging joint and air force doctrines are a bit more helpful in defining the mission of PA as "communicating truthful and factual unclassified information about DOD activities,"[1] with a useful list of possible effects such as "deterring conflict, fostering public trust and support for operations," or "countering adversary propaganda or misinformation."[2] But communication is a means rather than an end, and, to be properly understood and employed, PA's effects must build toward as yet unidentified objectives. To truly succeed in the global information environment, the air force must develop a deeper understanding of PA's strategic and operational "deliverable" and organise, train and equip its PA forces to provide it. This essay proposes legitimacy rather than credibility as the fundamental product of PA operations, and discusses the

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1. Joint Publication 3-61, *Public Affairs*, May 9, 2005, chapter I, paragraph 2.
2. Draft of Air Force Doctrine Document 2-5.3, *Public Affairs Operations*, February 14, 2005, p. 1.

How you gauge your success or failure in maintaining credibility as a strategic COG largely becomes a function of where you're looking.

implications of this concept to the way the air force plans and executes its public information activities.

CREDIBILITY IS NOT A CENTRE OF GRAVITY

Defining what military capabilities can provide to a commander often involves an analysis of the various strategic centres of gravity (COGs) those capabilities may effectively defend or attack. Joint and air force doctrines do not specify a COG associated with PA, although the doctrine's repeated emphasis on "credibility" or "credible communication" as the purpose, mission or focus of PA operations for a commander certainly marks it as the primary candidate.[3] Among other unintended consequences, the concept of credibility as a COG adds fuel to the fire in the public and institutional debate about the proper limits of PA and information operations (IO).[4] In this debate, the value of PA's cooperation with the IO capabilities the air force groups under "influence operations"—capabilities which are often wrongly perceived as relying on the communication of false information—is largely evaluated in terms of how such a relationship may harm the military's credibility with reporters or the general public.

Defining credibility as "the" thing PA helps commanders gain or maintain, creates greater difficulties than complicating the relationship between PA and IO, however. Credibility is a standard that is hopelessly situation-dependent, varying from message to message, media to media, spokesman to spokesman, and audience to audience. How you gauge your success or failure in maintaining credibility as a strategic COG largely becomes a function of where you're looking. If you're looking at Fox News, your credibility is probably skyrocketing;

3. See, for example, the discussion of "Using Public Affairs to Support Command Strategy" in chapter I, paragraph 4a of JP 3-61, where the doctrine asserts, "Absolute credibility must always be maintained."

4. Among those expressing concern about the roles of PA and Information Operations are the Chairman of the Joint Chiefs of Staff ("Policy on Public Affairs Relationship to Information Operations," Memorandum CM-2077-04, September 27, 2004), *New York Times* (Thom Shanker and Eric Schmitt, "Hearts and Minds: Pentagon Weighs Use of Deception in a Broad Arena," December 13, 2004), and the Public Relations Society of America ("Telling the Truth, Especially in Wartime," Professional Standards Advisory PS-5, January 2005).

if you're looking at al-Jazeera, it's probably tanking.

Assuming you can look in the right places, at the right times, to assess credibility, though, it is difficult to define how much credibility you need to be effective, or when your credibility is approaching a minimum acceptable level. You cannot, for instance, gauge your credibility by the relative absence of competing information you deem not credible. Media bias, the desire to provide balanced coverage or just the need to fill air time reliably ensures that everything from ill-informed dissenting opinions to outright lies will find an audience, and some percentage of that audience is bound to believe what is said. As a standard that terminates with a highly personal, internalised judgment ("I believe this" or "I don't believe that"), credibility also fails the "so what?" test by being unable to describe a meaningful outcome. Millions may consider the existence of Bigfoot credible, but that belief is meaningful only to the extent that it prompts real action to improve the understanding or material circumstances of any hairy eight-foot humanoids that might be roaming our forests. Belief gives you potential, but not results.

Truth and public access should be institutional values and the standard for the American military's public communication activities, both at home and abroad.

To say that credibility is not a good strategic COG is not to say it is worthless, that it's okay for the US military to lie to the public or give up its efforts to communicate honestly with audiences, even hostile or apathetic ones. Truth and public access should be institutional values and the standard for the American military's public communication activities, both at home and abroad. In order to uphold these values, PA must keep its core commitment to accurate communication with the broadest possible range of media to reach those audiences that affect or are affected by our operations.

But truth-telling is a tactic, not a result. We tell the truth because it is the right way to go about our business, just as we avoid using "dumb bombs" to conduct close air support of ground forces or to strike urban military targets. To call something a tactic is not to say that important values are not at stake: truth and

A selected military course of action must have some prior degree of accepted legitimacy in order for PA to "deliver" broader legitimacy by building greater consensus through public awareness of our motives and actions.

the preservation of human life are very important values. In these cases, though, the values define *how* we do something, not *why*.

Credibility, then, is certainly a professional standard for public communication—an unambiguous and inflexible PA "how"—but it does not define the strategic "why"—an end state PA can deliver to commanders and what, therefore, serves as the dividing line between communication success and failure. The reason why PA employs the tactics of truth-telling and public access to military operations is to give those operations legitimacy, which is a true strategic COG for most military operations.[5]

DEMONSTRATED LEGITIMACY AS PA'S STRATEGIC DELIVERABLE

As Robert W. Tucker and David C. Hendrickson argue in a recent issue of *Foreign Affairs*, US legitimacy in the post-World War II era has rested on four pillars: adherence to international law, consensus-building, moderate policies and a successful commitment to near-universal moral objectives, such as wider peace and prosperity.[6] By encouraging open public communication from all levels of our military organisation, the main function of PA in a contingency is to demonstrate the extent to which military operations conform to these or similar principles of legitimacy.

It is important to understand that a selected military course of action must

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5. Though not mentioned in doctrine documents, legitimacy—not credibility—is the conceptual subtext in most descriptions of what PA activities actually provide to commanders in a strategic or operational sense. In chapter I, paragraph 5b of JP 3-61, for example, components of credibility—"tell the truth," "provide timely information" and "provide consistent information at all levels"—are listed as "fundamentals" of PA practice, while three of the four PA capabilities provided to the JFC in paragraph 5d are actually effects of promoting military legitimacy among various audiences. Likewise, three of the four PA capabilities listed in AFDD 2-5.3 are effects of legitimacy: public trust and support, airman morale and readiness, and global influence and deterrence.

6. Tucker and Hendrickson, "The Sources of American Legitimacy," *Foreign Affairs,* 83, no. 6, November/December 2004, pp.18-32. This is by no means a definitive list of the factors that will determine the legitimacy of any specific military course of action; it merely indicates the kinds of conclusions public opinion seeks to confirm or reject about a military operation and the authority that undertakes it.

have some prior degree of accepted legitimacy in order for PA to "deliver" broader legitimacy by building greater consensus through public awareness of our motives and actions. Where the pillars of legitimacy as understood by key audiences simply do not exist, any PA effort will come across as cynical marketing of national interests or politically motivated aggression, regardless of how truthful the communication may be. PA on behalf of a military operation that lacks legitimacy must make the same vast leap across the credibility gap that faces someone engaged in public relations for Enron or Big Tobacco. Fortunately, we have not been forced to make that leap yet, although we soon may need to if we do not rapidly improve our ability to justify our motives and methods to foreign audiences.

Replacing credibility with legitimacy as the COG for PA activities in war may seem like substituting one hopeless abstraction for another. As Tucker and Hendrickson point out, legitimacy is itself "an elusive quality" that is "rooted in opinion."[7] But where credibility most clearly manifests itself in an opinion-based relationship between the military and media, legitimacy derives from real and readily apparent behaviours or effects that define the functional relationships between the military and key publics. Domestically, such behaviours would include the extent of political manoeuvring or public protests against military actions, imposed tactical restrictions on fire and manoeuvre, and blows to unit morale, defence spending and military recruiting. Abroad, legitimacy will affect the military contributions of our allies, basing options, transportation routes for force deployment and resupply, and grassroots support for terrorist or insurgent attacks against US forces, among other considerations. While we may lack a method for quantifying legitimacy precisely, we know it when we see it.

More to the point for military PA operations, by examining the desired behaviours or effects associated with legitimacy, we can develop criteria by which to determine whether public communication enhances or degrades the legitimacy of a particular military operation. Broadly considered, communication that promotes legitimacy demonstrates four basic characteristics:

- **Source Balance**. Any situation requiring military intervention will produce

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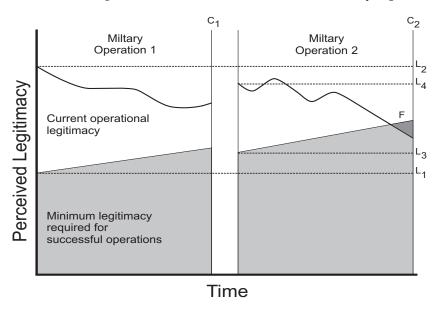7. Tucker and Hendrickson, Ibid., p. 18.

Operations are more likely to be considered legitimate if their causes and results are perceived to conform to domestic or international law and common standards of morality.

opinion groups that support or oppose our chosen course of action, and each group will provide spokespeople or information sources that in some way advance those opinions. A prerequisite to establishing the legitimacy of an operation in this environment is the availability of "friendly" spokespeople or information sources to key publics. Legitimacy will often depend on the extent to which media coverage—considered outlet by outlet, or as an aggregate of all media used by a given audience—favours friendly or hostile sources of information when reporting events.

- **Popular Consensus**. Beyond establishing a favourable balance of information sources in available media, legitimate military operations will promote public expressions of support from a wide variety of non-aligned sources: national leaders or their official spokespeople, international organisations, political or special interest groups, other opinion leaders like academics or clerics, or populations as a whole. As media coverage, desired organisational actions or public survey data indicate an increase in consensus, we can assess a corresponding growth in legitimacy; as opposition increases, legitimacy shrinks.

- **Moral Conduct**. Operations are more likely to be considered legitimate if their causes and results are perceived to conform to domestic or international law and common standards of morality. To the extent that basic human rights, innocent life, essential services and future economic potential are understood to be preserved in an area of operations—with unavoidable damage mitigated and rule-breakers punished—legitimacy will be sustained. Legitimacy will suffer where media coverage or public opinion does not demonstrate an awareness of such restraints on our use of force.

- **Effectiveness**. Even popular, morally justified military operations cannot continue indefinitely: there must be a public perception that those operations are progressing toward a more stable end state. As shown in Fig 1, the notional

Fig 1. Notional Relationship of Current Perceived
Operational Legitimacy to Minimum Required Legitimacy
Over Time During the Course of Two Consecutive Military Operations.

legitimacy required to successfully conduct military operations generally increases over time. A longer operation equates to more casualties, more questions about costs and objectives, and a greater desire to seek compromise on less favourable terms—all things that raise the bar for how much perceived legitimacy a chosen course of action must have in order to move forward. For similar reasons, the legitimacy that any operation enjoys will usually decrease over time, although it may receive occasional "bumps" from positive developments. These trends apply even if the operation enjoys favourable source balance, popular consensus and otherwise credible communications about moral ends and means throughout. In terms of effectiveness, the legitimate military operation is the one that is perceived as succeeding.

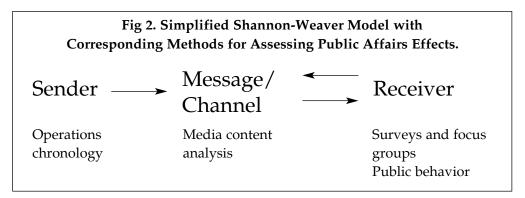## APPLYING LEGITIMACY TO EFFECTS-BASED OPERATIONS

Using Fig 1 as a conceptual model, the objective of PA activities throughout the course of an operation is two-fold. First, prior to the commencement of the

Table 1. Joint Force Air Component Commander (JFACC) Operational Objectives, With Sample Desired Effects and PA Tactics that Contribute to Achieving Those Effects.		
Operational Objective	**Desired Effect**	**PA Tactical Task**
Deter leadership of X from conducting military operations against Y	Demonstrate ability of friendly forces to rapidly and decisively destroy X's command and control (C2) network and fielded forces	Coordinate international media coverage of show of force exercises
Gain and maintain localised air superiority	Force X's surface-to-air missiles (SAMs) into autonomous mode	Conduct Press events for regional media on friendly suppression of enemy air defence (SEAD) capabilities/successes
Isolate X's leadership from fielded forces	Deter X's fielded forces from carrying out leadership orders	Incorporate theme of international cooperation enabling air operations (cooperation fuelled by consensus against X leadership actions/policies) into regional media events

operation, PA engages in credible, timely communication to help set conditions where the initial perceived legitimacy of a military course of action (L2 and L4 in Fig 1) is relatively high, and the minimum required legitimacy (L1 and L3) is relatively low. Then, over the course of the operation, PA works to keep current operational legitimacy above the minimum threshold until the operation reaches its decisive culmination point (C1 and C2). When operational legitimacy falls below the threshold before the culmination point, there can be a "legitimacy failure" (the shaded area F) with consequences leading to mission failure, such as overwhelming public resistance to continued use of military force and loss of political will.

Under an effects-based operations (EBO) approach, an air component's operational objective to "gain and maintain information superiority" could be

Fig 2. Simplified Shannon-Weaver Model with Corresponding Methods for Assessing Public Affairs Effects.

Sender ⟶ Message/Channel ⟶ Receiver

Operations chronology

Media content analysis

Surveys and focus groups
Public behavior

supported by the tactical task of "conducting public affairs operations" with the desired effect of "sustaining the legitimacy of operations among key media and publics." This is a somewhat rudimentary approach, however, that consigns PA to a dusty non-kinetic corner of commander concern, and, therefore, tends to marginalise legitimacy itself—which regardless of our attention, remains an essential precondition for almost any tactical action. A more useful approach might be to consider how perceived legitimacy may influence the human elements central to other operational objectives, aligning the appropriate PA tasks under those objectives, as shown in Table 1. This approach has the added benefit of linking the emphases of PA operations to the weight of effort being given to various objectives at any point in time.

What is missing from Table 1, of course, are Measures of Effectiveness (MOEs). How do I know that seeing an F-16CJ do its work on a satellite news programme, rather than the physical destruction of a communications node, was the primary consideration in a SAM operator failing to turn on his radar? How do I know that a field unit commander finally refused orders because he heard us tell the truth about his boss on a radio programme?

In many ways, the challenges facing the assessment of PA effects is inseparable from the great challenge of implementing EBO in joint operations: when examining a system with many inputs, outputs and internal complexities, it's hard to establish clear cause and effect, even from something as straightforward as a smoking hole in the ground. But a method to measure both relative legitimacy and PA effects is possible, and those measurements, when

provided, could be used to make useful decisions about how, what and when you communicate in support of operational objectives.

A conceptual framework for assessing PA effects is shown in Fig 2. The approach is derived from the Shannon-Weaver transmission model of communications,[8] identifying three essential components of any exchange of information: the "sender," the "message" or "channel," and the "receiver."

Sender Assessment. Although the typical PA message "sender" would be individual reporters or others producing news or opinion messages, surveying these senders for variables that may affect messages—such as attitudes toward various groups involved in, or affected by, military operations, defining individual conceptions of newsworthiness, etc.—is a risky task to implement during a crisis, since the time involved or reactions to the surveys themselves could be detrimental to good media relations. While PA professionals can often provide qualitative insight to media attitudes and expectations through their daily work with reporters (participant observation method), we can simplify the model by assuming that the newsworthiness of significant operational events itself generates messages. This provides a second-order linkage of operational events to both message and receiver assessment, since event occurrence, media content and public opinions or behaviours can all be tracked over time.

When evaluating observed trends in messages and receivers along a chronology of significant events, it is important that event "significance" be defined from both a military and media perspective. To establish a good chronology, in other words, we need to include both those events the military is trying to promote through Press releases, media events or command news services, and those events of clear significance to media agendas as demonstrated by increased media queries or news coverage. The chronology should also include the publication dates of public affairs guidance (PAG) or similar communication plans that direct specific communication efforts, in order to determine how effective that guidance is in shaping future trends.

Message/Channel Assessment. Analysing the content of PA messages or

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8. Claude E. Shannon and Warren Weaver, *A Mathematical Model of Communication* (University of Illinois Press, 1949).

channels—internal and external news products produced about a military operation—must be understood as more than what our military organisations currently do, which is assign or contract people to watch TV, read the newspaper, surf the Internet, and summarise the results.

First, the sample of messages must be collected systematically. If you want a purposive sample that describes just what the most influential media are saying, the selection of those media needs to be based on reliable, current data about media usage of the audiences in which you are interested, foreign as well as domestic. If you want data that can be generalised to what all media are saying, you need a statistically valid method such as cluster sampling, which can produce manageable random samples of content from the hundreds if not thousands of media outlets available to key audiences.

Second, you need a consistent approach to evaluating the quality of the message, a means of grading content or tone in a way that remains valid from day to day and evaluator to evaluator. The concept of legitimacy can help provide this consistency by establishing baseline criteria that apply to the military's specific interests in media content throughout the life of an operation. What do you want media coverage of a major combat operation to look like during the deployment phase? Generally, you want it to demonstrate an openness to friendly sources of information while communicating three broad themes: that the friendly cause is just and enjoys some degree of consensus, that friendly forces can be expected to apply force appropriately if called upon, and that the application of such force will be an effective solution to the crisis. Once combat starts, you want to see those same things reflected in the coverage, only in the present versus future tense. When the operation transitions to stabilisation, you are looking to sustain legitimacy on behalf of any continued force presence or future operations. By breaking down the components of legitimacy into a standard set of specific questions about media content or tone as shown in the example in Table 2, you can develop quantitative legitimacy "scores" for daily media coverage that apply to all phases of an operation.

Receiver Assessment. Since the chief value of legitimacy is that it finds expression in public behaviours that have real meaning for commanders,

Table 2. Legitimacy Components with Sample Questions and Likert-Scale Scores that Would Relate to their Assessment Through Media Content Analysis.		
Legitimacy Component	Sample Question	Likert Scale Score
Source Balance	How would you characterise the view or position of the first person quoted in the story toward friendly military operations? Enemy operations?	1 = entirely hostile 2 = mostly hostile 3 = neutral 4 = mostly friendly 5 = entirely friendly 9 = cannot assess
Popular Consensus	Does the item quote or reference a spokesperson for an international NGO? If so, how would you characterise the view or position of that individual toward friendly operations?	1 = entirely hostile 2 = mostly hostile 3 = neutral 4 = mostly friendly 5 = entirely friendly 9 = cannot assess
Moral Conduct	How does the item characterise the impact friendly operations have had on the availability of basic goods and services (water, food, electricity) to civilians in the area of operations?	1 = entirely negative impact 2 = mostly negative impact 3 = neither negative nor positive impact 4 = mostly positive impact 5 = entirely positive impact 9 = item does not discuss
Effectiveness	How does the item characterise the frequency of successful insurgent attacks against friendly personnel?	1 = attacks are constant 2 = attacks are frequent 3 = attacks are neither frequent nor infrequent 4 = attacks are infrequent 5 = attacks never occur 9 = item does not discuss

ultimately communication research that seeks to assess legitimacy must approach defining the impact of key publics on military operations. In some cases, it may be possible to develop a finite list of observable public behaviours—the granting of sufficient basing or overflight rights, no impact of public demonstrations on flight operations, sufficient contributions of allied forces, etc.—that define minimum public legitimacy requirements for a commander. In other cases, it may be appropriate to assess where public opinion trends about an operation are heading as a predictor of behaviour. Among other benefits, such assessment helps us trace the first-order linkage between messages and receivers: determining what media messages may influence the way people see or understand a situation, how those perceptions shape opinions and behaviours, and how opinions and behaviours may in turn influence future media coverage. Surveys focussing on public perceptions of legitimacy, therefore, help close the loop on assessment of media support activities aimed at fostering legitimacy.

There are inherent problems in assessing public opinion about military operations in general and during a conflict in particular.

There are, of course, inherent problems in assessing public opinion about military operations in general and during a conflict in particular. Two key military publics—political opinion leaders and enemy leadership—won't submit to surveys and usually aren't forthcoming about the true motivations for their actions. Additionally, the pace of modern military operations can outstrip an organisation's ability to conduct statistically valid surveys, even when the survey teams have relatively safe, unrestricted access to key populations. For example, the major military operations associated with the Coalition's push to Baghdad and the fall of Saddam Hussein's regime in 2003 took less time than survey teams working for the Coalition Provisional Authority (CPA) subsequently required to develop, collect and publish surveys from sample populations in six major Iraqi cities.[9]

Nevertheless, quantitative or qualitative public opinion research is within the grasp of military planners with the proper training, funding and inter-agency

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9. Based on author's own experience in developing and reviewing this public survey data.

support. Even in the developing world, even in periods of conflict, such research is widespread, and the military can mine these studies for applicable data or, better yet, work with the various public or private agencies conducting them to include questions of specific relevance to military operations. We can also fund our own opinion research.

Although time and access constraints may only give you the ability to collect "before" and "after" information about the legitimacy effects of combat operations on public opinion, this may be enough. Armed with solid data on where key publics currently stand with respect to various legitimacy concerns, PA planners can build a communications strategy and messages designed to sustain an operation's legitimacy, and use daily media content analysis as an interim predictor of opinion trends until they have better information to shape communication efforts in the stability phase.

While such assessment methods may never allow PA to claim an influence effect as specific as convincing a particular field unit to surrender, these methods can certainly assess whether the public messages available to those units and popular opinion in the region would reinforce a decision to surrender if the unit was so inclined. In this scenario, if you have an operations analysis brief with a "stoplight" next to the PA task supporting an objective to isolate leadership from fielded forces, you can get enough information to reliably colour that circle red, amber or green. You are not so much measuring a direct cause-and-effect relationship as you are measuring how hospitable the information environment is to current or projected operations. As Air Force Lt. Gen. Ronald Keys put it in an address to combat commanders in 2002, "engaged forces win the fight," but PA and other command advisors "keep you in the fight."[10]

IMPLICATIONS OF LEGITIMACY FOR PUBLIC AFFAIRS

Viewing PA first and foremost as a means to gain and maintain operational legitimacy—rather than a tool for institutional credibility—has several far-reaching implications for the way the air force organises, trains and equips PA

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10. Lt Gen Ronald E. Keys, "The Waging of Two Wars: Asymmetrical Threats and the Fight for Legitimacy," June 2002, PowerPoint presentation, slide 7. The concept of legitimacy as the defining strategic focus of PA activities has been adapted from this presentation.

forces, and how we plan and execute both PA and IO operations jointly. Five of the major opportunities and challenges associated with being able to deliver legitimacy through PA operations are briefly outlined below.
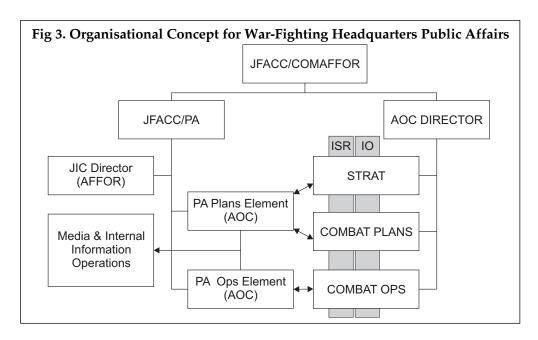
1. **Professional, Standardised PA Assessment**. To apply legitimacy to EBO as discussed above, the PA community requires more robust methodologies, language expertise, training and data tools to enable planners to conduct or mine public opinion surveys and media content analyses before, during and after military operations. Investment in such assessment capabilities will help us successfully negotiate a complex international environment during major military operations, but a professional, standardised PA approach to research can pay greater dividends for the air force. Since legitimacy underlies the health of our recruiting, training and acquisition programmes domestically, and our ability to project power internationally, effective analysis of legitimacy factors in media content and public opinion has enduring value to commanders in steady state as well as crisis.

2. **Defining the Right Relationship with IO**. An article forthcoming in *Air & Space Power Journal* offers some more detailed thoughts on creating a relationship for PA and IO that navigates the myths accumulating around the debate, but for now suffice it to say that the two disciplines only occasionally share legitimacy as a deliverable. IO is not centrally concerned with legitimacy because (1) non-influence capabilities like electronic warfare (EW) or computer network defence (CND) typically have only tangential effects on legitimacy; and (2) influence capabilities other than PA are best aimed at enemy audiences living beyond the frontiers of consensus. Legitimacy-building activities such as PA and public diplomacy, on the other hand, work entirely within the borders of consensus.

3. Therefore, when it comes to gaining and maintaining legitimacy, PA planning and execution must be deconflicted with—and, in some cases, override—IO planning and execution, particularly for influence operations using methods of dissemination that are available to the general public in an area of operations. This implies a close coordinating relationship between PA and IO, but coordination that recognises each as co-equals for commanders making

decisions about the conduct of the information war. Refocussing the PA-IO relationship on the legitimacy issue may, in fact, help free the debate from critics' foregone conclusion that any relationship with IO irreparably damages PA's credibility. If critics are patiently educated that PA is the "legitimacy czar" in its relationship with IO, they may eventually understand that coordination favours what they seek: that short-term gains sought through one-sided influence operations on broader audiences are more often than not limited in the interest of building long-term, sustainable public legitimacy through open forums.

4. **Establishing the Right Presence Inside and Outside the AOC**. Defining the right relationship between PA and IO, or between PA and other capabilities that are centrally planned and controlled at the operational level, is complicated by the way the air force currently organises, trains and mans PA positions in its war-fighting Air and Space Operations Centre (AOC) and Air Force Forces (AFFOR) staffs. Within the AOC, the training required to operate as an effective member of the weapon system is restricted to sparsely manned junior PA authorisations assigned to Information Warfare Flights (IWFs), and the remainder of PA is viewed as a function separate from the AOC—perhaps even geographically separated from it—on an AFFOR staff. What this organisational concept fails to recognise is that what should or must take place inside the AOC, in terms of information planning and collection, is inextricably tied to the external communication and coordination activities of the "AFFOR" PA staff in a way in which both need to take direction from the individual responsible for those communication activities: the commander's senior PA officer (PAO).[11] The PAO is, therefore, not much different from the staff judge advocate (SJA), who is the single legal advisor to the commander but provides legal support through a network of trained lawyers and paralegals dispersed to specialised positions throughout the AFFOR and AOC.

A better organisational model for PA—and one which is increasingly adopted

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11. This seems to be the current view of joint doctrine: see JP 3-61, chapter III, paragraph 4: "PAOs should work directly for the commander and all supporting PA activities should be organised under the PAO."

Fig 3. Organisational Concept for War-Fighting Headquarters Public Affairs

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                        ┌──────────────────┐
                        │  JFACC/COMAFFOR   │
                        └──────────────────┘
              ┌─────────────────┴────────────────────┐
       ┌─────────────┐                        ┌──────────────┐
       │  JFACC/PA   │                        │ AOC DIRECTOR │
       └─────────────┘                        └──────────────┘
                                        ┌───┬───┐
                                        │ISR│ IO│
   ┌──────────────┐                   ┌─┴───┴───┴──┐
   │ JIC Director │                   │   STRAT    │
   │  (AFFOR)     │                   └────────────┘
   └──────────────┘    ┌───────────────┐
                       │ PA Plans      │  ┌────────────────┐
                       │ Element (AOC) │  │ COMBAT PLANS   │
   ┌──────────────┐    └───────────────┘  └────────────────┘
   │ Media &      │
   │ Internal     │    ┌───────────────┐  ┌────────────────┐
   │ Information  │    │ PA Ops        │  │ COMBAT OPS     │
   │ Operations   │    │ Element (AOC) │  └────────────────┘
   └──────────────┘    └───────────────┘
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in expeditionary practice if not in the current structure of our war-fighting organisations—is shown in Fig 3. Here, the PAO oversees an "AFFOR"-type function external to the AOC that feeds a Joint Force Commander's (JFC's) Joint Information Bureau (JIB) or acts as a sub-JIB for the air component, providing media support and internal information products. At the same time, the PAO guides the efforts of PA planning and operations elements within the AOC which—like the Intelligence, Surveillance and Reconnaissance (ISR) Division, IO or other specialty teams—integrates planning and execution of operations through representatives within the AOC divisions. The PA plans element works to incorporate PA planning and assessment into the air tasking order (ATO) production cycle, while identifying the PA implications of the evolving air strategy and target sets to provide appropriate guidance to the JIB and PA operations element. The operations element works as part of a Combat Information Cell (CIC) or similar cross-functional group within the Combat Operations Division to: (1) identify emerging events that require a PA response; (2) collect and coordinate available information and imagery of that event within the AOC;

For the air force, the need for media access means that we must train PA airmen to conduct robust media support operations specifically tailored to the capabilities and limitations of air and space power.

and (3) provide that information to the external PA staff for additional coordination and release..

Such a model presupposes that PA and the larger operational community can reach certain compromises. On one hand, operators must be willing to accept a greater number of more senior PA players on their IWF and AOC teams, while recognising that those players must ultimately take direction from a senior PAO who is more connected to the media environment and worldwide network of professional communicators engaging it than either the AOC director or the IWF commander. On the other hand, PA must recognise that personnel assigned to support planning and operations functions within IWFs and AOCs will only be as effective as the training they have and the trusting relationships they build. This means placing a priority on building a robust PA capability that is ready to integrate with the IO and larger operational force: assigning some of our best people to war-fighting headquarters, AOCs and IWFs; ensuring they have the proper training and clearances coming in the door; and ensuring all PAs assigned to war-fighting headquarters have the steady-state time needed to plan, train, exercise and otherwise prepare to execute their wartime mission.

5. **Promote Broader Access to Military Operations at Every Level**. If the air force needs a better understanding of how PA plugs in to our evolving war-fighting headquarters construct, we also need a better strategy for employing traditional PA capabilities during conflict.

The recent history of PA approaches to media support has swung between providing centralised Press briefings at the strategic or operational level and relying more on direct ("embedded") reporting from tactical units. While many considerations go into such planning, at least one is what kind of communication military planners consider the most credible source of

information for reporters: the big picture or the "grunt's-eye" view.

Legitimacy—when defined as public awareness of the ethical conduct of effective operations—does not demand that military planners evaluate which modes of communication are desirable in terms of absolute accuracy, but instead presupposes that we need access at all levels to demonstrate how legitimate (ethical, effective) strategy equates to legitimate (ethical, effective) implementation of strategy. Viewed alternately as the need to ensure our facts and opinions receive the widest possible dissemination relative to competing facts and opinions (source balance), legitimacy in a 24-hour news cycle means putting forward as many different spokespeople at as many different places and times as we can. Either way, maximum openness becomes the rule to which we make exceptions at our peril.

Our own people have access most reporters only dream of, and the news-hungry global media market will accept the information products Service members can provide.

For the air force, the need for media access means that we must train PA airmen to conduct robust media support operations specifically tailored to the capabilities and limitations of air and space power at both the tactical and operational level, then man our Air and Space Expeditionary Force (AEF) requirements appropriately. It also means we must work with sister Services to put aside inter-Service competition for media coverage in favour of a comprehensive strategy for maximising media coverage of joint forces throughout the news cycle. Finally, promoting media access demands that we dedicate ourselves to the advance work of inculcating more supportive attitudes toward media access with tomorrow's expeditionary force leaders (through their professional development and education programmes) and our likely host nations (through steady-state engagement by our regional war-fighting headquarters). Our leaders and our friends understand why they need to risk life and treasure in support of military operations; we need to more aggressively address why they need to be willing to risk greater public access to our people, facilities and decision processes for the same

Legitimacy defines the real link between strategic national objectives in war and the operational and tactical communication activities that have direct impact on those objectives.

ends.

6. **Focus Internal Information on News Generation**. As we build legitimacy through media access, though, we must understand that traditional media response operations are a mostly reactive, defensive strategy. While a media response cell is nominally charged with producing news releases and otherwise pitching stories to media representatives, the name is fairly indicative of the end result when major operations commence and the media hordes descend: most effort goes toward fulfilling day-to-day requests established by competing media agendas. If we're content to leave media to their own devices in determining what information and images to collect, we should not be surprised when their efforts sometimes seem intent on degrading military legitimacy, since this can benefit their own legitimacy with audiences (we tell you things the US military won't) as well as their commercial survival (legitimacy is order and consensus, whereas chaos and conflict bring in the audiences).

One way we can promote more proactive communication and feed more legitimacy-based content to media during a conflict is to redirect the focus of military journalists, combat cameramen and the host of potential "content providers" on the modern battlefield—down to individual Service members keeping video diaries or Web logs—from command or internal information, as traditionally understood, to "news generation." Our own people have access most reporters only dream of, and the news-hungry global media market will accept the information products Service members can provide, especially if this information can be provided quickly and relatively uncensored. By organising our content providers to disseminate useful information with minimal layers of review—and by reducing the number of marginally effective, parochial command information products on which they too often squander their talent—they can still meet the communication needs of unit commanders while

providing a steady stream of information to media outlets that serve as legitimacy-builders for external and, increasingly, internal audiences.

The development of news generation networks happens in good PA operations, but almost always in an *ad hoc* fashion and almost never in a way where the inputs of all major players are consistently informed by a coherent strategic vision. With the exception of a few planned, high-profile missions, most content providers simply do what they think is best within the context of their immediate tactical environment. The stars sometimes align, but they would align more often if the content providers and the commanders responsible for them received regular centralised guidance about the themes, messages, content and specific audiences that could best support an evolving information strategy aimed at gaining and maintain legitimacy.[12]

Our core operational capabilities cannot expect to thrive unless the air force devotes serious attention and resources to the doctrine, training, planning, execution and analysis of what remains our primary "information" operation, public affairs.

CONCLUSION

Legitimacy defines the real link between strategic national objectives in war and the operational and tactical communication activities that have a direct impact on those objectives. At the strategic level, for example, America's leaders seek legitimacy in part by building consensus among other national leaders for the legal and moral necessity of military action. While such considerations may be above the pay grade of spokespeople farther down the chain of command, operational-level communicators can help that national effort by discussing how military objectives may be effectively achieved with reasonable restraints on the

12. One preliminary attempt at directing news generation during Operation Iraqi Freedom was the use of a "Communication Tasking Order" (CTO) by expeditionary air force units in Europe. The CTO was sent from the deputy COMAFFOR to unit commanders and PA staffs and provided general and specified tasks for PA, including the type of content desired for internal information products.

use of force. This message is in turn reinforced by tactical-level communication about such things as unit discipline, professionalism and precision targeting capabilities. Credibility, along with timeliness and accuracy, describes the desired quality of public communication up and down the chain, but legitimacy best defines the themes and purpose of that public communication in a conflict.

If air force leaders understand that *communicating* legitimacy is a necessary step in *possessing* the legitimacy required to fight and win, our leaders must take action now to better organise, train and equip PA forces to deliver the goods. Our operational capabilities are like vital organs in the body, each functioning differently but working in unison to keep us alive. PA is best understood as our operational skin: the organ that determines how we look to the outside world, perceiving changes in the environment in which the body does its work and affording the other organs some degree of protection from those changes. Like internal organs exposed to the elements, our core operational capabilities cannot expect to thrive unless the air force devotes serious attention and resources to the doctrine, training, planning, execution and analysis of what remains our primary "information" operation, public affairs.

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