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ISSN 0970-2512 Jul-Sep 2015 Vol. 30 (3)

INDIAN DEFENCE REVIEW

Editor : Lt Gen JS Bajwa

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ISSN 0970-2512
Jul-Sep 2015, Vol. 30 (3)

INDIAN DEFENCE REVIEW
FOREMOST SINCE 1986

Cover Photograph:
Multi Calibre Individual Weapon System
5.56 x 30 mm JVPC

iDR
INDIAN DEFENCE REVIEW

in print every january, april, july and october from new delhi

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DAILY ONLINE FROM NEW DELHI www.indiandefencereview.com

Contributors may please send their articles, not exceeding 3500 words, in a disk with a hard copy, with suitable illustrations to Editor, Indian Defence Review.

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Publisher: Anuradha Verma, Indian Defence Review, Lancer Publishers & Distributors, New Delhi.

Advertising: For information and rates, please contact Manav Randhawa, Director of Marketing or the Publisher.

How to reach us: Indian Defence Review, 2/42 (B) Sarvapriya Vihar, New Delhi-110016.
+91 11 41759461, 26854691 • Telefax +91 11 26960404 • idr@indiandefencereview.com • www.indiandefencereview.com
Printed at Sona Printers Pvt. Ltd., New Delhi.

Price: Rs 350

INDO-PAK WAR 1965

Are Commemorations Due?

"*We live in a wondrous time, in which the strong is weak because of his scruples and the weak grows strong because of his audacity.*" **—German Chancellor, Otto von Bismarck.**

Fifty years ago, Pakistan muddied the waters by initiating a spate of belligerent actions in the area of Rann of Kutch that led to a war between India and Pakistan on the former's Western borders. India claims it was the victor. Equally vociferous is Pakistan's claim to victory. Neutral military historians grade it as a 'stalemate'. How is victory measured – by the political objectives achieved, or territory captured or by equipment and wherewithal destroyed and captured or by tactical and operational level military victory? One needs to dispassionately analyse these to come to a conclusion.

Ever since Partition, even though Jammu and Kashmir was the main bone of contention, other border disputes existed. Early in 1965, Pakistan began by trying to resolve one of these in the Rann of Kutch. During Partition, Pakistan contested the alignment of the Southern boundary of its province of Sindh with the Northern alignment of the boundary of Kutch – two princely states prior to Independence. The contest first arose in 1956 which ended with India regaining control over the disputed area. This area is inhospitable, a salty lowland, rich in natural gas.

Pakistan's border patrols began foraying into territory controlled by India in January 1965 which was followed by attacks by both countries on each other's posts on April 08, 1965. Initially, these operations were conducted by the Border Police of both nations but soon escalated to intermittent skirmishes between the armed forces. In June 1965, the British Prime Minister Harold Wilson successfully persuaded both countries to end hostilities and set up an international tribunal under the aegis of the UN to resolve the dispute. A verdict was reached in 1968, much after the war, which gave Pakistan ten per cent (910 sq. km.) of its claim and 90 per cent (8,190 sq. km.) awarded to India.

...a limited war to wrest Kashmir was likely to bear fruit before India had completed full augmentation of its forces in the wake of the 1962 debacle.

Why did Pakistan initiate action in Kutch? India had suffered a major rout at the hands of the Chinese in November 1962. Consequently, there was a substantial augmentation of the armed forces undertaken in a phased manner. Increase in manpower is only one aspect; the induction of equipment, individual training, battle inoculation and collective training at formation level are essential prerequisites to formulate battle drills and procedures. These are time consuming very deliberate and necessary actions. Creating a suitable logistics infrastructure to support forward deployment and sustain forces in event of war are essential preparations in peacetime.

Pakistan wanted to exploit this vulnerability of the Indian armed forces then. It felt that a limited war to wrest Kashmir was likely to bear fruit before India had completed full augmentation of its forces in the wake of the 1962 debacle. Pakistan had a well-rested, well-armed military and saw an opportunity to take Kashmir. For India, the Kutch operation was a wrong war with the right enemy at the wrong place. For Pakistan, it was a victorious war with wrong lessons – that it could win a cakewalk in Kashmir. This false sense of victory wetted Pakistan's appetite for Kashmir and perhaps enabled it to firm its decision to wage the war.

Prior to 1962, the US had attempted to maintain a regional balance of power, which meant not allowing India to influence political developments in the other neighbouring states. In 1950, Pakistan's first Prime Minister Liaquat Ali Khan famously turned down an invitation to visit Moscow, choosing to visit the US instead. However, after the India-China War, the US and UK came forward to provide infantry weapons and miscellaneous military equipment to India. US - Pak relations were consistently positive since the US looked at Pakistan as an example of a moderate Muslim state and appreciated its assistance in holding the line against communist expansion.

Joining the South East Asia Treaty Organisation (SEATO) in 1954, and the Baghdad Pact, later known as Central Treaty Organisation (CENTO), in 1955, Pakistan consolidated its status to receive arms from the US that viewed Pakistan as a Cold War ally. Between 1953 and 1961, US military aid worth $503 million flowed into Pakistan. Under this false guise, Pakistan received massive modern war-waging offensive weapons, aircraft and equipment which it would use against India and not against any communists as given to understand; the chief communist, China, was now in collusion against a common enemy - India. As a result, Pakistani armed forces had a qualitative edge in air power and armour over India which it sought to utilise before India completed its build-up. Seeing this equation India had turned to Soviet Union for assistance, now that Soviet-Chinese relations had soured. The Soviet aid came to be more substantive in terms of aircraft, armour and artillery than what the US and UK provided. This move by India placed strains on the India-US relations. It also put a question mark on India's policy of Non-Alignment.

Pakistan's designs to grab Kashmir were galvanised by the Hazratbal incident of December 1963.

Pakistan's designs to grab Kashmir were galvanised by the Hazratbal incident of December 1963. There was a massive uprising as also the intense Islamic fervour among the Muslims in the Valley on the disappearance of the holy relic from the shrine. Such a tumultuous situation in the Valley was ideal for a revolt. Operation Gibraltar was ripe for launch. It was designed to use covert methods to induct a large band of armed irregulars into Jammu and Kashmir (J&K) and was expected to provide impetus to the anti-India sentiment and to sustain a campaign with the threat of an all-out war thereby to force a resolution on the issue of J&K.

While the original plan was prepared in the 1950s, the opportunity as perceived by Pakistan that came up after 1963 seemed appropriate to exploit. It was a plan backed by the then Foreign Minister Zulfiqur Ali Bhutto and others. The aim was an "attack by infiltration" launched by Paratroopers of the 50 Parachute Brigade of the Pakistani Army and specially trained irregular force of some 40,000 mujahideen – highly motivated and well armed. It was reasoned that the conflict could be confined to J&K. In the words of retired Pakistani General Aktar Hussain Malik, the aims were, "to defreeze the Kashmir problem, weaken India's resolve and bring India to the conference table without provoking a general war." Consequently, the ground work for intelligence gathering for the final execution was initiated under Operation Nusrat. Gaps in the deployment along the Cease Fire Line (CFL) were identified, actions taken to gauge the response of the Indian Army and local population.

Despite the initial reservations of President Ayub Khan, the Operation was set in motion. In the first week of August 1965, ten Forces (all named after significant Muslim rulers) were launched under the codename Operation Gibraltar – named after the place where the eighth century Umayyad conquest of Hispania was launched from. This Force was to cross the CFL and foment trouble in the Valley, Naushera-Rajouri-Poonch and Kargil. The Operation saw a quick demise due to poor coordination, poor execution and flawed presumption of an uprising by the local population. Undeterred, on September 01, 1965, the Pakistani army launched an armoured offensive across the CFL along the River Chenab directed at the capture Akhnoor and thereby isolate the Naushera-Rajouri-Poonch Sector. The United Nations Security Council intervened on September 04, 1965, calling for a ceasefire but Pakistan continued with its offensive. Although India was caught unawares, it reacted speedily and thwarted the offensive.

The launching of Operation Grand Slam towards Akhnoor was literally 'the last straw on the camel's back'. The Indian leadership would not bear it anymore and Shastri is said to have murmured to himself with a quiet determination, "Ab to kuchchh karna hi hoga." On September 06, President Ayub Khan declared, "We are at war with India. India has dared to go to war with a people whose hearts are filled with the message of Kalama of Quran that says that there is no one like Prophet Mohammed: the Prophet of Allah. We will never tolerate such attacks. Our army has been sent to the border and you must be ready and form the second line of defence." Distorting truth had evolved into a fine art in Pakistan. In earlier rumblings Ayub Khan had boastfully stated, "Hindu morale will not stand more than a couple of hard blows at the right time and place." He was to bitterly swallow those words.

India's riposte was directed at Pakistan's principal city of Lahore opposite Amritsar across the International Boundary, thus expanding the scope of the war which Pakistan initiated as a limited one in J&K. This offensive would also drive a wedge between the Pakistani forces deployed in Lahore and Sialkot. The offensive blunted the Pakistani armour thrust in Khem Karan, had successes in Dograi and Barki but failed to capture Pakistani territory up to Ichhogil Canal as planned. The operations in the Jammu-Sialkot sector captured about 500 sq. km. of Pakistani territory and took a heavy toll of Pakistani armour but it did not achieve the stated war aim to destroy the Pakistani war machine.

Pakistani operations in J&K which were aimed to wrest Kashmir from the clutches of India failed miserably. It was the locals who gave away the locations of the infiltrators, there was no insurrection as was trumpeted, and the offensive in Chambb was halted in its tracks as the Indian forces were poised to cut them off by the offensive from Jammu. Pakistan had to recoil its forces that had ingressed beyond Chambb towards Akhnoor to save Sialkot.

The Indo-Pak War of 1965 was essentially a limited war as East Pakistan remained uninvolved in

any ground operations. At that time there was only one Pakistani infantry division in East Pakistan. It is claimed by some that the Army Chief, General J.N Chaudhuri, who was also the Chairman Chiefs of Staff Committee, did not inform the Air Chief, Air Chief Marshal Arjan Singh of the ground operations. This is not possibly true as records in Defence Minister Y.B Chavan's diary dated September 07, 1965 indicate, "I told the CAS to hold his hand in East Pakistan. We do not want any wasteful escalation there."

It is evident that there was adequate interaction between the three Chiefs and the Defence Minister. Due to the limited resources available with the Indian Air Force (IAF) and given the superiority of the aircraft with Pakistan, the IAF could only spare limited effort in support of ground operations. It is surprising that despite the reasonably prolonged Kutch affair and subsequent unfolding of the infiltration in J&K inter-service planning and preparation for possible contingencies was not undertaken. The IAF appeared on the scene only on September 01. Also, even as the Defence Minister cautioned not to activate the Eastern front, the same day the IAF raided the Chittagong and Dacca airfields.

...some Indonesian leaders had even begun calling the Indian Ocean, the Indonesian Ocean.

The misunderstanding proved costly as in retaliation the Pakistani Air Force destroyed many aircraft on the ground at Kalaikunda, Bagdogra and Kolkata airfields. Airfields at Agartala and Barrackpore too were targeted. As regards the Indian Navy (IN), during the Kutch skirmishes, INS Vikrant had been moved to the Saurashtra Coast and this had a sobering effect on Pakistan.

After the Kutch operations, the Western Fleet sailed to the Bay of Bengal as per the existing SOP for relocating the fleet during monsoons. However, to give it a strategic facade it has been recorded that "keeping in view the political developments in the region, the Fleet was despatched there." It may be true that some Indonesian leaders had even begun calling the Indian Ocean, the Indonesian Ocean. The Indonesian Naval Chief made statements that the Andaman and Nicobar archipelago was a natural extension of Sumatra. Indonesian President Sukarno stated that an attack on Pakistan was like an attack on Indonesia and offered to provide whatever was needed by Pakistan. He despatched a submarine and missile boats to assist Pakistan and began to patrol around the islands. However, these developments notwithstanding, on persistent pleading by the Western Fleet Commander, Rear Admiral Samson, the Fleet was given orders to return to the West Coast.

Defence Minister Y.B Chavan summed up the IN's contribution as, "I greatly appreciated the silent but efficient role which the Navy played in defence of the country. The IN protected islands, which were vital to our security, guarded our ports and the long coast-line.....and achieved all that the Government desired of it within bounds and compass allotted to it." Should India have opened a front of the Eastern flank too? It was a decision that required immense strategic foresight and strong political will. Bangladesh could have been an independent country in September 1965!

In the final balance, the outcome of a war should be whether the political aim set was achieved. Pakistan started the war with the explicit aim to wrest J&K from India by force. In that it failed miserably. Minor tactical gains and territorial gains are not sufficient to claim victory. Since India was in a reactive mode in a war that was thrust upon it, denying the belligerent achieving any of his stated objectives was, therefore, a victory by all accounts.

Physical casualties, tanks destroyed or captured, artillery pieces destroyed, enemy posts captured and counter-attacks launched, aircraft shot down or destroyed on ground, ships sunk or square kilometres of territory captured will merely be "accounting for" figures if the political objective remains out of the grasp. In the aftermath of the war the situation was back to square one.

There are lessons to be learnt relevant even now. We need to debate these issues:

Though India proclaimed Non-Alignment as its strategic stance, it was compelled to seek the

assistance of US, UK and USSR for weapons and equipment. Is India shy of an alliance? In a power equation alliances give a boost to national power.

In a reactive scenario with a nuclear backdrop what are realistic political objectives?

In a limited regional war scenario, which will predominantly be a ground war, to achieve any political objective is a CDS the panacea that remedies all? The fact is that the IN and the IAF in any sub-continental context will be subordinate to the Indian Army.

Who will decide military objectives which will enable the defence forces to achieve the stated political aim – the Defence Minister or the Chairman Chiefs of Staff or the Army Chief or a most ridiculous option the Defence Secratary?

Who plans the campaigns of the war commensurate to the military aim and allocation of resources for its execution?

As per the Government of India (Allocation of Business) Rules 1961, the defence of the country entrusted to the Defence Secretary. In the Ministry of External Affairs, the Secretary is a professional diplomat who has risen in the stream and experienced the nuances of diplomacy to thus render professional advice and direction to the Minister. How can the Defence Secretary be expected to do justice the requirement placed on him when he is only serving in the MoD for a limited duration with no background on affairs of military security and strategy?

Is India shy of an alliance? In a power equation alliances give a boost to national power.

After the Kutch incident, how is it that the situation was misread and Pakistani action in J&K not anticipated? 1962, 1965 and 1999 were operations when India was taken by surprise. This seems to be a recurring pattern.

Despite the induction of more lethal weapons and technology, there has been no change in the organisation structures of the Army. Are we only replacing old weapons and equipment with new and continuing to prepare to fight as in the last war?

Rigid tactical doctrines continue to be applicable. Manoeuvre and fire and move (skirmish order) are only given lip service. Young Platoon/Troop and Company/Squadron Commanders feel more comfortable in dwelling on the 'higher direction of war' rather than grapple with the myriad imponderables of leading sub-units in tactical combat situations.

The US put pressure on forcing Pakistan not to initiate any action in J&K in 1962. China's collusive support to Pakistan existed in 1965, 1971 and in a subtle way, in 1999 as well. It is a reality that will have to be factored in. A two front war in the classical sense may not be on the cards but strategic redeployment of forces will surely be curtailed.

Pakistan had employed irregulars in its war with India in 1947, 1965 and 1999. Now it is mass producing more sophisticated well armed and trained 'mujahedeen'. India has to prepare for a complicated hybrid war contingency in any future conflict with Pakistan. For this, there must be synergy between the CAPFs and the Armed Forces. Who will coordinate this planning, preparation and equipping of these forces that fall under MHA and MoD??

B.H Liddell Hart observed that – "Non-aggressive states were likely to fight to extremes compared to aggressive nations. The latter viewed war more or less as business and would back off if an opponent proved too strong. By contrast, the former, motivated by ideals, tend to press a conflict to the bitter end." This ideal was so evident when the Indian Prime Minister said "Ab to kuchchh karna hi hoga."

LT GEN JS BAJWA

Indian Army's Multi-Calibre Individual Weapon System

Danvir Singh

Aping the philosophy of the West, the Indian Army wanted a rifle that would incapacitate a solider instead of killing him thus increasing the logistics burden for each soldier injured. However, as the Army started getting involved in Counter Insurgency especially in the North, the requirement for a gun with a higher kill capacity was felt. The infantrymen now prefer the famed AK-47 rifle over the INSAS.

Made in India vs Make in India

AMIDST MEDIA REPORTS OF THE Indian Army scraping the search for a multi-calibre assault rifle from foreign vendors, a team from the Indian Defence Review (IDR) visited the Armament Research Development Establishment (ARDE) at Pune recently. It was an exercise undertaken to understand the efforts made by Indian scientists in developing an indigenous assault rifle; a call unheard thus far. The Indian Army is conducting field trials on various assault rifles of foreign make at Northern Command. The world famous small arms manufacturers have entered the fray.

Going by newspaper reports, the top-of-the-line assault rifles such as Beretta's ARX-160 (Italy), Colt Combat Rifle (the US), CA 805 BREN (the Czech Republic) and Israel Weapon Industries (IWI) ACE1 model failed to make a mark owing to the unrealistic General Staff Qualitative Requirements (GSQR). However, these trials are still being conducted and no final outcome has emerged so far, a highly placed source at Army Headquarters informed IDR. The source negated earlier media reports that the army has scrapped its December 2011 tender to procure 66,000 multi-calibre assault rifles on June 15. Though the chances are high for abandoning this foreign dream, not for any other reasons hinting at a doctrinal shift but to save itself of the embarrassment caused due to the unrealistic expectations from its GSQRs, he added.

On the other side, braving all criticism of an inefficient INSAS rifle to its credit, unbelievably though, the ARDE has simultaneously developed a Multi-Calibre Individual Weapon System (MCIWS) as a technology demonstrator. The Indian Army, however, did not support this project and went ahead hunting in foreign lands for a dream assault rifle, thus ignoring the indigenous effort outright.

Danvir Singh,
Associate editor *Indian Defence Review.*

Multi-Calibre Individual Weapon System

MCIWS

5.56 x 30mm JVPC

Notwithstanding the fact that the hardy Indian Infantry soldier's torturous wait for a new-generation assault rifle may now get even longer; the movers and shakers remain unfazed, caught in bureaucratic tangles probably set up by the Army itself. India, under the new vigour for "Make in India" mission, may in all likelihood abandon its four-year-old hunt for new-generation assault rifles with inter-changeable barrels for conventional warfare and counter-insurgency operations. Will the Indian marvel in MCIWS see the light of the day? The trials will be followed keenly by the small arms manufacturers the world over.

The race for acquiring big-ticket weapons like fighters, helicopters, submarines, tanks, howitzers and the likes makes an assault rifle looks too small and may be unimportant as well. Advanced weaponry apart, infantry soldiers continue to be at risk without the basic modern bullet-proof jackets, webbing and lightweight ballistic helmets, terrain specific shoes and state-of-the-art field communication system - the fundamental right of a soldier.

In a country where the caste, creed and corruption form the backbone of our democratic system, the Indian Army cannot be kept isolated. No wonder, the 1.18-million strong Army's quest for 66,000 new rifles for its 382 Infantry battalions becomes a super lucrative deal (an estimated $3 billion to $4 billion) rendering indigenisation unattractive. It should come as no surprise if probed, that there are forces supported by the politico-bureaucratic-military nexus serving the designs of the arms mafia, who deliberately want this indigenous effort quashed. It may be surprising, but not really though, that our scientists can develop and launch a probe to Mars but fail to produce an assault rifle.

The 1.18-million strong Army's quest for 66,000 new rifles for its 382 Infantry battalions becomes a super lucrative deal...

Ongoing Field Trials

According to sources in Army Headquarters, during the ongoing field trials, the double-barrel rifles of foreign make on offer - with a 5.56 x 45 mm primary barrel for conventional warfare and a 7.62 x 39 mm secondary one for counter-terror operations - have thus far not been found robust enough for the military operations envisaged.

Evolution of an Assault rifle

To understand the importance of an assault rifle it is essential to recall the developmental and operational history of the assault rifle. Getting to the history of automatic rifles; the USSR by the early fifties began to arm her infantry with intermediate-cartridge weapons (automatic and semi-automatic carbines, as well as Light Machine Guns). Full-power rifle cartridges were kept mostly for platoon-level medium machine guns, as well as for sniper rifles.

The NATO and many other countries such as India went the "full-power" road with adoption of the 7.62 x 51 NATO round, developed in USA.

The key factor that allows moderns soldiers to be noticeably more effective in terms of hit probability is in fact sighting equipment...

Despite all stubborn efforts of the US Army to prove that its choice of new round was the right one, practice of the time proved that it was not the case. Full-automatic fire from newly designed 7.62 mm NATO rifles was ineffective to say the least and many countries like India (7.62 mm SLR) adopted the new rifles as semi-automatics. And in semi-automatic fire, the long-range potential of the 7.62 mm NATO round was basically lost due to limitations of the iron sights and the eye sight of a typical infantry soldier.

In parallel, a lot of research was done to find ways to improve effectiveness of infantry fire. Not surprisingly, this research pointed out what was already known by 1918 – the capabilities of the average soldier in a typical combat situation limit effective rifle fire to 300-400 metres maximum.

This old finding, along with the new concept of the "burst" firing to achieve "shotgun effect", in order to compensate for slight aiming errors resulted in a decision to decrease the calibre of the assault rifle from typical 7 mm – 8 mm down to about 5 mm – 6 mm or less. This decrease offered several advantages compared to standard calibre reduced power ammunition, including faster bullets with flatter short- to medium-range trajectories, decreased weight of ammunition and guns, and reduced recoil.

Several ambitious but largely unsuccessful programmes centred on sub-calibre flechette rounds, multi-bullet rounds, micro-calibre bullets (4 mm and below) and caseless ammunition. These were conducted in USA, Germany and elsewhere, but practical results were achieved only with conventional ammunition of .22" calibre (5.56 mm), developed in the USA during the late fifties in conjunction with the Armalite AR-15 / Colt M16 rifle.

This brought to life what could be called the third generation of assault rifles. Technically, these third generation weapons were automatic rifles or carbines firing reduced power, reduced calibre ammunition. Inspired by developments in USA, by the late seventies – early eighties this concept caught on both in the West and the East. NATO adopted an improved version of the American 5.56 mm cartridge as a next standard rifle ammunition in 1979 while the Soviet Army adopted its own version of the small-bore reduced power cartridge in the form of the 5.45 x 39 round in 1974 along with AK-74 rifle.

Today, forty or so years later, most armies of the world still use this "third generation" rifle ammunition (reduced power, reduced calibre) for standard infantry rifles and Light Machine Guns.

Basically, rifles designed in 2015 are not much different from rifles designed in 1964 or so, except for some more modern materials and finishes. And that's because they all fire the same ammunition. Limited success of the so-called bullpup configuration rifles also does not add much to overall combat capabilities of the rifle-armed soldiers, not to mention the fact that bullpup automatic rifles were designed and tested during the development and evolution of 1st and 2nd generations of individual automatic rifles.

Another modern trend is an attempt to bridge the gap between full-power, standard calibre and reduced-power (reduced calibre ammunition with introduction of some "more powerful than intermediate" rounds such as 6.5 Grendel or 6.8 Remington SPC). Indian scientists keeping pace with the latest trends; the ARDE, Pune has developed an indigenous 6.6 x 43 mm calibre round compatible to the best

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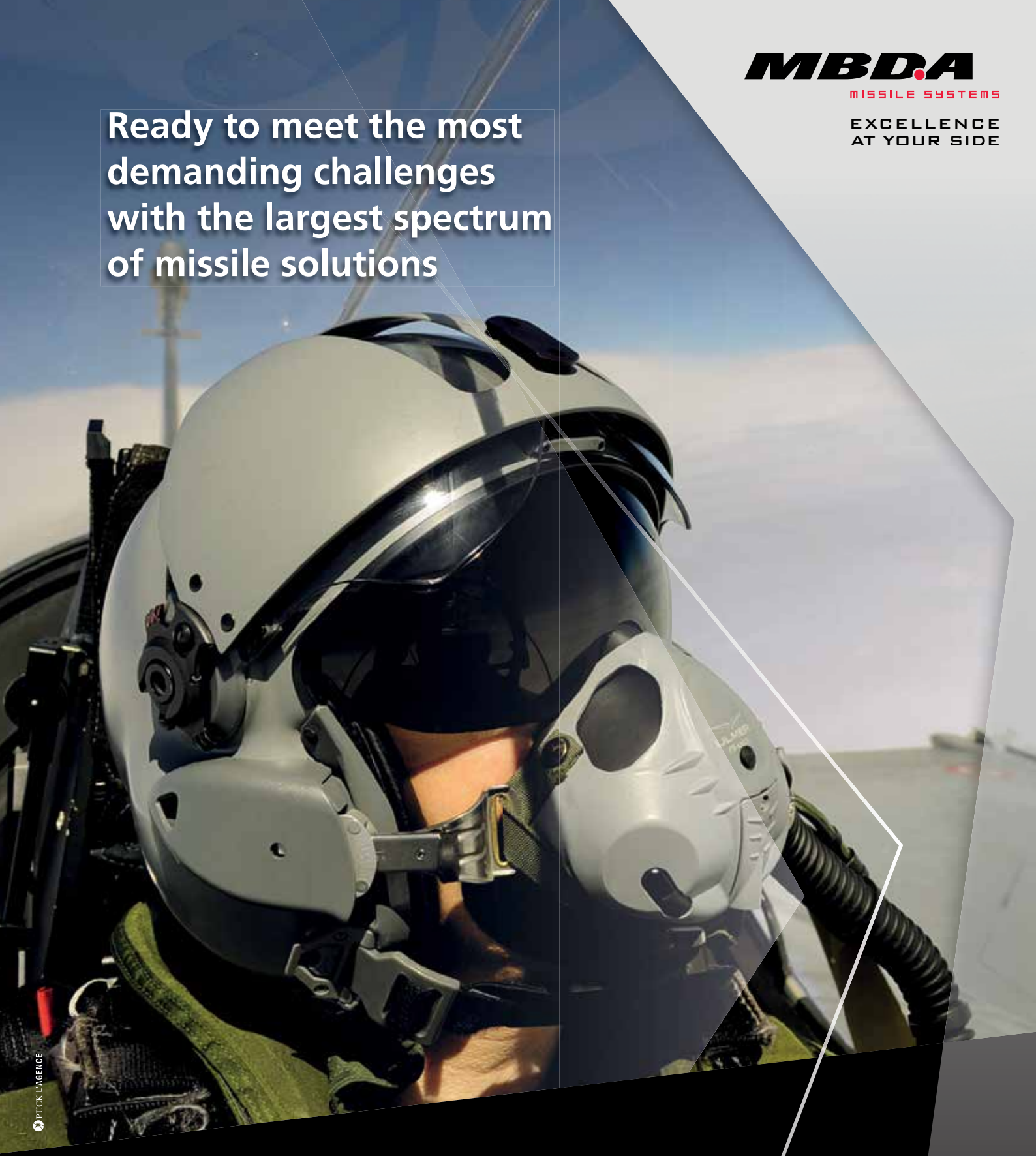

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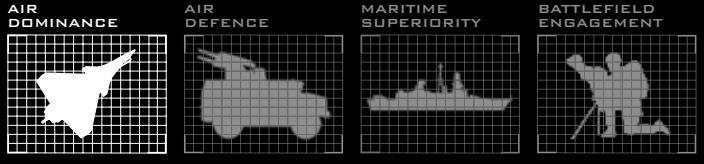

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UBGL with INSAS

in the world. These rounds are surprisingly close in basic ballistic properties to century-plus old warhorses such as 6.5 x 50 SR Arisaka, except that modern rounds have shorter and lighter cases (due to improvements in propellant chemistry) and bullets with better shape.

Therefore, in terms of overall performance any modern 6.5 mm – 6.8 mm "assault rifle" is not that far from 1916-vintage FedorovAvtomat, which fired 6.5 mm Arisaka ammunition. The most notable differences between modern and century-old guns would be materials, manufacturing techniques and overall reliability, especially in harsh and adverse environment conditions.

The key factor that allows moderns soldiers to be noticeably more effective in terms of hit probability is, in fact, not the rifle or ammunition but sighting equipment. Modern telescopic day and night sights greatly enhance shooter performance at medium and long distances, and red-dot sights bring short-range performance under dynamic conditions to a whole new level, compared to old-style iron sights.

However, in most cases, those sights are not unique to any given weapon, and in theory, anyone with access to a near-century-old weapon such as BAR 1918 or Fedorov 1916 could outfit it with modern sights with some minor adjustments. One interesting recent trend is a slow but noticeable return of the full-power automatic rifles firing 7.62 x 51 NATO ammunition. For some time, these rifles were issued mostly in semi-automatic, designated marksmen versions, with intent to increase reach of small infantry units armed with 5.56 mm weapons in desert or mountainous terrains. However, it appears that one such rifle per platoon is often not sufficient to fight enemies who are using distance, natural cover and modern body armour for protection against small arms fire.

Therefore, several companies worldwide now offer 7.62 mm automatic rifles which are intended for individual, rather than platoon support use. In May 2014, the Turkish army, the largest NATO military force in Europe, announced its adoption of the MKEK MPT-76 rifle, which appears to be a general issue, select-fire weapon based on the German HK 417.

Courtesy: www.wikipedia.org

1916 Vintage: Fedorov Avtomat

MKEK MPT-76

Technical Specification of MKEK MPT-76 Rifle	
Weight	4.1 kg (9.0 lb)
Length	920 mm (36 in)
Barrel length	410 mm (16 in)
Cartridge	7.62×51mm NATO & 5.56×45mm NATO
Action	Gas-operated rotating bolt
Rate of fire	650 rounds/min
Muzzle velocity	800 m/s (2,600 ft/s)
Effective firing range	600 m (660 yd)
Feed system	20-round detachable magazine
Sights	Iron sights or various optics

After the first prototypes were built in 2008 as the Mehmetçik-1 in 5.56 x 45 mm NATO, the rifle received negative feedback from Turkish soldiers testing it who reported that they preferred the 7.62 x 51 mm NATO round used in their G3 service rifles with far greater knock-down power and range. The proposed Mehmetcik-1 was cancelled after the first prototype and engineers started over again with a battle rifle design instead.

The first batch of 200 MPT-76s was delivered on May 18, 2014, and received positive feedback. The rifle was reported to be extremely accurate, reliable and had impressive knock-down power and outmatched the G3 in all categories. The Turkish Army plans to phase out its G3 throughout 2015 and to make the MPT-76 its main service rifle by the end of 2016. And it seems that the Turkish infantry can put up with decreased ammunition capacity in hopes of getting a more effective and far-reaching weapon. With these weapons, automatic fire is reserved for rare but still probable situations such as ambushes or CQB, and most shooting is to be made in deliberate, aimed semi-automatic fire.

Thus, it would be safe to say that the West is back to square one and the Indians have so wisely cancelled the tender for search of an imported Multi-Calibre Assault Rifle. As we have seen above, in terms of ballistics, those most modern weapons are very close to first-generation weapons dating back to WW I. However, rapid evolution of sighting equipment, with low-power telescope sights and red dot sights, and especially with emerging class of electronic sights with built-in ballistic computers and other digital sighting aids, helps to stretch the envelope of effective small arms fire beyond practical capabilities of intermediate-power ammunition.

When the INSAS rifle was initially designed, the Indian Army wanted rifles with a lower kill capability...

The battle winning and game changing ability has not changed when it comes to assault rifles right from the WW II days till recently in Afghanistan. In November 1942, the beleaguered German Army unit was surrounded and outnumbered by Red Army forces on the Russian front. The German Luftwaffe dropped the new and super-secret MKb42 machine carbines and equally new 7.92 x 33 mm Kurz ammunition to this vastly outnumbered German unit. The encircled German troops

Corner Firing Weapon

JVPC with Silencer

broke out of the tightening Russian noose to fight another day in great part to the tremendous and sudden increase in firepower provided by the revolutionary new German "assault rifle" and its intermediate rifle cartridge in its first appearance on the battlefield. Close combat would never be the same again.

Then, on July 13, 2008, during the Battle of Wanat in Afghanistan, Combat Outpost Kahler was manned by US troops. In this horrific infantry battle, nine US troops were killed with another twenty seven injured in what arguably was a failure of US small arms to keep up with Russian weapons designed decades earlier. Numerous M4 Carbines, M249 Squad Automatic Weapons and MK19 AGL's stopped firing as they overheated in the US Army troop's valiant attempt to repel the superior numbers of determined insurgent fighters armed with AK-47s and RPGs. No specific case study like the Battle of Wanat mentioned above could be quoted to suggest the inadequacies of our own Assault Rifle, the INSAS. However, it is important to mention that, in 1999, the Indian Army fought a three-month-long undeclared war with Pakistan over the dizzy heights of Kargil. It was also the combat debut of India's new INSAS assault rifle.

The battle winning and game changing ability has not changed when it comes to assault rifles right from the WW II days till recently in Afghanistan...

During the conflict waged over the control of heights strategically important to India for the defence of Leh — the INSAS rifles suffered with serious stoppages, and their cheap, 20-round plastic magazines cracked in the cold weather and often led to being a reason of choice between the life and death. Designed to shoot in semi-automatic and three-round burst modes, soldiers would pull the trigger and the gun would unexpectedly spray rounds like a fully automatic rifle. Soldiers also preferred the heavier 7.62 mm rounds in the FAL rifle which the INSAS and its 5.56 mm rounds replaced.

In 2005, Maoist rebels attacked a Nepalese army base. The Nepalese troops had INSAS rifles bought from India. During the ten-hour-long battle, the rifles overheated and stopped working. The Maoists overran the base and killed 43 soldiers. When the INSAS rifle was initially designed, the Indian Army wanted rifles with a lower kill capability. The 5.56 mm rifle was designed based on that demand. The INSAS is a family of infantry weapons consisting of an assault rifle, a Light Machine Gun and a carbine - all the same calibre. The first demand for a smaller calibre rifle came in 1982, when the army wanted to replace the 7.62 mm SLR that had been in use for over 30 years.

Aping the philosophy of the West, the Indian Army wanted a rifle that would incapacitate a solider instead of killing him thus increasing the logistics burden for each soldier injured. However, as the Army started getting involved in Counter Insurgency especially in the North, the requirement for a gun with a higher kill capacity was felt. The infantrymen now prefer the famed AK-47 rifle over the INSAS.

However, scientists from the Small Arms Division of the ARDE defended the INSAS claiming that the problems encountered during the Kargil War were manufacturing issues. They also agreed that the rifle is now outdated and upgrades are needed. The problems that came up during the Kargil War were quality related, and for that, the ordnance factory (manufacturing it) is responsible. However, the fact remains that the INSAS technology is now very old and upgradation is an urgent need, these scientists added.

A lot of water has flown under the bridge since the development of INSAS and today, the dedicated team of scientists have mastered the desired technology boasting that it is comparable to the best in the world. The Army has to overcome its phobia in this regard, the earlier, the better. Another DRDO scientist cited the lack of working in close collaboration as the reason for the shortcomings in the technology development and evolution.

"Between the time when we get a request and the time the product is ready after initial testing, the requirements change," informs a helpless scientist. "If the Army and the DRDO work together, and we are updated about the change in requirements, the product can be simultaneously upgraded," this senior scientist adds. Quoting an example he mentioned that India is now almost self-sufficient in radars because the Navy and the DRDO worked very closely on it.

Another ARDE official, meanwhile, informed that apart from MCIWS Assault Rifle, other weapons and weapons system are also being worked on including a Joint Venture Protective Carbine (JVPC). The user trials of which were recently conducted involved the German MP-7 and Belgium P-90, our JVPC fared better than the other two. Commenting upon the irrationality overshadowing the logic during trials, he cited the unnecessary non-critical tests responsible for delayed induction. He informed us that as per the GSQR laid down, this carbine was required to pass through 99.7 per cent reliability test. All the weapons (JVPC) tested were proved above 99 per cent reliable. However, six out of the lot were above 99.5 per cent thus largely bracketing them between 99.4 to 99.5 per cent reliable. All necessary changes are being incorporated to pass through the stringency of the tests. He said 50 JVPC will be provided to the Army for fresh trials in January 2016.

The top scientist looking after the development of the Small Arms informed us that the MCIWS Assault Rifle will be ready for trials by December 2015 - January 2016 for trials. Beaming with confidence they boasted of the mastery achieved over the metallurgy that will produce the world's one of the finest weapons in its class. The body of the MCIWS under development is made up of a single block of very high grade aluminium alloy. The rivet-less body makes the weapon more resilient to combat stress. The modular design makes the weapon unique and extremely soldier friendly. A soldier will be able to field strip MCIWS without any tool by just removing a pin.

The deadly looking weapon likely to become the basic weapon of an Infantryman has a multi calibre option between 5.56 x 45 mm, 6.8 x 43 mm and 7.62 x 39 mm...

The deadly looking weapon likely to become the basic weapon of an Infantryman has a multi calibre option between 5.56 x 45 mm, 6.8 x 43 mm and 7.62 x 39 mm. It is capable of firing different calibre ammunition by changing barrel group, breech block and the magazine while retaining 92 per cent of commonality of parts.

Latest improve version of INSAS

This affords the Army a choice between going in for a multi-calibre or a single calibre weapon as the case may be.

It is lightweight and modular in design having multiple picatinny rails for sighting system and foregrip. The already under production, indigenous 40 mm Under Barrel Grenade Launcher fitted with MCIWS makes it a very lethal combination. The air bursting grenade having a range of 500 m could work havoc on the enemy defiladed behind at those ranges.

The ineffectiveness of the INSAS rifle led to super imposition of the 7.62 mm AK-47 thus increasing the financial and logistical burden...

Having superior finish, it has a fully supported engineering plastic magazine with metallic insert and push type magazine release mechanism thus making it extremely strong and reliable plastic magazine unlike that of the 5.56 mm INSAS.

Other features that make this weapon system comparable to the best in the world are its ambidextrous features - cocking, change lever, magazine release. The MCIWS has a foldable butt with variable lengths, picatinny mounted universal iron sights, advance day and night sighting systems, automatic electronic graticule set for selected calibre and the earlier mentioned air burst capability.

Technical Specifications of MCIWS	
Calibre	5.56 x 45mm/6.8 x 43 mm/7.62 x 39mm
Automation	Gas Operated
Rate of Fire	600 – 650 rounds per minute
Mass with empty magazine	3.4 Kg
Mass with filled magazine	4.0 Kg
Length	910 mm
Effective range	500 m
Muzzle velocity	715 – 890 m/sec
Mode of Fire	Single and Automatic
Mechanical sights	Iron
Safety	Applied and Mechanical
Sighting System	CCD day sight, TI night sight, UBGL sight, LRF, DMC, FCS.

The MCIWS is a highly impressive weapon system. On July 13, 2015, a composite team comprising Director General of Para Military and representatives of various forces under the Additional Home Secretary visited ARDE. This weapon had impressed the visiting team and they are now willing to induct MCIWS for use by the BSF, CRPF, ITBP, CISF and the SSB as soon as possible. The strength of Indian paramilitary forces outnumber that of the Indian Army. This move could boost the sagging morale of the scientists whose tremendous efforts have constantly been overlooked thus far. And also, the MCIWS will give a huge impetus to those fighting the Naxal insurgency and may well prove to be a game changer.

No matter how confident these zealous scientists of ARDE, Pune are over their technological achievement in the form of MCIWS, the litmus test will be the field trials that lay ahead. It is to be seen, whether the Indian Army continues to follow the West blindly or professes a philosophy of its own. After all, our Army is one of the most combat experienced army in the world having been in combat since independence. Ironically, the responsibility of heavy costs incurred both financial and human in selecting the 5.56 mm as the calibre for the Infantry assault rifle is yet to be accounted for.

Prognosis

The ineffectiveness of the INSAS rifle led to super imposition of the 7.62 mm AK-47 thus increasing the financial and logistical burden. Our think-tanks need to debate and evolve a logical reason in confirmation with our environmental realities to go in for dual calibre as professed by the West. Or will a single calibre rifle suffice for our Infantry befitting our operational philosophy, budgetary considerations and logistic strain.

The MCIWS, if selected, will give us the option of three calibres (the Army can opt for single or dual calibre) to choose from. However, the other major advantage will lie in the technical support from the already established research and development institutions and manufacturing industry. A kind of back up no foreign vendor will ever be able to match.

GETTING MORE FROM LESS

Force Multipliers for the IAF

— Gp Capt Joseph Noronha —

Various devices or techniques to enhance or intensify military force have existed perhaps from the earliest period of human conflict but the term "force multipliers" has become popular in military circles only in the last few decades. According to Wikipedia, "Force multiplication, refers to an attribute or a combination of attributes which make a given force more effective than that same force would be without it." Hence a force multiplier is anything that substantially enhances the combat potential, impact and effectiveness of a given force. The commonly accepted force multipliers in the domain of air power include Airborne Warning and Control System (AWACS) and Airborne Early Warning and Control (AEW&C) aircraft, Flight Refuelling Aircraft (FRA), Precision Guided Munitions (PGM), Electronic Countermeasures (ECM), Unmanned Aerial Vehicles (UAV), stealth capability and military satellites.

THE COLD REALITY, THAT THE prospect of ever acquiring 42 combat squadrons is relentlessly receding, is beginning to dawn on the Indian Air Force (IAF). Although the target is formally scheduled to be achieved by 2022, this seems well-nigh impossible. Rather, a further drop from the existing 34 squadrons to 26 or lower is likely as older types, the Mikoyan MiG-21 variants and the MiG-27ML ground attack aircraft fleets retire from service over the next few years. Even the Sukhoi Su-30MKI twin-jet air superiority fighter, currently the backbone of the IAF's combat fleet, is plagued with poor serviceability and safety issues. At the same time, the air forces of China and Pakistan are growing and modernising. Despite bland official assurances, there are growing doubts over the IAF's ability to successfully carry out its core missions, leave alone prosecute a two-front war.

Of the planned acquisitions by the IAF, it will take at least a decade to induct the first operational squadron of Hindustan Aeronautics Limited (HAL) designed Tejas Mk II Light Combat Aircraft (LCA). The fifth-generation HAL Advanced Medium Combat Aircraft (AMCA) is much further into the future. Even the joint Indo-Russian project to produce the fifth-generation fighter Sukhoi/HAL Perspective Multi-role Fighter (PMF) is mired in endless wrangling and red tape.

On a more positive note, there is finally light at the end of the tunnel in the epic saga of the Medium Multi-Role Combat Aircraft (MMRCA). The proposed deal to acquire 36 Dassault Rafale jets off-the-shelf will hopefully bring these frontline fighters within two or three years and shore up the IAF's rapidly dwindling combat fleet. But this is merely a stopgap measure that will still leave a large deficit. Clearly, the IAF will be forced to make do with fewer combat

MiG-21

Group Capt Joseph Noronha, former MiG-21 pilot.

Dassault Rafale

aircraft for many years. And the best way to get the most out of what it has may be to acquire "force multipliers" in adequate numbers.

Multiplier Effect

Various devices or techniques to enhance or intensify military force have existed perhaps from the earliest period of human conflict but the term "force multipliers" has become popular in military circles only in the last few decades. According to Wikipedia, "Force multiplication, refers to an attribute or a combination of attributes which make a given force more effective than that same force would be without it." Hence a force multiplier is anything that substantially enhances the combat potential, impact and effectiveness of a given force. The commonly accepted force multipliers in the domain of air power include Airborne Warning and Control System (AWACS) and Airborne Early Warning and Control (AEW&C) aircraft, Flight Refuelling Aircraft (FRA), Precision Guided Munitions (PGM), Electronic Countermeasures (ECM), Unmanned Aerial Vehicles (UAV), stealth capability and military satellites.

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Although the IAF's quest for force multipliers is fairly old, it acquired added urgency when its potential opponents also began to deploy such devices. Further, the IAF doctrine of October 1995 gave renewed impetus to offensive operations in what had till then been a force characterised by a defensive mindset. Air defence was to be achieved through deterrence ("I carry a bigger stick than yours!"), as well as by upgrading the IAF's Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) capability and the entire air defence and communications network. The doctrine also placed emphasis on the induction and operational employment of force multipliers.

Awesome AWACS

In any contest to determine the most potent force multiplier, the AWACS would win hands down. It is a technology-packed aircraft that has radar, sensors and secure communications all rolled into one. Flying in the relative safety of friendly territory it can scan a vast volume of enemy airspace both for offensive and defensive operations. As the strike aircraft navigate towards their target the AWACS can provide target information and guidance to the strike pilots and target tracking to the weaponry. At the same time it can keep track of enemy aircraft that threaten to attack the strike force or friendly bases, right from the moment they get airborne and orchestrate the reaction of the defensive forces. It can thus function practically as an Air Defence Direction Centre (ADDC) and provide true area defence. Any nation that has this most coveted force multiplier will logically deploy it in every major military campaign.

The IAF too has enjoyed AWACS capability for over six years and it has swiftly become a mandatory component of air exercises and operations. It was on May 28, 2009, that the service inducted the first of three AWACS, consisting of the Israel Aerospace Industries' Phalcon system built around the ELTA ELW-2090 AESA radar mounted on a Russian IL-76 A-50 four-engine jet. The third AWACS was received in 2011. The Phalcon is an exceedingly capable system with an electronically steered phased array radar, IFF, C3I, ESM, data link, as well as SIGINT, COMINT and ELINT capability. Although the procurement of two more AWACS was cleared by the Defence Acquisition Council (DAC) in February 2014, the contract is yet to be finalised.

The IAF would naturally like to be free of dependence on import of such a vital component of air power. However, efforts by

the premier Defence Research & Development Organisation (DRDO) to develop a smaller indigenous AEW&C system have made progress only in fits and starts. There was also a fatal crash of the prototype aircraft in 1999. The programme was restarted in 2004, using the Embraer EMB-145i regional twin-jet. The radar, the most crucial component of the system, was developed by several DRDO labs including the Electronics and Radar Development Establishment (LRDE), the Centre for Airborne Systems (CABS) and the Defence Electronics Research Laboratory (DLRL).

The EMB-145i can fly continuously for five hours without refuelling. It can simultaneously track several hundred targets in the air and on the ground up to 350 km away, thus dramatically enhancing the strike capability of the IAF's fighter jets. Although the programme is several years behind schedule which is understandable given its complexity, the IAF is expected to receive its first of three systems later this year. If the system proves its worth, a dozen or more may be acquired.

But the EMB-145i can only provide 270 degrees of coverage and is far less capable than a full-fledged AWACS with 360-degree coverage. That is why the DRDO has been doggedly pursuing its dream of making a large system. Accordingly in March, the DAC sanctioned $818 million (Rs 5,113 crore) to order two modified Airbus A330 wide-body twin-jets as the airborne platform (with four more aircraft to be purchased later). This is the first step in this challenging attempt to make an indigenous AWACS. The large radar, now under development, will have both physical rotation and electronic rotation of the radar waves. The system is planned to be ready in seven years, which seems rather optimistic. However, it augurs well for the ambitious programme that Dr S Christopher, Programme Director (AEW&C) & Director, CABS, was recently appointed Director General of DRDO.

While the A330 option is still far into the future, the current holdings of three Phalcon AWACS and expected three EMB-145i AEW&C systems would take the total to just six aircraft. However, to effectively cover the extensive land and maritime boundary of the country would need perhaps twenty aircraft, a suitable mix of AWACS and AEW&C systems. In addition about 30 fixed aerostats, including DRDO's Akashdeep and the next generation Nakshatra, would need to be deployed along the most vulnerable borders.

Airborne Forever? Flight Refuelling Aircraft

Flight Refuelling Aircraft are another powerful means to enhance the capability of a combat fleet. The FRA enable strike aircraft to take off with limited fuel with full weapon load and then be refuelled one or more times *en route* to the target. This can extend their radius of action to a remarkable degree. An added advantage is that the precious strike squadrons can be based deep inside the country where they are far less vulnerable to strike by

Air forces everywhere are busy acquiring or enhancing their capability in unmanned platforms...

Phalcon AWACS

Embraer EMB-145

Airbus A330

enemy aircraft than if located at an airfield close to the border.

The IAF acquired a batch of six four-engine IL-78MKI FRA from Uzbekistan in 2003 to equip the 78 Squadron based at Agra. The IL-78MKI has a total fuel capacity of about 110 tonnes and can refuel six to eight aircraft per mission. Within a short period, its force multiplier capability was proved and its potential for out-of-area contingencies and operations against China was appreciated. The IAF decided that all future aircraft must compulsorily have flight refuelling equipment installed and initiated plans to induct more tanker aircraft.

However, as with so many other vital defence acquisitions, what should have been a straightforward proposal, has seen many twists and turns. For over two years, an approved deal for six Airbus twin-engine A330 Multi-Role Tanker Transport (MRTT) aircraft has been meandering through "final negotiations". The extremely versatile MRTT, a military derivative of the A330-200 airliner, carries 111 tonnes of fuel and 45 tonnes of non-fuel payload. Its cabin can also be modified to carry up to 380 passengers. It is a generation ahead of the IL-78 in technology and has far lower lifecycle costs. An enhanced version, likely to be supplied to customers from 2017 onwards, has more advanced avionics, a higher maximum takeoff weight, improved aerodynamics, reduced fuel consumption and other enhancements.

The DRDO too has achieved some success in the indigenisation of smart weapons...

Running the Gauntlet – Stealth/ECM

An IAF aircraft attempting to strike a target in China or Pakistan would encounter an array of lethal defences that would greatly reduce its ability to deliver its weapons accurately and make a safe getaway. A variety of tactical and technological solutions have been developed over the years to permit the strike aircraft to penetrate the defences. For instance, ECM can significantly degrade the effectiveness of hostile sensors and weapons. The IAF's Su-30MKI, Mirage 2000 and Jaguar aircraft possess adequate integral ECM capability; besides this, the IAF has a few dedicated ECM aircraft.

A related technique to boost the chances of survival of the attacking force is deception and camouflage. Stealth, the ultimate form of camouflage, can render an aircraft practically invisible to enemy radars and other sensors, thus greatly reducing the probability of detection and interception. At present the IAF lacks stealth capability. However, it is trying to attain this significant force multiplier, perhaps by early in the next decade through the Indo-Russian PMF project.

Hitting the Bull's Eye – PGMs

Ideal weapon delivery parameters can rarely be achieved under combat conditions and a large number of munitions regularly miss their target. This is especially so since an attacking aircraft must release its weapons at a great

distance if it wishes to remain clear of the lethal terminal defences. Enter the PGM that permits a large release envelope in terms of distance, height and speed, yet ensures high accuracy. A variety of guidance systems like Laser, Low-light Television (LLTV), thermal sensors and Inertial Navigation System/Global Positioning System (INS/GPS) devices may be employed to ensure that an air-to-surface weapon will hit its intended target. Even a "dumb" bomb can be turned into a smart weapon by fitting a guidance system on the strike aircraft and strapping another small kit to the bomb. Consequently, the days of attempting to swat a fly with a sledgehammer are over because each aircraft needs carry just enough weapons to deliver the right amount of explosive at the right point. Similarly, Air-to-Air Missiles (AAMs) can be delivered even far Beyond Visual Range (BVR) with very high kill probability. However, smart weapons are practically useless unless an Air Force's ISR capability is excellent.

Since PGMs are far cheaper than new aircraft, the punch of an older generation aircraft can also be multiplied by providing it with adequate PGMs. Accordingly, the IAF has ordered large numbers of AAMs and air-to-ground PGMs, essentially for the Mirage 2000 fleet. However, considering the array of targets it may need to engage, at least 40 to 50 per cent of the IAF's weaponry should have some form of guidance. Another must have is air-to-surface precision long-range missiles that enable the launch aircraft to stay well clear of enemy defences. The Su-30MKI will shortly integrate the 290-km range Brahmos supersonic cruise missile in the ground attack role.

Another option is the Russian Novotor K-100 missile that can hit a target at a distance of 300 to 400 km. The DRDO too has achieved some success in the indigenisation of smart weapons. So Next Generation-Laser Guided Bombs (NG-LGB) with stand-off ranges of 50 to 100 km, guided by an onboard navigation system, may soon be part of the IAF's inventory.

Unmanned and Unlimited – UAVs

Air forces everywhere are busy acquiring or enhancing their capability in unmanned platforms. The US military already has more UAVs than manned aircraft and their number is steadily increasing. While the US and Israel currently have a huge lead in UAV development and production, China is fast catching up. According to a Pentagon report released in May, China's military plans to produce nearly 42,000 land-based and sea-based unmanned weapons and sensor platforms. Four Chinese UAVs, the Xianglong, Yilong, Sky Saber and

Jaguar

SU-30MKI

Mirage 2000

Lijian especially need to be watched out for. All four can carry precision weapons and hence fall in the category of Unmanned Combat Aerial Vehicles (UCAV). The Pentagon also believes that China is aggressively pursuing development of stealth UCAVs such as the Lijian along with fifth-generation manned fighters. If China does acquire a formidable UAV capability, as seems most likely, Pakistan is bound to get enough for its needs.

The IAF has Israeli Searcher Mk II and Heron UAVs for surveillance and reconnaissance and is in the process of inducting the Harop UCAV. The Harop can loiter for long periods before homing on to a selected enemy radar emitter and in the process destroy both itself and the target. However, the IAF's total UAV holdings are extremely low, quite unrelated to its requirements. Some analysts estimate that the IAF needs over 300 UAVs of various sizes, roles and types including combat, micro and rotary platforms.

The Indian Regional Navigation Satellite System (IRNSS) is progressing and all seven satellites should be in orbit early next year...

The DRDO produces the Rustom-1, an all-weather, Medium-Altitude, Long-Endurance (MALE) UAV that can gather near real-time high-quality imagery and radio signals. Attempts to give it rudimentary weapons capability are underway. The DRDO is also developing the indigenous Rustom-2, a more advanced UCAV on the lines of the US Predator. Its first flight is expected this year. Rustom-2, weighing 1.8 tonnes, will have a capacity payload of 350 kg, a wingspan of 21 metres and an endurance of over 24 hours. Apart from weapon delivery, it will be capable of other missions of reconnaissance and surveillance, target acquisition, target designation, communications relay, battle damage assessment and signal intelligence. Further into the future is the Autonomous Unmanned Research Aircraft (AURA), a stealthy flying-wing UCAV armed with laser-guided air-to-surface weapons and other internally carried ordnance.

Eye in Space – Military Satellites

Space is one area in which India has a respectable capability thanks to the committed efforts of the Indian Space Research Organisation (ISRO). However, the military story is again one of missed opportunities. China already has perhaps 25 satellites in operation exclusively for military use. India on the other hand has just one. The GSAT-7, launched in 2013, is an indigenous multi-band communications satellite that helps the Indian Navy to maintain surveillance over the Indian Ocean Region (IOR). The IAF was expected to get its own satellite known as GSAT-7A in 2011, but the date of launch is still uncertain due to the delayed development of the Geosynchronous Satellite Launch Vehicle (GSLV). The GSAT-7A will enable the IAF to interlink ground radar stations, airbases, and AWACS, thus fortifying its C4ISR and Network Centric Warfare (NCW) capabilities.

Later this year, ISRO plans to launch a Multi-Object Tracking Radar (MOTR) that is likely to have some military applications. A satellite-based dedicated Defence Communications Network (DCN) is also planned to provide secure and reliable inter-service communications. In the meantime, the Indian Regional Navigation Satellite System (IRNSS) is progressing and all seven satellites should be in orbit early next year. This will provide military-grade accuracy to the navigation and targeting capabilities of airborne platforms of all three services, thus multiplying their effectiveness.

Intangibles Also Multiply

With so many force multipliers available and more on the way, surely the IAF should have an advantage over its opponents. However, the struggle to retain technological advantage is constant and grim. That's because force multipliers work best in a situation of

Heron UAV

Searcher Mk II

Rustom-II

asymmetry, where one side has force multipliers and the opponent either does not or has less advanced ones. This is starkly evident in the use of UAVs and UCAVs by the US and Israel against their adversaries.

The People's Liberation Army Air Force (PLAAF) of China is already well endowed with all varieties of force multipliers and the IAF must continuously strive not to lag too far behind. According to the Pentagon, the PLAAF is pursuing modernisation on a scale unprecedented in its history. In a recent report it says, "The PLAAF is rapidly closing the gap with Western air forces across a broad spectrum of capabilities from aircraft, C2, to jammers, to Electronic Warfare (EW), to data links." At the same time the IAF must keep a wary eye on the Pakistan Air Force (PAF) that is feverishly trying to play catch-up.

This is why intangibles also assume importance in enhancing the military effectiveness of any force. A technological force multiplier can be evaluated and matched, countered or even exceeded. However, intangibles like leadership, morale and motivation, superior training, innovative tactics, competent maintenance and a host of others can be kept under the wraps to greatly intensify performance and surprise the enemy when it counts most. Such force multipliers need not cost much. An oft-quoted example is that of the Israeli Air Force during the 1967 war, which was able to neutralise the numerical superiority of the Arab Air Forces by the simple expedient of reducing the turnaround time between sorties to the bare minimum, thus seeming to have the ability to stay airborne continuously! It served as a cheap yet highly effective force multiplier.

The PLAAF is pursuing modernisation on a scale unprecedented in its history...

Whatever the type of force multiplier employed, the aim is to get more out of an existing force or even one diminishing size. This is something the IAF will increasingly need to do in order to remain ahead of its potential adversaries.

Quietly Effective, Vigilant Airborne ISR

John Kiehle

Beyond India's current deployment of large aerostats for wide area radar-based monitoring of border areas, airships, new cargo airships, mid-sized aerostats and tactical aerostats also hold great promise to be cost-effective force multipliers for the IAF, increasing manpower efficiency and simultaneously reducing operating expenses. While unmanned drones also offer many exciting opportunities in military ISR and security enhancement, they often present payload limitations or network operational cost challenges absent with modern unmanned LTA platforms. LTA assets can be cost effective alternatives to larger ISR designated aircraft or multi-role rotary aircraft (HAL Dhruv) in ISR missions, or complement UAVs such as the IAI Searcher II and IAI Heron now in operation, particularly when persistent and regional ISR mission support is required.

THE BENEFITS OF LIGHTER-THAN-AIR (LTA) platforms should be considered carefully and broadly as part of a holistic approach to strengthening the air defence environment in India, deploying force multipliers for the IAF and enhancing offshore patrol capabilities. Traditional piloted ISR aircraft such as Phalcon AWACS remain expensive to acquire, operate and maintain while slower or stationary, helium-filled airships and aerostats present manpower and cost efficient alternatives for rapidly delivering persistent elevated situational awareness supporting diverse missions.

Beyond India's current deployment of large aerostats for wide area radar-based monitoring of border areas, airships, new cargo airships, mid-sized aerostats and tactical aerostats also hold great promise to be cost-effective force multipliers for the IAF, increasing manpower efficiency and simultaneously reducing operating expenses. While drones also offer many exciting opportunities in military ISR and security enhancement, they often present payload limitations or network operational cost challenges absent with modern unmanned LTA platforms. LTA assets can be cost effective alternatives to larger ISR designated aircraft or multi-role rotary aircraft (HAL Dhruv) in ISR missions, or complement UAVs such as the IAI Searcher II and IAI Heron now in operation, particularly when persistent and regional ISR mission support is required.

John Kiehle, Director of Communications at Aeros, a leading US - based manufacturer of airships, aerostats and elevated platforms for situational awareness.

"The application of aerostats for defensive area monitoring, or mobile airships for ISR patrol can deliver mission effectiveness and cost containment while freeing IAF assets for other tasks," explains John Kiehle, Aeros' Director of Communications adding, "Each LTA platform can provide enhanced capabilities and/or cost benefits to the IAF's other regional operational commands (CAC, EAC, SAC, SWAC, WAC) as can Aeros' ground-based solutions for elevated observation."

For a better understanding of capabilities enhancement for the IAF, now and in the near future, we will explore and illustrate the types of LTA assets and their expanding applications and benefits with the help of Aeros, a leading FAA-certified LTA manufacturer based in Los Angeles. Founded more than 25 years ago, the Aeroscraft Corporation (Aeros) has achieved multiple FAA airship type certificates and operates with an FAA Production Certificate while featuring a product line that includes advanced airships, tethered aerostats and the Aeroscraft cargo airship now in development.

Strengthening India's Air Defence Environment and Offshore Patrol with LTA Assets

There are three main categories of Lighter-Than-Air (LTA) assets, and each can further strengthen the air defense environment in different ways: unmanned and stationary Aerostats (tethered); mobile, piloted Airships (blimps), and new heavy-lift Cargo Airships that

will enter service in the coming years (variable buoyancy vehicles).

- **Aerostats**: Unmanned and tethered, aerostats are aerodynamic LTA platforms that provide cost-effective ISR support like a low-flying satellite system, but are much cheaper to launch and operate. Aerostats provide a constant 'eye in the sky,' providing persistent, wide-area coverage, particularly where topography or other factors limit land-based coverage. They can lend situational awareness to other air and ground support personnel, and are ideal when rapid deployment and persistent monitoring for days, weeks, months or years may be required. Large aerostats have fixed stations and can stay aloft for nearly a month between service maintenance, and often carry surveillance radar for long range detection and Precision Track and Illumination Radar (PTIR) to best focus on items of interest, as well as equipment for multi spectral HD imaging, and/or Communications and Signals Intelligence (COMINT & SIGINT) equipment.

  IDR readers are likely to be aware of India's current use of large 71 meter aerostats (from Rafael/TCOM) now monitoring border areas, or may also be familiar with the Akashdeep aerostat system developed locally during the last few years by Aerial Delivery Research and Development Establishment (ADRDE) under the Defence Research and Development Organisation (DRDO). However, readers may not be aware that aerostats similarly aid persistent monitoring of America's southern border and the area surrounding the US capital, supporting threat identification, immigration enforcement and national security because of their vigilance and cost-effectiveness.

- **Airships**: Also known commonly as blimps, airships are helium-filled multi-role aircraft often associated with event advertising and broadcast roles. However, airships provide a highly mobile, flexible, quiet and stable elevated sensor platform with slow-loiter and extended time-on-station capabilities that can service a variety of military and government missions.

  Airships provide flexible payload integration options for advanced radar systems, high-definition multi-spectral imaging (electro-optics, thermal imaging) electronic intelligence, communications equipment or other payloads. They are typically piloted but have potential for future unmanned operations. For example, Aeros' latest ISR airship, the 40E 'Sky Dragon,' can deliver 24-hour imaging or monitoring, has a range exceeding 500 km, and onboard workstations for analysis or HD downlink for remote operation and data acquisition.

Airships are typically piloted but have potential for future unmanned operations…

- **Cargo Airships**: Modern cargo airships will support strengthening the air defense environment and force multiplication for the IAF in a markedly different way than traditional airships and tethered aerostats. An emerging LTA category

Aeros 3200 - 39M aerostat system aloft

40D 'Sky Dragon' Supporting ISR missions in Asia

Aeroscraft Technology Demonstrator 'Dragon Dream'

being pioneered by Aeros to enhance military and commercial logistics, cargo airships are not currently in service, but should soon supporting logistics and humanitarian missions. Infrastructure independent cargo airships are likely to support commercial and economic development activities as well as military roles, helping support current air cargo growth in India; in 2013-2014, all operational airports in India handled two million Metric Tonnes (MT) of cargo (1.4 million MT international and 0.8 million MT domestic), registering a four per cent growth over the previous year.

For the military, this new generation of airships has the potential to revolutionise the future of intra-theatre airlift…

For the military, this new generation of airships has the potential to revolutionise the future of intra-theatre airlift, greatly increasing heavy cargo lift capability, reducing the logistics footprint in theatre, reducing dependence on airbases and ports, reducing the effectiveness of anti-access strategies employed by adversaries, and radically changing the hub and spoke logistics structure to one of point-to-point delivery. The cargo airship's introduction to global logistics will reduce operational constraints on future heavy-lift, radically reduce energy use for aircraft operations on a tonne/mile basis, permit high-payload operations directly into austere locations with little infrastructure, surpass by several times the speed of fast sealift, and reduce the need for intermodal transport to move cargo from origin to point-of-need, with corresponding reduction in delivery time.

So exciting is their potential, that the US Congress recently created a new caucus to support the accelerated deployment of cargo airships. The bi-partisan caucus is Co-Chaired by Rep. Tom Rooney (R-FL) and Rep. Brad Sherman (D-CA), and has just started working to hasten the take-off of the cargo airship industry, an infrastructure independent mode of transportation, in support of military, economic, national security, diplomatic and environmental objectives. The chairmen explained their motivations for leading the caucus, stating:

"Modern cargo airships have nearly three times the fuel efficiency as air transport alternatives, and can land in very remote locations," said Congressman Brad Sherman. "They have enormous potential to enable economic development opportunities and accelerate export logistics, expand US capabilities in disaster relief response, and drive greenhouse gas reductions in aviation."

"The recent advances in airship technology are exciting, and the Caucus will help illustrate the breadth of benefits enabled by cargo airships' efficient and infrastructure independent operations, including benefits to military operational tempo and mission flexibility, enhanced delivery capability, and operational cost savings," said Congressman Tom Rooney.

Cargo airships are an exciting innovation because cargo airship utility has been historically hindered by external ballast exchange requirements, as well as lack of Vertical Take-off and Landing (VTOL) flight capability, slow speed, and non-rigid structural design that has limited payload capacity, aerodynamic loading (speed) and propulsion flexibility. Essentially you needed a large volume of lead or sand bags pre-deployed and loaded at destination before heavy cargo removal, to keep the helium-filled vehicle grounded. Aeros' validated self-ballasting design for the

66-tonne and 250-tonne Aeroscraft address these limitations, while combining many of the flight attributes and benefits of fixed-wing, rotary and traditional LTA vehicles to move cargo directly or flexibly to new destinations independent from infrastructure.

Aeros' Aeroscraft: The Aeroscraft features internal rigid structure and onboard buoyancy management technology called Control-Of-Static-Heaviness (COSH), to control lift in all stages of air or ground operations, enabling both VTOL and off-loading of cargo/payloads without airships' traditional requirements for external ballast exchange. The innovative infrastructure independent airship is poised to launch new category of freighter aircraft capable of transporting heavy payloads to remote locations and providing flexible, point-to-point air cargo delivery for military, commercial and humanitarian applications.

Airship Missions

The flight performance characteristics of airships and their flexible payload integration can cost-effectively service a variety of military and para-military missions strengthening the defence environment, both onshore and offshore, including:

Primary: Onshore/Offshore Airborne Early Warning (AEW)

- Communications, Intelligence, Surveillance, Reconnaissance (C^4ISR)

  Air & Surface Wide Area Monitoring: supports multi-mode radar w/ Air-to-Air MTI/ GMTI. From altitude ceiling, airships can track targets up to 141 miles (228 km) LOS, 360 degrees, observing over 62 thousand square miles at a time.

  High Definition multi-spectral imaging: Electro-optic and Infra Red (EO/IR) - 1080P HD-SDI

  Communications & Intelligence: relays, jammers, Signals Intelligence (SIGINT) and traffic analysis (COMINT & ELINT); ECCM

Other Onshore Missions

- **Customs/Border :** improved line of sight visibility in urban/rural areas for cost effective monitoring and over-border observation

Rendering of Aeroscraft cargo airship moving perishable goods

- **Law Enforcement:** airborne surveillance and communications for increased ground unit effectiveness; command policing assistance in situations of widespread civil unrest
- **Event Security and Safety:** quiet and persistent area observation and documentation with benign advertising/ broadcast associations
- **Infrastructure monitoring:** cost-effective patrol of high value facilities, pipelines, and potential terrorism targets
- **Survey/Ground Mapping:** Spot SAR/Strip SAR; cost-effective geophysical survey, hydrographic and cartographic work, wildlife and archaeological surveys

Multi-mode radar & EO/IR camera payload

- **Area Control and Coordination:** airborne command and control; coordinating the actions of agencies and responders when natural disasters, fires and other events disrupt surface communications
- **Ground Radar Calibration (GRC):** more cost-effective initial and repeat calibration asset while freeing other aircraft for operations

Offshore/Naval Airship Applications

- **Coast Guard/ Territorial Waters Protection** – Standing patrols are inherently equipment and manpower expensive. Airships overcome limited visual and sensor search ranges of surface vessels with cost-effective air support, reduce expensive standing patrols, and improve environmental awareness for vessels/ convoys. Airships can maintain over costal and off-shore waters for longer periods, providing documentation and interdiction support
- **Search and Rescue** – helicopters are expensive and inefficient for these operations; while airships provide good visibility, long on-scene endurance, low altitude capability, and appropriate search speeds, and can permit survivor rescue by winch or inflatable rescue boat deployment
- **Anti Submarine Warfare (ASW):** Airships can deploy stationary tethered sensor arrays, or tow submerged sonar arrays, with the added benefit of rapid relocation between slow-speed listening positions
- **Mine Counter Measures (MCM):** airships make a great complement to the current use of Unmanned Underwater Vehicles (UUVs) for the identification and neutralisation of naval mines (contact, magnetic, acoustic, pressure), replacing more expensive and vulnerable marine assets as the umbilical connected parent vehicle. Airships can provide longer time on station, and slow, low-level flight characteristics to enhance efficient observation around straits and outside harbors.

Aeros airship in interdiction support role

40E 'Sky Dragon' Airship: Aeros' latest airship now in production, the 40E 'Sky Dragon' builds on the performance strengths of the 40D 'Sky Dragon' airships in global operation since 2007 for enhanced multi-role mission capabilities and surveillance/ reconnaissance support. The 40E features flexible payload integration with useful payload up to one tonne; advanced vectored propulsion and

View from 'Sky Dragon' airship over the Pacific

control; operational cost efficiency; onboard data workstations or HD downlink for remote operation; and enhanced added levels of safety, pilot empowerment and crew/passenger comfort, and the following performance characteristics:

Useful Payload:	2,200 lbs/ 1,000 kgs
Envelope Volume:	~113K ft3 HE / 3200 m^3
Range:	~ 275 nm/ 315 M/ 510 km
Propulsion:	twin engine/vectored (160 hp)
Engine:	Lycoming AEIO-320-D
Fuel:	AV100; 70.5 U.S. gal/ 267 L
Cruise Speed:	35 knots/ 65 kph
Speed Max:	54 knots/100 kph
Ceiling:	10,000 ft/ 3,050 M
Seating:	1 + 6
Crew	single pilot op.
Operation:	VFR/ IFR (day/night)

Unmanned LTA Missions (Aerostats)

Aerostats can generally be categorised into large (strategic), mid-sized (operational) and smaller (tactical) systems.

The Indian Air Force currently employs aerostat-based radar systems for border monitoring on 70M class fixed systems. They lift radars to 15,000 Above Sea Level for better visibility in mountainous terrain to efficiently augment ground and aircraft based early warning detection of moving aircraft or cruise missiles over a wide area. However, mid-sized aerostats can also combine persistent surveillance and robust performance with rapid redeployment capability. Whereas the largest systems have fixed mooring positions, mid-sized aerostats can have integrated mobile mooring stations, providing rapid re-deployment and mission flexibility for the Indian military.

The military and governmental applications of unmanned, tethered LTA assets (aerostats) are similar to airships. However, their stationary operation and enhanced mission persistence enhance benefits for vigilant area monitoring. Like mobile airships, stationary aerostats provide threat detection early warning solutions through flexible payload integration (radar, cameras, communications and large aperture antenna), supporting military and governmental ISR and security missions, including:

- **Onshore/Offshore Airborne Early Warning (AEW):** long range detection of air and surface targets
- **Customs/Border Monitoring:** persistent elevated observation with greater cost efficiency, improving line of sight visibility in urban/mountainous areas and over-border observation.
- **Port/Harbor Security:** aerial observation of onshore/off-shore environment for threats, smuggling or theft; ship-borne deployment provides operational mobility. Aerostats can also be deployed from smaller surface ships and cruise in normal weather, reducing the need for maintaining other aerial assets
- **Infrastructure Monitoring:** cost-effective monitoring of high value facilities and potential terrorism targets
- **Event Security and Safety:** quiet and persistent area observation and documentation with benign advertising associations

The benefits of Aeros' mid-sized and tactical aerostats have delivered to over-border observation, defensive base protection and area observation outside the continental US have transitioned well to other security scenarios where they aid vigilant observation, identification, communication, documentation and interdiction. Aeros has an existing portfolio of solutions that range in size from 6M (tactical) to 39M in length (mid-sized), and also manufactures custom aerostats based on the specific mission requirements such as payload, altitude, wind speed and operating temperatures. Aeros' production models range in payload accommodation from 9 to 300 kg, and the entire portfolio provides easy field operation and low manpower/maintenance requirements.

Aeros' 3200 is an example of a mid-sized aerostat system, similar to but longer than the Akashdeep aerostat system…

Aeros 3200 – Mid Sized Aerostat

Aeros' 39-metre length multi-payload aerostat has been designed to provide the full ISR capabilities associated with larger systems,

Aerostat Lenght	32M
Nominal Altitude	1,500M
Payload	300Kg
Max Sustained Operaing Wind	25M/S
Duration w/o Service Recovery	21Days

but with the flexibility and reduced logistical footprint of smaller tactical aerostats.

The multi-payload aerostat can accommodate 300-kg payloads at operational altitude of 1,500 M above ground station, with mission duration of 21 days between servicing. The Re-locatable Integrated Mooring System (RIMS) permits full system transport and rapid redeployment, while the integrated remote winch system empowers easy launch and recovery for the operator.

The system provides extended persistent observation and features a powered tether with fibre optic downlink, and integrated moving map software to integrate data into one comprehensive tactical map. The system also features a self-sustained full integrated Ground Control System (GCS) with multi-point redundancy and attached network storage capable of 24 hours of archived surveillance video.

Aeros' 3200 aerostat on RIMS

Aeros' 3200 is an example of a mid-sized aerostat system, similar to but longer than the Akashdeep aerostat system, which may be more familiar to IDR readers (developed by ADRDE for the DRDO of India). India's domestic aerostat development continues amid increasing mission demand.

The ADRDE is now working on a more advanced version (Nakshatra) with increased payload and longer endurance, expected to enter service next year. Other IDR readers may also be familiar with the large LTA asset, which is also technically an aerostat, used in the opening ceremony of the 2010 Commonwealth Games held in Delhi.

Recent market research suggests that the aerostat system market will experience rapid demand growth during the next five years, growing from $3.93 billion in 2014 to $9.96 billion by 2020, and this growth is being driven by all aerostat size categories, particularly tactical, as well as integration of payloads that support non-traditional missions (from precision agriculture to wildlife monitoring).

Tactical Aerostats

Tactical aerostats are smaller systems that can support ISR and communications for local

Aeros' SkyCrow Tactical Aerostat – 10M

areas, military installations or individual field-based soldiers. They can serve as a soldier-centric tactical ISR platform, or an advanced portable and quick assembly surveillance system.

Tactical aerostats have more limited payload capabilities due to lower HE volumes. However, advances in lighter payloads developed for drone integration now empower midsize and tactical aerostats with greater capability and cost effectiveness. Aeros has two tactical aerostat production models that can help illustrate the sub-category:

Skycrow

A tactical system, 'Skycrow' provides users up to 16 days extend Time-On-Station (TOS), wide payload flexibility, and the benefits of a highly-mobile asset providing persistent surveillance capability with reduced operational support. A turnkey aerial surveillance asset requiring minimum setup and training, at only 10.3 metres long, 'Sky Crow' can be deployed rapidly with minimal personnel.

The system integrates payloads for high-resolution electro optics or thermal imaging, communications relays, or other payloads up to 20 lbs.

Easily monitored from a Laptop Control Unit (LCU), the 'Skycrow' simplifies dedicated wide-area visual observation, data acquisition and communications support missions, among others.

SKYCROW

Aerostat Length	10.3M
Nominal Altitude	305M
Payload	10Kg
Max Sustained Operating Wind	20M/S
Duration w/o Service Recovery	16Days

Skycrow at OCONUS FOB

MPASS

Aeros' Man Portable Aerial Surveillance System (MPASS) has been designed for set-up and deployment by a single operator with minimal training requirements.

MPASS	
Aerostat Length	6M
Nominal Altitude	400M
Payload	4Kg
Max Sustained Operating Wind	20M/S
Duration w/o Service Recovery	3Days

The system can carry lightweight cameras and payloads to 300M. When vehicle mounted, MPASS can operate whether the vehicle is moving or stationary.

The system remains stable in winds up to 35 knots, and can transfer video data to virtually any video input device. MPASS uses a HD color camera with 5-FOV matched optics, equipped with Automatic Video Tracker to monitor the field of view, and can integrate a 100mW laser pointer Eye Safe Laser Range Finder (ESLRF) for marking targets.

Force Multipliers for the IAF

The performance characteristics of traditional airships and aerostats can also serve as significant force multipliers for the IAF, beyond strengthening the air defence environment, reducing operational costs to free budgets for other commands or capability acquisition. Airships and aerostats generally have reduced acquisition, operational and sustaining (maintenance) costs over comparable ISR aircraft. Their speed, operational altitude, range and low and slow capability are simply better suited to certain missions than fixed-wing or rotary aircraft. Beyond long endurance, they provide operational cost effectiveness with both man hour and fuel advantages, have payload volume and flexibility advantages (for radar,

MPASS: Field Tactical

ALH Dhruv

cameras, antennae and acoustic detection), and can accommodate relief pilots, and permit onboard data analysis or remote monitoring.

For example, the Dhruv (~$6.3 million acquisition cost) provides greater speed and a longer range at ~ 700 km (vs ~500 km), but with significantly less endurance (< 4.5 hours) than an airship, while consuming significantly more fuel per hour at ~537 litres per hour (L/hr), compared to airship fuel consumption between 30 to 60 litres per hour depending on operations. This pattern continues for other ISR platform alternatives (Si-76C+ ~300 L/hr); (Si-92 ~600 L/hr); (KingAir 350 ~500 L/hr) (G550 variant ~1350 L/hr).

Fixed wing commercial aircraft with comparable useful payloads used for ISR such as the King Air 250/350i (Beechcraft) and rotary aircraft such as the Dhruv or Sikorsky helicopters, require two pilots, while Aeros' airships can be flown by a single pilot. Sustaining costs are also significantly divergent. The 'Sky Dragon' airship from Aeros has a maintenance and spare part contigency of $64 per flight hour, wheras average airframe and engine maintence costs for a helicopter can be twenty times more per flight hour (Si-92 'Seahawk' ~$1,819 per/hr).

LOOK BEYOND FDI

Laying the Right Foundation for Defence Manufacturing

—— Dr JP Dash ——

Ranked fourth, India has a strong talent pool in science, technology and research, as well as some of the lowest labour rates in the world. Its concerns include the country's regulatory environment, high interest rates, and healthcare system, as well as under-developed physical infrastructure. The country has a goal of moving its manufacturing share from 16 per cent of GDP to 25 per cent by 2022. Now the same is propelled by an aggressive policy for 'Make In India'. The future outlook seems bright provided India can seize the opportunity.

WHAT IS THE FOREIGN OWNERSHIP with which we can get the trinity of technology, capital and manufacturing? Can we kill all three birds at the same time to make India a Defence Manufacturing hub? With time, the context changes forcing change in strategy. In the past, India banked on the Licensed Production route. We kept building the same thing that we got from abroad. We failed to build the next upgrades on our own. We failed to migrate to the higher part of the value chain. We have been changing our recommendations on Foreign Direct Investment (FDI) from 26 to 49 per cent, from 51 per cent to 74 per cent and so on, without having achieved the desired results. Thus, we have to revisit our conclusion and determine whether an incorrect diagnosis has been made.

FDI has changed the consumer goods industry in many countries, including China. But, when we talk about defence beyond the boundaries of the parent nation, there is concrete evidence to substantiate that. Which country does not want its jobs not to be protected? When it creates place for FDI, it loses on the count of job creation in the parent country. The sacrifices done to overcome some of the structural market barriers, maybe Entry Barriers or it may be to reap the best benefit of factor inputs in the destination nation so that the parent nation earns more bottom line. We have to find cogent and coherent reasons why India still struggles to make its military industrial complex self-reliant and sustainable.

Correlation between FDI and Technology Independence

"The Biggest Arms Importer Is India - No More". As per the IHS Global Defence Trade Report 2014, Saudi Arabia replaced India as the largest importer of defence equipment worldwide and took the top spot as the number one trading partner for the US. Saudi Arabia surpassed India to become the largest defence market for the US that supplied one-third of all exports and was the main beneficiary of growth. Saudi Arabia and UAE imported more weapons than all of Western Europe.

Saudi Arabia, Indonesia, Sweden and Nigeria are the UK's top trading partners. One out of every seven dollars spent on defence imports will be spent by Saudi Arabia (IHS, 2015). The selling proposition for 'Make in India' for defence for high amounts of acquisition may not be valid. The same may not hold good after five to ten years. Thus, it is time to set things right, as building of national capabilities cannot be left to assumption of higher FDI and consequent development of indigenous capabilities through technology.

Overwhelming evidence is available that FDI does not necessarily and automatically lead to transfer of advanced technologies. A study by academicians from the University of Oxford concluded that entry of FDI indeed leads to spillover of technologies to the local economy but that such spillovers are not automatic. This beneficial impact of FDI, however, is limited to ancillary activities. Specific policies are

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required for such beneficial effect to happen. A study by the United Nations concludes that most Transfers of Technology from MNCs occur within higher-income developing countries.

A nation can take its procurement decision but the FDI decision remains with the MNC. Whether FDI brings technology or not depends partly on the State Control on exports of such technology. Ultimately what matters, is how competitive and attractive is the domestic sector in the domain of technology. Greater the capability, higher is the possibility to absorb advanced technology.

Ease of Doing Business in India

The World Bank has come out with "Doing Business 2015" data for India out of 189 economies. Since there are no specific studies on defence manufacturing, the same will serve us a benchmark. No nation in the world, which is weak in manufacturing, has emerged as a strong player in military armaments. The only improvement in 2015, over 2014 Rank is in the protecting minority investors. Thus, the policy changes due to 'Make in India' Campaign will take some time before making an impact on ground realities.

The comparative data of 2015 vis-a-vis 2014 for ease of doing business looks like this:

Parameters	DB 2015 Rank	DB 2014 Rank	Change in Rank
Starting a Business ✓	158	156	⇩ -2
Dealing with Construction Permits	184	183	⇩ -1
Getting Electricity ✓	137	134	⇩ -3
Registering Property	121	115	⇩ -6
Getting Credit	36	30	⇩ -6
Protecting Minority Investors ✓	7	21	⇧ 14
Paying Taxes	156	154	⇩ -2
Trading Across Borders	126	122	⇩ -4
Enforcing Contracts	186	186	No change
Resolving Insolvency	137	135	⇩ -2

✓=Doing Business(DB) reform making it easier to do business. ✗=Change making it more difficult to do business. Click here to see all reforms made by India.

Manufacturing Competitiveness

The 2013 Global Manufacturing Competitiveness Index by Deloitte (Deloitte, 2013) once again ranked China as the most competitive manufacturing nation in the world both today and five years from now. Germany and the United States are within the top three competitive manufacturing nations. What is USP of each of the countries? What makes them competitive? What is India's USP?

Table 1: Global CEO Survey: 2013 Country manufacturing competitiveness index rankings

Executives believe China leads overall and emerging markets will become more competitive in the near future

Current Competitiveness

Rank	Country	Index score
		10 = High 1 = Low
1	China	10.00
2	Germany	7.98
3	United States of Amrica	7.84
4	India	7.65
5	Outh Korea	7.59
6	Taiwan	7.57
7	Canada	7.24
8	Brazil	7.13
9	Sigapore	6.64
10	Japan	6.60

Competitiveness in five Years

Rank	Country	Index score
		10 = High 1 = Low
1	China	10.00
2	India	8.49
3	Brazil	7.89
4	Germany	7.82
5	United States of America	7.69
6	South Korea	7.63
7	Taiwan	7.63
8	Canada	6.99
9	Sigapore	6.64
10	Vietnam	6.50

It is important to know their national strategy that makes them lead players in manufacturing. In spite of its economic slowdown, China continues to maintain its rank as the most competitive manufacturing nation. Reasons cited are the advantages of its labour and materials cost, strong government spending in manufacturing and innovation and an established supplier network.

Ranking highest in talent-driven innovation, Germany continues to make impressive gains since 2010. There is a renewed focus on manufacturing, and manufacturing exports nearly tripled between 2000 and 2011. The country is focusing on new technologies and a highly skilled workforce. It is dominating the field of "mechatronics", a multi-disciplinary field of science and engineering merging mechanics, electronics, control theory and computer science.

Ranking third, USA's strength lies in its appeal as a manufacturing destination, core competency for talent-driven innovation, physical infrastructure, established supplier network and a strong legal and regulatory system. An overall sense of uncertainty that plagues the US regulatory system is seen as a significant disadvantage.

Ranked fifth, South Korea's strength based on its competitive cost structure and quality products. Its favourable industrial policies and highly educated and skilled workforce are definite advantages. Its complex policy and regulatory environment is viewed as a negative point.

Ranked fourth, India has a strong talent pool in science, technology and research, as well as some of the lowest labour rates in the world. Its concerns include the country's regulatory environment, high interest rates, and healthcare system, as well as under-developed physical infrastructure. The country has a goal of moving its manufacturing share from 16 per cent of GDP to 25 per cent by 2022. Now the same is propelled by an aggressive policy for 'Make In India'. The future outlook seems bright provided India can seize the opportunity.

The report found that access to talented workers is the top indicator of a country's competitiveness – followed by a country's trade, financial and tax system, and then the cost of labour and materials. Enhancing and growing an effective talent base remains core to competitiveness among the traditional manufacturing leaders – and increasingly among emerging market challengers as well. How good is India in these respects? How are the factors of production faring well for India?

The Labour Factor

The table given below compares India's performance in Productivity - Wage Relation with that of the USA, the world economic leader with the highest levels of labour productivity. For this purpose, the national output has been measured in terms of market values after adjusting for variations in Purchasing Power Parity (PPP).

Labour productivity levels in India and USA in 2000 (US $)

	Actual		PPP Adjusted		India's Labour Productivity as percentage to USA's	
GDP per person employed	India	USA	India	USA	Actual	PPP Adjusted
	1033	73888	5452	69193	1.39	7.90
GDP per person employed per hour	0.458	38.52	2.42	36.08	1.18	6.70
GDP per person employed in Industry	2110	85911	11267	8451	2.46	14.00

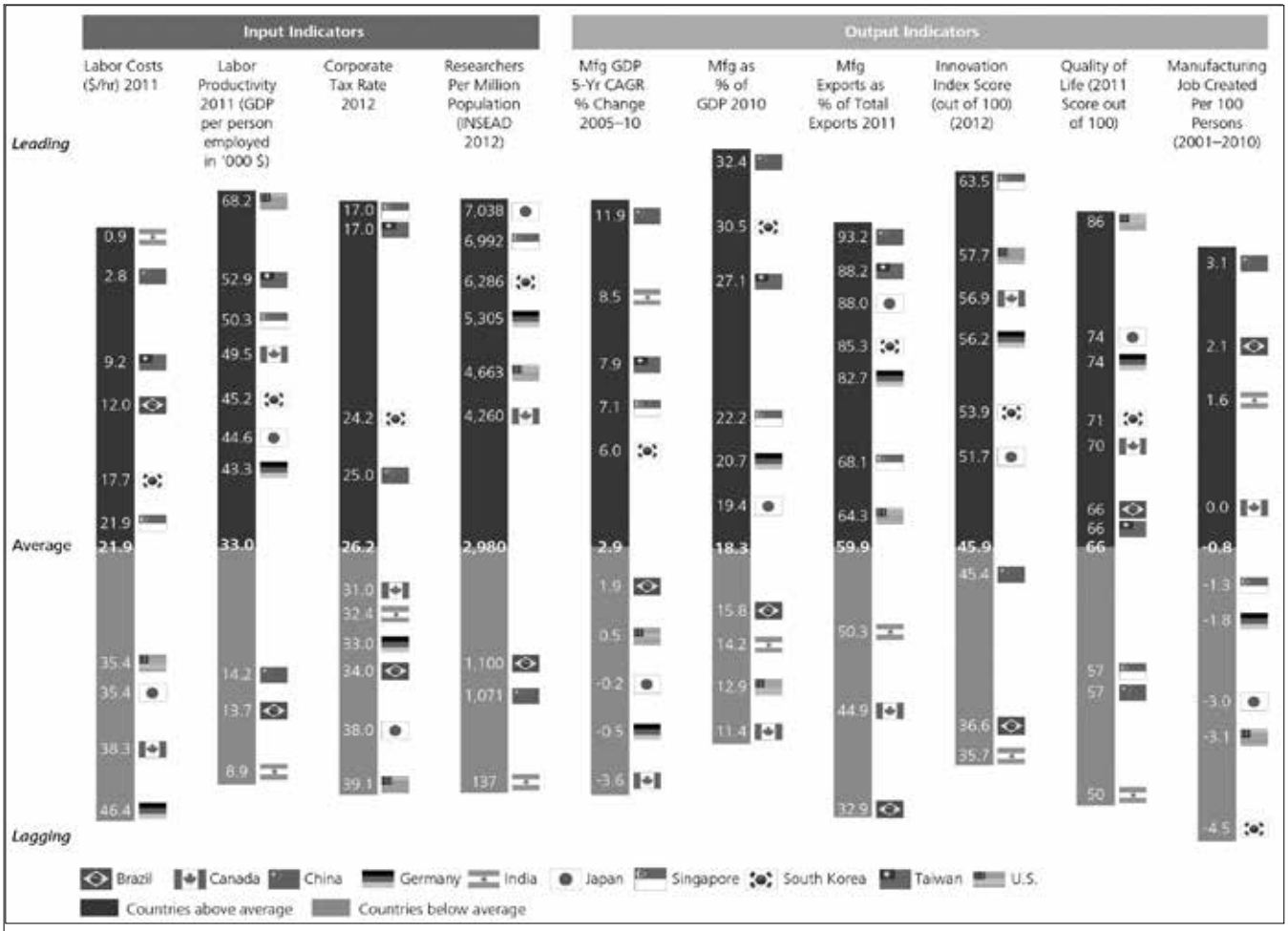
Source: Based on IMD (2001)

India's labour productivity is distressingly low, the GDP per person employed being as low as 1.39 per cent/7.90 per cent (Actual/ PPP) of that in USA. GDP per person hour employed is at 2.46 per cent/14.00 per cent (PPP adjusted) as compared to the USA. Although data may be outdated, not much has changed in the Indian landscape. High pay and low productivity makes Indian Public Sector employees one of the highest paid employees in the world. A recent study is quoted by Deloitte which bring out productivity in 2013.

Saudi Arabia and UAE imported more weapons than all of Western Europe…

The graph shows that India's labour cost although less (India, 0.9, China 2.8, USA 35.4, Germany 46.4), productivity at 8.9 (USA 68.2, Singapore 45.2, Germany 43.3, China 14.2, Brazil 13.7) is the lowest among comparative countries. Thus, low labour cost means little without productivity. The labour issue gets complicated with Unionism in the organised sector. In recent past, at Hyundai Motors India, subsidiary of the South Korean automaker, workers went on an 18-day strike to demand recognition of the employees' union. The company has debated moving the Tamil Nadu-based plant to Europe (Most of the production is for export).

At tyre maker MRF, the Arakkonam (Tamil



Supplemental data analysis: Competitiveness driven differently among most competitive nations. 2013 GMCI top 10 country comparisons of key country manufacturing related macroeconomic indicators (Source: Deloitte Touche Tohmatsu Limited analysis)

Nadu) unit was closed almost a month due to rival unions clamouring for recognition in October 2010. Workers at auto factories attacked supervisors and started a fire that killed a company official and injured 100 managers including two Japanese expatriates. The violent mob also injured nine policemen. The company's General Manager of Human Resources had both his arms and legs broken by his attackers, unable to leave the building that was set ablaze, and was charred to death. Operation was at less than ten per cent of its capacity at a loss of rupees one billion a day.

On December 17, 2010, at Honda Motors and Scooter India, a security personnel at the Honda factory misbehaved with a temporary worker. In response, temporary workers – not represented by the union- went on a wildcat strike, which brought production to a halt. The strike lasted for about 24 hours until the management intervened. The production loss is estimated to be Rs 7 crore (Ghosh, 2013).

Although statistically, there are fewer strikes and fewer losses of man-days due to strikes, the reason is that companies are expanding hiring on contract, as opposed to permanent workers. The contract system gives companies greater autonomy in choosing when to lay off workers in times of a slump, as the Industrial Disputes Act requires permission of the Government for lay-offs if the unit deploys more than 100 workers. Moreover, the same has been planned move by the management to prevent "unionisation". There is a small core of permanent workers, but a substantial number of workers are now hired on contract. Maruti for instance, has 85 per cent contract labour. According to news reports, the proportion of contractual labour in Nokia is 50 per cent, and that in Ford is 75 per cent.

Temporary workers are in a permanent state of alienation with their wages being a fraction of permanent workers. Their commitment to the company for innovation is questionable. Thus, the inefficiency of the permanent workforce is transferred to the temporary workforce. Moreover, as the data shows, India's innovation score is at bottom compared to others.

A white paper, "People Power: Human

Capital Drives Manufacturing Competitiveness by Tooling U-SME (Tooling U-SME, 2015)" brings out how a well-trained workforce is a competitive advantage, allows companies to drive innovation, customer satisfaction, productivity and growth.

A culture of learning including a structured workforce development programme can lead to engaged and loyal employees, satisfied stakeholders and economic growth. The report says even if two companies have the same technology, equipment, processes and materials that does not mean they have the same success. Companies that invest in developing their people are seeing the strongest results related to increased profits and productivity and reduced downtime and waste**.** Although we may boast of young population, the skill deficit in India is alarming. As per a Price Waterhouse Coopers (PWC) report in 2014, 63 per cent of the CEOs across the world surveyed for the report said that availability of key skills is the biggest business threat to their organisation's growth.

A FICCI Survey on Labour/Skill Shortage for Industry (FICCI, 2015) brings out that Indian industry is facing a serious problem with regard to availability of labour. Several companies have reported that their workers have started demanding higher wages and that companies are already beginning to face difficulties in terms of meeting confirmed orders on account of shortage of workers. About 89 per cent of the respondents said that they have been unable to fully meet the potential demand for their products in the market due to labour shortage. When asked to comment on the extent of potential loss due to shortage of labour, nearly two thirds of the participating firms said that their potential losses are to the extent of more than ten per cent of their demand.

As per CII's India Skills Report, 2014, India has 60 per cent of its total population available for working and contributing towards GDP but out of the total pool only 25 per cent is capable of being used by the market. If the research findings are to be believed, there would be a demand-supply gap of 82 to 86 per cent in the core professions. Only ten per cent of the MBA graduates and 17 per cent of engineering graduates in the country are employable.

A major reason for this is the classroom teaching orientation of most Indian universities, which themselves are far behind their global peers (as per the Times Higher Education World University Rankings 2013-2014, not a single Indian university figures in the top 200). This scarcity of skilled talent makes it impossible for the Talent Supply Chain to operate effectively and is an issue which if not taken care of immediately will become uncontrollable (CII, 2014).

Capital Factor

An EY (formerly Ernst & Young) survey (EY, 2014) has found that the average cost of equity capital in India is around 15 per cent. It has increased over last the three to four years and higher than most of the developed nations. The survey highlighted the fact that the average difference in the cost of capital for investment in India is 3.6 per cent in comparison to developed countries.

Another measure of efficiency and productivity of capital investments in the economy is the Incremental Capital Output Ratio (ICOR). A higher ICOR is an indicator of inefficiency – a higher level of investment is needed to produce one extra unit of GDP. ICOR is calculated as the ratio of fixed investments to incremental GDP (at market prices). Compared to an ICOR of 4.1 for the 10th Plan, the 11th Plan achieved an ICOR of 4.5, indicating erosion in resource use efficiency (PIB, 2013). According to the new GDP series, India's ICOR fell from 6.6 in fiscal 2013 to 4.3 in fiscal 2015. This means that over the years investments did become more productive. Even in the old series (with 2004-2005 base), ICOR was 7.5 in fiscal 2013 and fell to 6.8 in fiscal 2014. Although, the ICOR is improving, the same is not promising.

The Indian industry is facing a serious problem with regard to availability of labour…

ICOR can be lowered through a mature and better infrastructure. This requires huge investment. A modern port with fast turnaround times requires Rs 6,000 crore minimum outlay. In India, ICOR would continue to be high so long as the economy does not develop to be on a par with a developed country vis-a-vis infrastructure and manufacturing industry. The large ICOR is largely attributable to supply constraints such as power-coal imbalance and inordinate project delays. There is no immediate magic wand to bring it down.

Land Factor

Production of any kind of goods and services requires land. However, delay in land acquisition, protests and resistance on the part of the displaced have become central tailbacks for investments in the infrastructure sector. Whether it is Singur or Gopalpur, they stand as stark reminder of the risk and uncertainly of land acquisition. Environmental clearance adds to delays. Cost overruns and risks in infrastructure projects are intrinsically linked to land acquisition. The issue of displacement of inhabitants and the focus on environmental degradation activists in the country has become an opportunity for politicians to create an image of themselves in front of innocent citizens.

Although the new Land Acquisition Act removes many constraints, it makes the cost of land higher. The industry will wait and watch how things are affected on ground. Businesses will need to continue relocating affected populations, compensating affected individuals with two times the land's market rate for urban property and four times the rate for rural property. These relocation costs are as prohibitive as the complicated social impact and public approval process.

Only ten per cent of the MBA graduates and 17 per cent of engineering graduates in the country are employable…

Recommendations

If the country has to make a success of the "Make in India" objective, these serious drawbacks in the "human capital" domain will need to be addressed. The proportion of PhDs in the R&D or manufacturing organisations is low. However, to overcome the quality constraints, organisations such as ISRO and Atomic Energy Commission have devised their own methods. ISRO, for instance, runs a dedicated university, the Indian Institute of Space Science and Technology (IIST) that taps talent at a very early age and provides graduate, post-graduate and doctoral programmes in the areas of space science and technology. There is no such technical institution available for the defence industry.

Estimates suggest that almost 50 per cent of the workforce in this R&D sector is constituted by engineers and management graduates. Countries like France have developed highly regarded specialist schools like Institut Superier de l'Aeronautique et de l'Espace (ISAE) and Ecole Nationale de l'Aviation Civile (ENAC) in Toulouse and Ecole Nationale Superieure de Mecnique et d'Aerotechnique (ENSMA) in Poitiers to train engineers for this field. As the French industry grew, substantial investments were made in the form of professional federations such as Groupement des Industries Francaises Aeronautiques et Spatiales (GIFAS) to promote the interests of this sector. With a pool of 134,000 specialist employees, the French Aerospace and Defence industry today is clearly a European leader (KPMG, 2010). Thus, there is a need to promote National Technological University by converting few institutions such as an established IIT with few Centres of Excellence, DRDO/CSIR laboratories rather than starting *de novo*.

Instead of focusing on the entire gamut of defence production, India has to choose its area of specialisation in which it must demonstrate the product leadership. Let us the take case of positioning in the manufacturing landscape. The US emphasizes on next generation materials (and novel materials engineering) for manufacturing. Japan focuses on the implications of demographic change and they prioritizes research on new production technologies for an ageing workforce with a focus on quality and reliability. Germany puts its efforts related to manufacturing processes and capital machinery that protect products from piracy. Brazil places emphasis on bio-fuel and petrochemical technologies. Resources cannot be spread thin. Thus, it is better to focus resources on few core areas where such concentration will lead to better result in a defined time span. For example, India can make the Hyper Velocity Electromagnetic Gun, Next Generation Battlefield Management Systems and Stealth Technology based on systematic study of comparative advantages.

Conclusion

A national ecosystem must be created so that capability enhancement, infrastructure development and technologies development happens though removing supply side constraints such as skilled manpower, cheaper capital and enhanced efficiency. The structural bottleneck of the industry must be removed

by making it easier to do in business through a push by reducing the Red Tape, improving infrastructure and availability of cheap power.

Considering the limited time horizon in which this must be achieved in line with national aspirations, this must be undertaken as a national mission with industry, academia and R&D coming together and government setting the direction of reforms, sitting in the driver's seat. This is possible with a National Technological University being set by converting one of the established IIT and like-minded complementary institutions with international collaboration. The collaboration is beyond the capability of any single organ and institution. The state has to play a lead role with the user driving the innovations.

This National Technological University would create a Silicon Valley around it with generous seed and venture capital funding. The Silicon Valley is the story of a number of pioneers who were able to produce an environment that stimulated the emergence of entrepreneurial talent. The density of the starts up makes it entrepreneurial. The cluster allows seamless flow of people, ideas and capital making it a hotbed of innovation. Such a defence national manufacturing investment zone with academia industry hand-in-hand would promote collective learning and ensure steady supply of the skilled manpower. Such cluster's dense social networks and open labour markets would encourage experimentation and entrepreneurship. All the aspiring and leading players should have their bases in this defence Special Economic Zone (SEZ). While companies in this SEZ can compete intensely, at the same time, they can learn from one another about changing markets and technologies through informal communication and collaborative policies. Time is now to ensure the drivers of Innovation are in place by ensuring steady supply of talent and a critical mass of industries working in this domain with industry, academia and R&D coming together in defence SEZ supported by the enabling framework.

India has to choose its area of specialisation in which it must demonstrate product leadership…

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Making "Make in India" Succeed

Lt Gen Anjan Mukherjee

The 'Make in India' initiative has made a huge impact on the domestic sector and motivated the private sector to participate in the government projects with renewed confidence. Indian domestic private sector now has the ability to deploy the best of the technology available worldwide, invest large finances and produce state-of-the-art equipment in the country. If necessary, they are also in a position to get into Joint Ventures with the best technology providers in the world. Changes being brought in the policies for doing business with the MOD, specially under the provisions of the new DPP and DPM must aim to bring the domestic private industry to invest in defence manufacturing sector.

THE INDIAN ARMED FORCES HAVE been facing perpetual shortage of many of the strategic defence items ranging from military hardware to a variety of ammunitions. Maintenance and repair problems have reached critical levels wherein our aircraft, helicopters, tanks and electronic warfare systems are functioning at nearly 50 per cent serviceability. It is a matter of operational criticality and concerns national security, an issue which has been highlighted by the Chief of the three Services from time to time. The situation has also been discussed in the Parliament and commented upon adversely by the Comptroller and Auditor General (CAG) as well as defence experts.

This situation is not new. It may be recalled that during the Kargil conflict, the army had to move guns, ammunition and equipment from deserts and other sectors due to deficiencies and maintenance issues. While certain organisational restructuring and modernisation initiatives have been undertaken from time to time, not much has happened on the ground which would substantially enhance the confidence of the three Services.

In so far as the Indian Army is concerned, the shortage of ammunition has been a matter of great concern. The criticality is across the entire spectrum from quality to quantity. Such is the criticality that substantial restrictions had to be placed on the ammunition for training so as to manage huge shortages of critical items such as tank ammunition, Bi-Modular Charge System (BMCS) for medium artillery guns, 30 mm ammunition and modern hand grenades for infantry. While some initiative for modernisation of hardware is taking shape, the TNT filling in the tank and artillery ammunition is of late 1960s and early 1970s vintage. This has resulted in stockpiling less efficient ammunition and longer logistics chain due to the large quantum of ammunition necessary for the assigned task. This in turn has a tremendous effect on the government exchequer.

In the past, the Ministry of Defence (MoD) largely depended on the Defence PSUs (DPSU) and imports to meet India's defence needs. It remains so even now. The change that has taken place relates to the coming of age of private sector manufacturing in the country. The interest of the indigenous private sector to invest in the defence sector has been lacking due to various reasons. Perhaps it did not have technology, finance and confidence to venture into uncharted and risky defence business. The policies were not conducive and were found restrictive for the domestic sector to enter the defence manufacturing sector.

The Defence Procurement Procedure (DPP) and Defence Procurement Manual (DPM) were complex and inflexible, as also huge delays in finalising procurement projects created considerable uncertainty. The resultant delays

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in procurement processes and dependency on imports has resulted in huge outflows of foreign exchange and delays in meeting commitments by the foreign suppliers. The case of the Gorskhov aircraft carrier, SU-30 fighter aircraft, T-90 tanks, ANTPQ 37 gun locating radars, air defence radars, missiles and guns are well known and needs no emphasis.

The 'Make in India' initiative has made a huge impact on the domestic sector and has motivated the private sector to participate in government projects with renewed confidence. Indian domestic private sector now has the ability to deploy the best of the technology available worldwide, invest large finances and produce state-of-the-art equipment in the country. If necessary, they are also in a position to get into Joint Ventures with the best technology providers in the world. Changes being brought in the policies for doing business with the MoD, specially under the provisions of the new DPP and DPM must aim to bring the domestic private industry to invest in defence manufacturing sector.

However, there are few inherent issues that can derail the new initiative of the government. Foremost among these are the issues of level playing field and overreach by the DPSUs to take projects beyond their present and future installed capacity and thus restricting private sector participation. Perhaps this is one of the principal reasons for the present criticality in the equipment holdings with the three Services. This issue needs to be resolved through major policy initiatives by the government.

While there are many cases affecting the Indian Army's preparedness due to unmanageable equipment deficiencies, the most critical example is that of the Bi-Modular Charge System (BMCS). BMCS is the propellant used to fire 155 mm category guns such as Bofors, Dhanush, up-gunned Soltam and other modern artillery. Without BMCS, the army will have Bofors and other modern guns that cannot be fired. It is reported in the media that BMCS deficiency in the army is over 1.5 crore sets, which is expected to grow rapidly in the future once the modernisation programme of the artillery gathers momentum.

Now that the government is amending the DPP and DPM to bring in policy interventions so as to provide opportunities to the domestic private sector and integrating them with the MoD, a new chapter in defence manufacturing is opening up. The challenges are complex and have multi-departmental ramifications. The complexities can be better explained by few examples as follows:

BMCS. It is a well-established fact that long term perspective plan of the army had approved full mediumisation of artillery to 155mm howitzers. The process of induction of new 155mm guns has already commenced with the induction of Ordinance Factory Board (OFB) built Dhanush howitzers, up-gunning of 130mm guns to 155mm and trials of the 155mm self-propelled and towed howitzers (Buy and Make), issue of RFP for 155mm 52-calibre Mounted Gun System (MGS) and issue of indent to DRDO for the developing fourth generation 155mm 52-calibre gun. It is appreciated that the quantum of new medium guns to replace the existing 105mm/122mm/130mm guns held on the inventory of the army would be over 2,000 or more. The shells for all these guns are made in India by the OFB. Sufficient manufacturing capacity exists with the OFB to meet the army's requirement in the near future. However, the crisis in the artillery is due to acute shortage of BMCS.

There are few inherent issues that can derail the new initiative of the government...

In fact, appreciating the huge requirement of BMCS once the artillery modernisation gets underway, the MoD embarked upon an ambitious project to manufacture BMCS in the country. Accordingly, in the late 1990s it was decided to set up an Ordnance Factory (OF) at Nalanda in Bihar. Vast tracts of land were made available by the State Government and the plant was partially constructed after long delays. The Rs 300-crore project overshot to over Rs 1,200 crore and yet not a single piece of BMCS has been produced by the factory as yet. There are lingering technical and administrative issues that will affect commissioning and regular production from this plant for a considerable time, maybe four to five years or more. In the

meantime, OFB is supplying some quantity of BMCS from its existing plants making base ingredients and some are being imported from abroad at high costs.

With galloping deficiencies of BMCS in the Indian Army, final installed capacity at OF Nalanda would not be able to meet the basic minimum requirements of the Army now or in future. If the Investment and the Return on Investment to the government on this project is worked out, then the OF Nalanda will be at a perpetual loss. To make up the losses the OFB would have to increase the cost of BMCS periodically. The Army will have to fund the increase from its Revenue budgetary allotment, which otherwise should have been utilised in other critical procurements. Thus, the Indian Army and the MoD would face huge avoidable losses of revenue on a long term basis and yet the deficiencies of BMCS would continue to increase thereby affecting the Army's training and operational commitments. There is a need to appreciate that new guns will need intensive training for which the training firing would have to be increased substantially. Absence of BMCS would not permit such an essential aspect of integration of the new guns in the army for which the government is spending crores.

The DRDO, OFB and other government organisations are carrying out substantial original research work…

The MOD should, therefore, consider offering the domestic private sector which has the relevant license, approvals and capabilities to come forward to support the operationalisation of OF Nalanda as also manufacture the BMCS within the country. However, such a far sighted initiative would require serious policy intervention by the government as only one or at best two domestic manufacturers may be interested in such a high-tech, high investment project. Therefore, the issue of single vendor limitation for concluding such contracts may be considered prior to embarking on such an initiative. Such initiatives in other critical deficiencies must be considered now and included in the new DPP/DPM. The new DPP/DPM should permit comparison of the product cost and quality of the private sector with the procurement cost from the DPSUs and other sources viz ex-imports.

On its part, the domestic private sector needs to assure the MoD of its ability to produce world class quality within the laid-down timeframe utilising technology already approved by the army and in use. It is well known that approval and absorption of different technologies takes years to mature and absorb, which is not advisable in critical deficiency conditions. Issue of an RFI to find out the interest and capability of the private sector to produce BMCS in the country should be considered by the MoD. However, it would be prudent to suggest that much caution and due diligence would be necessary to weed out non-serious vendors who obtain a Letter of Acknowledgement from foreign vendors and join a project to derail it. Such vendors would eventually defeat the purpose of the initiative. Therefore, core competency should be one of the governing factors for selection. This concept should be considered by the MoD for any new project of this nature.

Pinaka Rocket. The Pinaka is a successful 'Make in India' venture. The equipment was developed by the DRDO and the technology was transferred to L&T and Tata Power for commercial production. In view of planned raisings of quite a few Pinaka regiments in the near future, the Army HQ placed indents on OFB for 10,000 Pinaka rockets to be supplied over a period of five years at the rate of 2,000 per annum. However, very limited numbers could actually be produced by them. This affected the training and optimal utilisation of the Pinaka in the Army. Yet the existing policies do not permit outsourcing of the shortfall to the private sector by the OFB. Thus, due to policy limitations, neither can the OFB/DPSUs fulfill the demand of the armed forces nor can the shortfall be outsourced to the private sector on turnkey basis with technical support of the OFB.

The OFBs cannot embark upon such a venture due to policy restrictions. With the Extended Range Pinaka Rockets (DRDO) having been successfully fired recently, the challenge to the OFB to produce them has increased manifold. Perhaps the time has come for sharing

the production responsibilities for Pinaka rockets between the OFB and the private sector, and reduce the burden on the government exchequer.

With OFBs setting up of facilities to produce 5,000 Pinaka rockets per annum at an investment of more than Rs 950 crore in the next three to four years, some of the hollowness of the Pinaka rockets is expected to be met. However, unless timely action is initiated, the problem of critical deficiencies of Pinaka rockets is likely to accentuate to crisis levels, as in the case of BMCS. Perhaps the situation can be managed adequately if the private sector is asked to show interest in the project at "no cost, no commitment" basis. As the OFB is the prime manufacturer of the rockets and DRDO is the technology provider, their support to such a novel initiative would be necessary. In doing so, the DRDO/OFB can get consultancy and technical fees, which would be beneficial to the government. Such an initiative, if successful, would substantially improve upon the quality and delivery parameters of the product at no cost to the government making it a win – win situation for all.

However, a caution must be sounded from the point of safety, security, Quality Assurance/Quality Control (QA/QC) and timely implementation of the project by the private sector jointly with the DPSUs or singly, for which strict rules and protocols, checks and procedures may have to be enforced.

To view the issue of challenges towards integrating the domestic private sector with the nation's defence production efforts, few important issues that emerge are:

Transfer of Technology (TOT). The DRDO, OFB and other government organisations are carrying out substantial original research work. The private sector closely works with these organisations during the product research and prototype building stage, as these are governed by the respective lab policies. However severe constraints are faced at the commercial production stage due to the absence of a well-defined policy on TOT and technical support/collaboration between the research laboratory, production agency and the private sector. All such cases need to follow a complex route of government approvals, which takes at least two to three years in the present system. Thus, the project loses dynamism resulting in loss of production and capital utilisation. In some cases, the research effort does not see the production stage as, quite often, import is undertaken to tide over the criticality due to inordinate delay in domestic production. Hence, there is a need to bring in definite policy interventions to correct the situation. As a policy it would be beneficial if proposal for new/ improved product introduction be completed within 24 months. The revised DPP/DPM could assist in achieving this concept.

Persistent Failure to Supply of Indented Inventories by DPSUs and Government agencies. This is a perennial problem faced by the armed forces. Even at the cost of increasing operational hollowness, no policy exists to invite private sector to take on responsibilities to bridge the production gap on a long term basis. Instead efforts are made to expand the existing capacities of the DPSUs and other production institutions of the government. This involves huge financial commitment by the government and inherent time penalty. Thus, Service Headquarters are deprived of its essential operational requirements even if the domestic private industry is confident and capable of meeting the requirement. This issue requires serious policy intervention through the revised DPP/DPM.

The 'Make in India' initiative can change the parameters of the way the MoD does business with the domestic private sector…

Conclusion

The 'Make in India' initiative can change the parameters of the way the MoD does business with the domestic private sector. It would save time, reduce inventory hollowness, reduce government expenditure, increase domestic employment, increase skill level of workers and save foreign exchange. Domestic private sector may also be invited to invest in the construction of specialised warehousing facilities for the armed forces against rent. These initiatives will make huge Capital and Revenue budgetary savings for the exchequer. On its part, the MoD

will have to formulate policies to encourage participation of the domestic private industry in defence production through initiatives in the new "Defence Procurement Procedure and the Defence Procurement Manual" as also by providing specific financial incentives.

Provision of a level playing field to the private sector that will provide a boost to industrial growth in the country should form part of this vital initiative. In order to encourage the private sector participation in the defence production, the following may be considered:

Concept of National Resource. MoD/ Service Headquarters should consider the facilities available in the private sector as national resource for manufacturing of defence products on a long term basis. Maintaining a National Manufacturing Asset Register and close interaction and visits to the facilities available with the domestic private sector by the stakeholders would increase confidence and progress projects optimally.

During 2012-2013, the Base Overhaul of Bofors Guns was stopped due to multiple reasons…

Product Development and TOT. The DRDO, OFB, Directorate General Quality Assurance (DGQA) and other government departments should provide requisite support for TOT, product development and validation, QA/QC support to the private sector at a reasonable cost. A Comprehensive Policy on the subject is necessary.

Protocol on Third-party Inspections. Third party inspections by the agencies of national repute duly, approved by the DGQA/MoD may also be permitted to provide QA/QC coverage to the private sector. It will assist the DGQA in expediting the product validation process. A separate protocol in this regard needs to be evolved. Protocol on third party inspection between the DGQA and top private laboratories, in India and abroad will bring in immense dynamism and latest practices into the system.

Managing Critical Deficiencies by Involving Private Sector. If the OFB and DPSUs fail repeatedly to fulfill the demands of the Armed Forces due to capacity and operational constraint over a long period, an alternate procedure should be available to invite participation of the private industry for supply of defence items through a transparent manner on a long term basis. This will require a policy intervention wherein the users must have the authority to invoke the provision through the MoD.

Flexibility. The new DPP and DPM should have enough flexibility to invite the private sector, initiate technical cooperation including QA/QC requirements, safety and security audit and other regulatory requirements at a reasonable cost so that the process of inclusion of the domestic private sector proceeds unhindered.

QA/QC. Military equipment requires high levels of QA/QC so as to sustain the challenges of training, deployment and war. However, not one agency/institution has been appointed by the government to check, advise and approve manufacturing standards at the production level in the private sector. The DGQA comes into picture only when official trials commence. Then how can indigenously produced equipment pass the GSQR parameters without earlier testing and advice by MoD appointed experts? Foreign equipment that competes with the indigenous ones would have better chance to succeed since their equipment are tested and inducted in their respective countries.

Similarly, DPSU manufactured items have the advantage of inhouse DGQA and other QA/ QC support. Hence, the issue of manufacturing level QA/QC support by the government for the private sector needs to be considered and policy enunciated. It is, therefore, recommended that a 'Consultancy Section' under a fairly senior officer having experts in various fields from DRDO and DGQA be nominated by the MoD and be available to the Indian industry on request, at a reasonable payment. While these officers may continue to be employed by their respective departments, they should be available on directions of the MoD, on case to case basis, to undertake product validation and provide technical advice. The MoD should become the driver of any major defence product entrusted to the private sector, by providing support that is not available in the private sector.

Trials. It is almost impossible for indigenous

manufacturers to undertake live firing trials since weapons, crew for firing, ammunition, range, range clearance, equipment for fall of shot observation and all other issues connected with the trials firing are not available on request. No weapons are earmarked for trials by the private sector as in-service weapons cannot be used for trials of ammunition or connected equipment. Thus, a domestic private sector manufacturer cannot undertake dynamic tests of his product to check quality and GSQR parameters. The DRDO and OFB have some weapons for trials which cannot be loaned to the private sector. In addition, the cost charged for ammunition and services by the MoD is prohibitive and needs to be substantially reduced to no profit no loss value for indigenous manufacturers. Unless this anomaly is corrected, the domestic private sector will never stand a chance against the foreign vendors and the DPSU. It is, therefore, suggested that a fresh approach to this problem be undertaken by the MoD wherein acquired artillery firing ranges and technical support be made available at a token cost to the private sector.

The DGQA should be allotted weapons and crew for proof testing for the private sector. Acquired field firing ranges close to manufacturing hubs may be made available for initial trials viz Devlali/Ahmednagar Field Firing Ranges for manufacturing hub at Pune albeit within the safety, security and applicable government policies. Longer acquired ranges viz Pokaran and Mahajan in Rajasthan should also be made available for maximum stress/range trials. Experts from the three Services, as per the requirement, and civilian personnel and equipment as also QA/QC team as discussed above should be made available while undertaking production level dynamic trials, at a reasonable cost.

Overhauls of Guns and Equipment. Presently, these are mostly undertaken by Electronics and Mechanical Engineers (EME) base workshops/DPSU. However, there is a large backlog affecting the operational effectiveness of the army. Delay and cost overruns for Base Overhaul by the EME Base Workshops for the critical equipment like 155mm Bofors gun, Main Battle Tanks of earlier vintage and heavy engineering equipment are well known. It is also a fact that during 2012-2013, the Base Overhaul of Bofors Guns was stopped due to multiple reasons. It should be appreciated that the present lot of 155mm Bofors guns are over 25 years old and their repair and maintenance requirements are increasing by the day.

Similar is the case of older model T-72 tanks and Armoured Fighting Vehicles. Delay in Base Overhaul would result in rapid degradation of this equipment. Artillery gun manufacturing industry by the private sector in the country has been modernised substantially and appears to be confident to undertake the challenge of overhaul and repairs of artillery guns. Notably, Bharat Forge Limited which has already produced a 155mm 52-calibre artillery gun and set up a medium gun production line, can undertake 'Base Overhaul' of 155mm 39-calibre Bofors as also other guns viz 105mm LFG/IFG and Russian 122mm towed gun, which has almost become obsolescent. Hence, the DPM should look into the existing policy of Base Overhaul of important equipment afresh and domestic private sector be brought in to share the load in an open and transparent manner.

The MoD needs to recognise the private sector organisations that take proactive steps towards successful indigenisation of complex products and support the 'Make in India' initiative...

In this process, the army and the government will gain substantially. On a long term basis, the government will be able to reduce the non-fighting component of the armed forces and use the manpower saving towards strengthening the combat elements. This concept has been attempted by the army from time to time but with little success. Such an initiative would reduce the logistics tail of the army as well and result in substantial financial savings to the exchequer.

Skill Development - Centres of Excellence. The involvement of the Indian private sector can provide necessary thrust to the ambitious initiative by the present government towards Skill Development at the grassroots and advanced levels, training of which is limited

in the country. The defence private sector has the technological wherewithal, financial strength, infrastructure and motivation to effectively support this initiative. These Centres of Excellence will form part of the respective manufacturing processes and can provide substantial employment opportunities. They can become co-opted partner with the government departments to support the initiative in a scientific manner. The DPP/DPM under formulation should look into this concept and provide policy initiatives accordingly.

Joint Operating Charter. Indian defence industry in the corporate sector is highly nationalist. High 'Return on Investment' does not drive this sector of the industry. The corporate leaders who have entered this 'risky' business have done so due to their own conviction to do something for the nation, national security and the Indian Armed Forces. Industry associations viz CII, FICCI and ASSOCHEM are representing these industries and are the informal link between industry and the government. While certain seminars and trade fairs have been conducted jointly, much more need to be done at the functional and execution levels, should the government wish to make indigenisation initiative a success.

The private industry need not be seen as a competitor to the DPSUs but as a strategic partner with common goals...

The basic framework to move ahead would be a Joint Operating Charter, which will act as Standard Operating Procedure (SOP) for any interaction, discussion, support, technical coverage, QA/QC, trials, warranty/guarantee, legal issues, arbitration and other miscellaneous issues. 'Joint Operating Charter' would be acceptable by all the government agencies including users and the industry. This will provide assurance of quality to the government and the user, and assurance of government support to the industry. It would be the most effective step towards Indian industry's deep association in defence production in the future.

The MoD needs to recognise the private sector organisations that take proactive steps towards successful indigenisation of complex products and support the 'Make in India' initiative by providing incentives in terms of technical advice, business related support and tax benefits as also providing level playing ground. The issue of equalisation of foreign exchange fluctuation on order value having foreign exchange component as also the issue of very large collateral deposit through bank guarantee needs to be analysed and a fair policy should be worked out for the domestic sector. Perhaps the time has come to divide large sector into very large sector and large sector, followed by Medium and Small Sector. Regular exchange of scientific and technical knowledge between the government departments, DPSUs and DRDO with the private sector will substantially improve indigenous manufacturing base, which in turn will enhance quality and ensure better value for money for the Govt of India. It would also be beneficial if the MoD (Defence Production) invites the leaders of various specialisation viz design and production, ammunition, components and electronics as also large corporations, medium and small scale manufacturers and listen to their views, so that the final DPP and DPM becomes complete in all aspect and becomes an engine for the great industrial leap in the future.

It may be pertinent to mention that India imports nearly $9 billion or more of defence products per annum. If the government involves domestic private sector's capability to undertake import substitution and hi-tech manufacturing, it would be able to save at-least $2.5 to 3 billion worth of foreign exchange and possibly another $1.5 billion from ancillary supplies. An initiative of this nature will ensure induction of cutting edge technology in the country at no cost to the government. It will be the best example of 'Make in India' initiative by the government.

As a concept, the private industry need not be seen as a competitor to the DPSUs but as a strategic partner with common goals. If the private sector is contracted to make up the production shortfall from the DPSUs, it would take care of the critical hollowness at no cost to the government. The downstream benefits at the level of job creation, upgrading of skill, economic benefits in the region and higher revenue to the government through taxes can well be understood.

Restructuring Defence Procurement Procedure

—— Ashish Puntambekar ——

A major show stopper in India's efforts to become self-reliant in weapons production is the Defence Procurement Procedure (DPP). The current DPP (2013) is a 361-page document which serves to confuse entrepreneurs and appears to complicate the manufacture of weapons in India. Presented here is a "Designer's View" in the form of six concepts that will hopefully get the concerned authorities to focus on what is important. By applying these six concepts, the 361-page DPP can potentially be reduced to a 54-page document which can be easily understood by all stakeholders and executed in a manner that allows our soldiers (the actual users) to get the best weapons possible at an affordable price.

THE THREE PRINCIPAL ARMS OF THE Indian armed forces i.e. the Indian Army, Indian Navy and the Indian Air Force are expected to buy or replace over $200 billion worth of military equipment over the next five to seven years. This unprecedented demand is accompanied by an unprecedented demographic phenomenon which will see over 150 million young people enter the working age group over the next seven to ten years. Previous governments did not do anything substantial to create new jobs in the manufacturing sector and as a result, the present government is likely to face very serious pressures within the economy if the indigenous manufacturing sector is not stimulated aggressively. It is in this context that the Modi-led NDA government's "Make in India" programme assumes importance especially in the field of defence manufacturing.

Objectives of Applying "Design Thinking" to DPP 2013

Design thinking is essentially "User Centric Design". Applied to India's Defence Procurement Procedure, design thinking seeks to achieve the following:

- Keeping the needs of the Indian armed forces at the centre of the procurement process.
- Ensuring transparency in defence procurement through elimination of loopholes and prevention of scams
- Ensuring efficiency and speed in defence procurement
- Encouraging domestic manufacturing through robust policy measures

Six Design Concepts Applicable to DPP 2013

A major show stopper in India's efforts to become self-reliant in defence production is the Defence Procurement Procedure (DPP). The current DPP (2013) is a 361-page document which serves to confuse entrepreneurs and appears to complicate the manufacture of military hardware in India. Presented here is a "Designer's View" in the form of six concepts that will hopefully get the concerned authorities to focus on what is important. By applying these six concepts, the 361-page DPP can be reduced to a 54-page document which can be easily understood by all stakeholders and executed in a manner that allows our soldiers (the actual users) to get the best weapons possible at an affordable price.

ABC Analysis Concept

The 49-page "Standard Contract Document" (pages 297-345) of the DPP 2013 is really the heart of the DPP. It comprises 85 per cent of the DPP and recognising this will help concentrate on the crucial aspects of defence procurement which can then be retained in DPP 2015.

Brahmos Analogy – The "Throw Away" Concept

Policy makers will note that India produced an excellent weapons system – the Brahmos Missile at a time when there was no DPP.

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This proves that most of the text within DPP 2013 (Pages 1 - 296) is not really necessary and could be replaced by a short six to nine page policy note that provides a broad direction "Make in India" and specifies the conditions under which we will import sophisticated weapons. The Brahmos example is, therefore, very significant in re-thinking DPP 2015.

To Achieve This - Focus on the Flow Chart (Pages 172-177)

To reduce the size of the DPP and make it business friendly and easy to execute, there is a need to focus on pages 172 – 177 of DPP 2013 (The Flow Chart). This six-page flowchart needs to be reduced to two pages by eliminating everything that is not absolutely essential and by clubbing activities that can be combined within a single department to save time in the acquisition process.

Policy makers will note that India produced an excellent weapons system - the Brahmos Missile at a time when there was no DPP...

Secondly, all standard forms need to be moved out of the DPP into a simplified supplement. The main DPP document should only include the policy/broad simplified procedure and the contract (54-page document). Companies should be able to just fill up the standard forms in a certain order quickly and submit them. Secondly, there should be just one common format for each form. Why have three or four different formats for "Make" and "Buy and Make"?

US Constitution Analogy - The Intentions Concept

The US Constitution that was written in 1787 and ratified in 1778 is a six to nine page document (depending on font size). In their 227 years of running a large country, the American people have made just 27 amendments to their constitution. Even after making these 27 amendments, the US Constitution still remains a very brief and effective document.

Pages 1 to 296 of the DPP 2013, therefore, need to be replaced by a six to nine-page policy document that talks about two things:

- Intention of the Government of India i.e. Make in India
- Broad policy and process guidelines to achieve manufacturing of 80 per cent of the equipment in India within the next decade

While we say this, the Design Lab is fully aware that the Current US Defence Procurement and Acquisition Policy (DFARS, PGI, and 5000.1&2 and the mother document, the Federal Acquisition Regulation, FAR) runs into thousands of pages.

The point, however, is that the US frame of reference and India's frame of reference are totally different. If we come up with a brief yet effective policy, maybe the Pentagon will learn from us and from the framers of their own constitution. If we do the above, DPP 2015 will be a 54-page document consisting of:

- A six to nine page policy note which includes a "broad process framework" that encourages "Make in India".
- A 48-page unified contract for military equipment, software and services.

The "Amendments Limitation" Concept

The framers of the US Constitution were learned intellectuals. Their clarity of thought and wisdom in drafting a brief constitution is recognised by everyone today. There have been approximately 11,000 attempts to amend the US Constitution; only 27 amendments went through in 227 years. The lesson for policy makers working on the DPP 2015 is therefore very clear. If you draft a brief document, how many amendments can you make over the next 50 - 100 years? We, therefore, need to have a very brief DPP document to ensure that amendments to the DPP do not become an annual affair, as it is at present.

Achieving "Best Value" Contracts - Burj Khalifa's "Collegium" Concept

Purchase of most equipment by the Ministry of Defence is under the Lowest Bidder (L1) regime wherein the contract is awarded to the bidder who provides a product which meets all the mandatory requirements set forth in the Services Qualitative Requirement (SQR) and the Request for Proposal (RFP) at the lowest cost.

Provisions also exist for buying from qualified L2 or L3 bidders under special circumstances but this requires approval from the Cabinet Committee of Security (CCS), which is neither easy nor convenient and creates huge problems for the party in power over corruption allegations. The other option (T1 Regime), where the government would be required to go for Quality Based Selection (QBS), that guarantees high quality in weapons procurement, is often unaffordable for the government. The third option (Best Value Contract) is perhaps the most optimum solution and is actually being used for procuring weapons and equipment for the following:

- India's Special Forces
- Indian Space Research Organisation (ISRO)

This method has worked extremely well and needs to be implemented for all procurement for the Indian Armed Forces.

Implementing "Best Value" - Learning from Burj Khalifa "Collegium" Experience

To make 'Best Value Contracts' the new normal in Indian defence procurement, the Ministry of Defence could learn from the Burj Khalifa's Collegium experience. To ensure that Dubai got the best design for the world's tallest tower, the project owner, state-backed Emaar Properties, brought in the world's experts in super tall buildings (1) The Chicago office of Skidmore, Owings & Merrill (SOM), (2) Kohn Pedersen Fox and (3) Pelli Clarke Pelli for an invited competition in 2002, to build an iconic structure that would set the Super-tall record not just for the Middle East but for the world.

The Designs produced by the various competing firms was reviewed by a collegium of experts and SOM's winning design that was selected by the collegium went into an EPC bidding round to produce a world class structure at the lowest possible cost. The Design Lab proposes to implement this "Collegium" concept in all India's Defence Contracts but under a different format which we will now discuss.

Implementing the "Collegium Concept" in Indian Defence Procurement

The "Best Value Contract" method involves assigning weightages to the various aspects of a piece of military equipment and its price structure. The main issue here is that if anyone challenges the basis of assigning weightages, the entire contract can be under a cloud. To overcome this and to ensure that our armed forces get the best affordable weapons, the Design Lab suggests that the government of India appoints a collegium of eminent persons to assign weightages to the various aspects of a weapons system. Before the collegium votes to assign the weightages, its members will be briefed by the Military Technical and commercial experts. This will provide enough information to these senior people to cast their votes.

> We need to have a very brief DPP document to ensure that amendments to the DPP do not become an annual affair, as it is at present...

The Defence Collegium of eminent persons would consist of the following:

- Members of the Parliamentary Standing Committee on Defence drawn from all major political parties
- Well known serving and retired military technical experts
- Retired Judges

The weightage assigned by the collegium, in each case, will be used in the evaluation and award of all contracts by the Ministry of Defence in future. This method is better than any operations research or other method to assign weightages as it will include members of the opposition in parliament, who will be party to every defence contract and therefore cannot be questioned. This collegium system will ensure quality and affordability of the equipment procured by the government.

Make in India - The Defence Economic Zones Concept

The government of India needs to start projects that could potentially employ at least half of the 150 million that are expected

to enter the job market by 2018. The Ministry of Defence is expected to place orders worth $200 billion or so within the next five to seven years. If we do not act now by initiating large manufacturing projects in the private sector, we will have to import a large part of the above mentioned military ordinance as the PSU sector (nine defence PSUs, 37 Ordinance Factories and the DRDO) has neither the competence nor the capacity to produce sophisticated weapons as demonstrated over the last 45 years.

In November 2014, a proposal to fast track domestic defence equipment manufacturing was submitted to the government of India. The proposal called for the setting up of six Defence Economic Zones (DEZs) across India in two phases of three DEZs each. Each DEZ will be a 3,000-5,000 acre self-contained defence manufacturing facility with large defence contractors as anchor partners and over 2,500 vendor companies located on each DEZ together with six IIT-sponsored engineering departments offering full time courses in defence related disciplines. Each DEZ is likely to create over 3,00,000 high technology jobs in the defence sector. The DEZs will also have their own extensive logistics facilities to move manufactured equipment to testing ranges and to export markets in case of finished products. The DPP committee should consider inclusion of a page on DEZs and a government of India policy on DEZs in DPP 2015.

The government of India needs to start projects that could potentially employ at least half of the 150 million that are expected to enter the job market by 2018...

Concluding Comments

We live in an era of extremely rapid change and challenges to our security. India has to respond to any kind of security threat be it from neighbouring nations or from terrorist organisations from around the world such as Al Queda and ISIS. Today, when global geopolitical structures such as the Berlin wall could collapse in a few minutes, and when phenomena such as the sudden rise of ISIS can threaten peace and security in South Asia, can we talk about the requirement of a precedent before we can be convinced to take action?

India has signed Strategic Partnership agreements with 20 countries. However, Ambassador K. Shankar Bajpai has said that when the chips are down, none of these strategic partnerships will work. It is, therefore, extremely important that the Phase I of the DEZ project be fast tracked on an immediate basis. Not doing so could have catastrophic results. This Government has won a historic mandate to bring in change. The people of India expect and demand change in the way things are done. Providing a DPP that works efficiently, creates millions of new jobs and secures our borders is a sacred duty. We cannot afford to fail.

AIRBORNE AND SPECIAL FORCES

Reassessing Role, Tasks and Organisations

—— Brig Deepak Sinha ——

The necessity for Special Forces (SF) is not in question. As I have myself written, in the context of Special Operations Forces, elsewhere "these forces can meet unorthodox security needs that conventional military organisations find difficult to accomplish, if at all." The confusion that prevails, especially in our context, is with regard to role definition. While SF personnel see themselves as a cross between the fictional characters James Bond and Jason Bourne, reality obviously, in terms of training, capability and operational employment is vastly different. This confusion has arisen because we have not differentiated nor laid down guidelines as to what is required of our intelligence operatives, that is what those fictional characters represent, and from our SF units.

OVER THE PAST TWO DECADES, our Special Operations Forces (SOF) and their capabilities have received a substantial boost in terms of numbers and equipment profile apart from the rapid increase in air transport forces especially with the introduction of the C-17 Globemaster III and C-130J Super Hercules aircraft. It is no secret that the Parachute Regiment today consists of nine Special Forces (SF) Battalions and five Airborne (AB) Battalions of which three form a part of the Parachute Brigade at any one time along with the brigades other fire support, assault engineering, air defence, communication and logistics elements. In terms of airlift capabilities, the Indian Air Force probably has sufficient air effort to be able to carry out a complete brigade group simultaneous assault in the airborne and heli-borne role, a capability likely to be matched by very few countries in the world.

Development of Special Operations capabilities in India commenced during the Second World War in 1941 with the raising of No 50 Independent Parachute Brigade which consisted of two Indian and one British Parachute Battalions. During the war years, it was involved in three operations, the first was an airborne assault by approximately two Companies to confront and subdue the Hun tribals in Sindh. The second operation was when the Parachute Brigade was committed as reinforcements for countering the impending Japanese offensive against Imphal. It was at Ukhrul and Sanghshak, that the Brigade hastily occupied defences to delay the Japanese advance on to Imphal. Field Marshal William Slim later described this as, "It was of inestimable value at this critical stage of battle."[1] The final operation of the war was the conduct of a successful airborne assault to capture Elephant Point as a part of the joint amphibious operation to secure Rangoon.

In the later stages of the war, this capability was subsequently enhanced with the raising of Brigadier Orde Wingate's Long Range Penetration Force, originally the Chindit Force and later 3rd Indian Division (which only accepted British, African and Gurkha troops) in 1944. They were air-landed behind the Japanese frontlines by gliders and transport aircraft to interdict Japanese lines of communication as well as destruction of logistics and headquarter elements in Burma. The force of approximately two Divisions with its own air effort, was only reasonably successful, especially in its second effort and the operation was called off once General Wingate was tragically killed in an air accident. By the middle of 1944 till early 1945, all SOF were brought together. The Chindit Brigades and 50 (Independent) Parachute Brigade were grouped into 44 Airborne Division with the raising of a second parachute Brigade, the 77th and 114 (British) Air Landing Brigade based on glider-borne troops. It was from this

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Divison that elements launched Operation Dracula, the capture of Elephant Point by airborne assault.

After independence and partition of India, the Indian Army drastically reduced its SOF capability to just one parachute Brigade of three parachute Battalions and other requisite support and logistics elements, which after the Sino-Indian conflict of 1962, was enhanced to two Brigades. Subsequently, based on the exploits of the Meghdoot Force in the 1965 Indo-Pak operations, two Para Commando Battalions were raised as a part of the Parachute Regiment.

After independence and partition of India, the Indian Army drastically reduced its SOF capability…

In 1971, the Commando Battalions of the Indian Army were utilised to carry out raids in their respective area of operations, while one Battalion of the Parachute Brigade was employed in an AB drop at Tangail, which certainly caused immense demoralisation among Pakistani troops. More importantly, its higher leadership whose state of morale can well be gauged from the fact that they unconditionally surrendered Dacca without a fight with over 90,000 being taken prisoner.

Similarly, during the Kargil War in 1999, in a move that has not been fully recognised or appreciated, the Parachute Brigade's employment from the East in Mushkoh threatened the Shaqma Axis, the only axis available to Pakistan to support all operations East of Shingo/ Olthingthang axis that is the Drass, Bimbat, Kaksar and part of Kargil sub-sector. It was a strategic master stroke that forced Pakistan to sue for peace to avoid another disaster.

The existing profile of the Regiment, mentioned earlier, has been achieved but not without its own unfortunate consequences, thanks mainly to a debilitating and bitter conflict within the Regiment over differing perceptions of what the role and doctrine of the AB and SF Battalions should be. Acrimonious debates and inadequately thought-through steps over recent years have increased rather than narrow the misconceptions about Airborne and Special Forces regiments. These retrograde steps have been based on personal preferences and mindsets rather than informed debate. These are founded on the assumption that SF and AB battalions have vastly differing roles and tasks, implying that what the SF battalion is meant to do cannot be replicated by an AB battalion, and vice-versa. Such an outlook is a flawed construct that we have imbibed from American and British military doctrine without sufficient analysis of its applicability in our context. It is, therefore, necessary to put both these types of units under the scanner, understand their existing roles/tasks and see if their organisations meet their requirement or is a clearly delineated SF/ AB concept of employment and linked issues needed.

The Airborne Conundrum

Perceptions

From the time AB forces came into being, and even to this day, they are seen as specially trained infantry that is transported by air to its objective area, dropped and after reorganisation is required to operate as a regular infantry battalion or formation and carry out the same tasks as they would. It seems like a completely reasonable and logical assumption if one were to completely discount battle winning factors such as surprise, speed and momentum of attack, morale and motivation and the likelihood of the enemy being unprepared to face such an assault given the depth at which it is likely to be effected. Furthermore, the disruptive effect on the enemy's command and control elements and the subsequent dislocation that is bound to occur is also not taken into consideration.

That they are highly trained light infantry is not in doubt, but historical study worldwide reveals that they were invariably used for the capture of objectives critical to success of the ground offensive. This they primarily achieved by destroying communication and logistics hubs, neutralising key commanders, ambushing reinforcing troops; overall causing mind paralysis and fear in enemy ranks. What is revealing is that many of these feats were "opportunity feats" created by wide dispersion in landing and executed by AB personnel trained in boldly executed directive command leadership driven by initiative and daring; calculated risk-taking to exploit "fleeting opportunities" more than by linear obedience to hierarchical

command This does not in any way imply that they do not hold ground. For example, after the capture of a bridge or an airfield, they do, but that is for a limited period till relieved by ground troops or till the situation demands after which they can disengage and fade away, as was finally resorted to at Arnhem after the ground forces failed to link up at Arnhem Bridge. That they had been launched to capture "A Bridge Too Far" by Field Marshal Montgomery, whose understanding of AB operations was at best sketchy and aversion to risk taking well known, is of course, one of military history's supreme ironies.

It has only been in rare cases that they have been utilised purely in a defensive ground role; the most striking example being during the Second World War when Stalin ordered the conversion of ten Airborne Divisions into Guards Rifle Divisons to stem the offensive against Stalingrad and in the Baltics.[2] There have also been some instances again of the Soviets utilising Airborne troops to reinforce defences in a sector facing enemy attacks but in the post war years, probably the airborne drop by the French at Dien Bien Phu in Indo-China as reinforcements is the only instance of such troops being utilised for a defensive purpose. Closer home, 9 PARA (SF) was used to reinforce defences at Chhamb while 50 Para Brigade was deployed in defence positions after being moved from the Eastern Sector to the Western Sector during the 1971 campaign.

Employment Philosophy

History is replete with examples that from the time small Airborne detachments were first employed operationally by the Soviet Union in 1925 against "*Basmachi*" or Muslim extremists in the Central Asian Republics[3] and by all sides during the Second World War and even in later years, airborne forces have always been employed against numerically superior forces. In this context, it may be worth recalling the German airborne assault on Crete in May 1941, because it truly exemplifies strategic offensive employment of Airborne/air-transported forces with no ground support or link up planned. In this operation, codenamed 'Operation Merkur', approximately 22,000 troops, consisting of one airborne divison with an additional airborne Brigade tasked in the airborne/glider borne assault role to capture airfields with a supporting Mountain Infantry Division for follow- on tasks in the air-landed role. These forces were employed against an Allied force of approximately 32,000 troops supported by the remnants of ten Greek Divisions, a total of not less than 45,000 troops deployed across the Island.

That German assessments of opposing forces were completely off target and heavy casualties ensured that no further airborne operations were undertaken is another matter. The German Airborne Forces were able to capture the major airfields in Crete through a combination of surprise, shock action and decisive numbers at the point of decision. Thereby, the Germans succeeded in their mission and forced an Allied evacuation of the island, but not without over 9,000 Allied troops being taken prisoner. That this was achieved despite the British being fairly clear as to overall German intentions and tactics, thanks to the success of their 'Ultra' code-breaking "Enigma" programme.[4] This operation, in many ways, can be considered to be the forerunner of the present day employment of airborne forces as advance elements of Rapid Deployment Forces (RDF), around the world.

There have also been some instances of the Soviets utilising Airborne troops to reinforce defences in a sector facing enemy attacks…

While this example and others too numerous to detail here, clearly show that numerically inferior airborne forces have time and again succeeded because of superior training, motivation and the element of surprise and shock, it is our flawed perception that they are regular infantry once dropped that has greatly impeded our understanding of their capabilities thereby restricting their use. Because we look at them as purely infantry units carrying out an assault on a defensive position we end up grossly under utilising and even undermining them. Hidebound conventional tactical reasoning demands we use standard force ratios while allocating troops to task which results in earmarking additional resources and preparatory time. We also tend to ignore the

fact that in the event they are dropped on the objective or in its vicinity, which will always be the preferred option, they need their initiative driven methods, not standard infantry battle drills and tactics to carry out their attack.

Thus, with our existing operational philosophy, an assault on an objective held by a Company would be undertaken by a Battalion group. If we were to follow historical precedent, this task could possibly be accomplished by either one Company or at best, by half a Battalion. The implication of this and the crux of the issue is that where we should actually be utilising just between six to eight aircraft for this mission, because of our fallacious thinking the task presently requires the use of 24 to 30 aircraft, depending on type of aircraft and distances to be covered. The comparative difficulties involved in organising a mission involving eight aircraft *vis-a-vis* one involving 30 aircraft in terms of factors such as resources required, complexity of launching and recovery of aircraft, provision of escorts, suppression of air defences and possibility of achieving of surprise, along with a host of interrelated factors are easily comprehensible. For example, in an aircraft stream of approximately 30 aircraft the difference between the first "*vic*" and the last will be anywhere between 100-150 nautical miles, which clearly explains the magnitude of the problems involved when organising air cover for the protection of the air transport stream.

As a rising South Asian power, India needs to protect her growing economic assets and citizens within the Indo-Pacific region…

This vast requirement of resources creates a dichotomy with regard to their employment in the context of the security environment that we are confronted with. Before we can launch such an offensive, the prevailing air defence environment will require the IAF to carry out considerable preparatory strikes and air superiority missions to ensure such a large air transport stream can be safely inserted without losses. This may require anywhere from four to seven days after the hostilities have broken out which, however, is unlikely to be available, given that such a conflict fought under a nuclear shadow will face tremendous international pressures to be quickly terminated. This implies that not only our ground offensive may be restricted in terms of depth, but also that it will probably only has a very limited window in which to be undertaken. Further elucidation of the strategic dilemmas that we face is given in my article "Divergent Paths: India's National Security Strategy & Military Doctrine", (IDR Vol 30.1 Jan-Mar 2015) as space does not permit further amplification here. Thus, if we continue to look at employment of airborne forces as we presently do, then it appears their use in support of such an offensive seems extremely unlikely.

This clearly requires not only a review of the organisation table of our AB forces to make them lighter and more potent, but also reassess employment philosophy. As a rising South Asian power, India needs to protect her growing economic assets and citizens within the Indo-Pacific region. We thus need troops to handle Out Of Area Contingencies (OOAC). The manner in which the intervention in the Maldives, Operation Cactus, was launched in a matter of hours by the Parachute Brigade in 1988, against terrorists who had deposed the Government, clearly shows the necessity for establishing an adequately strong RDF capable of responding with appropriate force within the required timeframe. That the Parachute Brigade with an additional SF Battalion will have to be the spearhead element of any such RDF is unquestionable and it requires that they be able to operate independently at great distances with sufficient capability till seaborne forces can be inducted in support.

The Special Forces Dilemma

Role Definition

The necessity for Special Forces is not in question. As I have myself written, in the context of Special Operations Forces, elsewhere "these forces can meet unorthodox security needs that conventional military organisations find difficult to accomplish, if at all." The confusion that prevails, especially in our context, is with regard to role definition. While SF personnel see themselves as a cross between the fictional characters James Bond and Jason Bourne, reality obviously, in terms of training, capability and operational employment, is vastly different.

This confusion has arisen because we have not differentiated nor laid down guidelines as to what is required of our intelligence operatives, that is what those fictional characters represent and from our SF units.

Our problems have emerged from our belief that covert and clandestine operations are one and the same. Our inability to understand the subtle difference between these terms has in fact led to our misinterpretation of the way in which the West generally differentiates between operations to be undertaken by intelligence agencies and those by SF, though there have been some examples of overlap due to peculiar circumstances. Covert operations require the highest degree of deniability and non-attributability while clandestine operations have lesser need of this. It stands to reason, therefore, that while covert operations fall in the realm of intelligence agencies, clandestine operations are the *forte* of the Special Forces.

Clearly, in the recent trans-border raid into Myanmar against insurgent camps we could afford to organise a clandestine mission that needed to remain secret only till it was executed as there would be minimal repercussions once the raid was attributed to us. However, in the Indo-Pak situation, we would certainly need to look at complete deniability, to avoid fallout thereby needing to organise covert action. Connected to this is the necessity for nations to ensure that regular armed forces and SF are very much an integral part of that, follow the protocols laid down by the Third Geneva Convention of 1949, of which we are signatories as well. Given this clear cut differentiation, it is necessary for Army HQ to specify the role of the SF units so that they can be organised and equipped to build up realistic capabilities that fall within their domain.

Employment Philosophy and Tasking

At the present time, our SF Battalions are scaled approximately one to two per field army. They are expected to operate in small teams within the theatre with the Battalion Commander located either at the Field Army HQ or with a Corps HQ to advise the commanders on their tasking and coordinate operations of his Battalion. In practical terms with his sub-units spread over large distances, he can have little influence in either planning of sub-unit level operations or in motivating his command through personal leadership. Moreover, given his limited service/age profile, his operational understanding is likely to be superficial and thereby his advice less than wholly credible.

When war commences, they primarily have the task of carrying out Reconnaissance, Surveillance and Target Designation (RSTAD) and Direct Action (DA) missions. While Human Intelligence (HUMINT) gathering is important and needed advances in technical and electronic capabilities have made them extremely relevant and often better options than dispersed SF HUMINT. A wise combination is obviously needed. Prior to hostilities breaking out they could carry out clandestine trans-border RSTAD, DA and providing liaison or assistance to rebel elements if operating in that country, which implies language skills and knowledge of terrain in the area of operations. It also stands to reason that employment of assets prior to hostilities will certainly lead to degradation of capabilities subsequently due to recovery, rest and recuperation issues.

Covert operations require the highest degree of deniability and non-attributability while clandestine operations have lesser need of this…

It, therefore, appears reasonable to deduce that DA will become their primary mission to include interdiction, raids and harassment tasks. RSTAD would become secondary and resources required to be deployed for this would be minimal since they would mainly be used to confirm specific information obtained by other means. However, for conduct of DA missions, the existing team organisation needs serious enhancements in numbers and capability to extricate themselves without reinforcements.

Miscellaneous Aspects

There has been much criticism that by increasing the number of SF Battalions, we have not only hurt their "exclusivity" and diluted standards but also ensured that units are perennially short of weapons and equipment because of sharing "poverty". The number of units of Special Forces that a country has is

based on threat perceptions, military doctrine and operational requirements and "exclusivity" is in that context a needless distraction. Thus, different countries have different numbers. For example, the US has approximately 50,000 personnel in their Special Operations Forces, while Russia probably has over a 100,000, if Spetsnaz from all Departments are considered, and even Pakistan's SSG now is about a Division strength. As regards training standards and equipment profile, these are matters of bureaucratic organisation, budgetary support and institutional implementation. Moreover, a 10,000-man Special Operations capability for a million plus army, such as ours, is hardly excessive.

Lack of role definition has led to an equipment profile that is not only skewered towards "high technology" imported equipment of limited utility with attendant serviceability issues, but also with regard to its authorisation. The necessity, for example, of maintaining over 500 Combat Free Fallers makes little sense because not only is it not practicable for units to ensure suitable manpower required is available, but more importantly there appear to be no suitable operational mission where they can ever be used in such numbers. All that has been achieved is that such a capability has tied up money which could have been better utilised elsewhere. There are numerous such examples of such excessive and unrealistic capability building which have impacted budgetary provision and need to be reconsidered. In any case, the armed forces as a whole have been suffering from endemic shortages for reasons too well known to bear repetition.

The armed forces as a whole have been suffering from endemic shortages for reasons too well known to bear repetition…

For the past two decades, our SF Battalions have been employed in the Counter Insurgency (CI) role. Command and control of SF units rests either with Army HQ or the Command HQ which means that these units are under hands-off supervision. This isolation certainly helps in ensuring that units can concentrate on training. Unfortunately, focus on training is only one aspect of professional development and aspects such as officer development, focus on unit administration are left only to the Commanding Officer's discretion and capability. This helps neither the Battalion nor its personnel and the old adage that "which is not inspected is not done" certainly holds true. SF units too require a supervisory hierarchy to excel in their work.

Recommendations

It would be fair to conclude that both AB and SF Battalions are specialised light infantry units which are required to operate behind enemy lines either in conjunction with ground forces or independently primarily to carry out DA missions aimed at interdiction of the battlefield and degradation of enemy command, control and logistics elements that will assist in the own overall design of battle at the operational level.

In addition, SF battalions would also be required to carry out limited RSTAD missions during the preparatory period and once hostilities commence. They would, however, operate differently in that AB units would operate with the company being the lowest manoeuvre element that would operate independently, while in the case of SF units they would also be required to operate at troop and squad levels as well, though tasks at that level are likely to be fairly restricted.

For OOAC tasks, ideally both these type of units would operate in conjunction as the spearhead element of any RDF. The AB unit would be tasked with establishing and holding the Air Head while the SF element carries out RSTAD and intervention missions in support. Thus, despite existing perceptions both these types of units overlap in the manner in which they operate and require personnel with similar mindsets.

We, however, see that given their likely operational employment, the AB battalions are excessively manpower heavy while the SF battalions lack the requisite manpower to be able to carry out the complete range of missions they may be assigned. It may, therefore, be appropriate to consider a combination of both these types of units and have battalions which consist of two to three AB companies/teams and one to two SF companies/teams each depending on terrain specialisation and likely employment.

One can visualise the employment of such a Battalion in a Corps Zone. It would employ one SF company RSTAD task with its AB companies being utilised for SHBO and AB tasks. Such an organisation would not only lead to better coordination but also better utilisation of resources. Air effort required would also be extremely limited and easier to organise and in acceptable time. In the context of a cold start such Battalions can be critical to success.

To strengthen command, control and advisory capabilities, in addition to tailoring the Parachute Brigade specifically for OOAC tasks, there is a need to establish an element under a Brigadier level officer at each of the affected Command HQs, with requisite staff support, who would exercise command and control of all such Battalions operating within the theatre as also provide requisite advice regarding their employment to the theatre and Corps Commanders. He would also be responsible for coordinating all such special operations with Army HQ. Such an organisation will also ensure that these units are also appropriately supervised.

The existing Pathfinder (PF) Squadron of the Parachute Brigade provided by the President's Body Guards needs rethought. PFs are needed and the existing system is inadequate. We could consider establishing a PF Squadron to be manned by selected personnel from all Battalions in rotation. It could be the repository of all CFF capability tasked to provide CFF assets wherever required. The same could also be thought of with regard to the Infantry Combat Vehicles presently held within battalions which could be grouped into a Mechanised Infantry Company manned by rotational regimental personnel.

The existing Pathfinder (PF) Squadron of the Parachute Brigade provided by the President's Body Guards needs rethought…

Conclusion

That the Indian armed forces' Special Operations capability needs serious reassessment is irrefutable. It must be organised; equipped and trained to meet perceived requirements for which we need homegrown not copy-pasted solutions. Similarly, doctrinal aspects must also be thought through. The unified organisation suggested in this paper is worth examining for its gains in inter-operability, unit rotation and manpower/ equipment management.

Notes

1 Slim, FM Sir William G; Defeat into Victory;

2 Glantz, David M; The History of Soviet Airborne Forces; Frank Cass & Co Ltd, 1994;pg 64

3 Sinha Deepak, Beyond the Bayonet: Indian Special Operations Forces in the 21st Century; Gyan Publishing House, 2006 pg 12.

4 Antill, Peter D; Crete 1941: Germany's Lightning Airborne Assault, Osprey Ltd, 2005, pp35-37.

The IAF and its Need for Close Air Support

Sqn Ldr Vijainder K Thakur

The outcome of the next war is going to be determined less by the IAF's deep strike or air combat capability, more by its ability to support own troops in mountainous terrain. No matter what targets the PLAAF manages to bomb deep in India, troop positions on the ground will decide whether the war ends in victory or defeat. If our troops are poised to enter Tibet, the war will end on our terms. What the IAF would need to do is dominate the air space over the mountains and unleash its Close Air Support (CAS) power.

THE MAJOR MILITARY POWERS OF the world - USA, Russia, France and China - meet their weapon systems requirements largely through domestic production. India, which aspires to be a great power, imports nearly 70 per cent of its weapons. Even worse, the country has struggled for around 50 years and has spent crores of rupees to enhance its defence production capability without much progress. The reasons for India's failure to reduce its dependence on imports have been well debated in the media. However, some facets of the problem may have been completely overlooked.

The Usual Suspects

Anyone who has closely followed the debate on defence production is likely to be familiar with the following explanations for our poor showing. We haven't built an industrial base to support our defence production," say analysts. "Each time we want to build a weapons system we have to start from scratch," bemoan officials of the Defence Research and Development Organisation (DRDO). "The problem lies in the incompetence of Hindustan Aeronautics Limited (HAL) and the DRDO," says the military staff. Blame game at its worst!

Industrial Base for Defence Production

We have been building fighter aircraft in India since the 1960s - Ajeet, Marut, MiG-21, Jaguar, Su-30MKI, Hawk and the Light Combat Aircraft (LCA). So how can anyone say we don't have an adequate industrial base? Didn't we create an

Marut

LCA

MiG-21

Hawk

Sqn Ldr Vijainder K Thakur, former fighter pilot with extensive flying experience on IAF Jaguar and HF-24 Marut.

industrial base during the 50-year long saga of licenced production? Over the years, HAL and DRDO have acquired the infrastructure and Intellectual Property (IP) to build contemporary weapon systems as a result of very expensive Transfer of Technology (ToT) agreements. Why can we not use the IP and infrastructure to design and develop our own weapons?

Analysts attribute the failure to poor management and laid back work culture typical of the public sector. The explanation has a ring of truth, but only half the truth. Take the case of the Indian Air Force (IAF). Its weapon procurement policies are as much to blame for the impasse in domestic airborne weapons system production as the laid back work culture at HAL and DRDO. The fact that DRDO has had more success developing sensors and weapons systems for the Navy is a pointer. The Navy helps DRDO gain strength in technological domains relevant to its most urgent needs - Heavyweight Torpedoes and Maritime Surveillance Radars - and places orders when DRDO developed systems come good.

The IAF does not help HAL build strengths - one could even say the IAF does not *allow* the HAL to build strengths! Because the IAF follows a procurement policy that is largely obsolescence-driven - aimed at replacing strike, air defence, air lift and reconnaissance assets due to be phased out with similar state-of-the-art equipment of similar nature. It is often alluded to in the media that the IAF is averse to procuring aircraft from HAL. This is not true. The IAF has consistently striven to accommodate HAL and DRDO capabilities in its procurement plans - LCA, HPT-32, the Intermediate Jet Trainer (IJT) are some examples - only to have its procurement plans derailed by interminable delays and massive performance shortfalls. From the IAF's point of view, accommodating delays and shortfalls would lead to capability erosion that would not be in the long term interest of the nation, or even HAL/DRDO for that matter.

The IAF has consistently striven to accommodate HAL and DRDO capabilities in its procurement plans…

Designing and developing a fighter aircraft is a far greater challenge than developing systems that DRDO has had success with developing - radars, missiles, tanks, guns and torpedoes. Combat aircraft sub-systems (electrical, hydraulic, life support, navigation, weapon management and cockpit displays) are smaller and lighter, sensors (radar, radio and optical) more compact and capable, and engines technologically more advanced. There is also the challenge of tightly packaging and seamlessly integrating the subsystems, sensors, and engine(s) into a lightweight, aerodynamically efficient airframe that is optimised for low observability and high maneuverability!

Intermediate Jet Trainer (IJT)

It is interesting to note that the IAF has readily embraced electronic sub-systems developed by HAL/DRDO for its aircraft - Display Attack Ranging Inertial Navigation (DARIN) for Jaguars, Radar Warning systems for Russian fighters. And the services have bought Radars and Missiles developed by DRDO. The alleged IAF apathy to indigenous weapon systems is a figment of imagination of a section of the press. And the same can be said about the alleged incompetence of the public sector defence undertakings!

Unrealistic Expectations

HAL, as it exists today, is neither as incompetent, nor as mismanaged as is widely believed. Its aircraft design and development capability may not be first rate but its capability is certainly not trivial. HAL has proven credentials in developing helicopters - Dhruv, Light Combat Helicopter (LCH) and the Light Utility Helicopter (LUH). It has started full spectrum (not licenced kits) production of Tejas LCA. The company is in the past developed the HJT-16 Kiran jet trainer and is now and developing albeit fitfully the HJT-36 Sitara IJT. It can be objectively stated that at this point of time, HAL has the IP and infrastructure to develop helicopters, single-engine lightweight fighters and jet trainers. It can meet the current and future requirements of the three services for these aircraft types.

HAL and DRDO have the ability to provide the Armed Forces with useful airborne weapons systems…

Future projects must build on current strengths of HAL. HAL and the Aeronautical Development Agency (ADA) jointly have the capability to meet IAF timelines for LCA Mk-2, with design of the aircraft already near finalisation. ADA's LCA development experience and over seven years research into fifth generation fighter technologies in combination with HAL's manufacturing and product support capability give the two organisations a good chance of making the Advanced Medium Combat Aircraft (AMCA) a success within the next ten years.

What HAL must not do is take on projects that are well beyond its core strength areas. Rafale licence manufacture, for example. It would provide HAL another assured revenue stream but will not help the country reduce its import dependence. HAL has been licenced manufacturing the Su-30MKI for many years

Dhruv

HAL LCH

HAL-LUH

HJT-16 Kiran

now. However, an attempt by HAL to develop a new air dominance fighter based on its Su-30MKI licenced production experiences will almost certainly not succeed. As they say, with licenced production you learn how, not why.

The requirement to modify the Su-30MKI to carry an air-launched version of the BrahMos missile illustrates the limitation of licence production knowledge and experience. HAL struggled for two years and sought help from Sukhoi before it was able to strengthen the Su-30MKI centre point pylon to carry the BrahMos missile. The project is likely to take four years to complete!

HAL does not know the 'why' for Su-30MKI production, but it does know the 'why' for LCA production, and the production of each and every indigenously developed component that goes into it. With the LCA Mk-2 featuring 80 per cent commonality of sub-systems, developing the LCA Mk-2 is well within the grasp of HAL/ADA.

Evolutionary Nature of Aircraft Production

Aircraft development is an evolutionary process. Whether developing an evolutionary new aircraft, or a revolutionary new generation aircraft, one starts from where one currently is, not from scratch. The T-50 PAK FA is a radical new fighter design, but it is an offshoot of the same Sukhoi Bureau knowledge and technology base that produced the Su-27/30 family of fighters. HAL did not acquire the Sukhoi Bureau's knowledge and technology base with Su-30MKI licenced production rights. It is for this reason that joint development and production of the PMF/FGFA is turning out to be such an intractable issue.

In developing the T-50, the expansion of Sukhoi's 'why' knowledge base is more significant than the expansion of its 'how' knowledge base. It may share the latter with India (if the two countries finally reach an agreement on co-production), but it will not share the former.

Emerging from the Logjam

HAL and DRDO have the ability to provide the Armed Forces with useful airborne weapons systems. HAL's inability to deliver a Rafale like 4++ or FGFA at this point of time is not alarming. Also, the right way forward for HAL is not joint production of Rafale or FGFA; it is dogged development of the AMCA with the 'how' and 'why' knowledge base at its disposal and foreign tie-up to fill gaps. It is worth remembering here that the 'how' knowledge can to some extent

Su-30 MKI

BrahMos

Sukhoi PAK FA-2

Rafale

F-35

be gleaned from strip down study of systems without violating IPR. The big question now is - If HAL cannot produce all the aircraft that the IAF needs, how are we going to reduce our dependence on imported fighter aircraft?

Rethinking Our Defence Needs

Reducing dependence on imported weapon systems is a long term goal. 'Make in India' is a vision not a solution. To fulfill the vision, a practical first step would be to rethink our defence needs, make them more realistic and bring our weapon systems requirements into harmony with our modest defence industrial base, secure in the knowledge that our technological prowess is growing rapidly and eventually imports will reduce. It is possible to tone down our weapon systems requirements without jeopardising our security. It just requires, realistic threat assessment, clarity of vision, good planning and training.

Knee-jerk obsolescence driven procurement seems to be leading the services, particularly the IAF, to overstate their defence needs. IAF planners appear so enamoured by the success of US-led air campaigns in Iraq and Libya that they have forgotten that the US lost a war against a diminutive, modestly equipped albeit gritty enemy despite a no holds barred unleashing of its aerial might. Yes, I am talking about the Vietnam War.

Muddled Defence Planning

Quiz any reputed defence analyst in India as to what should the IAF be buying - Rafale, Su-30MKI or LCA and you will receive a prompt answer, even if it is sometimes as bizarre as suggesting that the IAF should be buying the F-35! Ask what the IAF's war aims would be in case China annexes Tawang district and you will hear either a long silence or a disjointed discourse indicative of someone who has been truly stumped!

The IAF was completely unprepared and largely unequipped for the Kargil War. No one has cared to explain why. India's contested border with China runs entirely, and with Pakistan almost entirely, along the Himalayas; yet the IAF had equipped itself with attack helicopters and Close Air Support (CAS) fighters that were totally ineffective at high altitude in mountainous terrain! The IAF equipped and trained in total disregard of its responsibility to support Army operations along the LOC and LAC, which is why probably Kargil happened in the first place!

The Mirage-2000 was the only IAF aircraft that gave a good account of itself during Kargil, and that too, after the aircraft was hurriedly kitted for delivering Laser Guided Bomb acquired after the war started! The IAF tacitly acknowledges its utter failure during the initial stages of the Kargil War but publically never admits to its poor planning, preferring to sweep it under the carpet of its better showing during the later stages of the war. As a result, there has been no serious introspection, and consequently no change in the pattern of IAF procurements. They continue to be obsolescence driven, not threat assessment based. And they have an unrealistic air-combat orientation that compromises the IAF's strike ability.

Next Battlefield Contours

There is near unanimity among analysts in government funded strategic affairs think-tanks that the next war would be confined to the Himalayas, even if it is between India and Pakistan.; the reason being - China, India, and Pakistan are all nuclear armed and any threat to their territorial integrity would lead to nuclear deterrence erosion. In other words, India now does not have the option to negate any gains made by the Pakistani Army in Kashmir with a deep incursion into Pakistan. We will have to restrict the battle to Kashmir with the aim of driving the Pakistani army out of POK.

Gurmeet Kanwal, former Director, Centre for Land Warfare Studies, New Delhi says in the April 2015 issue of Geopolitics, "It is not in India's interest to enlarge a conflict with Pakistan in the plains sector South of River Ravi due to the possibility of escalation to nuclear exchange." As a result, "there is a fairly high probability that the next conflict with Pakistan, having broken out in the mountains, will also be limited to the mountainous terrain."

The next battlefield is known and its contours are tightly placed reflecting relief of mountainous terrain, but an analysis of the IAF's planned procurement does not suggest that the service is equipping itself well to provide close air support in the high mountains of the Himalayas. The IAF has acquired transport aircraft like the C-130J to support troops in mountainous region but not Close Air Support (CAS) aircraft capable of operating in the terrain. It is almost as if the IAF did not draw any lessons from the Kargil War!

Close Air Support in the Mountains

The IAF's current dedicated CAS fleet consists of Jaguars, MiG-27s and MiG-21 Bisons. None of these aircraft would be in a position to support our troops in the mountains because of their inability to manoeuvre in valleys at high altitudes, and their lack of precision attack capability. As in the Kargil War, Mirage 2000s could provide close air support from stand-off ranges, with the Su-30 MKIs acquired later also capable of chipping in.

CAS from stand-off ranges requires substantial inventory of very costly PGMs. Stockpiling PGMs raises capital and revenue costs, since they need periodic maintenance and have limited shelf life. Also, use of PGMs from stand-off ranges works best when a massive intervention is required and there is clear-cut separation between enemy and friendly troops. When smaller intervention is required, or when the lines of separation are fluid, visual identification of target is necessary. The IAF does not have a fighter capable of carrying out attacks after visual identification. As things stand, the morale of our troops battling the enemy in valleys and on mountain slopes is not likely to be buoyed by the sight of an IAF fighter during the entire course of a hypothetical war.

Mirage-2000

MiG-27

CAS from stand-off ranges requires substantial inventory of very costly PGMs…

What the IAF needs for providing the Army good CAS in the Himalayas is a low speed fighter aircraft that is highly manoeuverable even at altitudes (to enable it to enter into and fly in

valleys) and has good firepower including guns for smaller interventions. The fighter should feature armour protection for its crew, defensive suite with IR and radar decoys, and the ability to suppress enemy defences (Surveillance and AD radars). In other words, the IAF needs a USAF A-10 Warthog-like aircraft that can operate at high altitudes. The Russian analog of the Warthog is the Su-25 (Frogfoot).

Nothing available in the public domain suggests that the IAF has ever projected a requirement for such an aircraft to the government. It is difficult to understand why this is so. Reconnecting with the initial flow of this article, it is interesting to note that developing an A-10 - like aircraft optimised for Indian conditions is well within the proven capabilities of HAL. To compress timelines, HAL could seek US assistance.

The Arjun Mk-2 will be a complete non-performer if the war is taken to the mountains…

Light Tank for High Altitudes

Ironically, the Army has a similar requirement that it has never projected to the government - that of a light tank that could be deployed on the Tibetan plateau using our road and rail infrastructure. China has developed such a light tank. Pictures of the tank, which feature a 105-mm gun with sloped glacis plates armour protection, have appeared on the internet since December 2011. The tank has been sighted on railway flat wagons headed towards Tibet. The DRDO and the Indian army are focused on developing the 66-tonne behemoth - Arjun Mk-2 - which can only operate in the plains or on desert terrain. The Arjun Mk-2 will be a complete non-performer if the war is taken to the mountains.

Arjun Tank

Conclusion

If India's next war is likely to be fought along the LAC or LoC, the outcome of the war would also be decided by how events unfold along the mountainous battlefield. With good training and motivation, a well-equipped Indian Army backed by a well laid road and rail infrastructure can hold, and even win, ground against either adversary - China or Pakistan - provided troops are well supported from the air.

The outcome of the next war is going to be determined less by the IAF's deep strike or air combat capability, more by its ability to support our troops in mountainous terrain. No matter what targets the PLAAF manages to bomb deep in India, troop positions on the ground will decide whether the war ends in victory or defeat. If our troops are poised to enter Tibet, the war will end on our terms. What the IAF would need to do is dominate the air space over the mountains and unleash its CAS power. It is to be noted that the PLAAF does not have an A-10 - type fighter. Even if it did acquire one, the IAF's CAS fighter would be able to carry more weapons load because of the proximity of IAF bases located at lower altitudes. Also, PLAAF belligerence could be dealt with war time imports of non-lethal electronic equipment from the US, France and Israel.

The current state of the equipment and training of the Indian Army and IAF surprisingly do not reflect a sharp focus on mountain warfare. The IAF's planned future fighter aircraft procurements - Rafale, LCA Mk-2, FGFA, AMCA - are all at odds with the threat assessment. It appears that the government's 'Make in India' policy is being thwarted to some extent by lack of accurate threat assessment and planning. To reduce our dependence on weapon imports, we do not need to force the IAF to buy Indian, impose Make-in-India on foreign vendors, or privatise HAL; as much as we need to task HAL/DRDO with projects that address our vulnerabilities, and are well within their proven and growing capabilities.

INDIA
An Aerospace Power?

Gp Capt TP Srivastava

An objective analysis would indicate that India is truly not an aerospace power. We have as yet, not become a substantive aerospace power primarily because of two reasons. Firstly, the lopsided and flawed Defence Procurement Policy and secondly, near total absence of any worthwhile R&D from the 1960s to the 1980s. Merely establishing defence laboratories and ordnance factories was not enough. Had we continued with the HF-24 programme and taken it to higher levels, we might have had indigenous force multipliers, fighter aircraft, heavy lift helicopters, transport aircraft, radars and Surface to Air Missiles of proven operational capability matching in performance with the best systems available.

THE INDIAN SUBCONTINENT witnessed exponential growth in the acquisition and/or development of conventional aeroplanes as early as the 1950s. Immediately after independence in 1947, both India and Pakistan began acquiring aeroplanes from the Western nations such as France, UK and USA. China too was busy acquiring vintage but still airworthy variants of the MiG family from the erstwhile USSR.

Moment of Glory

India took a giant leap in the design and development of fighter aircraft when the first indigenously produced HF-24 flew on June 24, 1961. The HF-24 was a twin-engine, swept-wing design fighter with powered controls that could fly at speeds in excess of 900 kmph despite being somewhat under-powered vis-à-vis its overall weight. Notwithstanding the numerous shortcomings, the HF-24 raised quite a few eyebrows in the developed and militarily advanced nations such as USA and USSR. These nations considered entry of a third world country in the exclusive domain of production of state-of-the-art fighter aircraft as a threat to their continued primacy, not only in the sphere of military aviation but also in the economic arena. After the end of World War II, sale of military hardware had been and continues to remain the most prominent money churner for the advanced nations of the world.

By any standards, it was a crowning achievement of scientists and engineers of a fledgling nation within 14 years of getting independence. India was well on its way to becoming a formidable air power in South Asia. Three successive wars in 1962, 1965 and 1971 changed the scenario of indigenous development of aeroplanes. Military and political leadership led by less-than informed bureaucrats opted for acquisition of military aircraft from foreign sources. On the face of it, such an option might not appear to be wrong because the nation needed military hardware including aircraft in large numbers almost immediately. The domestic aerospace industry was in no position to meet the demands. But what is incomprehensible is the fact that we deliberately opted to slow down and finally stop indigenous development, which is what we did by consigning the HF-24 to museums in the late seventies/early eighties.

An Opportunity Squandered

Closure of the HF-24 programme would perhaps rank as the worst ever decision taken collectively by the Indian Air Force (IAF), the bureaucracy and the political leadership, a decision that was clearly against national security interests. Without doubt, foreign vendors must have popped the champagne to celebrate their unbridled primacy in the field of aeroplane manufacturing. Had we continued development of further variants of the HF-24, we would indeed have become an aerospace power in the 1980s itself.

Gp Capt TP Srivastava

Perhaps our decision to discontinue the

HF-24 programme was also influenced by an equally myopic decision by the UK in opting to discontinue the TSR-2 development programme around the same time. Duncan Sandys, a British Member of Parliament (MP), was instrumental in discontinuance of TSR-2 development programme. The learned but ill-informed MP argued that due to the advent of Heat Seeking Air-to-Air Missiles, the days of manned fighters were over. Rest is history.

India – An Aerospace Power?

An objective analysis would indicate that India is truly not an aerospace power. We have as yet, not become a substantive aerospace power primarily because of two reasons. Firstly, the lopsided and flawed Defence Procurement Policy and secondly, near total absence of any worthwhile R&D from the 1960s to the 1980s. Merely establishing defence laboratories and ordnance factories was not enough. Had we continued with the HF-24 programme and taken it to higher levels, we might have had indigenous force multipliers, fighter aircraft, heavy lift helicopters, transport aircraft, radars and Surface-to-Air Missiles of proven operational capability matching in performance with the best systems available.

Military and political leadership led by less-than informed bureaucrats opted for acquisition of military aircraft from foreign sources…

A nation does not become an aerospace power on imported hardware. Over the years, the nation's defence establishment, consisting of defence ministers, defence secretaries and the service chiefs, has not exerted itself as it should have. The euphoric victory of 1971 and the almost self-defeating decision by the then Prime Minister Indira Gandhi to keep the Defence portfolio with herself led to the 'Prime Minister as Defence Minister' becoming inaccessible to the executives of the defence establishment. Everything related to defence affairs slowed down. Her autocratic style of functioning made matters even worse. Service Chiefs could hardly find the ears of the Prime Minister as the Defence Minister.

Most of the Ordnance Factories have merely attained the status of money guzzlers with hardly anything to show for such massive infra-structure and investment in place. The Ordnance Factory Board, the controlling apex organisation has been worthless and has done immense disservice to the nation. Most of these factories deserve to be shut down and an entirely new techno-management organisation should be created. The Defence Research Development Organisation (DRDO) is yet another bureaucratic behemoth with nothing spectacular to its credit. All projects, without exception, have never met the declared timelines. Even the quality of the finished product continues to be questionable.

Indeed, there has been a silver lining in an otherwise bleak military hardware development programme. The Surface-to-Surface Missile (SSM) programme under civilian control led by our erstwhile President Dr APJ Abdul Kalam has become a world class SSM programme. We have already perfected technology to mass produce SSMs of 5,000 km range. However, we still have to perfect cryogenic engine technology.

Satellite fabrication technology has also achieved many landmarks. Our scientists have manufactured sensors installed on satellites for multi-dimensional uses such as weather monitoring, education, TV transmission and agricultural information. At the same time, few of these could even monitor ballistic missile launch. It might appear to be irony of sorts; the SSM and satellite development programmes have been totally civilian with hardly any military control. Indian military leadership, past and present, may like to ponder over this.

Our capability to produce force multipliers such as the Airborne Early Warning/Airborne Warning and Control System (AEW/AWACS) platforms, Flight Refuelling Aircraft (FRA), Electronic Counter Measure (ECM) Systems, reliable Cryogenic Engines and Surface-to-Air Missiles (SAMs) remains woefully inadequate. What is worse is that it is not likely to be any better in the foreseeable future.

Air Power and Aerospace Power

Before entering into the domain of what constitutes an aerospace power, the difference between air power and aerospace power must be understood. Except in the case of the erstwhile

super powers, USA and USSR, almost all other nations have acquired air power components based on regional threat. Conventional air power consists of three elements - the strike element (fighter aircraft and attack helicopters), the logistics element (transport aeroplanes and utility helicopters) and ground-based elements such as radars.

A fourth element has been added in recent years in the form of force multipliers such Flight Refuelling Aircraft (FRA), Airborne Early Warning and Control Systems (AEW/AWACS), Remotely Piloted Vehicles (RPVs), Unmanned Aerial Vehicles (UAVs) and Surface to Surface Missiles (SSMs). Relatively more expensive component of air power, the strike element, has little or no use for the nation during peace time. Indeed it remains as the most effective deterrent as a 'Force in Being' that must remain operational so that if the need arises it can be brought to bear upon the adversary almost instantaneously. The logistics element of air power is the most important component during peacetime. Aid to civil authority becomes a major commitment during peacetime and in times of natural calamities and civil disturbances.

The strike element of Indian air power has been used only twice during peacetime - once during the Nagaland crisis led by Phizo when Mystere aircraft were used for strafing the hideouts of Naga rebels and the second occasion was during Goa operations, when Canberras were used for bombing.

Aerospace power, on the other hand, has numerous other functions to support national requirements related directly to economic development and is constituted keeping in view the global scenario. Other than support to the military, aerospace power contributes to the following areas, which cannot be taken care of by conventional air power:

- Telecommunications
- Academics
- Tele-medicine
- Cartography
- Weather Monitoring

AWACS

Akash SAM on T-72

- Monitoring Bio-diversity
- Soil Conservation
- Forestry Management
- Land Cover for Wild Life Sanctuaries
- Agricultural Produce Estimates
- Flood Inundation Mapping

Thus, air power is actually a constituent of aerospace power. Global militarisation on a very large scale, induction of sophisticated weapons has led to an uneasy state of peace. The situation is almost akin to the Cold War period when the two superpowers could not risk escalation of tensions and wage a nuclear war. Consequences of such miscalculation were

bound to be disastrous for the entire world. "Mutually Assured Destruction", a term coined during the height of the Cold War is applicable in modern times more than ever before. Even with the use of conventional weapons, conflict of any kind can result in crippling damage.

Rapidly changing global world order has moved from conflict between nations to conflict-based on ideology and religion coupled with misplaced/irrational beliefs of a few nations about their right to interfere in governance in the contiguous region. For instance, the birth of ISIS, Russia's unilateral action in Ukraine and China's continued attempts at throwing the gauntlet in South China Sea emerging as one of the foremost maritime challenges after World War II. It is in this context that it becomes imperative that India move towards becoming a substantive aerospace power. But for that to translate into action, the Indian political and military leadership must adopt a doctrinal approach.

Ballistic missile threat has become the most feared situation in the event of hostilities…

Hence in order to maintain primacy in the comity of nations in the international arena, nations have taken a conscious decision to become an aerospace power rather than remain content from being a formidable air power. The primary constituents/capability of an aerospace power could be broadly termed as:

- Proven Launch Vehicle/s.
- Outstanding expertise in Satellite Fabrication.
- Development of Electro-optical Sensors.
- Sustainable and Consistent rate of Satellite Production.
- Development of Reusable Launch Vehicles.
- Miniature Warheads: Conventional and Nuclear.
- Advanced Metallurgy.
- Ground Infra-structure such as monitoring/tracking stations.
- Advanced Ground Testing Facilities.
- Launch Pads.
- Suitable Parking Slot/s for Geo-stationary Satellites.
- Operationally Deployed BMEWS/BMD Systems.
- Anti-satellite (ASAT) Weapons.

At this stage, it would be pertinent to clarify that possession of launch vehicles, indigenous or imported and warheads alone does not qualify a nation to become an aerospace power. Indeed, the launch vehicle and warheads are two of the prime constituents of an aerospace power, but merely their presence not supported by capabilities listed above, does not make them an aerospace power. Pakistan and North Korea would then be termed as aerospace powers.

Defence Against Missile Attack

Ballistic missile threat has become the most feared situation in the event of hostilities. Thus along with the development of strike capability by using ballistic missiles, nations have embarked on systems that would protect against a ballistic missile threat. Hence nations have concentrated on developing Ballistic Missile Early Warning Systems (BMEWS) and a protective shield, the Ballistic Missile Defence Systems (BMDS). Efficacy of each of these will now be highlighted.

The famous US project codenamed 'Star Wars' was developed during the height of the Cold War. Operational capability/effectiveness of this system can at best be a matter of conjecture even as on date. The proposed European Ballistic Missile Shield to protect against Ballistic Missile attacks is the latest system under development at a cost of billions of dollars. BMEWS and BMDS, irrespective of their origin, have never been tested under operational conditions. Hence the degree of reliability claimed by systems manufacturers cannot be trusted.

What should ring alarm bells amongst the protagonists of BMEW/BMD is a recent update by Pentagon, wherein operational efficacy of THAAD, Aegis and Patriot Systems has been questioned. All tests involving destruction of an incoming ballistic missile threat by different nations have been conducted in highly controlled environment, in which vital

THAAD Launcher

parameters of the 'enemy' ballistic missile such as launch window and likely trajectory, were already known. This will not be the case in an actual war scenario. To elaborate further without going into technological details, a ballistic missile threat can be neutralised only and only if the exact launch window, trajectory and probable target, are known. In an actual war scenario, the launch window will never be known.

Suffice it to say that neither the existing BMEW/BMD systems nor the systems likely to be developed in the foreseeable future could be termed as foolproof that would provide assured protection against an incoming ballistic missile. Lessons learnt from anti-aircraft missiles (Air-to-Air and Surface to Air Missiles) is that the kill capability would suffice to prove the likely effectiveness of the BMD system/s for a successful intercept of an incoming ballistic missile with extremely small radar signature. Guaranteed protection is a far cry.

ICBMs deployed all over the world carry multiple warheads along with dummies that behave in exactly the same manner as a live warhead. There is no technology available to differentiate between the two. Further it is extremely difficult, if not impossible, to guarantee intercept during the ballistic phase, when radar signatures are feeble. A ballistic missile has most prominent heat signature during launch phase; but the window of intercept during this phase is extremely narrow. Even if it was to be assumed that the missile shield will provide 100 per cent guarantee of successful intercept, the fact remains that the warhead will explode and cause radioactivity to spread not necessarily over the intended target. Exo-atmospheric interception would remain a better option as compared with endo-atmospheric intercept either during launch or re-entry phase.

Possibility of an armed conflict between nations is slowly but surely receding…

Utopian thoughts of making the world free of nuclear weapons will remain a distant dream. Nuclear tipped missiles will continue to remain on top of the list of most devastating weapon systems against which there is and will be no assured protection. The launch vehicle capability will decide the distance to which the warhead could be hurled.

The Need to Reevaluate Policy Imperatives

Possibility of an armed conflict between nations is slowly but surely receding. Unfortunately, however, there is no cause for mankind to rejoice because a far more

dangerous and unpredictable power in form of radicals is emerging all over the world. These groups have no international boundaries as exists between nations. Alignment of such extremist groups with rogue nations can translate into violence of gigantic proportions. If such extremist elements/organisations could get hold of a nuclear tipped ballistic missile system and/or sufficient quantities of fissile material from rogue nations having launch platforms and warheads, threat of nuclear tipped missile launch cannot be ruled out. No military strategist can even hazard a guess or predict the intended time and target for such cases. An organisation like the ISIS, which burns and beheads human beings with impunity, can or will resort to such actions without doubt.

Anti-missile weapon systems will require extensive and highly advanced tracking infra-structure spread all over the world…

In the prevailing geo-political scenario, India as an aerospace power should not only develop the above stated capabilities but also may have to re-examine the "No First Use" policy with respect to the use of nuclear weapons against a rogue nation/group. A rogue nation and/or group must be conveyed that should our national interests be threatened, we will not hesitate in carrying out a pre-emptive nuclear strike. Such a resolve or policy would be a far better deterrent and protect our national interests rather than a ballistic missile shield. The age-old principle of "threat in being" neutralised by "forces in being" is not applicable in the case of rogue nations/groups.

Our stated policy of non-alignment has kept us out of any military alliance such as NATO and Warsaw Pact. However, in reality, we have had to concede ground to nations from which we import military hardware. In order to remain truly non-aligned, a nation must be nearly self sufficient with respect to security issues. Unfortunately, our myopic leadership and flawed acquisition and indigenous manufacturing policies over the years have made the Indian military entirely dependent on imported hardware. Nearly 80 per cent of our military hardware is of Russian origin. Even the ammunition/missiles/bombs/PGMs are re-imported. In the recent years, our shift to other nations such as France, Israel and USA has not been taken very kindly by the Russians. India continues to occupy the top position as the biggest importer of military hardware.

In the strictest sense, our non-aligned status remains on paper. The truth and harsh fact is that for our security needs, we are and will continue to remain dependent on nations from which military hardware is imported such as Russia, USA, France and Israel. Selling of arms is the top money earner for any nation. Our position as arms exporter is perhaps at the bottom of the list, primarily because our inefficient and poorly managed defence industry. Fortunately, our diplomacy has been able to sustain our military posturing in the region. We, however, continue to remain at the "mercy" of military hardware exporting nations because of long term dependence on the exporting nation. In spite of being an import oriented air power, a recent study published places the IAF seventh amongst top ten air powers in the world.

The Way Forward

Creating, maintaining, sustaining and finally deploying the military assets define national power. The overall power of a nation can be sub-divided/classified as under:

- Military Power
- Economic Power
- Soft Power

Achieving top military/economic power status by India, even in Asia would be a difficult, if not impossible. However current economic growth and future projections as per IMF, our economy might double by 2020. To sustain unbridled national growth in all spheres, we must be 'militarily' strong. That can be achieved if we focus on attaining a top Soft Power status, which is possible.

It would neither be prudent nor technologically possible to bridge the yawning technological and manufacturing capability gap in the field of shipping, aeroplanes and weapons. The only option we have is to expand in the field of our strength, which are satellite manufacturing and launch vehicle design and

production. We can safely move into the top echelons of aerospace powers by manufacturing and demonstrating that not only can we fabricate satellites embedded with suitable sensors for national applications but also have the satellite neutralisation/destruction capability. Wasting time, effort and money in indigenous manufacture/imports to acquire BMEW/BMD systems will be counterproductive.

The world today has become increasingly dependent on transponders embedded in satellites. Destroying few important functional satellites can virtually 'blind' the nation to which those satellites belong. Deployed satellites are in different parking slots allotted to each nation in case of geo-stationary satellites. Others are in geo-synchronous orbit around the earth and many more in the Molniya orbit. Thus, orbit parameters of most of the satellites in orbit are known to everyone.

We must adopt a fundamentally different approach in acquiring aerospace power status. Firstly, we must aim to achieve fabrication of satellites embedded with sensors required for national development thus becoming a prominent soft power. Currently transponders numbering around 200 are installed in various satellites of Indian origin. We need to increase this number to around 500 by 2020. Secondly, in order to maintain a viable, effective and strong deterrent we should focus on satellite destruction capability of our adversaries, if and when the need arises. We can accomplish this within our existing technological capability envelope. Nations are developing missiles to destroy satellites. Few nations have attempted it but success rate is unlikely to be high or guaranteed.

The position of all satellites in their respective orbits is known. As a concept, if a nation desires to destroy the satellite of her adversary, placing an explosive laden satellite in close proximity of intended target satellite and exploding it would cripple the target satellite. Geo-stationary and geo-synchronous satellites could be engaged with relative ease as compared to satellites in Molniya orbit. Engaging a satellite in Molniya orbit at/or near the perigee might be relatively more difficult than engaging it at the apogee, when target satellite would be at the slowest speed in its orbit. Satellite destruction capability would have an adverse fall out as well. It will give rise to uncontrollable space debris, which would remain in orbit for years. Anti-satellite weapon development, viable economically and technically, therefore, is a distinct possibility and should be explored.

Anti-missile weapon systems will require extensive and highly advanced tracking infra-structure spread all over the world. Still guarantee for successful intercept cannot be assumed because each strike missile will have a different trajectory. Even if a small portion of the missile trajectory falls in no radar coverage area, chances of intercept would virtually be nil. However, in case of anti-satellite system no such dilemma exists because satellite orbits are known since these are pre-designated.

A key component of aerospace power is the development of drone technology, both for surveillance and attack purposes…

Most nations, India included, which are involved in the development of BMEW/BMD systems are actually influenced by US infatuation with Ballistic Missile Defence Shield and incurring huge expenditure in procuring a non-functional and unreliable system. In order to influence other nations US strategists have successfully embarked on linking Nuclear Deterrence and Ballistic Missile Shield and have succeeded. An objective analysis would reveal that the development programme of Ballistic Missile Defence Systems was in fact a planned "Economic Weapon" against the erstwhile USSR to bleed it economically. Indeed, the US succeeded in its plan beyond its wildest imagination. Each nation, individually as well as in a group, is spending (read wasting) huge amounts of money in developing a system that is bound to underperform under operational conditions. In a make-believe world of ballistic missile defence systems, new technologies and systems are being sold to less than informed nations. All known/proclaimed ballistic missile defence systems are highly localised and their effectiveness against supersonic missiles with

extremely small radar cross section, is highly questionable notwithstanding various test results under controlled conditions.

A key component of aerospace power is the development of drone technology, both for surveillance and attack purposes. Our progress in this field has been tardy. Extensive and deliberate effort in R&D to develop high quality/capability drones must become one of our top priorities. Budgetary support for R&D merits a total overhaul in our thinking so far. DRDO is assumed to be the sole proprietor of R&D. In order to retain our top class engineers from IITs, we must offer them better R&D facilities than the USA does to reduce or prevent 'brain drain'. At least one per cent of the GDP must be allocated for R&D in diverse fields. R&D has been our weakest link in overall national development. While our software engineers rule the world, we have virtually nothing to show in the domain of hardware. We cannot, should not and must not subjugate ourselves voluntarily to wear a tag of a 'Data Entry' nation. Unless we change our outlook towards investment in R&D, we as a nation would never become the global power that we can become.

R&D has been our weakest link in overall national development…

Conclusion

For all or some of the above suggestions to fructify, we have to alter our thinking radically. Aerospace power is not to be assumed as an extension of air power. In fact, air power is one of the several constituents of aerospace power. In the short term, the strike element of air power will continue to remain a formidable and most preferred option in the event almost instantaneous pre-emptive/retaliatory strike is required against an adversary. In the long term, aerospace power can be used to strike a telling blow by destroying satellites belonging to adversary. During peacetime, aerospace power would contribute significantly to overall growth of the nation. Every component of aerospace power listed above has a definite function towards making us a potent soft power.

Computer Network Operations and Electronic Warfare

Complementary or Competitive?

Lt Gen Davinder Kumar

New threats and technologies are giving rise to terms such as spectrum warfare that seek to blend electronic warfare, cyber warfare and other technological approaches to controlling the RF spectrum

Environment Scan

IN 1991, THE RAPIDITY AND PERCEIVED ease with which the United States demolished the Iraqi army shocked Russia and China. To counter the United States, other states began investing in information warfare capabilities — Electronic Warfare and Computer Network Operations — to try to retard the US ability to use cyberspace for military operations. These strategies mesh with existing usage of anti-access and area denial weapons and counter space capabilities, the employment of special operations and airborne units, and other similar low-cost/high-value tools. Unlike many in the US, Russia and China do not see cyber warfare tactics and operations as stand-alone strategic methods.

China's information warfare theory and doctrine is well-known. Chinese strategists contemplate attacks on military and civilian infrastructure in concert with deception operations and conventional weapons. The Russians have developed a similar set of ideas and doctrine rooted around concepts of reflexive control, which employs integrated deception and cyber operations. Both states maintain military and intelligence structures for employing information warfare but also have a murky relationship with patriotic hackers and cyber criminals who engage in espionage and political subversion.

Chinese and Russian exploitation of cyberspace, however, is not solely limited to information warfare. Rather, both states have also attempted to "informatise" their own armed services. Informatisation in Chinese and Russian military doctrine should be understood as a structural integration of modern information technology with existing and future military platforms. Chinese military writings in particular portray "informatisation" as the digital equivalent of motorising land armies in the inter-war period.

Other states and non-state actors pursue information warfare capabilities and means of exploiting cyberspace for powerful conventional weapons. North Korea and Iran are building up hacking and electronic warfare capabilities to counter the West and target their neighbours. North Korea has executed cyber-attacks against South Korean civilian targets, jammed air traffic communications and more recently attacked Sony Entertainment Company. Iran is believed to have carried out cyber attacks on the USA financial services and the Saudi oil facility using Shamoon virus and claims to have used Electronic Warfare to down an American spy drone. Non-state actors are engaging in what former Israeli Defense Forces commander Itai Brun called, "The Other Revolution in Military Affairs" using cyberspace as a medium for distributed operational command-and-control, communications, sensor networks and propaganda. The proliferation of precision-strike weapons predicted by many military analysts may add a kind of primitive non-state reconnaissance-strike complex to this mixture of cyber-enabled tactics and operations.

The Operational Environment (OE)

The Operational Environment (OE) has changed dramatically. Unprecedented levels of adverse activity in and through cyberspace threaten the integrity of nation's critical infrastructure, financial systems, and elements of national power. These threats range from unwitting hackers to nation-states, each at

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various levels of competence. Collectively, the threats create a condition of perpetual turbulence without traditional end states or resolution.

The ever-increasing rate of technological advances and its wide proliferation make it increasingly difficult to achieve success across the military Full Spectrum Operations (FSO). The convergence of wired, wireless and optical technologies has led to the merging of computer and telecommunication networks; handheld computing devices continue to grow in number and capability. Next generation systems are beginning to emerge, forming a global, hybrid, and adaptive network that combines wired, wireless, optical, satellite communications, Supervisory Control And Data Acquisition (SCADA) and other systems. Soon networks will provide ubiquitous access to users and enable them to collaborate when needed in near real time. Consequently, the current vocabulary, including terms such as Computer Network Operations (CNO), Electronic Warfare (EW) and Information Operations (IO) will become increasingly inadequate. Full Spectrum Operations (FSO) will encompass three interrelated dimensions each with its own set of causal logic and requiring focused development of solutions:

Computer Network Operations (CNO) is one of the sword arms of the Information Warfare (IW)…

- First dimension - The first dimension is the psychological contest of wills against implacable foes, warring factions, criminal groups and potential adversaries.
- Second dimension - The second dimension is strategic engagement and involves keeping friends at home, gaining allies abroad, and generating support or empathy for the mission in the area of operations.
- Third dimension - The third dimension is the cyber-electromagnetic contest. Trends in wired, wireless and optical technologies are setting conditions for the convergence of computer and telecommunication networks. This dimension focuses on gaining and maintaining an advantage in the converging mediums of cyberspace and the Electro-Magnetic Spectrum (EMS).

Computer Network Operations

Computer Network Operations (CNO) is one of the sword arms of the Information Warfare (IW) which is defined as, "actions taken to achieve 'information superiority by adversely affecting the adversary's information, information-based processes, information systems, and computer-based networks whilst simultaneously protecting one's own information, information-based processes, information systems and computer-based networks." The seven forms of IW mentioned in the Indian Army doctrine are Command and Control Warfare (C^2W), Intelligence Based Warfare (IBW), Electronic Warfare (EW), Psychological Warfare, Cyber Warfare, Economic Information Warfare and Network Centric Warfare (NCW). Cyber warfare is conducted through CNO in the cyber space using cyber power.

Cyberspace is defined (by the USA) as, "a domain characterised by the use of electronics (ICT and Media) and the Electro Magnetic Spectrum to store, modify and exchange data via networked systems and associated physical infrastructure." Civilians, terrorists and the military operate in this cyberspace to conduct their business and/or operations.

Cyberspace is an operational space where humans and their organisations use the necessary technologies to create effects, whether solely in cyberspace or in and across the other operational domains and elements of power. It is an operational medium through which "strategic influence" is conducted. The fundamental condition of cyberspace is the blending of electronics and electro-magnetic energy.

Worldwide, people and in some cases, the governments are engaged in the exploitation of cyberspace for illegal activities such as espionage, theft of technology, financial frauds and so on. They have, accordingly, developed means and methods to carry out such activities by way of viruses, root kits, malware and so on. This evolving threat to society manifests in the ability to disrupt networks, systems and

their functionality and their suitability for the conduct of asymmetric warfare by attacking Critical Information Infrastructure.

Cyber power is the use, the threatened use or effect by the knowledge of its potential use, of disruptive cyber attack capabilities by a nation state. Nations may project cyber power in a number of ways - in concert with kinetic operations, masked and with no clear link to the attacker, as part of complex military-diplomatic escalation, or in indirect manners to exert influence or advance national goals. CNOs are the instrument of application of cyber power in cyberspace. These, in concert with EW, the other sword arm of IW, are used primarily to disrupt, disable, degrade or deceive an enemy's command and control and critical information infrastructure thereby crippling the enemy's ability to react and make effective and timely decisions, while simultaneously protecting and preserving own Command and Control and critical information assets.

Electronic Warfare (EW)

EW is any action involving the use of the Electro-Magnetic Spectrum (EMS) or directed energy to control the spectrum, attack an enemy or impede enemy assaults via the spectrum. The purpose of EW is to deny the opponent the advantage of and ensure friendly unimpeded access to the EMS. EW can be applied from air, sea, land and space by manned and unmanned systems and can target humans, communications, radar or other assets radiating EM energy and using EMS.

Military operations in today's digital battlefield are executed in an information environment increasingly complicated by the EMS. The EMS portion of the information environment is referred to as the Electro-Magnetic Environment (EME). The recognised need for armed forces to have unimpeded access to and use of the Electro-Magnetic Environment creates vulnerabilities and opportunities for EW in support of military operations. Within the information operations construct, EW is an element of information warfare; more specifically, it is an element of offensive and defensive counter-information activity.

As the sophistication of EW systems has increased, and EW receivers and transmitters have become software-defined Radio Frequency (RF) systems, EW techniques have evolved from brute force power-based electronic attack to more surgical electronic attack on targeted systems. The inclusion of cyberattack techniques in the tools available to the EW designer and planner is a natural extension of EW system capabilities.

Cyberspace operations, in conjunction with Electronic Warfare and Electro-Magnetic Spectrum operations are identified as one of the core competency areas critical to shaping the operational environment and winning decisively. Equally new is the concept of Cyber Electromagnetic Activities or CEMA that integrates and synchronizes cyberspace operations, Electronic Warfare (EW) and Spectrum Management Operations (SMO). The unprecedented challenges are to ensure continued access to a congested and contested electromagnetic environment, the explosive growth of spectrum dependent systems, the continued proliferation of wireless technology, and the increased use of advanced cyber capabilities in a dynamic and uncertain world.

Nations may project cyber power in a number of ways - in concert with kinetic operations, masked and with no clear link to the attacker…

The constituents of IW as propagated by West as indeed the definition of cyberspace elude to the integrated application of CNO and EW as offensive weapons, their dependence on EM spectrum and the consequent requirement of operating in the contested and congested EM space.

Integrated CNO and EW Strategy

The Chinese have adopted a formal IW strategy called Integrated Network Electronic Warfare (INEW) that consolidates the offensive mission for both Computer Network Attack (CNA) and Electronic Warfare (EW). The PLA sees CNO as critical to seize the initiative and achieve 'electromagnetic dominance' early in a conflict and as a force multiplier. PLA theorists have coined the term "Integrated Network

Electronic Warfare" to outline the integrated use of EW, CNO and limited kinetic strikes against key command and control, communication and computers nodes to disrupt the enemy's battlefield network information systems. The PLA, accordingly, has developed significant capabilities in all spheres of IW and is recognised as an emerging cyber power.

The Russians do not want to ape the West as far as definitions and concepts are concerned. The Russian military role in cyberspace is defined in the Russian Military Proto-doctrine and the Information Security doctrine.

The definition of the information war which the armed forces are called upon to deter and prevent is worth citing in full, as it illustrates the enduring holistic nature of the Russian perception of information warfare and cyber conflict as an integral part of it. Information war, according to the Russian Federation is, "a conflict between two or more states in information space with the aim of causing damage to information systems, processes and resources, critically important and other structures, subverting the political, economic and social systems, mass psychological work on the population to destabilise society and the state, and coercing the government to take decisions in the interests of the opposing side."

The crisis in Ukraine was the largest battlefield of cyber war since Russia's cyber-attacks on Estonia in 2007 and Georgia in 2008.

Both Russia and China maintain military and intelligence structures for employing information warfare but also have a murky relationship with patriotic hackers and cyber criminals who engage in espionage and political subversion. Chinese and Russian exploitation of cyberspace, however, is not solely limited to information warfare. Rather, both states have also attempted to "informatise" their own armed services. Informatisation in Chinese and Russian military doctrines should be understood as a structural integration of modern information technology with existing and future military platforms. Central to these is the integration of CNO and EW for undertaking offensive IW operations.

Case Studies

Integrated application of CNO and EW is a very potent weapon of IW. The same is being highlighted in the following three case studies.

Case Study 1: Capture of RQ 170 UAV, "The Beast of Kandahar", A classic example of integrated EW and CNO.

In December 2011, Iran claimed the capture of the RQ170 Sentinel drone intact by an 'electronic ambush' engineered by Iranian EW specialists. They jammed the communication and data links and that forced the drone into auto pilot. At that stage, "the bird loses its brain". The Iranians reconfigured the drone's GPS coordinates and they used precise latitudinal and longitudinal data to force the drone to land on its own. In doing so, the Iranian team did not have to bother about cracking remote control signals and communications from a control centre in the US, and the RQ170 suffered only minimal damage. The drone was thus tricked to land in Iran thinking it was its base in Afghanistan.

Simon Tsipis, Cyber warfare expert

Case Study 2: IW in Ukraine; Integrated application of EW, Cyber and Kinetic Warfare. The largest military cyber-attack was the attack implemented by the Russian Military Intelligence (GRU) on the armed forces of Ukraine," as reported by the BBC. According to the law enforcement agencies of Ukraine, Russian cyber attacks collapsed the communication systems of almost all Ukrainian forces that were based in Crimea that could pose a danger to the invading Russian troops. Attacks of a lesser scale were directed at government websites, news and social networks. Russia managed to hit almost all Ukraine government websites and it was able to take control and to put on surveillance and monitoring all the Internet and telephone communications lines, before the invasion and occupation of Crimea by its military. Russian Special Forces managed to derail all important communications systems through direct physical impact on them by combined field and high-tech operations.

Case Study 3: Hacker uses an Android to remotely attack and hijack an airplane.

The "Hack in the Box" security conference in Amsterdam in April 2013, had a very interesting presentation made by Hugo Teso, a security consultant in Germany on 'Aircraft Hacking'. According to the abstract, "This presentation will be a practical demonstration on how to remotely attack and take full control of an aircraft, exposing some of the results of my three years research on the aviation security field. The attack performed followed the classical methodology, divided in discovery, information gathering, exploitation and post-exploitation phases. The complete attack was accomplished remotely, without needing physical access to the target aircraft at any time." (A testing laboratory was used to attack virtual airplanes systems).

Here are a few important facts which emerged after a detailed study and analysis of aircraft monitoring and control systems. Automated Dependent Surveillance-Broadcast (ADS-B) has no security. It is unencrypted and unauthenticated. Earlier, a hacker was able to inject ghost planes into radar exploiting this vulnerability. The Aircraft Communications Addressing and Reporting System (ACARS) also has no security; it is used for exchanging text messages between aircraft and ground stations via radio (VHF) or satellite. The ACARS datalink allowed for 'real-time data transmission' and all communications between planes and airports are sent unencrypted. ACARS was used to exploit and break into the airplane's onboard computer system and then upload the Flight Management System (FMS) data. FMS could be uploaded by software defined radio and ground service providers.

By taking advantage of two technologies (ADS-B and ACARS) for the discovery, information gathering and exploitation phases of the attack, and by creating an exploit framework (SIMON) and an Android app (PlaneSploit) that delivers attack messages to the aeroplanes' Flight Management Systems (computer unit and control display unit), he demonstrated the terrifying ability to take complete control of aircraft by making virtual planes 'dance to his tune'.

There has also been a recent report in the media about a hacker who was able to take over the control of both Airbus and Boeing aircraft employing EW and CNO. Such possibilities will increase exponentially with the spread of Internet of Things (IoT).

Conclusion

EW and CNO are the sword arms of the IW and are independent entities with specific capabilities and functions which reinforce each other. These can be used both in stand-alone and in an integrated manner. While EW is well established and gaining primacy due to the importance of availability of EM spectrum, security and survivability of combat and logistic assets, CNO, in contrast, is still evolving and its application at the strategic, operational and tactical levels is yet to crystallise.

Presently, CNO and EW capabilities complement each other and produce exceptional effects when used jointly…

Presently, CNO and EW capabilities complement each other and produce exceptional effects when used jointly, more so along with the kinetic power. These also compete with each other particularly during pre-hostility period when stealth and attribution issues would favour application of CNO. On the other hand, EW encompasses electronics, the entire EM spectrum and EM space that include cyberspace. While both CNO and EW will grow exponentially, it is only a matter of time when CNO, EW and EM spectrum will merge into a single entity. Glimpses of this are very much visible.

Spectre of China's Artificial Islands

— Prof Swaran Singh & Dr Lilian Yamamoto —

Although the UNCLOS is far from being adhered to even after ratification of the states involved in the South China Sea dispute, it is a case where international law alone might provide a pragmatic start even while it may not promise to provide the full necessary response to these enormous geopolitical challenges. Based on reports on the nature of naval strategy of China in recent years, the construction of artificial islands is more likely to be guided by China's military strategy rather than claims on EEZ stipulated by the UNCLOS. Since China's rise in general and its artificial islands in particular have gradually been altering the *status quo* of the region, this may continue to add to tensions and further reduce the possibility of resolving the dispute.

TENSIONS HAVE BEEN ESCALATING rapidly in the South China Sea due to the construction of artificial islands by China that the US fears might become military bases in the near future. Although Chinese officials argue that these islands will be used mainly for rescue missions and scientific research, there is evidence that military equipment has been shipped to these places[1]. In view of these insinuations, to the least these constructions of artificial islands raise concerns about the breach of the 2012 Declaration on the Conduct of the Parties in the South China Sea[2] which provides for the respect for freedom of navigation in and flight over the South China Sea as provided by the UN Convention on the Law of the Sea (UNCLOS). This in the backdrop of the continuous strengthening of the Chinese military presence, especially of the PLA Navy, over the years seems to enable the government to increase its assertion and presence in the area thereby redefining the very geopolitics of South China Sea.[3]

The South China Sea is surrounded by China, Brunei, Indonesia, Malaysia, Philippines, Vietnam and Taiwan all having had claims on this maritime territory. This area has been under active dispute for several decades due to the strategic interest of the surrounding countries. The main groups of islands in the area are Paracel Islands, which are targets of dispute between China and Vietnam, the Pratas Islands, which are administered by Taiwan, Scarborough Reef, Macclesfield Bank and the group of Spratly Islands[4] which are disputed between China and the Philippines. This area is of remarkable importance due to its strategic location, sea-lanes and mineral and natural resources, including fisheries as also vast oil and gas reserves.[5] More than half of the annual global merchant fleet tonnage, with over 70.000 ships navigates through the South China Sea.[6]

The potential flashpoint where the construction of artificial islands is taking place is a subject of controversies over claims and counter claims of sovereignty primarily between China and the Philippines. On January 22, 2013, Philippines had submitted a formal Notification and Statement of Claims to the Arbitral Tribunal to begin compulsory arbitration proceedings under Article 287 and Annex VII of the UNCLOS regarding the dispute with China over its "maritime jurisdiction" in the South China Sea.[7] The Chinese government declined the Philippines' '*note verbale*' and published a 'position paper' in respect to the topic.[8] In this 'position paper', China asserted that the entire Spratly group of Islands belongs to her and also rejected the jurisdiction of the Arbitral Tribunal.

Disputed Spratlys and Artificial Islands

The group of Islands in the Southern part of South China Sea was named so after Captain Richard Spratly, master of the whaler "Cyrus South Seaman", who discovered these Islands in 1843. The Islands are controversial features under a Chinese-Filipino dispute and it is important to

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underline that according to international law, most of these cannot generate maritime zones and finally, it is estimated that between 20 and 46 can actually be considered as islands depending on high or low tide.[9] Most of these islands are under water at high tide, but some have a low elevation and are called reefs.[10] They are small and uninhabited except for government and/or military personnel who could be stationed under special circumstances.[11] Vietnam claims 22 features while Philippines claims nine, China occupies seven and Malaysia claims the other eight of these.[12]

The expansion of China in the South China Sea has had correlation with creation of vacuums following the exist by powerful countries. Such was the case of the occupation of the Paracel Islands in 1974 followed by the Vietnam War which took place after the US left Subic Bay. In similar ways, when the Soviet Union withdrew from Vietnam, China advanced its occupation in the Spratlys. In addition, after the US withdrew from the Philippines, China also occupied Mischief Reef.[13] The construction of artificial islands by the Chinese government has been receiving protests from all these neighbouring countries, especially Philippines and Vietnam who emphasize the breach of the *status quo* in the region by the unilateral construction of them by the Chinese.[14]

This is not, though, the first time that temples have been rising amongst these littoral claimants to the South China Sea. These features were occupied by China after its naval vessels sunk three Vietnamese vessels in 1988. Following this, the ASEAN had asked China to sign the Declaration of the South China Sea in 1992.[15] This instrument provided that China and ASEAN were to solve questions of sovereignty claimants to the South China Sea without resort to force that China and ASEAN were to solve question of Mischief Reef in 1995 in breach of this understanding and this island is especially within the Philippine EEZ.[16] Following this, from 1995 to 1999 too China had built atop the Mischief Reef, a cement building alongside the three octagonal structures which are used for communications, anti-aircraft guns, and radar systems for monitoring aircraft and ships.[17] On that occasion, the Philippines government had filed a diplomatic protest against Beijing for the occupation of this Reef.[18]

The most recent of the artificial islands construction has been the one on the Fiery Cross Reef which is also claimed by the Philippines and is located in the region of the Spratly group of Islands facing the Philippines and Vietnam. Both these countries have had rather acrimonious political ties with Beijing. Unlike several other dormant claimants to these features in the South China Sea, these two have been fiercely confronting China's assertions of its sovereignty over the whole of this maritime territory. Also, they may not have raised this hyperbole, if the construction of artificial islands occurred in the EEZ of the PRC. However, China has been carrying out these constructions far away from its EEZ and these have revived the above mentioned legal dispute that was brought forward by the Philippines before the United Nations Arbitral Tribunal.[19]

Even in case of this Fiery Cross island feature, the advance of the Chinese government had also been suspected earlier during the 1990s and specifically during 2011, when China had designated Fiery Cross marine observation station as the main command headquarters equipped with radars and high-powered naval guns. And now, China seems to have replicated this on other features in the South China Sea.

The UNCLOS does not provide any specific mechanisms to solve competing claims of sovereignty over such maritime features…

Artificial Islands Regime and the UNCLOS

To begin with, China has been a state party to United Nations Convention on the Law of Sea (UNCLOS) as it had ratified the Convention on June 07, 1996. However, China was seen as the one not fully observing the UNCLOS. Indeed, in August 2006, Beijing had formally filed a 'reservation' statement saying it does not accept the 'compulsory procedures' of the UNCLOS entailing 'binding decisions' as stipulated in Article 298 of this Convention. Although the UNCLOS provides for the regime of islands, it does so assuming that the boundaries are already established. Therefore, the UNCLOS does not provide any specific mechanisms to solve competing claims of sovereignty over such maritime features. Such matters are expected to be ruled by the principles of customary

international law regarding the acquisitions and loss of territory.[20]

Second, China is also not an isolated case amongst various claimants to make 'nine-dash-line-type' extravagant claims to the South China Sea. Other countries of the East and Southeast Asia have also been making excessive maritime claims using flexible interpretations of the UNCLOS provisions, especially when they set straight baselines, which have been often interpreted in a very liberal way.[21] This is often seen at their strategic positioning of their claims to keep margins for political bargaining. However, unlike these other claimants, what is different is rising China's will and its wherewithal that makes it so confident to take the risk of seeking out its sovereign claims on these waters. In particular, under President Xi Jinxing, China's rather assertive neighbourhood policy, especially recent forays by China's aircraft carrier, have triggered speculations if not nightmares amongst neighbouring countries forcing the US to make a far more assertive response to this. The recently released National Security Strategy 2015 by the US, for instance, described tensions in South China Sea as "reminders of the risks of escalation" and urged all parties for "an early conclusion of an effective code of conduct for the South China Sea."[22]

The concept of an 'island' according to the UNCLOS does not encompass 'artificial' islands…

As regards building a regime for islands, it is stipulated in the Article 121 of UNCLOS. In paragraph 1, it provides that an island is "a naturally formed area of land, surrounded by water, which is above water at high tide."s regards building , it states that the territorial sea, the contiguous zone, the continental shelf is determined by the coastline of islands as well. However, Article 121(3) provides that, oastline of islands as well. However, Article 121(3) provides thatnental shelf is determined bygraph 1, it provides that a

Many of the features in the Spratlys might meet the definition of rocks including those where the construction work of China is being carried out but most of these cannot be categorised as islands. Especially, the features where the Chinese are building the artificial islands are mainly divided in two groups. The first one includes Jonhson South Reef, Cuarteron Reef and the above mentioned Fiery Cross Reef, all classified as rocks.[23] Jonhson South Reef has a few rocky protrusions rising above water at high tide. Cuarteron Reef is a collection of coral rocks reaching no higher than one and a half metres and Fiery Cross is a submerged bank with protruding rocks no more than a metre above sea level in high tide.

In the second group, there are low tide elevations named Gaven Reef, Subi Reef and Mischief Reef, which are neither rocks nor islands. Regarding the first group of rocks, China claims entitlements beyond the 12 nautical miles in the waters and excludes other states from these areas[24], which does not follow the UNCLOS since according to Article 121 (3), rocks do not generate maritime rights larger than 12 nautical miles. Regarding the second group of features, low tide elevations which submerge at high tide and cannot be considered either as islands and or as rocks; they are part of the seabed and belong to the country's continental shelf (within 200 nautical miles).

The concept of an 'island' according to the UNCLOS does not encompass 'artificial' islands. Article 80 of the UNCLOS explicitly establishes that those that submerge at high tide do not possess the status of islands. Hence, the consequence of not being considered as an island is that it will not generate territorial sea and cannot be used as base point measuring the territorial sea. But China has deeply modified the status of these reefs and low-tide elevations into artificial islands which is how it legally claims rights to a 500-metre safety zone as long as there was not conflicting claims over them.

However, some of these features are within the Philippines EEZ and the Chinese claims of sovereignty over them have caused tensions and protests from the Philippines government. Although the UNCLOS has been signed and ratified by all the involved states, it is their perceptible tendencies to interpret and surpass its provisions in the name of national interests that pose a serious threat on the maintenance of peace and stability. The situation becomes especially perilous when the refusal to apply the spirit of UNCLOS is blended with China's increasing militarisation and overall ever expanding power projections.

Dialectics of China's Doublespeak

As regards this recent groundswell of polemics, most analyses have clearly missed on the very interesting dialectics of inherent contradictions in China's own policy positions with regards to artificial islands. The most apt case in point is China's policy responses to earlier instances of Japan's flexible interpretations of UNCLOS regarding the condition of islands. The Okinotori Reef, which is located at 1,770 km South of Tokyo, constitutes of two barren rocks located 1,400 yards apart and these are no more than two feet out of the water at high tide.

The standard Chinese government line on this has been that these are rocks which cannot sustain economic and human life and therefore, Japan cannot obtain an Exclusive Economic Zone around the Reef. Conversely, the Japanese government has argued that their efforts have been to simply keep the Okinotori Reef -- which it calls '*shima*' (island) - above water. That is why it has constructed circular blocks of steel and concrete around these two rock features. Japan professes Okinotori is an island and not as a rock. The same is true in the case of the islands that are being constructed by the Chinese government. By the same logic, it should be counter intuitive for China to argue that the reclaimed area is a natural one.

Indeed, the legal status of an artificial island is even more disadvantageous than of natural rock features. In legal terms, it would be better for China to argue that the Fiery Cross Reef is a rock rather than an artificial island in terms of claiming maritime zones. In its application, the interpretations of UNCLOS though have differed depending on the location of the artificial islands in the marine space. If the Chinese government had reclaimed these features within their territorial sea, it would have had full legal jurisdiction over them. Were the construction of these islands to take place within China's EEZ and continental shelf, the coastal state would also have exclusive jurisdiction over such artificial islands, installations and structures. A country is even allowed to build artificial islands in the high seas. However, there is a prohibition on states claiming sovereignty in the high seas or seeking to establish maritime zones around them. Besides, South China Sea is surely not seen as high seas but a disputed maritime territory and this makes the UNCLOS open to subjective interpretations.

Conclusion

To conclude, therefore, the ongoing sabre rattling is driven far more by the pre-conceived China threat theories and is not likely to help either side of the divide. No doubt, China is seen altering the *status quo* of these highly-contested and sensitive maritime features. Also, China's unstoppable spate of constructions has surely further shrunk any openings for peaceful resolutions. It was more than a decade ago that Asia's senior leader Lee Kuan Yew had advised the West on urgent need for caution against China's inevitable rise.

There does exist a mechanism to interpret facts on the ground and to foster bilateral or multilateral negotiations or even to establish third-party tribunal though these are often uninspiring and painfully slow. On the other side, given the exaggerated nature of these enormously overlapping claims of nations with complicated equations, muscle-flexing and jingoism is also no way out and is not going to add up to producing any definite solutions towards maritime delimitations. Ensuring peace in *status quo* and accommodation though joint explorations seem the only pragmatic way out and must be the aim of all stakeholders and the first step has to be creation of an atmosphere of trust and dialogue.

The legal status of an artificial island is even more disadvantageous than of natural rock features…

Although the UNCLOS is far from being adhered to even after ratification of the states involved in the South China Sea dispute, it is a case where international law alone might provide a pragmatic start even while it may not promise to provide the full necessary response to these enormous geopolitical challenges. Based on reports on the nature of naval strategy of China in recent years, the construction of artificial islands is more likely to be guided by China's military strategy rather than claims on EEZ stipulated by the UNCLOS. Since China's rise in general and its artificial islands in particular have gradually been altering the *status quo* of the region, this may continue to add to tensions and further reduce the possibility of resolving the dispute.

Among the available solutions in the backdrop of China's unstoppable rise, fostering bilateral or multilateral negotiations or third-party tribunal seem the most pragmatic way out even though chances of clear the maritime delimitations remain elusive and distant.

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China's Game of Territorial Claims

Lt Gen Gautam Banerjee

There is no hope of a resolution of the India-PRC border dispute unless it is grossly in favour of China. It would, therefore, be wise for India to learn to live with the problem – as indeed she does with many other issues - and not be in hurry to escape from it. Learning that trick from Vietnam, China's ever distressed yet stable neighbour, may help. Thus while well considered economic and industrial cooperation must flower, a resolve not to permit territorial usurpation must also be made clear. To do so in the context of China's cultural orientation, India's debilitated military capability must be built up – and very soon.

"China's strategy of peaceful development and readiness to negotiate on disputes for settlement does not imply giving up rights." **—Xi Jingpin**

Escalation of Territorial Assertions

With the installation of a new Government in New Delhi, Beijing had been quick to reiterate her stance on the disputed Indo-Tibet Border. The purpose is obviously to keep stoking the revisionist stance of the People's Republic of China's (PRC) and drive home the inevitability of its escalation to a point where India is left with no option but to yield to her territorial claim lines. India's option of standing up to her propensity for military solution in the near future is a bit far-fetched. Frequent albeit less reported intrusions across the McMahon Line in the East and the latest incidents of virtual 'land grab' by the People's Liberation Army's (PLA) Border Guard Regiment in Ladakh's Sirijap, Demchok and Chumur areas are but the links in that chain of escalation.

In the recent months, leaders on both sides have had a series of conversations – mostly implied but adequate for the wise statesmen to take measure of each other's stakes. It would, therefore, be interesting to delve into this matter and see as to what might the Chinese do in the coming days and what the new, more vigorous, Government of India can do about it.

Environmental Determinants

In cricket, 'Chinaman' is a 'leg-break' bowled by a left hander, which appears to come to a right-handed batsmen as an 'off-break', but actually turns the other way! China's doings are no less complex; they call for deep scrutiny to measure. The intended discussion may, therefore, be better served if certain shades of 'grey-scale' environmental determinants, which impinge on decision making in the Sino-Indian context, are taken note of. These determinants are - one, the compulsions of China's Communist regime; two, the strategic culture of China's ruling class and three, certain pacifist distortions in the Indian discourse.

Legitimacy of the Communist Regime

The PRC is ruled by an oligarchic system in which the Chinese Communist Party (CCP) takes precedence over the State, its rule legitimised, not by people's choice or past imperialistic covenants but by the Party's grip over citizens' choices. Having more or less taken care of the people's basic needs over the first fifty years of its rule, 'reclaim' of such territories of the Chinese Empire which, in the Party's contention, had been 'lost' due to weak and corrupt rule in the past, has emerged as a nationalist mission. The CCP can back out of that mission only at the cost of its survival in power.

Incidentally, the CCP's territorial claims are borrowed from its *bete noire*, the Nationalist Government of the Guomintang Party. The Guomintang rule was tottering by the late 1920s

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when it chose to publicise its sweeping territorial claims across the entire neighbourhood. After the Communists overthrew them to capture power in 1949, that claim was adopted with minor changes to accommodate the post-World War II realities. Hereafter, the Chinese culture of deceit was in full play when they mixed their territorial claims with other rhetorical bombast because of which few took them seriously. Then, as the PRC gained in power and found its 'time was ripe' (sic), gradually and selectively, the bombast morphed first into diplomatic contention and then political-military assertion.

Notably, China does not delineate politics, diplomacy, commerce and military power into distinct sectors. Therefore, when confronted with a challenge that remains untamed to her full satisfaction by civil means, she is naturally inclined to apply military pressure to catalyse her purpose. Further, recourse to military solution is invariably dictated by two extreme parameters - one, military force-application is always total and ruthless, there is no allowance, no quarter; and two, military objectives are set to serve just the bottom-line political goals and terminated accordingly. That indeed is part of China's strategic culture.

China does not delineate politics, diplomacy, commerce and military power into distinct sectors...

Continuation of Party rule being the first priority for the CCP, no relief from tension on the borders may be expected, unless of course, new issues of far-reaching consequences emerge to divert the course of regional politics – like internal revolt in China or coalescence of neighbourhood alliances of her victims.

The Realm's Sources of Threat

From the time China's history is recorded, the rise and fall of the Han civilisation has been inexorably linked to the power play in what are described as the 'peripheral territories' surrounding the 'core' of Chinese Empire viz Manchuria, Mongolia, East Turkestan, Greater Tibet and Southern Yunnan. These are actually nations of distinct ethnicity, but ever influenced, politically and socially, by the Han culture. Referred to by the Hans as 'barbarians' or lesser peoples, these nations have been a source of strength as well torment for the ruling dynasties down the ages, sometimes submitting to China's suzerainty and sometimes invading and installing their rule over the Empire. From the time of the Manchu Empire – a neo-Han Manchurian dynastic rule – keeping these peripheral areas under central control, as much as its military power permitted, became a fundamental plank of state policy. Presently, this policy is in full play through PRC's ruthless domination over East Turkestan (Xinjiang) and what is left of Greater Tibet after its apportioning to neighbouring provinces, i.e. Xijang. That indeed is a policy for survival, and above that, ascendency of the 'Communist Empire' to 'great power' status – that goal cannot be allowed to dissipate.

The PRC, therefore, plays over-safe when besides conclusively integrating its peripheral provinces, proceeds to gobble up as much as possible of such areas beyond where these societies might have exercised some influence at any time in the past. In other words, Beijing seeks to secure 'buffers plus' – adding Arunachal Pradesh (so called 'Southern Tibet') to Tibet and Northern Ladakh to East Turkistan, for example - leaving no reckonable threats-in-being; if history has to be reconstructed to that purpose, so be it!

A Lifeline of Raw Materials

The Communist regime's stability is inexorably linked to economic progress and control over the growing disparity between the miniscule rich and the majority of poor. Basic needs having been secured by and large, China's vast population of modest means today harbours aspirations ever higher and that demand is fuelled by the tide of democratisation, albeit tentative, in the society. However, the better part of China's terrain is unproductive and that stifles the natural advantages of possession of vast lands. It is here that the compulsion of securing humongous supplies of raw materials, to keep the economy vibrant, is imposed upon the CCP. Past policies having led to devastation of natural resources and environmental havoc in the mainland, Beijing is obliged to look for outsourcing of raw materials that must flow in uninterrupted to keep the progress upwardly mobile. Obviously, that assurance is contingent

upon two factors - one, access to mineral-rich areas either by sovereign right or lease-purchase of foreign sources, preferably the former and two, the security of the lines of communications.

Territorial expansion – *a la`* Imperialist Japan's pre-World War II 'South-East Asia Co-prosperity Sphere' therefore is an obligation that the CCP will overlook at its peril. However, there are more conducive means to achieve that end. Hopefully then the CCP's search of security may not cause insecurity among its neighbours. Beijing's behaviour, however, causes the trepidation to linger.

Beijing's Institutional Mentality

China's millennia old imperialist bureaucracy has ever been sanctimonious in propagating its dictates as unquestionable and conclusive. This psyche is moored at China's self-vision of cultural superiority over all other civilisations. Indeed, as the 19th century European and American companies discovered, the Mandarins could neither be dissuaded nor distracted unless imposed upon by force. China's great cultural tradition has left no choice for the Mandarin's new incarnations - the Republicans of the Guomintang and now their successor Communist Party's supreme leadership but to inherit that mentality. It is so that they are compelled to arrogate their 'historical rights' over all such foreign lands which at one time or the other might have been engaged with China in some manner or the other - even fishing, grazing, transit, migration, political and religious alliance, exchange of tributaries and so on.

Beijing then goes two steps further. One, she has declared 56 of the progressive neo-Han ethnicities as 'part' of the Han stock thus expanding her nativity and two, she has extended, by default as discussed, her 'historical' claims over such areas where China's past tributaries or allies had exercised some form of influence. Furthermore, determinants of the PRC's 'sovereign right' over such territories are sought to be bolstered by interpretations of ancient writings of their own chroniclers. This one-track mentality is best depicted by Beijing's selective and sanctimonious citation of history and tradition to justify her claims, and description of her military aggression, past as well as intended, as "counter-attack in self defence". Obviously, Beijing does not accord any concessions to geo-political understandings of the contesting parties and nonchalantly dismisses these.

It is, therefore, futile to expect that PRC's territorial claims could ever be settled by logic or consensus unless of course, it is in China's favour.

Border Settlements?

There is mention of the PRC having settled all its border disputes barring just two – those with India and Bhutan, that of the latter actually remaining in contention by default due to its linkages with India. Most such hints insinuate to India's supposed obduracy in settling the Sino-Indian Border issue. The facts are however rather qualifying. The PRC has borders with 20 neighbours. 12 of these have land frontiers, two have land as well as maritime boundaries and six are purely in maritime domain – not counting Pakistan which does not have a recognised border with the PRC, and the Republic of China (ROC) which, though a part of China, remains independent of the PRC's control. Of these, land border disputes with ten neighbours have been 'settled' but these are not all above controversy; these are liable to be revisited in the future. Then, there is the gathering dispute in the Russian Far-Eastern Border region where harness of Russia's natural resources is dependent on Chinese migrants.

Territorial expansion is an obligation that the CCP will overlook at its peril...

All such settlements have been concluded on PRC's terms, with minor concessions allowed to show Beijing's indulgence of her 'lesser' neighbour's sensitivities. The balance ten disputes continue to fester, most of those in maritime domain have in fact escalated beyond the level of comfort. Indeed, so outlandish are Beijing's claim over the surrounding seas that had it not been clad in sinister motives, these could be topics of levity.

Self-effacing Arguments

In some Indian discourses, there is a hint of growing tolerance, if not cognition, of Beijing's territorial claims. Unless balanced, this is a

dangerous trend. It needs to be appreciated that point to point, and shorn of the wariness that the PRC's economic and military power instils among other stakeholders, India's case is as true, if not stronger, than that of the PRC. In fact, many of the Beijing's pronouncements may well be turned to New Delhi's favour. Just two examples of the notions which are at the core of the PRC's claims would clarify this aspect.

One, the PRC's stance that 'the boundaries were drawn by imperialist powers for their own rather than the host nation's concerns and therefore cannot be acceptable to a free nation' (sic), could also be turned to bolster India's case. It is a fact that Chinese imperialists unilaterally claimed sovereign rights over the Kun Lun - Karakoram Region without any concern for the native Tibetan and Turkic nations, just as the British imperialists did to Indians. In fact, the British were keen for Imperial China to take over much of North-East Ladakh just to keep the Russians out. China. However, Britain deliberately chose to leave the matter vague for expansive interpretations when it suited her. Repudiation of the request made by the British Indian Government in 1848 to delineate the Indo-Tibet Border was only a ploy to that end. At that time, the Chinese Government has replied that "since the territory has ancient frontiers, it was needless to establish any other". It was after China refused to respond to the call that the British Indian Government had to draw its territorial limits according to the Ardagh-Johnson Line, or its more convenient version, the McCartney-MacDonald Line. That the British kept changing their mind on these alignments as it suited them, actually turns China's pretentious anti-imperialist argument in India's favour. India, rather than China, had then been a victim of British colonialism, and now she is a target of China's expansionism.

The British were keen for Imperial China to take over much of North-East Ladakh just to keep the Russians out...

The fact is that the Westphalian concept of contiguous and continuous territorial boundary alignments in European model could not apply to Asia. Existence of vast unliveable frontier-lands between nation-societies resulted in such areas remaining as 'every-man's land', so to say. Periodically, some stretches of these lands had been traversed by traders who bought safety by paying some tax to certain overlords who dominated the fringes of such lands. China's unilateral claim over these 'every-man's lands' as her sovereign territory, after shying away from the offer of mutually acceptable delineation and then keeping mum for hundred years after the British Government in India went ahead to delineate the boundary line, which has now been inherited by independent India, defies justification.

Two, the PRC's claim over the Tawang Tract and by default, most of Arunachal Pradesh, is sought to be justified by the prevalence of a practice in which the Buddhist estates paid religious contribution or tribute in some form or the other to the Potala Palace in Lhasa which headquartered the seat of Buddhism - a religion with its roots in India. Truly, Beijing's argument is a specious one because religious endowments have been, and continue to be, exchanged across national boundaries – by the followers of Vatican, Grand Mosques and similar religions institutions, for example - without mixing religious superintendence with sovereign functions. In any case, the matter is dead after the PRC invaded Tibet, toppling the religious seat in the process, then desecrating it during the 'Cultural Revolution' and finally destroying the institution of Dalai Lama and the Buddhist nationality. Besides of course, in the past, Tibetan marauders had been occasionally foraying into Indian North-East to plunder, but such dominations do not qualify for sovereignty. International borders are fundamentally defined by geographical features and societal construct, not merely by religious affiliations or plundering quests, after all.

As mentioned earlier, the CCP's territorial claims are copied from the Guomintang government's quixotic vision, which had been depicted in the form of a map published in 1927 and in which some parts of Asia had been left out (pun intended) of the grand vision of China's sovereign domain. Point to note is that at that time the Guomintang Party government was in control of only some parts of China – it was a lame and fractured rule. There is, therefore, no reason to take that map, produced by a

delusionary government of questionable legitimacy, seriously.

Conversely, an earlier map published in 1917, after the McMahon Line had been drawn under the Shimla Agreement of 1914, shows the Indo-Tibet Boundary aligned exactly as it is shown in Indian maps. So where does partisan interpretation of history, recorded under motives debatable, may finally rest, how far back in time would Beijing go? By analogy, why should New Delhi not revive her possessions over parts of Tibet which she chose to forego after independence? Indeed, why should not Tibet or Mongolia lay claims upon China based on their control over parts of imperial China?

Arguments can go on in endless circles. In international politicking, facts are construed in 'grey-scale' and interpretations and arguments may be turned in any way. But invariably, the outcome is decided not by logic or sentiments but, as we witness on daily basis, by the backing of brute power. Eating grass to buy guns may not be such a ludicrous idea after all – Mao's China did just that to be where it is now! That is the lesson to be imbibed.

Having discussed the environmental determinants which influence the course of Beijing's policy on what she believes to be her bounden duty of reclamation of 'lost territories' - a promise that the rest of the neighbourhood views as blatant expansionism. We may now think of 'living' with the Indo-Tibet Border issue.

Living with a Problem

If so far New Delhi had been stoic in playing down Beijing's growing assertiveness in the banal hope that the menace will get reconciled, recently it had gone a step further by explaining away PRC's case – the theme being 'the differing perceptions of the LAC'. Apparently influenced by Beijing's ruse, this theme is an escapist urge and an invitation to more torment. Of course, both India and the PRC know exactly how the LAC runs.

Many may believe that India's post-Independence delineation of the Ladakh-Tibet Border had been ambitious and unilateral. They, therefore, acquiesce with a 'give (what meat the PRC takes)-and-take (what residue the PRC may leave)' arrangement and settle the issue once for all, on the same line as the thought of 'regularising' as International Border (IB), the Line of Control with Pakistan Occupied Kashmir. That attitude having been India's undoing over the centuries past, wisdom suggests that such simplistic, pacifist ideas are to be summarily jettisoned. In fact, looking at the post-independence situation and Beijing's predatory instincts, it is amply clear that New Delhi really had no better option than what it did to delineate her territory. Indeed, the LAC of today owes much to the so called 'Forward Policy' which prevented, albeit at the cost of our sacrificial soldiery, the PRC from gobbling up the entire Central Ladakh and much of Arunachal Pradesh. Today, when India has much of what is her own territory, why alter the *status quo* and either cede more or reward the PRC with the gains of its aggression?

There is no hope of a resolution of the India-PRC border dispute unless it is grossly in favour of China. It would, therefore, be wise for India to learn to live with the problem – as indeed she does with many other issues - and not be in hurry to escape from it. Learning that trick from Vietnam, China's ever distressed yet stable neighbour, may help. Thus while well considered economic and industrial cooperation must flower, a resolve not to permit territorial usurpation must also be made clear. To do so in the context of China's cultural orientation, India's debilitated military capability must be built up – and very soon.

It would unwise for India to venture into any kind of military conflict to arrest the existing or future encroachments...

Notwithstanding the brave front recently put up by the Indian border forces in face of PLA's intimidation, it would be unwise for India to venture into any kind of military conflict to arrest the existing or future encroachments. Given the PLA's tradition of building up overwhelming operational and logistic superiority before committing to even minor engagements, it is certain that such encroachments are backed up by deliberate preparations that India may match only through build up at least a corps-size, fully balanced force, with more forces ready at the jumping board should matters escalate.

It may take India many years of full throttle build up to marshal that kind of force-level and its attendant logistics. The Government has placed itself in this situation after decades of de-prioritising military preparedness, its repudiation of saner counsel being that, "There will be no war with China". A true, if unfortunate, statement because in any case, India may not have the capacity to deter the PLA in its adventurism should the latter decide to do so.

The post-1962 LAC and the alignment of the Indo-Tibet Border are two separate matters...

It would take up to a decade or so of defence build up just to be able to stonewall the PRC from its stratagem of 'creeping encroachment'. Meanwhile, astute diplomacy would have to manage the situation as best it can be. To that end, it may be the time to clarify to Beijing that the post-1962 LAC and the alignment of the Indo-Tibet Border are two separate matters. The former is a fall out of deliberate military aggression while the latter is dictated by geography and past usage. These two matters have to be resolved in exclusivity. The dividend of pushing the LAC further into India would, therefore, be but illusionary. Further, we may adopt China's own stance vis-a-vis its European, Russian and Japanese tormentors of the 19th and 20th centuries to articulate that any territorial imposition that is forced upon India under duress by the communist-imperialist regime will not be acceptable and that it would remain a 'live' issue, to be rectified in the future as and when India's 'time is ripe'.

Maybe at one time, some kind of mutual 'give-and-take' – more agreeable than China's propensity of 'take-and-take' - might be arrived at, and that would settle the territorial manoeuvres. Build up of military power would bring that time sooner.

Aerospace and Defence News

Priya Tyagi

MILITARY AVIATION

Prototypes of Russian Stealth Fighter

AT THE RECENT AIR SHOW IN PARIS, YURI SLYUSAR, PRESIDENT OF THE MOSCOW-based United Aircraft Corporation revealed to the media that its subsidiary Sukhoi plans to deliver three more prototypes of the advanced stealth fighter jet the T-50 PAK-FA, a fifth-generation stealth fighter, to the Russian Air Force for testing early 2016. That will bring the total number of T-50 prototypes to eight, according to a factsheet distributed at the Air Show. The company plans to deliver the first batch to the customer at the end of 2016 or by the beginning of 2017. The PAK-FA first flew in 2011 and is designed to compete against US military aircraft as the F-22 Raptor and F-35 Joint Strike Fighter, both of which are made by Lockheed Martin Corporation.

Compared to the previous generation fighters, the PAK-FA combines the functions of a strike and air defence aircraft thus offering a number of unique capabilities. While the T-50 has experienced some development challenges such as engine flameouts, the aircraft is performing well in tests, according to Slyusar. He also said the company expects to sign a contract this year to sell 24 Su-35s for the Chinese military and is in talks to ink a deal to provide maintenance support for Russia aircraft on their inventory. Russia and India are jointly developing an export version of the T-50 aircraft. The Indian version will be customised to meet with the specific requirements of the Indian Air Force.

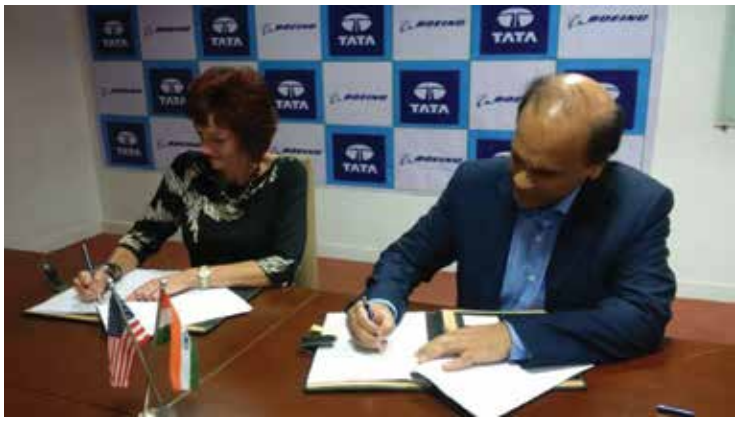
Sukhoi PAK-FA T-50

Priya Tyagi

Airbus-Mahindra Aerospace Deal

Mahindra Aerospace has bagged a multi-year contract from Airbus Group company, Premium Aerotec of Germany, to manufacture and supply aero-components. The contract envisages manufacture and supply by of a variety of metallic components for several types of aircraft produced by Airbus. Mahindra Aerospace's deliverables under this contract will be in excess of a million parts per annum. The parts will be produced at the new Mahindra Aerostructure's facility located at Narsapura near Bengaluru. Deliveries of spares to Premium Aerotec's facilities in Germany are scheduled to commence this year, the company said.

Announcing the contract award during the 2015 Paris Air Show at Le Bourget, senior representatives of the Airbus and Mahindra groups mentioned that this contract is aligned with the Indian government's 'Make in India' initiative and validates the two groups' commitment to accelerate India's participation in the global aerospace industry while simultaneously creating high-growth opportunities within India's burgeoning aerospace and defence ecosystem.



Shelley Lavender, president Boeing Military Aircraft and Sukaran Singh, chief executive officer and managing director of TASL, sign a framework agreement in Hyderabad

(Left to Right): Dennis Swanson, vice president, Boeing Defense, Space & Security, India; Shelley Lavender, president Boeing Military Aircraft; Sukaran Singh, chief executive officer and managing director of TASL; and Pratyush Kumar, president, Boeing India at the signing ceremony

Airbus and Mahindra are already global partners in the aerospace engineering domain with Tech Mahindra being one of the global E2S engineering services providers to the Airbus Group. Premium Aerotec and Mahindra Aerospace have started a journey to build capability and capacity in India to support the global market demand for Airbus aircraft.

Boeing and TASL Joint Venture

On July 15, 2015, Boeing and Tata Advanced Systems Limited (TASL) signed a framework agreement to collaborate in aerospace and defense manufacturing and integrated systems development opportunities, including UAVs. The companies intend to access markets jointly for products and platforms developed together by Boeing and TASL. TASL is already on contract to manufacture aero structures for Boeing's CH-47 Chinook and AH-6i helicopters. "This agreement with TASL is significant because it demonstrates Boeing's commitment to expanding its aerospace manufacturing footprint in India," Lavender said.

"As we step into our 100th year in business, a new aerospace partnership with India is the perfect milestone to accelerate the momentum we have generated for making in India," said Pratyush Kumar, President, Boeing India. "It is noteworthy that TASL will produce Chinook helicopter parts in India even before the procurement contract is signed with the Indian government." "This framework agreement is the result of the world-class competencies of TASL as well as the vendor eco-system it has helped establish in India. It gives us an opportunity to

explore the massive potential in India for aerospace manufacturing and make the investments required to grow the industry," said S. Ramadorai, Chairman, TASL.

Airbus C295W Aircraft for Saudi Arabia

After carrying out a complete evaluation in open competition, the Ministry of Interior of Saudi Arabia has purchased four C295W aircraft to enhance its capabilities. The C295W has been chosen based on its demonstrated excellent operational capabilities in hot and severe conditions and its proven affordable maintenance and operational costs. Together with the previous orders received from Algeria, Egypt, Jordan and Oman, this new order from Saudi Arabia cements the C295W's position as the market-leading medium transport and patrol aircraft in the Middle East and North Africa region.

"We are very proud that the C295W is joining the Airbus A330 Multi-Role Tanker Transport (MRTT) and CN235 transports previously ordered by Saudi Arabia. We greatly appreciate the confidence shown in the C295W by a nation with long expertise in operating military aircraft in desert conditions", said Antonio Rodríguez Barberán, Head of Commercial for Military Aircraft.

C295W

Apache-Chinook Contract Imminent

A contract worth over $2.5 billion for 22 Apache attack helicopters and 15 Chinook heavy-lift helicopters with US aerospace major Boeing is likely to be cleared by the Government of India in the near future. Issues pertaining to the offset conditions for the contract has been cleared by the Ministry of Defence and now the deal will come up for discussion in the Cabinet Committee on Security. The extended validity period of the price quoted by Boeing ended on June 30, 2015.

Apache AH MK1

Boeing, along with the US government, had extended the validity of the price quoted by them for another three months in April hoping to wrap up the deal soon. The Ministry of Defence had, in March, sought extension of the validity period on its expiry on March 31. The US firm had in February this year warned of a price hike if India does not finalise the contract soon. Boeing has extended the price validity for the deal at least thrice since cost negotiations concluded in 2013.

Chinook

The deal for the Apache is a "hybrid one", with one contract to be signed with Boeing for the helicopter and the other with the US government for its weapons, radars and electronic warfare suites. The US has been pushing for this contract as it will further bolster American presence in the burgeoning defence market of India.

IAF Jaguar Fires the Harpoon

On May 22, 2015, for the first time, the Indian Air Force launched a Harpoon anti-ship missile from a Jaguar maritime strike aircraft against a pre-designated target in the Arabian Sea 200

Jaguar

nautical miles off the West coast. The Jaguar fighter belongs to the maritime strike squadron of the IAF and is based at the Lohegaon airbase on the outskirts of Pune. The Jaguar was refuelled mid-air during the mission.

The Harpoon anti-ship missile is built by the US defence and aerospace major Boeing. With a range of 124 km, the Harpoon is capable of striking land targets as well. This was the "first live firing" of the Harpoon from a warplane in India after integration by state-owned Hindustan Aeronautics Limited. The Indian Navy had tested the Harpoon last year when a Boeing P-8I long range maritime reconnaissance aircraft launched the subsonic missile to take out a 'target' in the Bay of Bengal. India has bought a package of 24 Harpoon Block II missiles for its Navy and another 22 for the IAF. Having won deals worth over $10 billion in the last six years, the US is currently the biggest supplier of weapons to the Indian military. India and the US are expected to ink an amendment to the 2005 India-US Defence Framework Agreement, renewing the pact to deepen cooperation in several security-related areas. The agreement, first signed in 2005, led to some major weapon sales to India and strengthened the overall strategic partnership.

IAF Mirage 2000 Lands on Yamuna Expressway

At 6:40 a.m. on May 21 this year, a Mirage 2000 combat aircraft of the Indian Air Force (IAF) carried out a trial landing successfully on the Agra Yamuna Expressway. The exercise carried out for the first time in India, was meant to test whether the national highways can be used for emergency landings especially during war when the runway at the military air base is put out of action by the enemy. For quite some time, the IAF has been considering the use of national highways for emergency landing by fighter aircraft and has plans to activate more such stretches on highways in the future. For the trial landing, all facilities such as make-shift Air Traffic Control, safety services, rescue vehicles, bird clearance parties and other requirements were set in place by the IAF. The exercise was conducted in coordination with District Magistrates and Superintendents of Police of Agra and Mathura.

IAF Mirage 2000 on Yamuna Expressway

Airbus Helicopters and Mahindra Group Joint Venture

Taking advantage of the 'Make in India' theme of the Modi-led NDA government and the first company to do so, Airbus Helicopters, a division of Airbus Group, has joined hands with Mahindra Defence, a subsidiary of Mahindra Group, to produce military helicopters in India in order to meet the country's requirements. The two companies will set up a joint venture company in the next few months. The joint venture will be dedicated to supplying the Indian armed forces with Made in India, state-of-the-art helicopters of high reliability, quality and safety standard based on combat-proven platforms. The resulting joint venture will create hundreds of high-tech jobs locally and lead to a flow of cutting edge technologies to India should it be selected in the governmental helicopter tenders.

Joint venture with Airbus Helicopters is the third major collaboration pact between a Mahindra group company and global aerospace companies in the recent past. In June 2015, Canadian firm Magellan Aerospace entered into a partnership agreement with Mahindra Aerospace to manufacture major structural assemblies, machined components and fabrications, all made in India. Around the same time, Mahindra Aerospace and GE Aviation entered into an agreement for collaboration to manufacture aero structures.

China to Deliver 50 JF-17 Fighter Jets to Pakistan

As per reports in the Chinese media, China is set to deliver 50 JF-17 Thunder combat jets to the Pakistan Air Force over the next three years. Li Pei, former Head of the aircraft project under the Aviation Industry Corporation of China, described the JF-17 as a major achievement in cooperation between Beijing and Islamabad in the defence sector. China's Chengdu Aircraft will produce 50 jets for Pakistan over the next three years, Li told the state-run People's Daily.

JF-17

Pakistan has already received 60 jets from China since 2007. Ten of them were used by a test and evaluation unit of the Pakistan Air Force while 50 jets were assigned to two combat squadrons. Under the contract signed by the two countries, Pakistan will receive a total of 110 JF-17 jets. The JF-17 was jointly developed by Chengdu Aircraft Industry Group and Pakistan Aeronautical Complex. China will deliver fifty more JF-17 Thunder fighters to Pakistan over the next three years. Recently, eight JF-17 jets of the PAF escorted President Xi Jinping's aircraft when it entered Pakistani airspace before his arrival in Islamabad on April 20, 2015.

Qatar Dassault Mirage 2000

Rafale Fighter Jets for Qatar

French aerospace major Dassault Aviation has entered into an agreement to supply the State of Qatar, 24 Rafale fighter jets, which is expected to boost the military might of the Gulf nation in the volatile Middle East region. The value of the contract is estimated at $7 billion. According to the French defence ministry, the deal also includes MBDA missiles, the training of 36 pilots and about 100 technical personnel. The first delivery of the Rafale fighter is due in 2017. Qatar has long been a customer of Dassault

Rafale

with its Mirage F1, Alpha Jet and the Mirage 2000 and the present deal underpins the historic relationship between the two.

For Dassault Aviation, this is the third contract this year after years of unrelenting efforts to sell its advanced twin-engine fighter jets abroad. In February 2015, the company agreed to sell 24 Rafale jets to Egypt for €5.2 billion, while India announced the purchase of 36 aircraft earlier on. Expressing his delight over the deal Eric Trappier, Chairman and CEO of Dassault Aviation said in a statement, "This new success for the French team demonstrates the Rafale's operational qualities and confirms the confidence that countries, that are already users of the Mirage 2000, have in our company."

Taliban Downs Pakistani Military Helicopter

In the second week of May this year, Pakistani Taliban claimed to have shot down a Pakistani military helicopter killing six people, including the envoys of Norway and the Philippines. The incident occurred in the Gilgit-Baltistan region of Pakistan-occupied Kashmir and the helicopter crashed into a school with children inside and set the building ablaze. According to the Pakistan Army, besides Leif H Larsen, the Norwegian envoy and Domingo D Lucenario Jr of the Philippines, the dead included the wives of the Malaysian and Indonesian ambassadors, as well as the two member crew flying the helicopter. Polish ambassador Andrzej Ananiczolish and Dutch ambassador Marcel de Vink were also injured, the army added.

It is possible that this was a case of mistaken identity as reports indicate that Prime Minister Nawaz Sharif was their actual target. The helicopter is believed to have been brought down by an anti-aircraft missile. Prime Minister Nawaz Sharif was reportedly travelling to the mountainous Northern region of Gilgit on a separate aircraft to launch two projects when the accident happened. The helicopter that was shot down was one of three carrying a delegation of envoys to inspect projects on a three-day trip to the Gilgit-Baltistan territory where they were to meet with Prime Minister Sharif. Gilgit-Baltistan, with its spectacular mountain ranges and unique culture, is a strategically important region that borders China and Afghanistan but is not known as a stronghold of the Pakistani militant outfit.

Russia-China Collaborate for Advanced Heavy-Lift Helicopter

Russian Helicopters and Aviation Industry Corporation of China (AVIC) have signed a framework agreement to work together on creating an Advanced Heavy Helicopter. Under the agreement, the parties will work on all areas of development and preparation to launch serial production of the new aircraft, named the Advanced Heavy Lift (AHL).

Graphic: Advanced Heavy-Lift Helicopter

The agreement has been signed at the Moscow Kremlin by Alexander MIkheev, CEO of Russian Helicopters and Lin Zuoming, Chairman, Board of Directors of AVIC in the presence of Russian President Vladimir Putin and Chinese President Xi Jinping. The manufacture in China of a heavy-lift helicopter developed jointly by the two countries has been an important component of Russian-Chinese collaboration in the aviation industry.

This agreement marks the beginning of work on the ground for the project. The demand for the new heavy-lift helicopter in China could exceed 200 aircraft by 2040. The AHL is planned to have a take-off weight of 38 tonnes, internal cargo capacity of ten tonnes and underslung load of 15 tonnes. The helicopter will be designed to operate round-the-clock in hot climates, mountainous terrain and all weather conditions and will be able to fly a highly varied range of missions from transportation to medevac, fire fighting and more.

LAND SYSTEMS

Indigenously-Built Surface-to-Air Missile Akash Inducted

Over three decades after the project was initiated, on May 05, 2015, the Indian Army inducted the indigenous supersonic surface-to-air missile Akash, capable of targeting helicopters, aircraft and UAVs from a range of 25 km and up to an altitude of 20 km. The missiles, developed by the Defence Research and Development Organisation will be a boost for the Army Air Defence Corps which had been grappling for years with obsolete air defence weapons.

The Chief of Army Staff, Gen Dalbir Singh in a group photograph, during the dedication ceremony of Akash Weapon System to the Indian Army

"The capability that we have with this system will ensure that it takes care of vulnerability of our assets. Akash is a step towards self-realisation of indigenisation," said General Dalbir Singh Suhag, Chief of Army Staff, while presiding over the formal dedication ceremony. He added that the Army was in the process of reinventing the command and control and battlefield management system of the Army Air Defence. The Akash Missile System has 96 per cent indigenisation, is capable of simultaneously engaging multiple targets in all-weather conditions and is capable of providing comprehensive short range missile cover to the vulnerable assets in the field. The Akash which will be deployed facing the Western borders, employs command to line of sight guidance and relies on sophisticated radars and control systems to guide the missile to its targets.

Bullets That Can Change Course Midair

The US military has successfully tested self-steering 'smart' bullets that have a real-time guidance system to track targets and can change their course if needed. The 'smart' bullets equipped with optical sensors, passed their most successful round of live-fire tests to date, according to the Defense Advanced Research Projects Agency (DARPA). In the tests, an experienced marksman, "repeatedly hit moving and evading targets," a DARPA statement said. "Additionally, a novice using the system for the first time hit a moving target."

The system has been developed by DARPA's Extreme Accuracy Tasked Ordnance programme, known as EXACTO. "True to DARPA's mission, EXACTO has demonstrated what was once thought impossible: the continuous guidance of a small-calibre bullet to target," Jerome Dunn, DARPA Programme Manager said in a statement. The goals of the EXACTO program are giving shooters accuracy at greater distances, engaging targets sooner and enhancing the safety of American troops, DARPA said. The EXACTO program has developed new approaches and advanced capabilities

to improve the range and accuracy of sniper systems beyond the current state of the art. The programme sought to improve sniper effectiveness and enhance troop safety by allowing greater shooter standoff range and reduction in target engagement timelines.

Indigenously Built Field Gun Dhanush

The indigenously designed and manufactured 155 mm artillery gun, Dhanush, is finally expected to be inducted into the Army after the 45 mm calibre gun has successfully met all technical parameters during the winter and summer trials. End April this year, briefing Members of Parliament of the consultative committee attached to his ministry, Defence Minister Manohar Parrikar said the Dhanush incorporates many improved features compared to the guns with the Army at present.

Dhanush

The DRDO undertook the 155 mm artillery gun project to overcome the delays associated with the overseas procurement of artillery guns due to issues of corruption and irregularities. Many of the companies that bid for the contract are either blacklisted for utilising unfair means to gain the contract leading to single vendor issues and guns not meeting the requirement of the Indian Army. No artillery guns have been procured for the Indian Army after the Bofors scandal. Hence it was planned to replace the older guns with an indigenously developed, modern 155 mm artillery gun.

NAVAL SYSTEMS

India's First Indigenous Aircraft Carrier INS Vikrant

Built at Cochin Shipyard Limited (CSL), India's first indigenously-built aircraft carrier INS Vikrant was undocked on June 10, 2015. The ship will now undergo a series of fitment and trial

Undocking of INS Vikrant

processes before it is ready for propulsion. It will be inducted into the Indian Navy after successful completion of a series of static and dynamic trials as also extensive sea trials. Induction of the 40,000-tonne aircraft carrier will put India in the elite group of four nations in the world, namely the US, Russia, the UK and France that are capable of designing and constructing aircraft carriers. The basic design of the indigenous aircraft carrier was accomplished by the Indian Navy's Directorate of Naval Design, which was developed into a detailed design by the design team of CSL. The ship has a length of over 260 metres and breadth of 60 metres. It has two take-off runways and a landing strip with three arrester wires, capable of operating STOBAR aircraft including the indigenous LCA, as well as a range of helicopters with hangar facilities.

Porbander Naval Base Commissioned

In the second week of May 2015, the Indian Navy commissioned the newly created Naval Base Sardar Patel at Porbander in Saurashtra region of Gujarat. As per Admiral Robin Dhowan, Chief of the Naval Staff, this new facility of the Indian Navy would support ships, submarines and aircraft

INS Sardar Patel (Gujarat Chief Minister Anandiben Patel along with Navy Chief Admiral Robin Dhowan and other officers on board the INS Kolkata (below) at INS Sardar Patel)

of Western Naval Command operating along the 1,600-km long coastline of Gujarat. Addressing media after commissioning the new naval base, Dhowan said that INS Sardar Patel is a strategic forward operating naval base of the Indian Navy in Gujarat and it would also provide the vital logistics and administrative support for all collocated units in Gujarat area.

Post 26/11 terror attack on Mumbai, the Indian Navy has been given responsibility to coordinate coastal and offshore security requirement, as well as augment naval presence in sensitive areas, the Chief of Naval staff said. "Through a naval base like INS Sardar Patel, the Navy has decided to leverage technology and installed 46 radar stations and 74 Automatic Identification Centres (AIC) throughout the Indian coastline in order to establish a National Command Control Communication and Information network. Some of the parts of this network are on Gujarat's coastline as eight coastal stations and 11 AICs to provide security cover," he stated.

India – Singapore Joint Naval Exercise

In May 2015, a four-day bilateral naval exercise was held with Singapore in which INS Satpura, an indigenously-built guided missile stealth frigate and INS Kamorta, the latest indigenous anti-

Singapore Indian Maritime Bilateral Exercise 2015

submarine warfare corvette, participated. Naval sources said that the Eastern Fleet's deployment, led by Rear Admiral Ajendra Bahadur Singh, saw the vessels which included guided missile destroyer INS Ranvir and fleet tanker INS Shakti, make port calls in Australia, Cambodia, Indonesia, Malaysia and Thailand.

INS Satpura and Kamorta had reached Singapore on May 18 and participated in IMDEX-15, a maritime defence show. They took part in the bilateral naval exercise, SIMBEX-15, with the Singapore Navy which was conducted from May 23 to 26.

Operational interaction between the two navies commenced with Anti-Submarine Warfare (ASW) training exercises in 1994, which has grown steadily over the past 20 years. The operational interaction was formalised as an annual bilateral exercise, 'SIMBEX' in 1999. Since its inception, SIMBEX has grown in tactical and operational complexity. It has transcended the traditional emphasis on ASW to more complex maritime exercises involving various facets of naval operations such as air defence, air and surface practice firing, maritime security and search and rescue. This year, Singaporean ship Supreme and submarine Archer along with Maritime Patrol Aircraft and fighter aircraft participated whilst the Indian Navy was represented by INS Satpura, INS Kamorta and a Long-Range Maritime Reconnaissance Anti Submarine aircraft P-8I.

Chinese Activities in Indian Ocean

Amid increasing Chinese presence in the Indian Ocean Region, the Indian Navy today said it

"minutely" monitors the activities of its Chinese counterpart in the region. Admiral R.K Dhowan, Chief of the Naval Staff, said the People's Liberation Army (PLA) Navy ships have been deployed in anti-piracy operations in the Indian Ocean since 2008 along with some submarines. The Indian security establishment sees the presence of Chinese submarines in waters close to it and their developmental activities in neighbouring countries such as Pakistan, Maldives and Sri Lanka as a matter of concern.

"The PLA Navy's activities are minutely monitored by Indian Navy and our belief is that the responsibility of protecting Indian Ocean and our coastline lies with the Indian Navy. Our ships and aircraft are always on alert so that this responsibility is carried out well," he said while addressing the media. He was responding to questions on China's recent White Paper on defence, which talks about enhancing its naval reach for the first time to "Open Seas Protection" far from its shores.

China had recently unveiled an assertive military strategy enhancing its naval reach for the first time to "Open Seas Protection" far from its shores which could pose a challenge to the Indian Navy especially in the Indian Ocean.

Underwater Ballistic Missile Test-Fired by North Korea

On May 09, 2015, the official Korean Central News Agency announced that North Korea had successfully test-fired a newly developed underwater ballistic missile which it described as a "world-level strategic weapon". Leader Kim Jong-Un gave the order to test-fire the missile and watched as it was launched from an attack submarine, the news agency said. "The ballistic missile was developed on the personal initiative of Supreme Commander of the Korean People's Army Kim Jong-Un." It described the weapon as meeting the latest military science and technology requirements, calling the test an "eye-opening success" on par with a satellite launch.

"The acquisition of the technology made it possible for the Korean People's Army to possess a world-level strategic weapon capable of striking and wiping out in any waters the hostile forces infringing upon the sovereignty and dignity of Songun Korea and conduct any underwater operation," it said. It came after Pyongyang slammed US allegations that its space research is essentially a disguised ballistic missile programme and vowed to send more satellites into orbit in defiance of UN sanctions. There is little doubt that North Korea has an active ballistic missile development programme but expert opinion has been split on just how much progress it has made.

Laser Weapons for the Indian Navy

The Indian Navy hopes to develop high-energy lasers and high-power microwave weapons in the near future that can destroy targets with minimum collateral damage. The weapons, which emit concentrated beams of energy, can be used to intercept incoming missiles as well as destroy electrical equipment and communication networks of the enemy.

As per sources in the Indian Navy, its policy and plans wing has identified directed-energy weapons as a key long-term development project. The weapons which are still in the conceptual stage offer significant advantages over conventional weapons. Currently, the United States is the only nation to have successfully tested a laser weapon.

SPACE AND NUCLEAR

Sunita Williams on NASA's First Commercial Space Flight

Sunita Williams, an American astronaut of Indian origin, will be among four selected by NASA to fly the first commercial space vehicles, a part of the space agency's ambitious plan to put a man on Mars by 2030. The 49-year old Sunita Williams accompanied by Robert Behnken, Eric Boe and Douglas Hurley, will train and prepare for commercial spaceflights that will return American launches to the US soil and further open up low-Earth orbit transportation to the private sector.

Space crew (from left: Bob Behnken, Eric Boe, Doug Hurley and Sunita Williams)

A veteran of two long-duration spaceflights, Sunita Williams spent a total of 322 days in space and currently holds the record for total cumulative spacewalk time of 50 hours and 40 minutes by a female astronaut. She now ranks sixth on the US endurance list and second for a woman astronaut. NASA chose her for the astronaut programme in 1998.

The four astronauts will work closely with the Boeing Company and SpaceX to develop their crew transportation systems and provide crew transportation services to and from the International Space Station (ISS). "These distinguished, veteran astronauts are blazing a new trail - that will one day land them in the history books and Americans on the surface of Mars," said NASA Administrator Charles Bolden.

PSLV-C28

ISRO Launches British Satellites

Indian Space Research Organisation's (ISRO) Polar Satellite Launch Vehicle (PSLV) rocket, the PSLV-C28, carrying five British satellites was launched successfully from the space station at Sriharikota on Friday, July 11, 2015 at 9:58 pm. It took only 19 minutes from the time the rocket was blasted off to place the satellites into the orbit. ISRO had only a 15-minute window for the launch. This is the 29th launch successfully carried out by the PSLV, which is now one of the most reliable rockets in the world. It has been in the service for the past 20 years and has launched 40 satellites for 19 countries. The PSLV was also used for some of the important Indian missions including Chandrayaan and the Mars Orbiter Mission.

The 44.4-metre high rocket weighing around 320 tonnes carried five British satellites cumulatively weighing around 1,440 kg. This is the heaviest commercial mission for the PSLV rocket till date, though its total carrying capacity for such a mission is around 1,750 kg. This is also the first commercial mission for

ISRO in 2015. ISRO is now preparing to launch the GSAT6 communication satellite, which will be carried by the Geosynchronous Satellite Launch Vehicle (GSLV).

China's Anti-Satellite Weapons

As per a report emanating from the Defense Department of the US, China has the most rapidly growing space programme in the world and continues to develop lasers, satellite jammers and other weapons aimed at the space-based assets of adversaries. China has also built sizeable infrastructure on the ground to build, launch and control satellites.

By October 2014, China had launched 16 spacecraft that had expanded its satellite communications and surveillance capabilities, including the first satellite that provided very high resolution imagery. Despite public statements about the use of space for peaceful purposes, China has continued the development of destructive space technologies. The report provided new details about China's so-called "counter-space" technologies.

Chinese military writings continued to emphasize the necessity of "destroying, damaging and interfering with the enemy's reconnaissance and communications satellites to blind and deafen the enemy. The Pentagon is getting increasingly alarmed about China's growing space and counter-space capabilities.

Nuclear Plant in Karachi Under Construction

As per reports appearing in the Dawn, Pakistan has approved the construction by China of two nuclear power plants near Karachi, ignoring the concerns of civil society groups over the project's proximity to the country's biggest city and a lack of proper evacuation plan in case of emergency. The Sindh Environmental Protection Agency has accorded the approval to the project's Environmental Impact Assessment (EIA) report and allowed its construction at Paradise Point. Pakistan already has three operative nuclear power plants including the Canadian-built reactor in Karachi.

Karachi Nuclear Power Plant

The Paradise Point, an earthquake-prone seafront vulnerable to tsunamis, is a popular beach on the outskirts of the Karachi, whose population has doubled in just the past two decades to more than 20 million. The projects, known as K-2 and K-3, are nuclear power plants of 1,100MW each. These are to be built by a Chinese company while the government agency involved in the project is the Pakistan Atomic Energy Commission (PAEC).The representatives of civil society organisations have publicly raised a number of reservations over the construction of the twin nuclear power plants. The concerns ranged from the close proximity of the project to the city, failure of the PAEC to conduct a fresh EIA to the lack of a proper evacuation plan in case of an emergency.

China Scuttles India's Bid for Membership of NSG

The relationship between India and the Nuclear Suppliers Group (NSG) was discussed in the annual plenary meeting of the 48-nation group which was held at Bariloche in Argentina in the first week of June this year. The US argued that India was ready for membership of the NSG. China, however, continued to insist on consensus on the issue of admissibility into the bloc of "non-NPT nations" that did not sign the Nuclear Non-Proliferation Treaty.

China even linked India's membership bid with that of Pakistan. The NSG guidelines prohibit its members from entering into nuclear ties with countries that had not signed the NPT. Neither India nor Pakistan has signed the NPT. The NSG controls global commerce of atomic fuel, equipment and technology. Thus Beijing's tacit opposition again thwarted New Delhi's bid to seek membership of the NSG. China's stand is apparently intended to prepare the ground for Pakistan to stake claim for NSG membership in case it admits India.

According to officials in New Delhi, it might be easier for India to get membership of the MTCR as China is not a member of the bloc. India has already formally applied for the membership of the MTCR, which governs global business of technology and materials that could be used to develop unmanned systems capable of delivering weapons of mass destruction.

Indo-Russian Civil Nuclear Cooperation on Even Keel

In his recent visit to Russia, President Pranab Mukherjee held a 45-minute meeting with his Russian counterpart Vladimir Putin covering a wide ranging review of bilateral cooperation between the two nations. There is steady progress on Indo-Russian civil nuclear energy cooperation and the second unit of the Kudankulam project is progressing satisfactorily towards commissioning as the two countries aim to boost their strategic ties in spheres of space and energy.

Kudankulam Nuclear Power Plant

As per the Indian Ministry of External Affairs, contracts for supply of equipment for KKNP 3 and 4 have been concluded. In December last year, three Joint Working Groups were constituted to take the level of nuclear cooperation to a higher plane.

Nuclear Deal with Iran

History was made in the first week of July 2015 when Iran and six major world powers reached a nuclear deal capping more than a decade of negotiations with an agreement that could transform West Asia. US President Barack Obama hailed a step towards a "more hopeful world" and Iran's President Hassan Rouhani said it proved that "constructive engagement works."

Even as Israel pledged to do what it could to halt what it called a "historic surrender", the agreement will now be debated in the US Congress with President Obama promising to veto any measure to block it. "This deal offers an opportunity to move in a new direction," said Obama, "We should seize it." Under the deal, sanctions imposed by the United States, European Union and United Nations will be lifted in return for Iran agreeing to long-term curbs on a nuclear programme that the West has suspected was aimed at creating a nuclear bomb. The agreement is a political triumph for both Obama, who has long promised to reach out to historic enemies, and Rouhani, a pragmatist elected two years ago on a vow to reduce the isolation of his nation of almost 80 million people.

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A very popular choice is the next-generation artificial grass called FieldTurf (USA) which provides all the bio-mechanical properties of natural grass. It is much more resilient and requires virtually no maintenance, provides all-weather playability and replicates the surfaces international teams are playing on. The soldiers playing on it are less prone to injury and can play on the field 24/7. These FIFA, FIH and ITF standard products allow multiple sports like Football, Hockey, Cricket, Volleyball, Badminton, Golf and can also be used for non-sport usage like parades.

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The Dragon's Adventures in the Indian Ocean

Vice Admiral Anup Singh

Starting with the early part of the last decade, the Chinese had been carving out a plan that analysts in many parts of the world had assessed as a move to "contain" India. In India, the string was seen as a clever way of using excess money and excess capacity at home to "win" friends for a give-and-take game wherein the 'take' would translate in to use of ports and other infrastructure for the Chinese Navy, as well as for 'special arrangements' for Chinese trade.

IN MANY WAYS, THE YEAR 2005 WAS important for China to re-educate itself on the benefits of sea power. Then President Hu Jintao had been preparing the ground for over two years to celebrate China's maritime heritage, and to revive its ancient love for venturing to the far seas. The occasion was the 600th anniversary of Admiral Zheng He's Treasure Voyages which took place between 1405 and 1433. While the anniversary was celebrated with much fanfare, another important 'announcement' about Chinese vision emerged from the United States. Consultancy firm Booz Allen Hamilton had, in an analysis for the State Department, identified a Chinese strategy of creating maritime infrastructure in selected ports in the Indian Ocean (apart from some in the Pacific), and labeled it the *string of pearls*.

Starting with the early part of the last decade, the Chinese had been carving out a plan that analysts in many parts of the world had assessed as a move to "contain" India. In India, the string was seen as a clever way of using excess money and excess capacity at home to "win" friends for a give-and-take game wherein the 'take' would translate in to use of ports and other infrastructure for the Chinese Navy, as well as for 'special arrangements' for Chinese trade. All of that analysis is clearly falling in place as seen in Chinese warship movements into some of these ports as well as in the newly promulgated *Maritime Silk Road*.

Vice Admiral Anup Singh, former Commander-in-Chief of India's Eastern Naval Command.

PLA (Navy)'s Forays

Gulf of Aden. The best thing that could have ever happened to the Peoples Liberation Army (Navy) or PLAN was the menace of Somali piracy that peaked in the years 2007-2008. A couple of hijacking attempts on Chinese merchant ships in the Gulf of Aden, and an embarrassing incident when another navy's frigate on patrol rescued a Chinese trader, got the PLAN involved in the anti-piracy mission in Dec 2008. Chinese warships have since been coming to the Gulf of Aden in the form of a Task Force of three ships comprising two destroyers/frigates, and one comprehensive supply ship (Logistics Ship). Each Task Force stays on station for three to four months, before being relieved by its successor. The comprehensive supply ship stays for six to seven months, serving two consecutive Task Forces. Currently the 20th Task Force is on duty and is scheduled to get relieved by the

21st Task Force which should be 'on station' in the Gulf, by end August. This activity, initially thought by the Chinese, to be a military and economic burden on the country, has proved to be the greatest boon for accumulation of sea power of the State. Firstly, it has made the Chinese earn their *sea legs* for deployment in distant waters, and have moved the PLAN in to the Blue Water mould. Secondly, the Chinese have for the first time, learnt the art of maritime diplomacy by virtue of this deployment. The formerly shy PLAN officers, who were hitherto restricted in their contact with foreigners, were allowed to interact with other navies' personnel after the first year of deployment in the Gulf of Aden got over. More significantly, each Task Force, was charged to route via a couple of countries on its way home, to re-establish friendship and institute such confidence building measures (CBMs) through exercises,

as would make for partners beyond friendship. In this effort, the homeward journey of the 16th Task Force has been the most noteworthy so far. On leaving the Gulf of Aden, that Task Force was routed via the Mediterranean, and the West coast of Africa, before returning home. Enroute, it visited eight countries including seven on the West African coast. These went beyond just "goodwill" visits. All the countries visited were countries of significance in the Chinese strategy of creating and nurturing new *pearls* in various oceans.

What has surprised the world is the fact that while piracy in the area has almost disappeared since 2012, the Chinese are steadfast in their newfound occupation. The first reason is not difficult to assess. The Chinese have suddenly realised the benefits of maintaining station in the North Indian Ocean, where they were always looking for an excuse to establish their presence. It helps the cause of China's strategic heft in the most important ocean, and it serves the objective of watching India's backyard at close quarters before trying to "contain" it. The second reason is that for China, the Gulf of Aden is half way to anywhere else in the world! So why not maintain station with a fully capable flotilla, in the name of providing security to international shipping? And, a test of this geographic theorem came in 2011 during the Libyan crisis when the Chinese had the largest numbers to be evacuated from the port city of Benghazi. Frigate Xuzhou from the Seventh Task Force in the Gulf of Aden was dispatched to supervise and protect all the Chinese evacuees who were ferried to Greece and Malta, before being airlifted home. Then, in end March 2015, when the Yemen crisis erupted, one of the three ships of the 19th Task Force was diverted to Aden harbour (just next door), to ferry the 400 odd Chinese citizens to Djibouti for further airlift to mainland China. The Chinese were the first ones to be able to dock a warship in Aden harbour – thanks to its location within the Gulf of Aden where their Task Force operates.

Just a month and a half later (May 2015), the annual Sino-Russian Bilateral Exercise was inaugurated in Novorossiysk in the Black Sea, and conducted in the Eastern Mediterranean. The PLAN dispatched all three ships of the 19th Task Force which was concluding its three month mission, to participate in that exercise. It was not just found convenient to nominate the 19th Task Force for this deployment in the Mediterranean, but was obviously done as per a plan scheduled from beforehand! Perhaps the reason for shifting the exercise from the Western Pacific (its normal locale since inception in 2012), to the Mediterranean, was also to utilize the Task Force after its duty in the Gulf of Aden, while simultaneously projecting PLAN's 'far seas' deployment capability, to the world.

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So, China will not like to wind up from the Gulf of Aden. And now, the latest Defence White paper, released in May, 2015 – for the first time titled as China's *Military Strategy* – clearly states that the PLA (Armed Forces) will

continue to discharge their duty in the Gulf of Aden. Clearly, as suspected two years ago when other navies had started reducing their presence because of a decline in piracy, China is here to maintain "presence" in the classical naval sense. Recently, there has also been substantial news that the possibility of a Chinese Logistics Base in Djibouti is now closer to reality. That would mean a *base* and not just a *place* within the Indian Ocean.

Other Locations. In end 2013, a PLAN flotilla, comprising of the Expeditionary Operations platform Changbaishan, and two destroyers, Wuhan, and Haikou steamed down from Hainan Island, down the Sunda Strait, almost hugged the Christmas Island in the Indian Ocean (belonging to Australia), and turned North through the Lombok Strait. This flotilla carried out maneuvers throughout its passage including through the International Straits within the Indonesian Archipelago. This adventure seemed a deliberate move by the Chinese to firstly test the reactions of Indian Ocean states – particularly Australia, India, and Indonesia, and secondly to tell the world that China's new maritime capability had translated its expansionist strategy in to action.

China's interest in the Indian Ocean also stems from its locational advantage for tracking its satellites.

Submarine Force

In end 2013, the Foreign Affairs Department of China's Ministry of Defence informed the missions of six countries including India, Pakistan, Russia, and United States that one of its nuclear powered Attack submarines (NATO code: SSN), would be making an entry into the Indian Ocean. This was the first time ever that any nation owning nuclear powered submarines was announcing its intentions to "patrol" certain waters. Even conventional submarine' patrols are never promulgated. But the reasons for doing so was twofold: first, to deliberately tell the world that China is now a player in the elite club; second, to forewarn all littorals and nuclear powers operating submarines, of the presence of a Chinese submarine so far away from home, that could need assistance in any eventuality. (Till 2013, PLAN nuclear powered submarines were reported to have had some glitches in their propulsion/control systems, because of which they had never been deployed for prolonged patrols even within home waters). This *excursion* was the first ever by a Chinese strategic platform in to waters of the Indian Ocean.

In 2014, two Chinese submarines called at Colombo South port in September and November respectively, a move that was seen as intimidating to the peaceful texture of the Indian Ocean. (The first submarine in Sep 2014 was also accompanied by a Submarine Support Vessel). In all likelihood, it was the same submarine – a Song Class – that called at Colombo, first on its way to the Gulf of Aden, and then on its return. What made these port calls intriguing to India were not only the visits but also the explanations offered by the two sides. As per China's Xinhua news agency, a Chinese Ministry of National Defence spokesperson said after the September visit: *"It is an international common practice for submarines to stop for refueling and crew refreshment at an overseas port."*[1] He also laboured the point that the PLAN's submarines were joining the Surface Task Force in the Gulf of Aden, to supplement the anti-piracy mission (!) The Sri Lankan statement went a step further to paint it in the 'business as usual' colour. It read: "*A submarine and a warship have docked at Colombo harbour ….. there is nothing unusual ……. Since 2010, 230 warships have called at Colombo Port from various countries, on goodwill visits and for refueling and crew refreshment."*[2]

The fact that PLAN submarines have started making "visible" forays into the Indian Ocean is in itself a matter of serious concern to not only India but also many other powers – within and without the Indian Ocean. Over the last decade, there have been many pieces of news that had indicated Chinese submarines having made quiet patrols in the Indian Ocean. But none was ever seen on snort (breathing to charge batteries), or calling at friendly ports, and therefore news – whether from international sources, or as a result of media speculation – remained unconfirmed. The repeated visits now (including the most recent one at Karachi), however, appear to be a deliberate move by China, to nudge all interested powers, particularly India, with a catch-me-if-you-can nuance.

Coupled with the impressive economic growth over the last decade, the eye-catching naval expansion of China is being directed by a clearly defined maritime strategy. Initially it was thought that the naval expansion was a result of the hurt felt by China in the third Taiwan Strait incident[3], and was intended only for imbibing the capability of offensive defence against any future US adventure in the Western Pacific. This was of course true; but simultaneously the Chinese also had the Indian Ocean in mind. After all the Indian Ocean maintains all the crucial sea lanes for Chinese import of raw material including oil, gas, and iron ore, and, export of its manufactured products to the Western hemisphere.

China's interest in the Indian Ocean also stems from its locational advantage for tracking its satellites. Starting with the early part of the last decade, the Chinese used to station special "research" vessels with huge parabolic antennae in the Indian Ocean, to track their satellites, and to monitor, and conduct telemetry for ballistic missiles from these floating earth stations.

Another reason for frequenting the Indian Ocean is China's newly acquired real estate here. In 2011, a big piece of the ocean, measuring 10,000 sq. km area on the South West Indian Ocean Ridge (SWIOR) was allocated by the International Seabed Authority to China for exploration and production of polymetallic sulphides. Now the pieces in the jigsaw are clearly falling in place. The Chinese are known to be long term thinkers and planners. Their strategy for presence in the Indian Ocean was scripted more than a decade ago. The allocation of area by the International Seabed Authority (ISA) – a UN body – itself came as a surprise to many including India. The Chinese had done their homework, lobbied hard at the ISA, and received approval in record time. That was a huge bonanza to legitimize one more interest in the Indian Ocean Region (IOR), while simultaneously securing their future with promise of precious metals like gold, silver, and other strategic minerals including rare earths.

The string of pearls was initially appreciated by some, to serve the purpose of securing China's energy lines of communication, in fact its "strategic" lines of communication in the IOR; but it is now becoming abundantly clear that China had crafted a strategy that hinges on force projection – as correctly appreciated by India – aimed at building its stock outside home waters, as also of building its deterrence threshold beyond the Pacific.

There is no doubt in any one's mind now, that China craves a permanent strategic presence in the IOR. After all, the various ports and other infrastructure projects she has established in Myanmar, Bangladesh, Sri Lanka, Pakistan, and in a number of East African countries over the past decade, were planned only with the purpose of "enabling" presence in this ocean. In other words, China has executed a carefully crafted plan of creating for itself, *places* which, in time of need, could also double as *bases* – tweaking the methodology of creating, and dictating the utilization rights of such ports, as distinct from the cold war models of the two sides which had their own problems of uncertainty of lease or offer by the host countries. Having learnt from the cold war experience, China had made such lucrative propositions to the host countries that they could not think of refusing because of the openly lavish funding incentives that accompanied these proposals. So, Gwadar in Pakistan (a half Billion Dollar port project in Phase1) was almost entirely funded and built by the Chinese, and now the Chinese have even taken over management of that port by edging out the Port of Singapore Authority (PSA) which had stood guard for the first couple of years. Now, the Chinese are also in the process of expanding the port further (Phase II), at another Billion Dollars in direct funding.

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In Sri Lanka's case, the story is even more interesting. Hambantota's first phase was built by the Chinese, with 85% of the 361 Million dollars having been financed by the EXIM Bank of China. It is located on the East-West trade route and was intended as a transshipment hub. Till recently,

it was reported 80% underutilized except for an odd car ferry-a-week that brought vehicles from India's Mudra Port, for transshipment (on larger vessels), destined for other countries. Phase Two of Hambantota Port too is now under construction, and will be much more expansive and deeper than Phase I. Its cost – almost a Billion dollars – is once again being financed by the Chinese, on long-term-low-interest basis. This would obviously mean that the Chinese will have a fair say over utilization of Hambantota, for its own forces – whenever required. But much more significant is the case with the Colombo South Port Project. The Colombo Port is old, and has limited capacity for handling general cargo, and particularly, containerized cargo. Therefore, in the year 2008, a US $ 360 Million project (majority funding by ADB), was executed to extend the old port, by building two long breakwaters to provide additional terminals, and tranquil waters for what is now known as the Colombo South Port. These breakwaters were built by M/s Hyundai Engineering and Construction Co. of the Republic of Korea (ROK) in well under the contracted period of four years, and the infrastructure created with these, including congruent perimeter roads, a Port Administration and Operations Control Building, and a unique 5 metre high concrete barrier wall along the Main Breakwater – to provide shelter against rough weather – can all be described as of contemporary global standards in terms of design/quality. Then in mid-2011, it was time to award a contract for making the Container Terminals on the Main Breakwater of this extension. Hyundai, it is learnt, sought preferential rights to build the Container Terminals, but they were denied the bid. It was once again a case of "Hobson's Choice". In Dec 2011, the Chinese firm, M/s China Merchants Holding International (CMHI), was awarded the contract to build only one large terminal of 1200 mts length x 300 mts width along the Main Breakwater. (The entire breakwater is 5.1 km long, and has provision for creating three such terminals of 1200 mts each, with up to four berths on this length). Construction of the terminal (including massive reclamation) was commenced in Dec 2011, and the terminal was ready by Apr 2014, as per schedule. This is the terminal that is named the Colombo International Container Terminal (CICT). The CICT has the capacity to add 2.74 Million TEUs (20 ft containers) to the existing throughput of the old Colombo port. The deal with the Chinese was concluded with a 35 year Build, Operate, Transfer (BOT) model. Even though the international norm is to offer a lease of 30 years in projects financed by the builder, this terminal will be operated by the Chinese for 35 years. This is because the Chinese have 85% stake in financing the project and therefore must have dictated the lease terms. The balance 15% has been provided by the Sri Lanka Port Authority (SLPA). The Chinese Song Class boat had docked at this very terminal in Sep and Nov 2014. So, is there any analysis needed on the give-and-take equation in this project? The Chinese were obviously very clear about their long term plans. Undoubtedly, they are going to extract every pound that they have pooled in to this port.

In so far as China's use of submarines as messengers of deterrence is concerned, one has to remember that the first offensive arm to be raised by China was its submarine arm – right from the days of Chiang Kai Shek!

In so far as China's use of submarines as messengers of deterrence is concerned, one has to remember that the first offensive arm to be raised by China was its submarine arm – right from the days of Chiang Kai Shek! Mao went a step further by introducing nuclear submarines from the Soviet Union, and insisting on indigenization – for the sake of self-reliance. What the PLA thought at the time to be an instrument of power projection, was actually intended for sea denial against bigger powers whose surface and air forces could not be matched. Today, however, China has so many of them (conventional, as well as strategic boats), that it is able to send them on reconnaissance patrols in the Indian Ocean – its secondary area of interest (after the Pacific). It finds the timing right, as clients in the IOR are now "hosts" who have no choice but to offer port facilities at the asking. But these countries do not realise the implications on their own security, and on their political independence, while accepting infrastructural largesse.

In so far as International Law goes, as an independent nation, Sri Lanka did not flout any rule in providing a temporary (transit) home to the submarine and the accompanying tender. Men-o-war routinely visit foreign ports – after obtaining diplomatic clearances – whether on goodwill visits, or on transit to another area. The only condition in which Sri Lanka could be found legally at fault is, if it had allowed these actions while India and China were at war. That would have meant violating the Law of Armed Conflict (LOAC). However, between India and Sri Lanka, there is a clearly spelt out agreement under the Indo-Sri Lanka Accord of 1987, that makes it obligatory upon Sri Lanka, against making any of its ports available "*for military use by any country in a manner prejudicial to India's interests.*"[4] Sri Lanka has, of course, cited the international norm of permitting warships on goodwill visits, and not bothered about the 1987 accord, as it kept another answer up its sleeve (as already used by China): that the Chinese submarine was on its way to the Gulf of Aden – for the anti-piracy mission (!!) and that apart from goodwill, the submarine being conventional, required a "rest and replenishment" (R&R) halt!

The good thing is that with the new dispensation in Sri Lanka, there has been a lot of course correction. First, the new President had mentioned that Sri Lanka will not allow relations with China to be strengthened at the expense of India. Then, during a visit to China earlier this year, the new Sri Lankan Foreign Minister, Mangala Samaraweera noted that Sri Lanka would not allow visits by Chinese submarines to its ports. "I really don't know under which sort of circumstances that led to some submarines… to [visit] the port of Colombo… we will ensure that such incidents, from whatever quarter, do not happen during our tenure."[5] However, India must remember that the other *pearls* in the string, namely Pakistan (Gwadar), Myanmar, Bangladesh will also be used by China soon enough. While Pakistan cannot be tamed (and is a "gone" case), it is time for India to start interacting with Bangladesh, Myanmar, and East African countries with more than those frugal "Lines of Credit". These countries that have had the benefit of Chinese largesse will need to be rerouted through the soft power route so that they are fully aware of the dangers of falling prey to the game of *give-and-take*. For India, not conducting this "education" in time for friends in the IOR could mean *hanging the albatross around its neck*! Simultaneously, India's Navy must be spruced up fast enough, with larger force levels so that sufficient numbers are available to patrol areas of interest, and are "visible" to the others.

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NOTES

1 Times of India online edition Nov 04, 2014, downloaded at http://timesofindia.indiatimes.com/india/China-defends-docking-of-its-submarine-in-Sri-Lanka/articleshow/45029781.cms .

2 "Chinese Submarine Docks in Sri Lanka Despite Indian Concerns" by Shihar Aneez and Ranga Sirilal, Reuters online, Nov 02, 2014, downloaded at http://in.reuters.com/article/2014/11/02/sri-lanka-china-submarine-idINKBN0IM0LU20141102.

3 The Third Taiwan Strait incident was triggered by the grant of a visa by the United States to then Taiwan President Lee where after a standoff between China and the US brought two carrier battle groups off Chinese coast (including one in the strait itself). It is since then (1996) that China has been on a rapid modernization of its navy.

4 This clause was accepted in letters exchanged between then Indian PM Rajiv Gandhi and then SL President Jayewardene on the day of signing of the accord, and are therefore treated as part of the very accord.

5 "Sri Lanka May Bar Port Visits by Chinese Submarines" by Ankit Panda, The Diplomat, downloaded at http://thediplomat.com/2015/03/sri-lanka-may-bar-port-visits-by-chinese-submarines/.

Influence of Aerial Combat on the Development of Armoured Fighting Vehicles

Artsrun Hovhannisyan

Initially, the tank came into use when lines of defence became impassable. The main aim of the tank was to break through defensive barriers that were often heavily fortified; all other uses of the vehicle were sprung from circumstance. Tanks are most effective for breaking through barriers in places where there are structures to be breached, meaning fortified constructions and boundaries to plateau-like spaces that are easy for tanks to access. Unfortunately, tanks more often than not come to painful ends. This occurs particularly when they are used in cities or purely for defence; the use of tanks in mountainous terrain is also quite rare. The future of the tank however, was seriously put to question only when the efficiency of military aircraft in air-sea and aerial combat became clear, followed by an unprecedented rise in its use.

OVER TIME THE ROLE OF MILITARY aircraft in modern warfare has steadily increased. Moreover, the technology of aerial combat has fundamentally changed the ways in which wars are conducted. Development in aerial combat has been swift and its effect on land forces profound, particularly when it comes to Armoured Fighting Vehicles (AFV). The money allocated by the United States (US) government in 2011 for the enhancement of major tanks was reduced by half when compared with the previous year. In 2012, that amount was cut once again. That trend will probably continue until 2017, meaning that improvements to Armoured Fighting Vehicles (AFV) will move rather slowly[1]. Moreover, these cuts are happening at a time when M1 Abrams, a major American tank, is expected to remain a key weapon in the US armed forces until 2050.

It seems that the US Army plans to improve its armed machines little by little, at a rate of about ten machines per year until 2028. It is interesting that the US is not eager to get rid of its tanks but at the same time, is taking time to upgrade them.

Artsrun Hovhannisyan, Press Secretary of MoD of Armenia, a military expert and analyst.

The Barrier Breaker

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Too Soon to Say Goodbye

In such cases when there are no boundaries to break and seize, an army may often choose to attack from the air. These circumstances make it possible for land forces to lose a battle without actually entering into combat. For example in 1973, the Israeli Air Force stopped several thousands of modern Soviet tanks which had broken the boundary of Bar-Levin and greatly outnumbered the Israelis. In 2003, US divisions that had already reached Baghdad were able to manoeuvre the battlefield freely as each division was accompanied by hundreds of helicopters. In other words, once the US tanks were fortified with an air force, enemy tanks could do little against the land forces.

To this day, it is possible to find hundreds of pictures of burned and destroyed tanks or other types of military vehicles that, even without

firing one shot, were rendered useless as soon as they became targets of high-flying military aircraft. These findings clearly show that even being well-disguised does not save AFVs from military aircraft. Of course, this newsflash does not infer that in the near future, tanks will sprout wings and take to the air, as was attempted by some research experiments in the past.

Naturally, in situations where there is direct contact with the enemy, the main weapon of land forces remains the tank. Not always is it necessary to break lines of defence, it is also possible to go around them. However, this requires paratroopers and relatively advanced aircraft. Not everyone can afford such technology and during prolonged wars this tactic maybe difficult to maintain.

Specifically in our region of the Southern Caucasus it is very difficult to deploy and manoeuvre large units of tanks. This is mainly due to the mountainous terrain of the area. Nevertheless, for solving strategic problems such as defeating an enemy and freeing occupied territories, armoured forces are currently irreplaceable. Of course, we are in reference to the forces themselves and not the fighting machines (such as tanks) of which they are comprised. It is also very possible that in the future, combat in this region may not only take place in mountainous terrain.

During the Artsakh struggle of the early nineties, Azerbaijan used large armoured units comprising 40 to 50 vehicles. Due to the terrain however, as well as poor strategies, the invading forces did not succeed in taking the area and suffered significant losses. Initially the Armenians were unable to deploy such quantities of tanks, partly because they did not have them and partly due to the nature of their military operations.

The limited number of tanks that they did have however were distributed among small fighting units and used as enforcement in battles. As a rule, tanks release sniper fire at a distance of 2.5 kilometres since they are equipped with smoothbore cannons, and this makes them a good addition to small units of land forces. In the final phases of military action, when Armenian forces were in the process of freeing occupied territories, they began to use land forces that were easy to maneuver, in other words armoured forces.

Current Issues

In order to improve modern tanks it is necessary to address their limited visual field, firing speed and the ability to multitask. The weight of modern tanks keeps increasing which creates major problems of manoeuverability. Modern tanks generally weigh between 60 to 65 tonnes and the power of their motors usually reaches 1,500 h/p^2. The tank was developed during the Cold War when all attacks were expected to come from the front and for this reason only the front armour was thick.

New tanks need all around protection, which will create even more problems due to increased weight. The main firing weapon of the tank remains the cannon, the firing speed of which is very low. These days a well armoured tank is necessary because during guerilla warfare attacks come from every direction. Thus the modern tank contradicts the two main rules of war - manoeuvre with force and with fire.

Even being well-disguised does not save AFVs from military aircraft…

Possible Solutions

It is no accident that the last war in which tanks were used to a great extent was the Iran-Iraq War in 1980. All attempts after that have not been successful, in many local wars the air force has been able to effectively fight against tank units. Now there are hundreds of machines that can do limited tasks and are rapidly wearing out.

In modern warfare, the role of the tank is minimum. However, the problem of the tank's visual field might be solved with UAV and satellite navigation. Some have even considered installing radars on each tank. For example, the Russian tank that was showcased at the WWII parade in Moscow was created as a solution to many of the tank's problems. They tried to solve the problem of the crew's safety by means of a special chamber, they made better the firmness of the armour by using special materials, and they tried to install a special radar. Nevertheless all the improvements mentioned above are for problems that are difficult to solve, and in the case of this project not meant to be addressed.

Naturally, one cannot solve all of the general drawbacks of the tank by improving only one of the components. Moreover, even when improved, an advanced field of view will not save the tank from defeat by air force. Even small UAVs that can be released into air belong to the sphere of military aircraft. If, for example, there are one thousand tanks in a unit, they will not shoot all at the same time but rather a few will release their UAVs, and the rest will receive information from a central device. This device however, is still dependent on air domination, because it might be shot down.

Soon, thousands of small UAVs also will enter into the air supremacy struggle. In the case that all of tanks in a unit choose to release their UAVs, then the sky will become crowded. If each tank has its own anti-aircraft gun, then the same issues of overcrowding and competition will occur. If the anti-aircraft actions are centralised as well, then once again the solution belongs to the air force realm. In other words, tanks are designed for the past or else they must succumb entirely to air firepower.

The problem of the tank is primarily economic and strategic…

More on the Development of Tanks

The problem of the tank is primarily economic and strategic. Thus we see the effect of military aircraft on AFVs but that is not all. The use of tanks has come close to its end, and it is hard to start a new revolution in that sphere.

The fact is that any victory for tanks is connected with air supremacy, and the best tanks will be used in Eurasia where they will use this supremacy to its full, particularly in limited contact battles. In other words, the West (in this case the USA) never intended to hold extensive strategic actions or exhausting wars, otherwise we would have seen the replacement of tanks long ago.

Note: The latest tank that was created in the world is Japanese «Type 10» which is considered a simple machine. The interesting thing is that the car is extremely close to Soviet/Russian machines in its size and weight. In spite of that it has high electrical standards, and is considered a modern yet weak machine. Although this vehicle is not considered to be the best among 50 tonne fighting machines, today it is probably the best tank in the world.

Another problem is the continuation of famous tank generations - T-90C, T-64, T-72 and T-80. In this line Soviet/Russian machines are the simplest but also the most unreliable. Moreover, they are designed for combat in total wars.

Not all tanks will disappear at once; the internet did not abolish newspapers or the cinema all at once. However, the main thing keeping tanks around is the fact that the world's strategic centre remains to be Eurasia. Wars in this region will not be determined by air supremacy, rather there will be land wars in which armoured forces will play a huge role. Tanks will stick around because no acting country will find replacements for them.

Creating Something New

It seems that thus far no one is willing to create something that will take the place of the tank and thus critically change modern warfare. There is no country today that creates tanks from completely new designs. The current trend is that superpowers dictate military development.

Almost all major development of tanks is currently being carried on by Eastern countries such as China, Korea, and Japan. These new tanks however are not original and mere reinterpretations of Western machines. From time to time they speak about creating new machines with Russian specialised frames, yet this has never been actualised. As was mentioned earlier, tanks are created mainly by the pioneers of military research and the Russian Federation is not considered to be as such, besides there is no need for the extra expense.

Discussions about possible substitutes for tanks are ongoing, and there have been a great deal of intriguing suggestions. For example, specialists think that the new Russian tank must have a 140mm cannon, because the existing model does not meet Western standards. Of course such improvements will create new problems for the machine and raise the price; thus we have our typical deadlock.

Lots of possibilities of armoured machines have already come close to tanks, they also come close to their possible limits. Modern fighting machines with their weight, engine power and other expenses have reached the standards of

tanks from 1950 to 1970s. The weight of tanks already surpasses all reasonable conditions. Of course, the added weight comes from heightened measures for protection. The difficulties that arise from tank development suggest that solutions ought to be sought elsewhere.

Where to Look

All these issues make us think about the eminent replacement and improvement of tanks, especially as we may soon be facing new wars in this region. In all probability new tank models will be uniform and differ only in weapons systems. Such designs are already underway in various countries. Fighting machines are created in Israel on the basis of Soviet "T-54/55" tanks and are designed with increased protection.

Namer fighting machines are created based on the designs of one of the world's best Merkava tanks.[4] This machine has an additional department for personnel - a unique feature for tanks. It also seems that Israel is the new dictator when it comes to weapons research and development in this sphere.

There are several factors that show why expectations of new tanks are simply naive. Modern arms that are not usually used for traditional fighting actions (some people consider them means of occupation) have become supports for tank forces, and in some cases, have merged with them. Nowadays, the supports to tanks play an interesting role; machines that provide protection, rapid fire, a better visual field and increased mobility to tanks present new and interesting options.

Tank Supports and the Future

Let us look at a concrete example of the tank support technology mentioned above. The Russian "БМПТ (Объект 199 Рамка)" AFV is made based on the designs of the traditional tank, yet it is on another level entirely. The machine is armoured with two powerful 30 mm automatic rockets, two automatic bombers, an anti-tank rocket multiwave complex and common machine-guns. Evidently the firepower of the machine is great. Moreover, the car can hold two snipers along with the commander and can fight against three targets at the same time. Indeed this new model is a high quality machine[5].

Machines of that kind will see significant use in future. The interesting thing is that it is not difficult to build them. It is possible to take the main arm base from the old tanks and use them to construct newer models. The problem in this case is mainly electronic - the controlling system decides the success of the machine. Even today you can find improved variations of the machine.

A system of this type can be armoured with target finding radio location, satellites and laser systems. It should also have two automatic cannons with 30 mm caliber combined, and at least 2,500-3,000 fire speed with the ability to shoot together or with aim at different targets. They must also have approximately 5,000 shell stock. It is necessary for such a machine to be armed with fire guns that can also work together or separately.

Not all tanks will disappear at once; the internet did not abolish newspapers or the cinema all at once…

The machine must have two common 7.62 mm machine-guns and be armed with a rocket complex that can aim at two different targets and carry at least eight rockets. The machine must also be armed with laser pressure weapons, different types of modern protective systems and so on.

This kind of system can place various kinds of arms in its body. However automatic cannons must be placed on the tower and should be used all around. The fire guns must also be used all around as the automatic independent form cannons. The two operators of the machine must be able to command the machine's weaponry easily. The commander joining the operators may be free to command other groups. With this kind of approach, where electronic devices play a significant role, it will be possible to aim at four targets at the same time. Moreover, such machines will have an advantage over tanks, fighting more effectively against air targets.

Conclusion

Tanks are gradually giving way[6]; they are like armoured trains and battleships in the 1920s and 1940s that vanished due to advancement in the air-force. Nowadays however, non-traditional armed machines are merging with one another to create new and interesting weapons.

It is likely that wars fought in Asia will use tanks that are enhanced with qualities now associated with military aircraft. Perhaps they will build tanks that are lighter and do not need personnel; such machines would be used to break barriers and would be followed by slower tanks that would carry commanders who will direct the battle. Especially considering that most losses occur during the initial breach of defensive lines, using tanks without personnel for such actions will be of great advantage.

Once adversary defensive lines have been broken, the lighter and simpler tanks will be of great use in the battle…

Once adversary defensive lines have been broken, the lighter and simpler tanks will be of great use in the battle. In this case the role of the above mentioned fire enforcement machines will also be clear; they will be able to back up the breakthrough units with greater fire power. This strategy is also used in aerial combat. In the future, military aircraft will fight in ranks as well, with first rank aircraft entering a battle followed by commanding aircraft.

Thus, it seems clear that the solution to most problems connected with AFVs has to do with aircraft technology. Furthermore it is evident that improvements to AFVs must come in the shape of better field of vision, aim, fire speed and manoeuverability thus enabling the machines to hit their targets and survive battles.

In other words, it is crucial to transfer the basics of military aircraft technology onto the design and use of tanks and other AFVs; essentially aircraft technology acts as both the problem and the solution when it comes to armoured land forces.

For some time now, attack and defence issues for tanks have been solved using the same models that are applied to those of the air force. For example, anti-air defence systems that can hit approaching shells and missiles are placed on cars. The Israeli army was the first to promote this technique of defence, not only was it behind the development of the technology, but was also the first to actually use it[7]. While this technique of defence may prove highly effective, evidently it is another case in which the tank has been improved using technology that comes from the sphere of military aircraft. In the future, it seems that new models of tanks will be lighter and resemble some form of hybrid. Moreover, they will be crewless and have armour built from very different materials than before. Nonetheless the superiority of aircraft over tanks is irreversible, and their effect, the only salvation for the traditional war machine that is the tank.

After nearly 50 years of research, American specialists have concluded that the primary causes of defeat in a fair battle stem from the following:

- 67 per cent lack of maneuverability
- 12 per cent lack of fire strength
- 12 per cent lack of support.[7]

These statistics act as further proof that military aircraft technology touches all other spheres of warfare. Indeed, during the past fifty years the air force first showed dominance over land forces, then over the navy and now finally over the "God of War".

NOTES

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3 R.P. Hunnicutt. Abrams: A History of the American Main Battle Tank Vol.2. — Novato, CA: Presidio Press, 1990. p. 306

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5 "Техника и вооружение" №8, 2009 г., стр.25; "Военныйпарад" №3 май-июнь 2006 г, стр.28-29; "Военныйпарад" №2 (98) март - апрель 2010г.

6 For more information see - В.Мясников: Рыноктанковпадает, Главныйтренд – оккупационныемашины и модульнаяконструкция: НВО 2011-07-29 :http://nvo.ng.ru/armament/2011-07-29/7_tanks.html#

7 We believe that such an approach can be effective in certain cases, however in a broader context with large-scale military action, it is not so.

Fifty Years Since Haji Pir

—— Special Correspondent ——

50 years have gone by since the capture of Haji Pir Pass by India and its return to Pakistan under the Tashkent Agreement. Where did we go wrong? We have had Parliament resolutions that Kashmir is an integral part of India, and rightfully so because the entire State of Jammu and Kashmir was acceded to India by the then ruler, Maharaja Hari Singh through an Instrument of Accession signed on October 26, 1947, post massive Pakistani infiltration. The CFL had been drawn under the 1949 Karachi Agreement under aegis of the UN Commission. It was Pakistan (not India) that breached the Cease Fire Line (CFL) through massive infiltrations by her Gibraltar Force and 'Op Grand Slam'.

AT A HEIGHT OF 2,637 METRES, THE Haji Pir Pass is located on the Western fringe of the formidable Pir Panjal Range that divides the Srinagar valley from the Jammu region. It is through this Pass that a wide, metalled highway connected Srinagar to Jammu via Uri-Poonch–Rajouri, over which bulk of passenger and trade traffic used to ply. This road is of strategic importance as it connects Uri with Poonch; but since a major portion of road is in Pakistan Occupied Kashmir (POK), it cannot be used by India. In the event of a conventional war with Pakistan, Haji Pir would be a vital objective for India because it is through this Pass that trained Pakistani militants have been sneaking into the Kashmir Valley, Poonch and Rajouri districts. Also, this Pass cuts into Indian-held territory by severing the Poonch-Uri route and can provide access to much of POK.

The Poonch Valley link road connecting Jammu with Poonch Valley was a hot favourite military objective of military planners in Pakistan, right from 1947-1948. Pakistan captured 78,114 square kilometres of area in Kashmir in 1947-1948 through a mix of regular troops and *mujahideen* post independence, and this territory called POK, remained with Pakistan because Pandit Nehru halted the Indian Army pursuing the fleeing Pakistanis through a unilateral ceasefire and approaching the UN. Buoyed by this success, the idea of launching a guerrilla war in Jammu and Kashmir was in vogue in Pakistan since the 1950s as admitted by A.O Mitha, a former Pakistani General, who had raised the Special Services Group (SSG) though he had been advising the hierarchy that such operations had no chance of success.

It was Foreign Minister Zulfiqar Ali Bhutto who convinced Ayub Khan that Pakistan was in a position to dislodge the Indians from Kashmir and once trained Pakistani soldiers went inside Kashmir, the people of the Valley would spontaneously rise in revolt while fear of China would prevent India from provoking an all out war. Bhutto did not have to cajole Ayub much because the latter had his own vision of a grandiose victory based on the pusillanimous performance of India in not getting POK vacated from Pakistani aggression post partition. While approving Operation Gibraltar, Ayub wrote, "As a general rule, Hindu morale would not stand more than a couple of blows delivered at the right time and place. Such opportunities should, therefore, be sought and exploited."

Gibraltar Force and Operation 'Grand Slam'

Success of capturing POK apart, Ayub was primed by Chinese Premier Chou-en-Lai who while visiting Pakistan in the early 1960s advised Ayub that, "Pakistan should prepare for prolonged conflict with India instead of short-term wars. He advised Pakistan to raise a Militia Force to act behind enemy (India) lines." So, Ayub used a minor skirmish in the Rann of

Kutch area in May 1965 to launch Operation Gibraltar. According to a Pakistani military scholar, the Gibraltar Force, established in first week of August 1965, consisted of a number of guerrilla groups of roughly a battalion strength including Kashmiri volunteers trained by the Pakistan Army, SSG and some regular infantry troops, some 5,000 to 7,000 strong.

Wikipedia puts the strength between 26,000 and 30,000. The forces had five sub-divisions, each with nucleus of regulars, with specified area targets - Srinagar Valley, Mendhar-Rajauri area, Dras-Kargil area, Nowshera-Sundarbani area and Bandipura-Sonarwain area. The Kashmir Valley task force was further subdivided to target specified areas of Qazinag-Naugam, Tithwal-Tangdhar, Gurais and Kel-Minimarg. The mission assigned to the various Gibraltar forces was warfare in the enemy's rear including harassing communications, destruction of bridges, logistic installation and headquarters with a view to create conditions of an armed insurrection in Kashmir finally leading to a national uprising against Indian rule – much akin to what Chou-en-Lai had advised Ayub Khan who in turn believed that his Gibraltar Force would capture Jammu and Kashmir for keeps.

India had realised that Pakistani infiltrating groups were a serious threat to the security of Jammu and Kashmir…

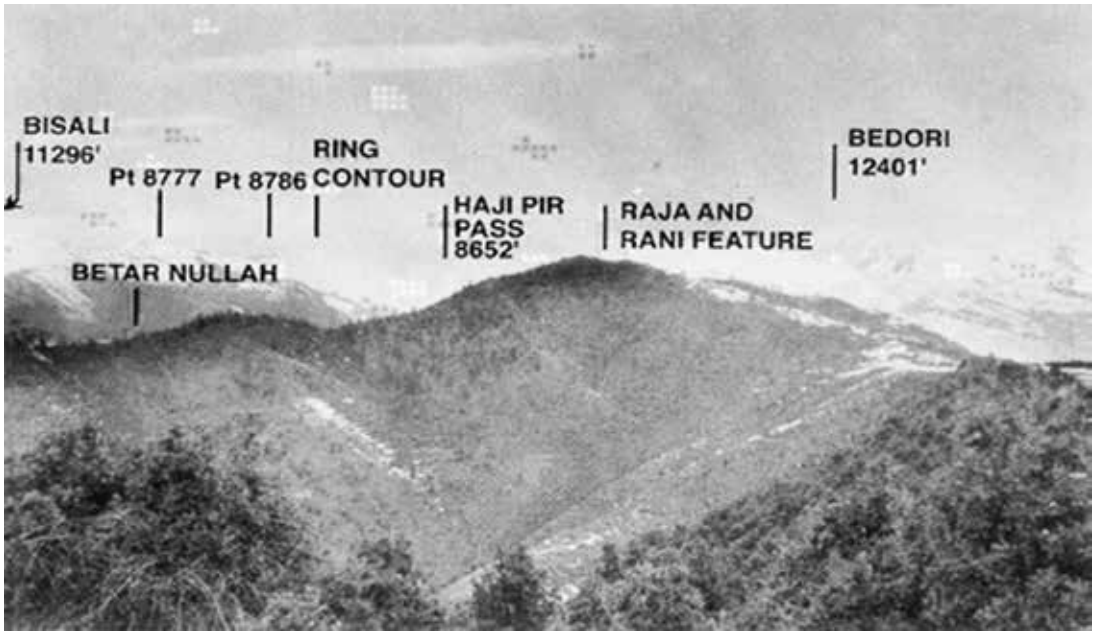
In conjunction and as follow up to launch of the Gibraltar Force, Ayub wanted Number 12 Division to capture Akhnoor. This objective was chosen because it had a single Class 18 bridge on the fast flowing River Chenab which was the key to Indian communications from Jammu and a group of valleys lying South of the Pir Panjal Range and West of River Chenab, most prominent of which was the Poonch Valley. The bridge was the sole all-weather lifeline of an Indian infantry division, with some twenty infantry battalions defending Poonch, Rajauri, Jhangar and Nauhshera and one independent Infantry Brigade defending the Chhamb-Dewa Sector. Possession of Akhnoor could enable Pakistan to threaten Jammu; the key to all Indian communications from Pathankot to Srinagar/ Ladakh. The offensive to capture Akhnoor was assigned the codename 'Operation Grand Slam.'

India had realised that Pakistani infiltrating groups were a serious threat to the security of Jammu and Kashmir and that the only way to deal with the threat was to plug their infiltration routes and destroy their sanctuaries across the Cease-Fire Line (CFL) even as Pakistani forces moved a large concentration of their guns close to the CFL and began shelling Indian positions near Tithwal, Uri and Poonch. So, Indian troops sallied forth to capture two important posts in the Tithwal Sector advancing up to the Kishanganga River, Point Pt 13620 in Kargil Sector, Rishmar Ridge in Tithwal Sector and moved onwards to the Pir Sahiba feature from where they could see more of POK and dominate infiltration routes. Next, was the capture of Sunjoi feature on the outskirts of Mirpur and this was retained despite two counter attacks. Next was the capture of Ring Contour overlooking the Mirpur Bridge, which the retreating Pakistanis destroyed. This was followed by the capture of Haji Pir Pass and then Point 9013 in Tithwal Sector, which gave our troops complete domination of the Mirpur area right up to the bridge at Jura on River Kishenganga thus cutting off the routes for further infiltration into the Gurez Valley and Tithwal Sector.

Operations 'Bakshi' and 'Faulad'

All communication between the infiltrators in Uri-Poonch area passed through the Haji Pir Pass. The Pass was dominated by three neighbouring hill features; on the East by Bedori (3,760 metres), on the West by Sank (2,895 metres) and Ledwali Gali (3,140 metres) to the South-West. It was considered essential to seize these posts before proceeding to the Haji Pir Pass (2,673 metres). Bedori was situated 14 km South East of the CFL and Haji Pir Pass is some ten kilometres South West of Bedori.

Being an important lifeline for the Pakistani infiltrators-cum-saboteurs, it was considered vital to capture the Haji Pir Pass. Considering the lie of the ground, it was apparent that capture of the Haji Pir Pass involved large-scale pincer movement for quick capture of the dominating features without giving time to the enemy to regroup and bring in reinforcements, finally converging to capture the Haji Pir Pass itself. The pincer movement required one thrust along the general axis Uri-Haji Pir Pass, in combination



with a second thrust from the South via the Poonch-Kahuta approach.

It was appreciated that the link-up between these forces would cut off all routes of approach into the crucial area of the Haji Pir Bulge. The responsibility for the thrust from the North (along general axis Uri-Haji Pir Pass) was given to 19 Infantry Division and 68 Infantry Brigade under Brigadier (later Lieutenant General) Z.C Bakshi, Commander, 68 Infantry Brigade, was tasked for this operation codenamed 'Operation Bakshi'. The responsibility for the combination pincer along general axis Poonch-Kahuta approach from the South, to link up at Haji Pir Pass, was given to 25 Infantry Division with 93 Infantry Brigade in the operation codenamed 'Operation Faulad'.

Operation Bakshi

This operation was planned as a two-pronged simultaneous attack against an enemy holding well-fortified defences adding up to some three and a half battalions. The left prong was to advance along Uri-Sank-Ledwali Gali-Haji Pir Pass while the right prong advanced along Uri-Bedori-Kuthnar Di Gali-Kiran-Haji Pir Pass. The capture of objectives was planned by August 25, 1965, followed by mopping up of the area. The time schedule of the plan, however, had to be modified due to heavy rains. Also, in preparation for the operation and to facilitate forward dumping of artillery and infantry ammunition and other war-like stores, the formation's engineers were also constructing motorable tracks for one-tonne trucks up to Solikot reasonably close to Haji Pir and a 21-metre Bailey bridge across a torrential river under conditions of darkness and in heavy rain.

The operation commenced at 2150 hours on August 25 on schedule as per the new plan. The rain-sodden ground being slushy, progress was slow resulting in the attack on Sank being daylighted and contact was broken on the morning of August 26, with the enemy to enable preparing for the second attack the same night. The second attack by 1 PARA was pressed home at 2230 hours on August 26. 'B' Company led by Major (later Lieutenant General) Ranjit Singh Dyal charged up the slopes of Sank followed by 'D' Company, supported by artillery fire. Enemy troops rushed forward from their trenches and opened fire with MMGs, LMGs and other small arms but effective fire from the attackers forced the enemy to fall back to his trenches. By 0430 hours on August 27, 'B' Company had reached within 450 metres of the enemy positions, where they formed up in front of the enemy positions at Sank and charged frontally. In a daring platoon attack, enemy MMGs and LMGs were silenced as closing up

> Being an important lifeline for the Pakistani infiltrators-cum-saboteurs, it was considered vital to capture the Haji Pir Pass…

troops showered enemy emplacements with grenades and bullets. The enemy withdrew to Sar and Ledwali Gali features leaving 16 dead but managed to evacuate about 100 wounded. As a follow up, 1 PARA soon captured Sar, Ledwali Gali, Sawan Pathri, Agiwas, clearing the area South of Sank including Point 10033, thus capturing all allotted objectives.

The progress along the right prong (Uri-Bedori-Kuthnar Di Gali-Kiran-Haji Pir Pass) could not keep pace with the left prong. The massive Bedori feature was heavily defended by the enemy. With Bedori still in enemy hands and the delay in capture of Sank having alerted them, the enemy had begun moving a regular brigade into the bulge. 1 PARA, therefore, was tasked to go for the Haji Pir Pass though it was not the original task allotted to them. The only chance of success at capturing Haji Pir Pass lay in a frontal attack through a re-entrant that ran North of it. The risk was that the advance would be under observation by the enemy.

The capture of Haji Pir Pass by 1 PARA was a remarkable achievement, an example of excellent leadership…

A company strength column of 1 PARA was formed under Major Ranjit Singh Dyal for the task. The approach involved a climb of over 1,220 metres, and it had to be done during the hours of darkness. The force starting from Ledwali Gali was to infiltrate through Hyderabad Nullah on the night of August 27 and 28 and capture Ring Contours 1194 and 1094 to proceed further, descending from Ledwali Gali into the Hyderabd Nullah in heavy rain and under intermittent enemy fire, which was silenced through artillery fire and quick physical action by a platoon. Climbing along the Hyderabad Nullah and later directly to the Pass, the column surrounded a house and captured one LMG, nine rifles and ten personnel of Azad Kashmir Militia.

At 0430 hours, the company hit the old Uri-Poonch Road. Here, the troops were given a much needed short break in the cold and bitter morning. At 0600 hours, the column was again on the move. Moving along the road, it reached 700 metres short of the Pass at 0900 hours. The enemy was surprised to see the 1 PARA column and opened up with MMG fire from the Western shoulder of the Pass and with LMG and rifle fire from the Pass area itself. Major Dyal ordered two platoons to climb up the spur, assault the enemy from the Western side of the Pass and then roll down to eliminate the LMG and rifle fire on the Pass. The enemy could not withstand this daylight daring attack and withdrew in confusion to a feature to the West of the Pass.

Soon the LMG on the Pass was silenced and by 1000 hours on August 28, the formidable Pass fell to the column of 1 PARA. The enemy did try to counter attack but could not succeed. The capture of Haji Pir Pass by 1 PARA was a remarkable achievement, an example of excellent leadership, the element of surprise and the ability of our troops to quickly regroup and continue attacking. On August 29, information was received that the enemy was regrouping some 2,000 yards South-west of the Haji Pir Pass. A column of 1 PARA under Major A.S Baicher made a daring daylight attack descending nearly 1,000 feet to get to the other side of the Nullah. Hand-to-hand fighting erupted but stunned by the ferocity of the attackers, the enemy panicked and fled leaving behind bodies of eight of their comrades, identified from 20 Punjab. Further attempts at counter attack by the enemy failed. The surviving members of Pakistan's 20 Punjab then retreated and took up positions on two tall hill features; Points 8786 and 8777 which overlooked a long stretch of the Uri-Poonch Road. Point 8768 was subsequently captured by 1 PARA in the face of heavy resistance.

Simultaneously, following the stalemate at Bedori, the feature was being attacked again and was finally captured by 10 Punjab by 0600 hours on August 29. The battalion then moved to Kuthnar Di Gali and further on to Kiran. The link up at Haji Pir Pass through the right prong by 19 Punjab was achieved on September 01.

Operation Faulad

'Operation Faulad' aimed at sealing the Haji Pir Bulge from the South. The enemy had many fortified picquets on numerous hill features between Poonch and Kahuta, which effectively dominated the Poonch-Haji Pir track, the most formidable posts being Raja and Chand Tekri

picquets held individually by battalion strength enemy. These posts served as the main pivots and staging camps for all infiltrator activities in the Poonch Sector. On the night of September 05 and 06, 1965, a simultaneous attack was launched on both these posts. Under heavy fire and hand-to-hand fighting for over two hours Raja and Chand Tekri were captured by by 2 SIKH and 3 DOGRA respectively. These two massive features dominated most of the area, East of Betar Nullah, along which ran a track that linked Poonch with Haji Pir Pass. The capture of these picquets was necessary not only to seal off the Haji Pir Pass area but also for the destruction of the two major bases of the enemy operations. The link up with 93 Infantry Brigade eventually took place on September 10. The entire Haji Pir Bulge was thus captured by Indian troops. This closed the mouth of the Bulge and sealed the Haji Pir Sector, ceasing all enemy resistance East of Betar Nullah. On September 01, 1965, Pakistan had launched 'Operation Grand Slam' with a view to capture Akhnoor but this was yet another fiasco.

Pakistani Blunder

'Operation Gibraltar' may be termed a bold operation that was well coordinated through multiple infiltration routes. However, it was also stupid since its failure lay in the basic presumption that that the population of Jammu and Kashmir would side with them and rise against India. It failed miserably despite limited local support in some pockets of the Srinagar Valley and Mandi area South of the Pir Panjal Range, only resulting in sporadic violence other than its use for embedding contacts for future use. The blunder may be attributed to the hallucinations of Ayub Khan and his Foreign Minister Zulfiqar Ali Bhutto, with their juniors not raising much opposition.

The Tashkent Agreement

Indian and Pakistan forces withdrew to their respective positions, as prior to August 05, 1965, in accordance the Tashkent Agreement signed on January 16, 1966 under Russian brokerage. It will never be known what pressures, if any, were brought upon Prime Minister Lal Bahadur Shastri since he died under mysterious circumstances the very next morning and though his body was brought back to India, no autopsy was conducted.

The Indian media did hint at the possibility of an international conspiracy. But even if there were no pressures on Prime Minister Shastri and there was no international conspiracy, the Prime Minister possibly signed the agreement in good faith and hoping for good neighbourly relations with Pakistan in the future. What is known is that Prime Minister Shastri had wanted talks with Ayub Khan at Tashkent itself, the day after signing the Tashkent Agreement, the aim being to extract a promise from the latter never to use force again. But that meeting did not take place because he passed away. However, a promise of this nature would not have made much difference given Pakistan's history of deceit and broken promises. Under the Tashkent Agreement, the strategic Haji Pir Pass and its adjacent areas were thus returned to Pakistan. Had the Haji Pir Pass remained with India, the distance from Jammu to Srinagar through Poonch and Uri would have been reduced by over 200 kilometres and Pakistan's major infiltration routes would have remained blocked.

Had the Haji Pir Pass remained with us, the distance from Jammu to Srinagar through Poonch and Uri would have been reduced by over 200 kilometres…

Beyond 1965

50 years have gone by since the capture of Haji Pir Pass by India and its return to Pakistan under the Tashkent Agreement. Where did we go wrong? We have had Parliament resolutions that Kashmir is an integral part of India, and rightfully so because the entire State of Jammu and Kashmir was acceded to India by the then ruler, Maharaja Hari Singh through an Instrument of Accession signed on October 26, 1947, post massive Pakistani infiltration. The CFL had been drawn under the 1949 Karachi Agreement under aegis of the UN Commission. It was Pakistan (not India) that breached the CFL through massive infiltrations by her Gibraltar Force and 'Operation Grand Slam'.

The 1949 UN Resolution called for plebiscite, categorically ruling that first Pakistan must withdraw all its security forces from territory of Jammu and Kashmir. Pakistan not only reinforced her security forces in Jammu and Kashmir but also changed the demography of area through large number of settlers from

the plains, which continues to date. So there was no reason for India to return the Haji Pir Pass or for that matter any captured territory as citing the above could have thwarted any international pressure including that of the UN. Prime Minister Lal Bahadur Shastri was strong willed. Therefore, one possible reason would have been the bureaucratic advice he got *sans* any strategic sense – the bane of India's defence from independence till date. The military certainly did not want the strategic Haji Pir Pass and surrounding areas returned, laying open the Haji Pir Bulge for infiltration again.

What have we learnt post Pakistan's Operation Gibraltar and Operation Grand Slam during 1965?

China noted India's vacillation from the time of partition and did not think twice about invading and occupying Tibet and Aksai Chin, taking over the Shaksgam Valley from Pakistan, nibbling our territory across the Himalayas, particularly in Ladakh, and now claiming the whole of 90,000 sq. km. of Arunachal Pradesh. Pakistan remains emboldened with the support it receives from China, the United States, Saudi Arabia, OIC and now even Russia. Post 1965 was the 1971 Indo-Pak War. Despite having some 92,000 Pakistani Prisoners of War, India failed to extract a written agreement over Kashmir from Pakistan. How could we agree to a verbal assurance from Zulfiqar Ali Bhutto when he, along with Ayub Khan, was the main architect of the Gibraltar Force and 'Operation Grand Slam' during 1965?

While enabling the birth of Bangladesh, we also missed the opportunity of straightening out the issue of the Siliguri Corridor or resolving the final border with Bangladesh. But then as Lieutenant General R.S Dyal once said, "Our people never read maps." How do you expect a bureaucrat to read a map when he has no sense or education of matters military? So, Pakistan continues to exercise the state policy of terror, a proxy war against India with 42 terrorist training camps in POK, instigating sedition and waiving of Pakistani flags at rallies in the Srinagar Valley while Sartaj Malik, the NSA of Pakistan declares that Pakistan should not target those terrorist organisations that do not attack Pakistan. So, we have a rogue country, Pakistan, as a neighbour, being pampered by China and the US with all the military hardware and financial largesse while we still do not have an effective deterrent in place against sub-conventional and asymmetric war despite being subjected to terror for some three decades.

Conclusion

What have we learnt post Pakistan's Operations Gibraltar and Grand Slam during 1965? Apparently, not much as we still are without a strategic culture. India's higher defence structures do not match the 21st century conflict scenarios. The military is still kept outside strategic planning and decision-making on matters military. Generalist bureaucrats man the Ministry of Defence and the users (military) are deliberately kept out of the planning, decision-making and even design levels of the defence-industrial complex.

India is still without a National Security Strategy while national security objectives remain undefined and comprehensive defence review is yet to be undertaken. India is still without an effective deterrence against Pakistan's proxy war. The question is whether the present government can cure the Parkinson's disease afflicting the defence of the country.

THE MIDDLE EAST

An Assessment

Air Marshal Dhiraj Kukreja

Secularism in the Muslim world appears to be in terminal retreat. The two levels of struggle within that world are, first, Sunni versus Shiite, and second, complex, and interacting factions. The IS has taken on Al Qaeda's ideology and is attempting to institutionalise it. The leading Western power (read USA) lacks the political will to pacify the Islamic world. Pacifying a billion people requires a gargantuan capability. The surrounding nations have limited options and a limited desire to collaborate. Other nations such as Russia and China, are alarmed by the IS' spread among their own Muslim populations.

THE TERM "MIDDLE EAST" originated with the British Foreign Office in the 19th century when 'Britannia ruled the waves'. The British demarcated the area into the Near East, the area closest to the United Kingdom and most of North Africa, the Far East, which was due East of British India and the Middle East, which was between British India and the Near East. It served as a useful model for organising the departments in the British Foreign Office, being important for the region as well, since the British defined not only the names of the region but also the States that emerged in the Near and Far East.

Today however, the term is loosely used to include Muslim-dominated countries from West of Afghanistan and along the North African shore. With the exception of Turkey and Iran, the region is mainly Arab and predominantly Muslim. On leaving the area, the British attempted to model the political systems of the nations of the Middle East based on European nation-states. While Turkey and Iran shaped themselves as secular states, the Arabian Peninsula which had a large tribal population, was formed into a complicated coalition as Saudi Arabia, Iraq and Egypt were sculpted into monarchies.

Any understanding of the Middle East hence, must begin with the creation of a new political geography after World War I and the partitions that had been created by the British. The first divide was between Islam and European secularism which was further accentuated when the Soviets involved themselves in the region during the Cold War. To explain it simply for laying the foundation of the assessment, suffice it to say that while one part of the region was secular, socialist and built around the military, the other was Islamist and traditionalist. In general, the former was pro-Soviet while the latter was pro-Western.

The second divide was between the new States that had been created and the fundamental actuality of the region. The States in Europe were based on the principle of nation-states as in the 20th century. However, the States created by the Europeans in the Middle East did not conform to that principle. There was some at a lower level and others at a higher level. At the lower level were the tribes, clans, and ethnic groups that not just made up the new States but also were divided by the borders. Those at higher level owed religious loyalty to Islam and to the major divisions of Islam, the Shia and Sunni movements which laid claims across borders on their allegiance. Added to these divisions was the pan-Arab movement initiated by the former Egyptian President, Gamal Abdel Nasser, who argued that all the Arab states should be united into a single entity.

While laying claims to their allegiance on the broader base of religion, the nations faced hurdles due to the many different social and political realities in managing their people and the relations between themselves. The only

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single unifying factor amongst all the diversities among the Muslim nations was the creation of Israel, though that too appeared more as a mirage. The secular, socialist States of Egypt and Syria, actively opposed Israel, while the more traditional ones felt threatened by the secular States and saw an ally of sorts in Israel. This situation continued until the end of the Cold War.

Post Cold War Scenario

The power of the traditional royal families in the Middle East increased with the disintegration of the Soviet Union due to the consequent collapse of support for the secular socialist States. It was not that these States did not get enough monetary support for they did have the money; it was a question of values with the socialist secular movement losing its patronage and standing. With the diminishing Soviet support, fringe emerging groups based on Islamic ideology gained power, raising tremendous cross-currents in the process; some secular States, however, continued to survive.

The retaliation after the infamous 9/11 was massive but no major upheavals were seen in the Muslim world...

The defeat of the Soviets in Afghanistan in the hands of the *mujahideen* coupled with the loss of authority of the secular regimes, opened the door to sub-national groups, which now saw the existing regimes not as powerful, and illegitimate. In addition, the events in Afghanistan brought the idea of a pan-Islamic resurrection to the forefront. With the Sunni faction winning the war in Afghanistan, the enthusiasm of Shiite Iran, which had unilaterally taken the mantle of becoming the politico-military spokesperson for radical Islam, made the action plan clear.

The sub-national groups, to be successful in giving the necessary impetus to the pan-Islamic movement, planned a three-pronged strategy. First, for their thrust to be seen as doing well, they needed to give the movement a historical background. To achieve this, they went far back to the Crusades and the US became the natural enemy as a major Christian power. Second, the US had to be shown to the doubting Thomases, not just as an enemy but a vulnerable one at that. Lastly, the numerous groups of the many countries had to be united to achieve success, not just against the US, but also to overthrow regimes, in both the secular and traditional worlds, which were perceived to be morally corrupt. The result was the formation of Al-Qaeda which, through its actions, highlighted the vulnerability of its prime target, the US and compelled it to take action against the Islamic world at large and against Al-Qaeda, in particular.

The retaliation after the infamous 9/11 was massive but no major upheavals were seen in the Muslim world. On the contrary, many Muslim nations cooperated with the US in its conflict against the Al-Qaeda and the Taliban in Afghanistan. Did the US succeed? Yes, in the first phase, it did. However, in the second phase, when it wanted to transform the regimes in Iraq and Afghanistan, it got involved in the internal squabbles of the sub-national groups, thus strengthening them in turn, without reshaping the countries as per its liking. The combine of the lack of effective governance and the newly empowered sub-national groups, made a forceful demand for trans-national Islam, to be governed under a single entity, the Caliphate.

The Islamic State and a New US Strategy

The factionalism amongst the sub-national groups and the domestic pressures on the US Government, forced it to shift approach and adopt a new strategy. Whether it was in Libya, Iraq, Afghanistan or Syria, the Americans were unable and unwilling to join the factionalised non-Islamic State forces on ground and turn them into a strategically effective force. As a result, the region between Lebanon and Iran became a whirlpool of competing forces. It also highlighted the fact that the sub-national forces were a reality and could not be wished away. It also emphasised the presence of the trans-national power of the Islamic State (IS) that had erased the Iraq-Syria border and had created the core element of the Caliphate.

The region has four major powers - Iran, Saudi Arabia, Israel, and Turkey. Each has its internal divisions yet has been able to keep its act together. Barring Iran, the other three have

strategic relations with USA. Put differently, three of them are non-Arab powers and the one Arab power, Saudi Arabia, is perhaps the most concerned about internal threats. The US strategy therefore, became more complex and transformed in to an intricate variation of President Reagan's Policy of the 1980s where it allowed the warring forces to war amongst themselves. The IS as the guardian of the Caliphate, has turned the fight into one against the Shia community and established nation States.

For Iran, the IS poses the threat that it could recreate an effective government in Baghdad that could once again threaten Iran. Thus, Tehran has maintained support for the Iraqi Shiites and for the Al Assad government in Syria, while trying to limit Al Assad's power.

For Saudi Arabia, which has aligned with Sunni radical forces in the past, the IS represents a threat to its very existence. Its call for a transnational Islamic movement has the potential to resonate with Saudis from the local Wahhabi tradition. The Saudis, along with some other Gulf Cooperation Council members and Jordan, are apprehensive not only of the call for trans-nationalism but also of the rise of Shiite power in Iraq and Syria. Saudi Arabia, hence, needs to contain the IS without conceding ground to the Shiites.

For Israel, the situation in the Middle East has been simultaneously wonderful and terrifying. It has been outstanding because it has pitted Israel's enemies against each other. Al Assad's government in Syria has in the past supported Hezbollah against Israel. So long as they fought amongst themselves, Israel's security would be enhanced. The problem is that whosoever wins in Syria, may be more dangerous than the one before it, particularly if the IS ideology spreads to Palestine. The IS therefore, represents a long-term threat to Israel.

The current Turkish Government, which recently suffered a setback in the parliamentary elections, is proving to be the most difficult to understand. While it is hostile towards the Al Assad regime in Syria, it does not wish to involve itself in Syria, lest it affects its own political system. From its actions and statements, it appears to be less averse towards a victory of the IS. The US and its allies have not really been to comprehend Turkey's strategy, unless the Turks feel that the IS, as a movement, would be defeated by the US forces and it shall be able to control the remnants.

Towards the end of March this year, a Sunni Arab nation coalition launched air strikes against Shia rebels in Yemen. Apart from the firepower, what was striking about this coalition was the absence of any US aircraft. The US did provide intelligence and other technical support, but stopped short of physically participating in the air campaign, thus giving credence to the new strategy discussed above. The US is shifting the burden of fighting to the regional powers while playing a support role. The regional powers such as Saudi Arabia have accumulated enough firepower over the years to undertake a 'sophisticated' campaign, against a fledgling nation like Yemen. The attacks also put the spotlight on the continuing war between the Shias and the Sunnis in the Middle East.

The US is shifting the burden of fighting to the regional powers while playing a support role...

Where Does Iran Stand in This Conflict?

The world is well aware of the full-blown conflict that is raging in Iraq and Syria. The world is also aware of the long-standing differences between the Shias and the Sunnis, whether they are in the confines of a single nation or spread out in many nations. What many, however, may not be aware of is that there is tension not only between the Shiites and Sunnis but also within the Shiite and Sunni groups. Both in Iraq and Syria, the warring factions have a complicated mix of Shiite militias, Sunni Arab tribal groups, Sunni Kurdish groups and even a smattering of Christians on the one side and the Sunni dominated IS on the other. It is much more complex than a simple Shiite-Sunni war and has to be understood with the Sunni-Shiite component.

Iran's ongoing nuclear agreement with the P5+1 nations has always been viewed with continuing suspicion by the other nations of the Middle East, as a move to gain major influence

in the Arab world. This is nothing new, for Iran has always sought to regain its prominence in the Arabian Peninsula, ever since the overthrow of the Shah regime. More recently, it has struggled to create a sphere of influence stretching from Iran to the Mediterranean Sea. To achieve this, the survival of the Al Assad government in Syria and the success of a pro-Iranian government in Iraq are essential, for it would create that much-desired Iranian sphere of influence, given the strength of Hezbollah in Lebanon and the ability of Al Assad's Syria to project its power.

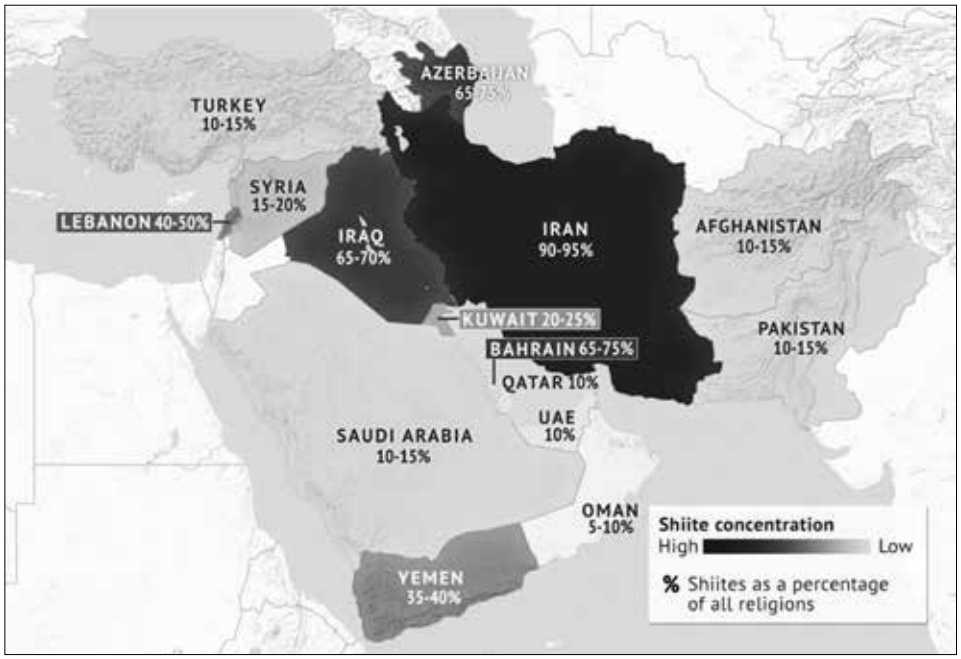
Why has India, over the years, been always fighting shy of exercising its true geopolitical influence?

The near collapse of the Al Assad government in 2012 and the creation of an Iraqi government that initially appeared to be relatively successful and was far from being an Iranian puppet, seemed to indicate a failure of Iran's stratagem. Ironically however, the rise of the IS has bolstered Iranian power in the area. The IS propaganda with the horrific videos of killings and beheadings, is designed to show its power. The truth however, is different. While it may be militarily strong, the IS represents merely a fraction of Iraq's Sunni minority community. The propaganda has also mobilised the Shiite community to resist it and accept Iranian advisers in the militias and to some extent, even in the Iraqi Army. It has also brought the US airpower to bear on the IS, in collaboration with the Iranian ground forces. The weakness of the IS has thus become a strength for Iran. A similar situation exists in Syria albeit with different demographics.

The Saudis have always been extremely sensitive to the rise of Shiite regimes in the Arabian Peninsula with close relations with the Iranians. The issue is simple for the Saudis. They represent the centre of gravity of the religious Sunni world. With the Iranian strategy of regaining prominence in the Arab world having got a boost from unexpected quarters, Saudi Arabia had to act to contain the rising Iranian and Shiite power in the region. Hence, the coalition attacks in Yemen.

Whither Pakistan?

The monarchies in the Middle East may possess the latest in armament courtesy USA, but in times of a conflict in the area, have looked towards Egypt and Pakistan for 'technical' expertise. The reasons are obvious; the tribal composition of the armies and less than optimal training, with little or no operational experience. It was for this reason that Pakistan was directly approached by Saudi Arabia for assistance as a part of the coalition.



Shiite Populations in the Greater Middle East
(Source: Pew Research Centre; US Department of State; Brandeis University)

The Pakistan Government did not readily jump into the fray and displayed reluctance. It then forwarded the request to its National Assembly, which, after much debate, declined to send its military forces to aid their long-term benefactor. Whether pragmatism had won over sentiments or the Army had prevailed over the decision, is not known, but with the refusal to provide ground troops and aircraft to help the Saudi-led coalition, Pakistan has definitely earned the ire of the entire Sunni Middle East. There is

no doubt that the decision came as something of a surprise both for the Saudi King and for Nawaz Sharif.

It is too early to conclude the fallout of this decision on the part of Pakistan. Will this refusal be the beginning of a widening schism between the Arab monarchies and Pakistan? While the changes to their earlier relationship cannot be explicitly determined now, the fact is that Pakistan's refusal will certainly influence future relationships. The UAE has already made this very clear, saying Pakistan would pay a heavy price for its betrayal of the Sunni cause. Saudi Arabia, in all likelihood, will bide its time and effect changes in the relationship only gradually, but change it will. Pakistan should be under no false pretence of guaranteed assistance in the future.

Whither India?

India's rescue mission in Yemen was front page news. Media worldwide – television, newspapers, the internet – still carry stories of how the Indian Navy and the Indian Air Force, supported by Air India, evacuated from Yemen, more than 6,000 people belonging to more than 40 nationalities. Enough has been written, spoken and filmed about India's Yemen operations and this piece is not intended to add to that. The Yemen evacuation however, does raise some pertinent questions and issues. First, the world at large and the close neighbours in particular are now aware of India's strategic capabilities. Second, will this evacuation set the tone for India's growing geopolitical influence? Third, why has India, over the years, been always fighting shy of exercising its true geopolitical influence?

In this crucible of what is essentially an Iran-Saudi Arabia proxy war, the Western nations found themselves handicapped and hence, unwelcome in Yemen. India, on the other hand, was allowed access in Yemen, a country with complex sectarian equations, due to its longstanding neutrality in the Middle East's sectarian battles. No airlift or naval operations would have been possible without a combination of Indian military and civil aviation assets as well as goodwill for India on the ground among all combatants. The world media has taken note of this (in contrast to Indian media's grudging and belated recognition of the huge rescue effort involved); so have global leaders taken note. This is the right time therefore, for initiating a fundamental shift in India's geostrategic policy and strengthening its own diplomatic and strategic interests in the Gulf.

Conclusion

The IS represents a logical continuation of the Al Qaeda, which triggered a sense of Islamic power and shaped the United States into a threat to Islam. The IS however, does not behave like the Al Qaeda. It explicitly wants to create a Caliphate and that wish should not be ridiculed or summarily dismissed. At the very least, on the strategic level, it is operating with the kind of centralised command and control that makes it far more effective than other non-state forces the world has seen thus far.

Secularism in the Muslim world appears to be in terminal retreat. The two levels of struggle within that world are, first, Sunni versus Shiite, and second, complex and interacting factions. The IS has taken on Al Qaeda's ideology and is attempting to institutionalise it. The leading Western power (read USA) lacks the political will, to pacify the Islamic world. Pacifying a billion people requires a gargantuan capability. The surrounding nations have limited options and a limited desire to collaborate. Other nations such as Russia and China, are alarmed by the IS' spread among their own Muslim populations.

The apparent defeat of Al Qaeda opened the door for its logical successor, the IS...

It is interesting to note that the apparent defeat of Al Qaeda opened the door for its logical successor, the IS. The question at hand, then, is whether the four regional powers have the capabilities and desire to control it. The evolution of Turkey would be a critical step in the emergence of a regional balance of power, in which local powers, not the United Kingdom or the US, determine the outcome. It is extremely convoluted and not suited for a simple or an ideological analysis, for it represents the next generation of Middle Eastern dynamics.

Climate Change in the Himalayas

A Ticking Time-Bomb?

Col CP Muthanna

There is a large and permanent military presence in the Himalayan region. The overall emissions are a result of both the troop deployment and the movement of maintenance and administrative convoys that result in heavy movement of truck transport. This is not an attempt to make a case for demilitarisation of the Himalayan region, since troop deployment is linked with security concerns and national policies of the concerned countries. However, it is pointed out that there is ample scope for the respective countries to take practical steps to see that there is considerable reduction in the emissions caused by army deployment and administrative convoys.

THE HIMALAYAN RANGES STRETCH across a length of 2,500 kilometres with an average width of 300 kilometres. They stand in the path of the moisture bearing currents from the South and the freezing cold air from the North and have a vital meteorological influence not only on the weather patterns of South Asia but on the entire global climate. Three of the major river systems of South Asia, namely the Indus, Ganges and the Brahmaputra originate from the Himalayas. 500 million people inhabiting the plains of North India, Nepal, Pakistan and Bangladesh depend directly from these waters. Considerable areas of the Indus and Brahmaputra river basins fall within Chinese territory. The Salween, Yangtze, Irrawady and Mekong are some of the important Chinese rivers that originate in the Himalayas. It is estimated that 1,400 cu.km of freshwater are locked up in the Himalayan glaciers that act as the fountainhead for the rivers of South Asia.

It is, therefore, a matter of deep concern to the entire global community and to the people of South Asia particularly that the Himalayan environment is under serious threat due to the effects of climate change. Lester Brown of the World Watch Institute in USA says that due to the effects of global warming, the pattern of precipitation in the Himalayas and the regions contiguous to the Himalayas will undergo a more drastic change in the years to come. The increase in temperature will reduce the amount of snowfall and the snow-fed rivers of China and the Indian subcontinent will have less water flow in the summer months when the snow melts. However, since the quantum of water in the atmosphere is constant, reduced snowfall will convert to excessive rainfall during the monsoons. The rivers will have reduced water in the summer months and the flooding of these rivers during monsoons will be more intense. We are already witness to a cycle of more pronounced drought and floods in the region.

Another alarming trend is the shrinking of the glaciers due to the rise in temperatures. The Gangotri glacier that is the source of River Ganges has receded by 600 metres in the past 40 years. There has been a marked increase in the rate since 1971 and the glacier has been shrinking by 30 meters per year. According to ISRO's Space Applications Centre, as many as 127 glaciers of less than one square kilometre have lost 38 per cent of their geographical area since 1962. The larger glaciers, which are progressively getting fragmented, have receded by as much as 12 per cent. It is predicted that at this rate, many of the Himalayan glaciers will be severely degraded in the decades to come and most of the snow-fed Himalayan rivers, including the Ganges, will become seasonal rivers.

It is evident that if the trend of reduced snowfall, increased precipitation and shrinking of the Himalayan glaciers continues, the result would be catastrophic for several millions of people in South Asia, Southeast Asia and China. Food productivity of the entire region would be severely affected due to the cycle of droughts and floods. It has been estimated that during

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this century, the accelerated ice melts in the Himalayas flowing into the seas will cause sea levels to rise by one metre. Such rise in sea levels would destroy fifty per cent of the rice fields of Bangladesh. It would also result in millions of 'refugees of climate change' fleeing from the low-lying areas in India, China, Bangladesh, Indonesia and Vietnam.

The mountains and valleys of the Himalayan region are home to 100 million people that include several indigenous communities whose livelihoods and culture are closely linked to the mountain ecosystem. They face an uncertain future in the face of the climate change. Increased temperatures will have a drastic impact on their water and food security and on horticulture. They will become increasingly dependent on food imports and will be more vulnerable to flooding and Glacial Lake Outburst Floods (GLOF).

As regards the direct implications for the forests in the Himalayan region, mitigation strategies are vital in order to ensure that the forests themselves do not get degraded and destroyed due to climate change. In the middle altitudes of the Himalayas, Chir Pine is taking over Oak dominated forests. Degradation of the natural forests due to invasive species and other climate associated factors is accelerating climate change and the rise in temperatures will in turn result in further degradation of the forest ecosystems. In this context it is very important to take urgent measures to check the trend of rising temperatures in the Himalayas.

The rise in temperatures will adversely affect the biodiversity of the Himalayas. As regards the riverine ecology, the degradation of bio-diversity will be felt not only in the Himalayan region, but along the entire course of the rivers and up to the estuaries where they drain out into the oceans. Changes in the river regime, will impact inhabiting aquatic biodiversity and river dependent livelihoods.

It does not require a Nostradamus to predict the impending doom that is awaiting a region already battling with crippling poverty and overpopulation. It is also vital to realise that we do not have the luxury of time. The clock is ticking and we must act now before it is too late. A problem of this magnitude has to be tackled in its totality. A two-pronged strategy is essential. Firstly, we have to be prepared for the consequences of climate change. This would involve adaptive measures such as planning for disaster management at the national level, changing cropping patterns and implementing water conservation measures. The second aspect of the strategy would be to try to stabilise the climate to the extent possible so that the impacts of climate change are minimised.

Climate Stabilisation of the Himalayan Region

As with any other ecosystem, the Himalayas will be adversely influenced by emission of Green House Gases (GHG) in any part of the world. However, it is crucial to understand that there would be a considerable influence from the emissions of certain GHG and aerosols from within the Himalayan ranges and the contiguous areas. The local emissions create a regional climate impact that combines with the overall global warming to further accentuate the temperature rise. Being a snow-covered mountain eco-region; the Himalayas are particularly vulnerable due to the 'trapping' effect of the valleys. The GHG with a shorter life span will also remain in the atmosphere for longer periods in cold climates.

The Gangotri glacier that is the source of River Ganges has receded by 600 metres in the past 40 years…

In this context, it is relevant to note that the rapid melting of ice caps in the Arctic region is influenced not only by global warming but also due to regional emissions mainly from Eurasia and oil and off-shore oil exploitation. Heavy shipping traffic with large concentrations of Nitrogen Oxide emissions is another cause for the Arctic Haze that compounds the overall effect of global warming. The Siachen Glacier is another case in point. According to a study by the WWF, the past two decades have seen a rapid melting of the glacier and it is amongst the fastest melting glaciers in the world. It was precisely two decades ago that the Siachen Glacier dispute flared up between India and Pakistan, with massive troop deployment in the area by both countries.

The study states that the Siachen Glacier has been melting alarmingly more due to military

activity of India and Pakistan than due to global warming.

The regional emissions and pressures in the Himalayan region can be categorised as under:

The Asian Brown Haze

The Asian Brown Haze is caused mainly by domestic wood and coal fires and vehicle exhaust fumes. Certain mega-city hotspots such as Delhi, Beijing and Dhaka have been identified that contribute significantly to the Black Carbon in the Asian Brown Haze. The Asian Brown Haze is causing a regional heating effect that is accelerating the glacier melt in the Himalayas. In fact it, is estimated that the heating effect of the Asian Brown Haze is the same as that of the global warming due to GHG. In a sense, the Himalayan region is perhaps being subjected to a 'Double Whammy' due to the combined effect of overall global warming coupled with the impact of the Asian Brown Haze. Black Carbon is an important component of the Haze and reduction in Black Carbon emissions should be given top priority. According to an IGSD/INECE report, the impact of Black Carbon on melting snow-pack and glaciers in the Himalayas may be equal to that of CO_2.

An intensive forest land restoration programme by the Himalayan nations will be of vital importance…

Concentration of Green House Gases at the source of Emissions

While the effect of Carbon Dioxide (CO_2) emissions has a more global effect, there is sufficient scientific evidence to prove that other non-CO_2 gases and aerosols have a more pronounced effect on the climate in the immediate vicinity of the emissions.

Urban Heat Islands

Both the core Himalayan region and the contiguous areas have a number of large cities and townships that form Urban Heat Islands (UHI). The UHI effect is like a balloon of higher temperature formed over the urban areas. This balloon of higher temperature is shifted to the adjoining non-urban areas due to wind factors and causes a higher temperature in these contiguous areas outside the cities/towns. The effect could be more intense in mountainous regions due to the 'trapping' effect of valleys. This is indicated in the high levels of pollution in the Kathmandu Valley. Levels of air pollution in Kathmandu are one of the highest in Asia, although the number of vehicles is far less than cities such as Mumbai and Delhi. UHI effect can extend to a range of up to 2.4 times the size of the city, beyond the city limits. Hence increased urbanisation in the Himalayan region could create a number of climatic 'hotspots' that could contribute to the overall regional temperature rise if further unplanned expansion of these cities is not curbed

Pressures of Tourism and Pilgrimages

Tourists and pilgrims form a large floating population in the Himalayas. They are concentrated more in the cities and popular tourist and pilgrimage destinations. They exert a more direct 'point' influence and contribute to the Urban Heat Island effect in the cities such as Srinagar and Kathmandu. This effect is also pronounced in site-specific pilgrimage destinations such as the Gangotri Glacier.

Military Presence in the Himalayas

There is a large and permanent military presence in the Himalayan region. The overall emissions are a result of both the troop deployment and the movement of maintenance and administrative convoys that result in heavy movement of truck transport. This is not an attempt to make a case for demilitarisation of the Himalayan region, since troop deployment is linked with security concerns and national policies of the concerned countries. However, it is pointed out that there is ample scope for the respective countries to take practical steps to see that there is considerable reduction in the emissions caused by army deployment and administrative convoys.

Cost-Benefit Analysis

It is beyond the scope of this paper to present a detailed cost-benefit analysis of reducing emissions, principally Black Carbon and non-CO_2 GHG, in the Himalayas. However, available information points towards huge savings by way of improved health conditions, especially of women and savings in the energy sector. Other benefits include the avoidance of disasters caused by climate change such as bursting of glacial lakes due to increased levels of glacial melt. Huge benefits would also accrue

by preventing climate-induced drought/floods in the lower regions such as the Indo-Gangetic plains, Southern China and Bangladesh. Regional strategies for mitigation of Climate Change in the Himalayas and adjoining regions will address key issues such as food productivity and water security for large parts of South Asia, South East Asia and China. This would again lead to reduced tensions within the region. A review of the economics of climate change by the British Government states that, if no action is taken now, the overall cost and risks of climate change could be equivalent to the loss of five per cent of global Gross Domestic Product (GDP) each year. If a wider range of risks and impacts is considered, the estimated damage could reach as high as 20 per cent of global GDP.

Time Factor and Regional Perspective

Leading climatologists have warned of the need to act immediately to cut GHG emissions, with a window of 10-15 years for global emissions to peak and decline, and a goal of at least a 50 per cent reduction by 2050. However, it is to be understood that from the regional perspective of the Himalayan ecology, we may not have so much time. Moreover, the Himalayan region will witness increased population pressures in the coming decade. This is all the more reason that emission reduction strategies must worked out and executed at the earliest. Concentrated efforts must be made to drastically reduce aerosol and non-CO_2 emissions within the next five years, primarily to cut down on the formation of the Brown Haze over the Himalayas. If this is not done, the ecological damage to the Himalayas and especially the Himalayan glaciers may be irreversible.

There is no time to be lost in carrying out further exhaustive research and analytical studies. Findings of credible research studies already carried out need to be taken into account. The stress should be on identifying and categorising the principal sources of aerosol, Black Carbon and non-CO_2 emissions such as Nitrous Oxide. This will need to be followed by working out strategies for achieving the required scale of reduction for these emissions within a mutually agreed timeframe.

The Way Ahead

The five Himalayan countries and Bangladesh, together with certain other global agencies should form an organisation to formulate and execute a joint strategy for mitigation of climate change in the Himalayan region. Such an organisation could be modeled along the lines of the existing Arctic Union.

Advantages of Regional Cooperation on the Himalayas

A joint strategy by the six countries will have tremendous advantages. It will ensure that there is an integrated, time-bound approach to tackling the issue with the active involvement of other concerned International Agencies.

Framework for A Joint Strategy

A joint strategy for emission reduction in the Himalayan region could be based on the following parameters:

(a) Identifying the extent of the zone requiring intervention. This would include the Himalayan ranges and contiguous areas. Broadly, the Himalayan Ranges would be the core zone and the contiguous areas would be the outer zone. Initially, the outer zone could be for a radius of fifty kilometres from the core zone. The outer zone could then be increased periodically till a maximum laid-down radius is covered under the action plan.

The Asian Brown Haze is causing a regional heating effect that is accelerating the glacier melt in the Himalayas…

(b) An analysis of the interventions required in the core zone and the outer zone in order to reduce emissions and mitigate climate change and to stabilise the effects of global warming to the extent possible.

(c) The countries concerned will then have to sign an agreement on the various interventions and the timeframe within which these will be implemented.

(d) The process will need to be facilitated by the United Nations and other organisations such as UNFCC, IPCC, IUCN, FAO, UNEP and ICIMOD which should also be involved in organising the required funding mechanisms.

Recommended Interventions

Certain measures that could be considered

are enumerated below. Some of these will have to be applied more stringently and on priority in the core zone as compared to the outer zone.

(a) **Industries**. Certain types of industries will have to be banned and phased out. Alternatively, they should be permitted only on introduction of upgraded technology that will sufficiently minimise emissions. They will also require financial assistance to incorporate cleaner technologies. There is good scope for reducing BC emissions by improved technology for thousands of brick kilns in the region. Nepal, Bhutan and Bangladesh may need financial support for installing cleaner technologies. An international funding mechanism will be required for this purpose.

(b) **Automobiles.** Automobiles in both the core zone and the outer zone should convert to environment friendly fuel. As far as the Government of India is concerned, priority for converting to CNG or LPG should to given to Jammu, Dehradun, Srinagar, Shimla and Manali. All the countries concerned maintain a very large military presence in the core zone. Thousands of Army trucks move within the core zone every day. Therefore, environment friendly fuel for these vehicles is essential. However, in view of logistical considerations, this may not be practical in the near time. Hence, the Himalayan countries must ensure that military vehicles plying in the Himalayan region conform to the required emission norms. Adequate mass transport facilities such as buses should be provided for tourists and pilgrims. A simple cost effective innovation developed and patented by Somender Singh, a Mysore-based technician is also available for reducing vehicular emissions and improving fuel efficiency.

There is considerable stress on the Himalayan landscape due to overgrazing…

(c) **Road Construction Activity.** There is constant road construction and maintenance activity in the Himalayan region. The obsolete road construction methods require burning large quantities of coal tar. This contributes substantially to the GHG, Black Carbon and aerosol emissions in the Himalayas. Hence there is an urgent need to introduce cleaner technologies for road construction and repair in the Himalayas.

(d) **Demography.** Demographic pressure always translates to greater levels of human activity. Concentrations of populations should be avoided. The Government should encourage the development of well-planned satellite townships in the Himalayan region rather than increased growth of cities such as Kathmandu, Jammu and Shimla.

(e) **Forest Land Restoration.** An intensive forest land restoration programme by the Himalayan nations will be of vital importance. The establishment of trans-boundary National Parks could be considered. This would be a useful initiative by neighboring countries to improve the management of forests along border areas. Ecological Territorial Army Battalions comprising ex-servicemen will be able to play a very important role in forest land restoration in the Himalayas in India.

(f) **Improved Technologies In Domestic Fuel Consumption.** There is good scope for improving technologies for domestic fuel consumption requirements such as cooking. The National Programme on Improved Cook (NPIC) stoves in Himachal Pradesh is a good example. Such initiatives will have dual benefits of emission reduction combined with the improved health of women and children.

(g) **Land Use Practices.** Burning of huge agriculture residue such as paddy in Punjab and other parts of North India could have a direct influence on the Brown Cloud over the Himalayas. Burning of agriculture residue is a common practice in some of the Himalayan states. The fires lit in the fields often spread to the Himalayan foothills causing forest fires. These issues need to be addressed in the areas close to the Himalayas. There is considerable stress on the Himalayan landscape due to overgrazing. Slash and

burn cultivation in Eastern Himalayas must also be taken into account.

(h) **Mega-City Hotspots.** There will be a need to concurrently reduce Black Carbon emissions in some of the identified mega-city hot spots closer to the Himalayas. These could be New Delhi, Kolkata, Dhaka and Karachi.

Conclusion

There is sufficient evidence to indicate that regional emissions of non-CO_2 GHG, aerosols and Black Carbon are key factors in the rise of temperatures in the Himalayan region. Reducing these emissions will result in mitigating the overall effect of climate change in the Himalayas. Massive forest land restoration programmes across the Himalayan region will also be essential. In turn, this could check the trend of reduced snowfall and rapid glacier retreat.

All this could best be achieved by forming an alliance of the five Himalayan countries and Bangladesh along the lines of the existing Arctic Union. International agencies will need to facilitate the process. The concept of cutting down on regional emissions, combined with efforts to improve the forest cover could herald a new dimension to dealing with Climate Change. It is for consideration that the idea could be applied to other similar eco-regions such as the Alps.

International agreements such as the Kyoto Protocol and the Bali Declaration call for achieving desired level of reduction in emissions by 2050. The Himalayas and other similar eco-regions may not have that much time. Hence there is an urgent need for the Himalayan nations to formulate and execute a joint strategy to save the Himalayan eco-region before it is too late.

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Restructuring Defence Reforms for National Security

Brig Gurmeet Kanwal

Systemic weaknesses and structural shortcomings in India's national security decision making system have led to sub-optimal synergisation of the available combat resources, meagre as these are. The government must accord the highest priority to the implementation of the recommendations of the Naresh Chandra Committee so that the country's armed forces are well prepared to meet future threats and challenges and are in a position to contribute positively to security in South Asia and the Indian Ocean Region along with India's strategic partners.

SOUTH ASIA IS THE SECOND MOST unstable region in the world and is closely vying with West Asia for the number one spot. Among the world's major democracies India faces the most complex threats and challenges spanning the full spectrum of conflict from nuclear to sub-conventional. The key geo-strategic challenges in South Asia emanate from the ongoing conflict in Afghanistan and on the Af-Pak border; unresolved territorial disputes between India and China, and India and Pakistan; and, the almost unbridled march of radical extremism that is sweeping across the strategic landscape. The rising tide of Left Wing Extremism (LWE) and the growing spectre of urban terrorism have also contributed towards vitiating India's security environment.

However, despite the prolonged exposure that the security establishment has had in dealing with multifarious challenges, defence planning has been marked by knee-jerk reactions to emerging situations and haphazard single-Service growth. The absence of a clearly enunciated National Security Strategy, poor civil-military relations, the failure to commit funds for modernisation on a long-term basis and sub-optimal inter-service prioritisation, have handicapped defence planning. With projected expenditure of $100 billion on military modernisation over the next decade, it is now being realised that force structures must be configured on an integrated tri-Service basis to meet future threats and challenges.

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Early Efforts Towards Defence Reforms

The Sino-Indian Conflict in 1962 had aroused a new defence consciousness in the country after years of neglect and efforts to formalise defence planning began in 1964. Various organisational changes were tried out:

- Defence requirements were assessed on a five-year basis and the First Defence Plan (1964-69) was drawn up.
- A Planning Cell was established in 1965 in the Ministry of Defence (MoD).
- The Second Defence Plan (1969-74) was instituted on a 'roll-on' basis. After a year was completed, an additional year was tagged at the other end so that the armed forces would always have a revised and updated five-year plan. This method was found to be impractical.

  In 1974, an Apex Group under the Union Minister for Planning suggested that a steady long-term defence effort would be more cost effective and economical than fluctuating allocations on account of periodic economic and security crises.

Structures for Defence Planning: Most of the defence planning machinery and planning methodology were developed in the decade 1964-1974:

- In order to integrate defence planning

within the overall economic planning effort, defence and economic development plans were made co-terminus.

- The Committee for Defence Planning (CDP) was established under the Cabinet Secretary.
- The Joint Intelligence Committee (JIC) was constituted in the Cabinet Secretariat to provide external and internal threat assessments.
- Planning Units were also established in the Department of Defence Production and Defence Research and Development Organisation (DRDO).
- A Planning and Coordination Cell was created in the MoD to coordinate and compile various plans into a comprehensive 'Defence Plan' for Cabinet approval. However, generalist civilian bureaucrats in the MoD lacked the necessary expertise to arbitrate between the Services and only succeeded in appending together the different requirements of individual Services without any analysis.
- In the Services HQ, Perspective Planning Directorates were established in the late 1970s.
- In 1986, the Directorate General of Defence Planning Staff (DG DPS), comprising officers from the three Services, DRDO, MoD and the Ministry of External Affairs, was constituted to coordinate and harmonise defence planning under the Chiefs of Staff Committee (COSC).

Weaknesses: While efforts have been made to improve defence planning and suitable structural changes have been instituted within the MoD, implementation of the process continues to be tardy.

- **Guidance.** The CCS, chaired by the PM, meets as often as necessary to review emerging situations with adverse impact on national security so as to issue suitable policy directives. However, the National Security Council (NSC), also chaired by the PM, whose charter it is to evolve an integrated national security strategy and provide guidance for long-term defence planning, seldom meets.
- **Plans.** Five-year defence plans are rarely accorded formal government approval. The Tenth Defence Plan (2002-07) and the Eleventh Defence Plan (2007-12) were not approved at all and drifted along on an *ad hoc* basis.
- **Funding.** Annual defence budgets, in which funds are committed only for one year at a time despite five-year defence plans having been in vogue for several decades, add an element of uncertainty to the planning process. Unutilised funds continue to lapse at the end of the financial year.
- **Coordination.** The absence of an empowered CDS is a glaring anomaly. The COSC works on the basis of consensus and is unable to agree on inter-service priorities for force structuring and modernisation as every Service wants a larger share of the pie. The Services HQ makes its own assumptions of the likely military strategy for future wars and plans its force structures accordingly. Consequently, the LTIPP is integrated merely in name and is actually only a compilation of single-Service plans.

The absence of an empowered CDS is a glaring anomaly...

- **Defence Acquisition.** Despite the much-trumpeted reform in the procurement process, the acquisition of new weapons and equipment by the armed forces is still mired in bureaucratic red tape.
- **Defence R&D.** There is a dichotomy between the time consuming quest for technological self-reliance and the desire of the Services to import arms and equipment based on immediate operational exigencies. The disconnect in the interface between R&D, production agencies and users remains unresolved. As a result, 'Make' or 'Buy' decisions are still contentious and DRDO projects continue to be delayed with consequent cost overruns.

Recent Efforts

The only time a serious security review was undertaken in the recent past was after the Kargil conflict of 1999 when the Kargil Review Committee (KRC) headed by the doyenne of Indian strategic thinkers, the late K Subrahmanyam, was appointed. The committee was asked to "…review the events leading up to the Pakistani aggression in the Kargil District of Ladakh in Jammu & Kashmir and to recommend such measures as are considered necessary to safeguard national security against such armed intrusions." Besides K Subrahmanyam, who was appointed Chairman, the Committee consisting of three members - Lieutenant General K.K Hazari (Retd.), BG. Verghese and Satish Chandra, Secretary, National Security Council Secretariat (NSCS) who was also designated as Member-Secretary.

The GoM recommended sweeping reforms to the existing national security management system...

Though it had been given a very narrow and limited charter, the KRC looked holistically at the threats and challenges and examined the loopholes in the management of national security. The Committee was of the view that, "The political, bureaucratic, military and intelligence establishments appear to have developed a vested interest in the *status quo*." Consequently, it made far reaching recommendations on the development of India's nuclear deterrence, the management of national security, intelligence reforms, border management, the defence budget, the use of air power, counter-insurgency operations, integrated manpower policy, defence research and development, and media relations. The Committee's report was tabled in Parliament on February 23, 2000.

The Cabinet Committee on Security then appointed a Group of Ministers (GoM) to study the Kargil Review Committee report and recommend measures for implementation. The GoM was headed by the Deputy PM and Home Minister L.K Advani and included Defence Minister George Fernandes, External Affairs Minister Jaswant Singh, Finance Minister Yashwant Sinha and National Security Adviser Brajesh Mishra. In turn, the GoM set up four task forces on intelligence reforms, internal security, border management and defence management to undertake in-depth analysis of various facets of national security management. These were headed, respectively, by Jammu and Kashmir Governor G.C Saxena, former Defence and Home Secretary and Principal Secretary to the Prime Minister N.N Vohra, former Home Secretary Madhav Godbole and Arun Singh, former Union Minister who was then Advisor to the Ministry of External Affairs on security matters and who had himself headed the Committee on Defence Expenditure in the early 1990s.

The GoM recommended sweeping reforms to the existing national security management system. The CCS accepted all its recommendations, including one for the establishment of the post of the Chief of Defence Staff (CDS) which has still not been implemented. The CCS approved implementation of the following key measures:

- The post of Chief of Defence Staff (CDS), whose tasks include single-point military advice to the government, inter-services prioritisation of defence plans and improvement in jointmanship among the three Services. However, a CDS is yet to be appointed – ostensibly because political consensus has been hard to achieve and there are differences among the three Services on whether or not a CDS is necessary. The NDA government has once again stated that it will strive to achieve political consensus on the appointment of a CDS.
- Headquarters Integrated Defence Staff (IDS) was established with representation from all the Services.
- A tri-Service Andaman and Nicobar Command and a Strategic Forces Command were established.
- The tri-Service Defence Intelligence Agency (DIA) was established under the Chiefs of Staff Committee (CoSC) for strategic threat assessments.
- Speedy decision making, enhanced transparency and accountability were

sought to be brought into defence acquisitions. Approval of the Defence Procurement Procedure (DPP 2002) was formally announced. The DPP has been amended several times since then.

- As part of the DPP, the Defence Acquisition Council (DAC) and the Defence Technology Board, both headed by the Defence Minister, were constituted.
- Implementation of the decisions of the DAC was assigned to the Defence Procurement Board (DPB).
- The National Technical Research Organisation (NTRO) was set up for gathering electronic and other technical intelligence.
- The CCS also issued a directive that each of India's land borders with different countries be managed by a single agency like the Border Security Force. The concept of "One Border, One Force" was adopted.
- The CCS nominated the Central Reserve Police Force (CRPF) as India's primary force for counter insurgency operations. This experiment has not yet fully succeeded as the CRPF is taking inordinately long to settle down in its new role as a counter insurgency force.
- The establishment of a National Defence University was approved.

Decision making is gradually becoming more streamlined. The new Defence Planning Guidelines have laid down three inter-linked stages in the planning process:

- 15 years Long Term Integrated Perspective Plan (LTIPP), to be drawn up by HQ IDS in consultation with the Services HQ and approved by the DAC.
- Five-year Defence Plans for the Services (current 12th plan: 2012-2017), including five-year Services Capital Acquisition Plan (SCAP), to be drawn up by HQ IDS in consultation with the Services HQ and approved by the DAC.
- Annual Acquisition Plan (AAP), to be drawn up by HQ IDS and to be approved by the DPB. Budgetary allocations for ensuing the financial year (ending March 31st) are made on the basis of the AAP.

Naresh Chandra Task Force

Despite the new measures approved for implementation by the CCS on May 11, 2001, many lacunae still remain in the management of national security. In order to review the progress of implementation of the proposals approved by the CCS in 2001 and to take stock of the new developments over the last 10 years, such as the threats emanating from the sea *a la* the 26/11 Mumbai terror strikes and the rapid deterioration of the regional security environment due to the growing spread of radical extremism and creeping Talibanisation, the government appointed a Task Force on National Security in mid-June 2011. The 14-member task force was led by Naresh Chandra, former Cabinet Secretary and Ambassador to the US.

A CDS is yet to be appointed – ostensibly because political consensus has been hard to achieve...

The members included G Parthasarathy, former High Commissioner to Pakistan, Air Chief Marshal S. Krishnaswamy (Retd), Admiral Arun Prakash (Retd), Lt Gen V.R Raghavan (Retd), Dr Anil Kakodkar, former Chief of the Department of Atomic Energy, K.C Verma, former Secretary R&AW and V.K Duggal, former Union Home Secretary, among others. On May 23, 2012, the Committee submitted its report which was circulated to various ministries and departments of the Government of India for their comments and suggestions. Simultaneously, the government had appointed another Task Force chaired by Ravindra Gupta, former Secretary in the government, to analyse the requirements of defence modernisation and self-reliance. This Task Force is also understood to have submitted its report, but the details are not yet known.

The report of the Naresh Chandra Committee on Defence Reforms in India focused attention on the hollowness of the national security decision making process and the urgent need for change. Over a period of one year, the Naresh Chandra Committee had wide ranging consultations with various government bodies

but did not appear to have consulted strategic studies think-tanks and independent experts with specialised domain knowledge. Though the report of the Naresh Chandra Committee has not been made public, the recommendations purportedly made by the Committee have been appearing in spurts in the press.

The recommendations made by the Naresh Chandra committee, as known in the public domain, appear to be incremental rather than revolutionary. According to news reports, the Committee has urged the government to ensure adequate military preparedness to deal with a militarily aggressive China. By far, the most important recommendation of the Committee is to appoint a permanent Chairman of the present CoSC, that is, another four-star post in addition to the Army, Navy and Air Force Chiefs of Staff. This falls well short of the inescapable operational requirement of appointing a CDS and simultaneously creating integrated theatre commands for joint warfare in future conflicts.

The solution lies in the establishment of tri-Service integrated theatre commands with Cs-in-C who report to the CDS...

While a permanent Chairman of the CoSC will certainly be able to better coordinate the modernisation plans of the three Services and improve the management of tri-Service institutions than a rotating Chairman, he will have no role to play in integrating operational plans for joint warfare. The solution lies in the establishment of tri-Service integrated theatre commands with Cs-in-C who report to the CDS while the Chiefs of Staff of the three Services are primarily planners responsible for recruiting, the raising and equipping of new units, acquisition of weapons and equipment, specialised training and maintenance.

Other recommendations of the Committee include the creation of three new tri-Service commands to better manage future challenges and vulnerabilities - Special Operations Command, Aerospace Command and Cyber Command. The establishment of a Bureau of Politico-Military Affairs to deliberate on security issues having foreign policy implications, the setting up of an Advanced Projects Agency on the lines of DARPA under the Scientific Advisor to the Defence Minister to oversee defence Research and Development (R&D), the posting of additional armed forces officers to the MoD and the MEA and civilian IAS officers to the services HQ for better integration and coordination. The Committee had also recommended an increase in FDI in defence joint ventures from 26 to 49 per cent; this has been implemented. The Committee's recommendations are unexceptionable and if implemented, will go a long way towards overcoming present shortcomings.

Managing National Security

A lot still needs to be done to institutionalise the defence planning process and improve the management of national security in India. The first and foremost requirement is for the government to formulate a comprehensive National Security Strategy (NSS), including internal security, so that all the stakeholders are aware of what is expected of them. The NSS should be formulated after carrying out an inter-departmental, inter-agency, multi-disciplinary strategic defence review. Such a review must take the public into confidence and not be conducted behind closed doors. Like in most other democracies, the NSS should be approved by Prime Minister, who is the head of government, and must be placed on the table of Parliament and released as a public document. Only then will various stakeholders be compelled to take ownership of the strategy and work unitedly to achieve its aims and objectives.

The 12th Defence Plan (2012-2017), now in its fourth year, has not yet been formally approved by the government in that financial expenditure has not been committed. The government has also not approved the Long-Term Integrated Perspective Plan (LTIPP 2007-22) formulated by HQ Integrated Defence Staff. Without these essential approvals, defence procurement is being undertaken through *ad hoc* annual procurement plans, rather than being based on carefully prioritised long-term plans that are designed to systematically enhance India's combat potential and the ability to sustain conflict over the anticipated duration of future wars. These are serious lacunae as effective defence planning cannot be undertaken in a policy void.

The government must commit itself to supporting long-term defence plans or else defence modernisation will continue to lag and the present quantitative military gap with China's People's Liberation Army will become a qualitative gap as well in 10 to 15 years. This can be done only by making the dormant National Security Council a proactive policy formulation body for long term national security planning. The Cabinet Committee on Security (CCS) deals with current and near term threats and challenges and reacts to emergent situations.

PRIORITY MEASURES NECESSARY

- Formulate a comprehensive National Security Strategic (NSS), after undertaking a strategic defence review.
- The government must immediately appoint a Chief of Defence Staff to head the defence planning function and provide single point military advice to the Cabinet Committee on Security.
- Approve LTIPP 2007-22, the long-term integrated perspective plan of the armed forces, and the ongoing Defence Plan 2007-12, now in its fifth and final year.
- The defence budget must be enhanced in stages to 3.0 per cent of the GDP for meaningful defence modernisation and for upgrading the present military strategy of dissuasion against China to deterrence.
- The long-pending defence procurement plans such as C4I2SR, artillery modernisation, the acquisition of modern fighter aircraft and aircraft carriers and submarines must be hastened.
- Modernisation plans of the central paramilitary and police forces must also be given the attention that they deserve.
- Anomalies created by the Fifth and Sixth Pay Commission have led to a civil-military divide and must be redressed early, including acceptance of the ex-Servicemen's legitimate demand for One Rank-One Pension (OROP).
- A national War Memorial must be constructed at a suitable high-visibility spot in New Delhi to honour the memory of all those soldiers, sailors and airmen who have made the supreme sacrifice in the service of India.

The defence procurement decision making process must be speeded up. The Indian Army is still without towed and self-propelled 155mm Howitzers for the plains and the mountains and urgently needs to acquire weapons and equipment for counter-insurgency and counter-terrorism operations. The Indian Navy has been waiting for long for submarines and the construction of the indigenous air defence ship is lagging behind schedule. The plans of the Indian Air Force to acquire 126 Medium Multi-Role, Combat Aircraft (MMRCA) in order to maintain its edge over the regional air forces are also stuck in the procurement quagmire. All three Services need a large number of light utility helicopters. India's nuclear forces require the Agni-III and IV missiles and nuclear powered submarines with suitable ballistic missiles to acquire genuine deterrent capability. The armed forces do not have a truly integrated C4I2SR system suitable for modern network-centric warfare, which will allow them to optimise their individual capabilities.

The Indian Army is still without towed and self-propelled 155mm Howitzers for the plains and the mountains...

These long-pending high-priority acquisitions will require extensive budgetary support. With the defence budget languishing at 1.74 per cent of India's GDP – compared with China's 3.5 per cent and Pakistan's 4.5 per cent plus US military aid – it will not be possible for the armed forces to undertake any meaningful modernisation in the foreseeable future. Leave aside genuine military modernisation that will substantially enhance combat capabilities, the funds available on the capital account at present are inadequate even for the replacement of obsolete weapons systems and equipment that are still in service such as the MiG-21. The Central Police and Para Military Forces also need to be modernised as they are facing increasingly more potent threats while being equipped with obsolescent weapons.

The government must also immediately appoint a CDS or a permanent Chairman of the COSC to provide single-point advice to the CCS on military matters, along with the simultaneous establishment of theatre commands. Any

further delay in these key structural reforms in higher defence management on the grounds of the lack of political consensus and the inability of the armed forces to agree on the issue will be extremely detrimental to India's interests in light of the dangerous developments taking place in India's neighbourhood. The logical next step would be to constitute tri-Service integrated theatre commands to synergise the capabilities and the combat potential of individual Services.

Long-pending high-priority acquisitions will require extensive budgetary support...

It is time to set up a tri-service Aerospace and Cyber Command as well as a Special Forces Command to meet emerging challenges in these fields and to better manage all available resources. A tri-Service Logistics and Maintenance command has also been long overdue. International experience shows that such reform has to be imposed from the top down and can never work if the government keeps waiting for it to come about from the bottom up.

The softer issues that do not impinge immediately on planning and preparation for meeting national security challenges must never be ignored as these can have adverse repercussions on the morale of the officers and men in uniform in the long term. The numerous anomalies created by the implementation of the Sixth Pay Commission report must be speedily resolved. In fact, the ham-handed handling of this issue has led to a dangerous "them versus us" civil-military divide and the government must make it a priority to bridge this gap quickly.

Our ex-Servicemen too have had a raw deal and have been surrendering their medals and holding fasts to get justice for their legitimate demand of "one rank-one pension". This is an idea whose time has come and it must be implemented without further delay and without appointing any more committees of bureaucrats to look into the issue. While a Department of Ex-servicemen's Welfare has been created in the Ministry of Defence (MoD) in keeping with the UPA's Common Minimum Programme, till recently there wasn't a single ex-Serviceman in it. Such measures do not generate confidence among serving soldiers and retired veterans in the civilian leadership. Also, rather unbelievably, India is still without a National War Memorial.

Concluding Observations

During the long history of post-independence conflicts with India's neighbours and prolonged deployment for internal security, the Indian Army and its sister services have held the nation together. Dark clouds can once again be seen on the horizon; but the efforts being made to weather the gathering storm are inadequate. The government must immediately initiate steps to build the capacities that are necessary for defeating future threats and challenges. It must take the opposition parties into confidence as a bipartisan approach must be followed in dealing with major national security issues. In fact, there is a requirement to establish a permanent National Security Commission mandated by an act of Parliament to oversee the development of military and non-military capacities for national security.

A fluid strategic environment, rapid advances in defence technology, the need for judicious allocation of scarce budgetary resources, long lead times required for creating futuristic forces and the requirement of synergising plans for defence and development, make long-term defence planning a demanding exercise. The lack of a cohesive National Security Strategy and defence policy has resulted in inadequate political direction regarding politico-military objectives and military strategy. Consequently, defence planning in India had till recently been marked by *ad hoc* decision making to tide over immediate national security challenges and long-term planning was neglected. This is now being gradually corrected and new measures have been instituted to improve long-term planning.

It is now being increasingly realised that a Defence Plan must be prepared on the basis of a 15-year perspective plan. The first five years of the plan should be very firm (Definitive Plan), the second five years may be relatively less firm but should be clear in direction (Indicative Plan) and the last five years should be tentative (Vision Plan). A reasonably firm allocation of financial resources for the first five years and an indicative allocation for the subsequent period is a pre-requisite.

Perspective planning is gradually becoming tri-Service in approach. It is now undertaken in HQ IDS, where military, technical and R&D experts take an integrated view of future threats and challenges based on a forecast of the future battlefield milieu, evaluation of strategic options and analysis of potential technological and industrial capabilities. Issues such as intelligence, surveillance and reconnaissance, air defence, electronic warfare and amphibious operations, which are common to all the Services, are now getting adequate attention. However, unless a CDS is appointed to guide integrated operational planning, it will continue to be mostly single-Service oriented in its conceptual framework.

Systemic weaknesses and structural shortcomings in India's national security decision making system have led to sub-optimal synergisation of the available combat resources, meagre as these are. The government must accord the highest priority to the implementation of the recommendations of the Naresh Chandra Committee so that the country's armed forces are well prepared to meet future threats and challenges and are in a position to contribute positively to security in South Asia and the Indian Ocean Region along with India's strategic partners.

Wanted A Full Spectrum Military Doctrine

——Brig Amar Cheema——

The military, which is a major component of the nation's CNP, needs to be contribute meaningfully to this future, for which it needs to be given direction and enabled in terms of capabilities. Evolving a Military Doctrine to channelize its growth and provide direction is, therefore, the need of the hour. This is a national requirement that merits intervention at the highest political levels to prevent turf battles which have proved to be the biggest impediment thus far. At the same time, it is reiterated that providing a Military Doctrine is not the requirement of the military but of the civil leadership and it is they who need to recognise the necessity to change and having done so, provide the necessary direction and impetus. Left to themselves, neither the bureaucracy nor the services or for that matter the Para Military Forces would solicit for change – they would be content with the status quo ensconced in the comfort of their respective empires.

"War throughout the ages has been a battle of doctrines. The really decisive successes have come from those who adopted a new doctrinal concept to which their enemies were unable to respond."

—John A Warden III, US Air Force

LYING AT THE HEART OF MILITARY Activity and braiding the three levels of warfare, 'doctrine' defines the path, objectives and pace of development of the defence forces. While a 'doctrine' is defined as a body or system of teaching relating to a particular subject, the US definition of 'Military Doctrine' which is universally acceptable defines this as, "laying fundamental principles by which Military Forces guide their actions in support of National Objectives." Since Military Doctrine is crucial to provide direction, it is axiomatic that its absence can result in defence planning to be out of sync with foreign policy aspirations and/or result in the disjointed growth of security forces; both evident in the case of India.

It is also pertinent to highlight that in the absence of a doctrine emphasising synergy in force application, Independent India has

Brig Amar Cheema

created more impediments 'within' the system than it has made enemies outside its borders – weak decision making, indifferent structures, impermeable civil-military relations and lack of 'jointmanship' amongst the Services, heading the list. Having stated what is well known, there is a need for course correction to put our house in order to ensure that our security planning supports the ends of the India's current and futuristic foreign policy.

The demi-official study 'Non Alignment 2.0' has (rightly) observed that 'India stands at a pivotal moment in its history....the main thing that can hold back India is India itself."[1] The study also provides guidelines and policy options, based on which the proposed Military Doctrine can be derived. Having said that, the doctrine needs to be articulated in the form of a blueprint defining the objectives, desired capabilities and *inter se* priorities. This is a major challenge, at the same time, it is a requirement whose time has (finally) come; an imperative that merits the attention of India's leadership.

In one of his most profound articulations on the state of the People's Liberation Army (PLA), in 1975, Deng Xiaoping set the tone for undertaking large-scale military reforms in China – a transformation which in two decades has changed the security landscape of the world. He pinpointed five traits of the then PLA which he said **were** 'bloated, lax, arrogant, extravagant and slothful.' If 'arrogance' was to be substituted with 'deferential,' and 'slothful' for being 'busy without business,' he could well be passing judgement over the state of the Indian defence forces. This is the uncomfortable reality of the Indian defence forces, a reality that would be denied in public reflexively by the brass, but would resonate with the majority, especially with the middle and lower rungs of military leaders. This makes it yet another reason to act before its hollowness is put to test – the earlier the process starts, the better.

Military power is not merely a component of the nation's Comprehensive National Power (CNP), it is an indispensable tool for diplomacy. *Ipso facto,* more than the uniformed leadership, it is India's civilian security planners who are required to take the initiative to take a *de novo* look at India's strategic requirements and set the tone by extrapolating the contours around which a holistic Military Doctrine could be developed in tune with the challenges. Substantiating the point that Military Doctrines need to be sensitive to the threat dynamics, examples that merit attention are given in succeeding paragraphs.

Military Doctrines – The Revolution in Military Thought

Within a span of sixty years after the Great War, the war that was fought to end all wars, an undeclared war in the form of the Cold War erupted between the former allies even before the fires of the World War had been put out. While this period of internecine fighting saw no physical combat, it saw the emergence of Military Doctrines like 'Air-Land Warfare' from the allied side, while the Soviet Union refined its combined arms application of forces, centred on the 'Deep Attack' Doctrine – both favouring 'Manoeuvre' over 'Attrition' style of warfare.

Military power is not merely a component of the nation's Comprehensive National Power (CNP), it is an indispensable tool for diplomacy...

China expounded her doctrine of the 'People's War' under Mao Zedong. Though this was a reactive response, it suited the Low-Tech PLA, who responded with her biggest asset-manpower and the threat of unacceptable attrition, defeating America's war strategy in Korea. Over the years, the People's War Doctrine was adapted for fighting under 'Modern Conditions' in congruity with China's concept of 'Active Defence.' Riding a crest of unprecedented economic growth, China subsequently transformed the People's War Doctrine to fight a technologically driven, 'Informationalised' War - a structured response against the world's lone standing superpower; her Anti Access-Area Denial (A2/AD) initiative being an ingenious solution against America's domination of the seas.

On the other side, the US military re-invented itself after the stalemate of Korea and the process gained fillip after the humiliation in Vietnam. The change was seen in the first

Gulf War, a war that showcased 'Precision Engagement' and 'Dominant Manoeuvre'- a result of America's domination of the 'Electro-Magnetic' Spectrum and the domain of space. In response to the emergence of China threat and to modulate the direction for America's re-balancing, the USA reworked its Military Doctrine to 'Sea-Land Battle,' a major shift from the land centric, mobile warfare developed for the European front during the height of the Cold War.

Unlike the fast-paced changes that came in war fighting doctrines worldwide, India has been a slow starter. The only change, came after the 1965 War, when it adopted the Strike Holding Corps concept, pivoted on defence around linear defences – the Holding Corps responsible for defence and the Strike Corps providing the offensive component. Not only did this surrender the initiative to the enemy but left a major part of the army out of battle due to extended deployment. The time taken for mobilisation of the Strike Corps, resulted in delayed build up as was witnessed during OP Parakaram. Lessons learnt from this deployment led to the evolution of the 'Cold Start' strategy. While this overcame many of the maladies by integrating the roles of the Corps and paved the way for speedier launch of Battle Groups, the reality remains that it is also a reactive (counter) strategy albeit faster off the block.

India has not evolved a meaningful doctrine nor has it a military concept and relies on static defence...

Having said that, it is pertinent to highlight that despite paying lip service to the contrary, India stays wedded to attrition warfare which is inherent in the strike-pivot (erstwhile 'holding') Corps operations; a doctrine that requires frontal application of forces to effect the initial break-through. In terms of meeting the challenge in the mountains, both from Pakistan and China, India has not evolved a meaningful doctrine nor has it a military concept and relies on static defence. At the same time, India has no real answer for waging a sub-conventional war. Having said that, the urgency to do so is re-emphasized since the time window to do so is limited.

Conceptual and Structural Impediments

Anticipatory and Reactive Self Defence

The right to self-defence is recognised as a fundamental right and the UN position is clear, "Nothing in the present Charter shall impair the inherent right of collective or individual self-defence if an armed attack occurs against a member of the United Nations." It goes on to clarify that, "International law recognises the right of self-defence, as the International Court of Justice (ICJ) affirmed in the Nicaragua Case on the (pre-emptive) use of force" Thus, the right for self-defence even when an armed attack has not actually occurred is accepted, and this that brings in the element of 'pre-emption' or the concept of 'anticipatory self-defence.'

Pre-emption has been an important part of international relations and warfare and relates to an action or a series of actions aimed to pre-empt, prevent or dislocate the adversary and negate his actions 'beforehand.' On the other hand, reactive retribution as the name suggests, is taken against a hostile act afterwards. Having said that, the Principle of '*Justum Bellum*' or 'Just War' should be sustainable in international law - the US raid violating the territorial integrity of Pakistan to capture/kill Osama-bin-Laden, an internationally proclaimed fugitive, being an example.

The USA practices the doctrine of pre-emption to prevent any strike on itself. China also follows the same in her operational concept of active defence. In military terms, following a doctrine of pre-emption or active defence not only bestows the advantage of gaining the initiative, it sets the tone for further action(s). On the other hand, India has thus far demonstrated a reactive mind set, even in the face of grave provocations. The attack on the Indian Parliament and the Mumbai attack are examples. Acting after an attack or when national security has already been compromised reflects weak state policies and has not worked for India in the past. More than anything else, this reaffirms the global perception that India is a 'Soft State'. This needs to change and articulating

this in the Military Doctrine, especially after the trans-border raid in Myanmar, is a requirement of the times.

The Security - Defence Conundrum

There is more to national security than the application of security forces and at the same time, the role of the military is to provide security. Thus, at the conceptual level lies the issue of defining the primary responsibility of forces – is it ensuring security for the nation or providing defence. By definition, 'defence' implies offering resistance or providing 'protection' whereas 'security' is an assurance of being free from risk or danger. Thus, branding them defence forces would imply the latter whereas what the label security forces convey is all inclusive and beyond a defensive mindset.

There is a sea of difference between the two as the former is premised on deterrence and/or compellence, which is beyond the purview of the military operation of defence, as understood by the defence forces. At the same time, the Strategic Forces, Air Force and Navy essentially provide security, as intrinsically, their operations are dynamic and focussed on offensive strikes. On the other hand, while the Army conducts defensive operations, as any military man would tell you – defence may deny victory to the opponent but would not win victory by itself. Hence, even for land operations, defence is a 'situation-based' requirement, a stepping stone so to say.

Since it is a component of the gamut of warfare, the Indian Army, like the Indian Air Force, the Indian Navy and the Strategic Forces, cannot be labelled as 'defence' but 'security' forces. There is more in labels as they encapsulate the primary role and mission of the force – providing defence is 'not' their role, 'security' is. Though this may be dismissed as semantics, this is brought out to highlight India's deep-rooted defensive mentality and it is this that mandates a rethink of how India approaches matters military - this is not a superficial change but psychological.

To reiterate the position, the military is there to provide 'security' and not 'defence' which is essentially the task of Border Guards, as is the practice the world over. In India, this translates to the BSF, ITBP, SSB and the like. Being tied down to defence is counter-productive for the Army's larger aim, as this can only be at the cost of undertaking offensive operations – the prerequisite for victory. It goes without saying that for this to come about, a paradigm change in thinking is required at the highest level as it is more a matter of mindset of the leadership, involving issues of turf and empires, than a matter of training and equipment.

On the other hand, the task of Border Guards is Border Management, both in peace and war and includes ensuring the territorial integrity of the real estate they are entrusted with. The army may support but it essentially contributes by mitigating the threat by undertaking offensive actions. The practice of passing on the responsibility of defence of the borders during 'Hot War,' not only ties down the Army to static operations but keeps well-trained forces out of battle, when their presence can make a significant difference, entailing a heavy and unnecessary cost on the exchequer.

There is more to national security than the application of security forces...

Higher Security Planning and Structures

Ensuring security from external threats is as a much a function of the Ministry of External Affairs (MEA), as it is of the Ministry of Defence (MOD), though the task of ensuring security is constitutionally mandated to the office of the Defence Secretary. While the National Security Advisor acts as the Principal Security Advisor, by default, his office has become the focal point for issues of external security. Though there is nothing against the existing system, it is recommended that a Nodal Military Officer to provide a single point source for military advice and synergise the functioning of the three services be added as the Defence Secretary has neither the experience nor the time. This arrangement has created an 'functional' void at the highest level.

The ideal solution being the appointment of a Chief of Defence (sic) Staff (CDS) to bring in the much required 'jointness' between the services. With his elevated stature, he would be able to

interact with all Ministries on matters military, and in addition, he would be able to provide direction for defence research, development and production by co-opting them with the requirements of the military. More importantly, he would be able to articulate the Military Doctrine and ensure change.

It is important to highlight the point that even while impetus is being given to the modernisation of the Indian Military, mere infusion of technology and introduction of weapon systems would not automatically translate to 'capability improvement.' These need to be backed up by a well thought out doctrine to develop, organise and use these capabilities to achieve national aims and objectives.

Joint Commands

Warfare is an interplay of strengths and weaknesses and the requirements of high tempo - modern war necessitate synergistic application of different types of forces. In view of this requirement, 'Integrated Commands' is the norm the world over. Despite the acceptance of this operational requirement, the pace of integration has been tardy – more a result of turfs than a matter of principle, and is played up with the (convenient) 'divide and rule' policy of the bureaucracy and political class. This needs to change – the faster, the better as a mutually acceptable doctrine would provide an answer.

Pakistan's strength lies in its propensity to sustain low intensity conflict against India...

Strategic Guidance for Evolving an Indian Military Doctrine

At the strategic level, there are multiple factors that would provide guidance for evolving a Military Doctrine for India; the obvious ones being the threat from Pakistan, China or a collusive threat. At the same time, the role India feels it should be playing in the future – both within the South Asian and Indian Ocean Region, as also outside its immediate neighbourhood is another consideration. The last factor would be the issue of inter-operability with friendly foreign militaries – the question being with who? This obviously falls within the domain of Foreign Policy. The translation of these guidelines into Military Doctrine would provide direction to all components involved with external security and make them move in concert with one another.

Pakistan

Pakistan's strength lies in its propensity to sustain low intensity conflict against India; the level may fluctuate but the threat remains ever present. By repeatedly playing the nuclear card, Pakistani military leadership, who call the shots behind the facade of democracy, are confident that they have created space for sub-conventional warfare. While there can be a number of counters from the Indian side, both conventional and unconventional, it makes sense in raising the cost for Pakistan. While it would be beyond the scope to discuss strategy, tactics and options, it is axiomatic that Pakistan is paid back in the same coin – only in greater measure and this means evolving a doctrine for sub-conventional warfare as an active sub-sect of the All-encompassing National Military Doctrine to deter Pakistan.

China

India needs to develop a different strategy to deter China and it makes practical sense to confront her on own terms by having the capabilities to target her vulnerabilities and sensitivities. A wide appreciation needs to be undertaken to identify her vulnerabilities – in Tibet, at sea, in space and in the Electro-Magnetic Spectrum. The point being made is simple – strike where it hurts, ideally away from the area of conflict, and as discretely as possible to avoid escalation and spill-over. The idea is to convey a clear but unambiguous signal: If confronted, India would react–'when', 'where' and 'how' is immaterial. This roughly translates to 'deny' in the mountains and 'strike' through Air, Space and Maritime Forces – something that is recommended in the paper Non Alignment 2.0, the aim being to expand the operational envelope of counter-measures and to ensure retaliation against a weakness. Again, the aim is not to discuss specifics but to highlight the possibilities and avoid knee-jerk reactions.

The South Asian Region

Apart from the physical advantage India enjoys in terms of location, size and military capabilities, emerging India's greatest strengths are the India success story and the global perception that it is not a 'threatening' power. While the current

regime under Prime Minister Narendra Modi is making the right moves, it is recommended the 'follow up' especially in the immediate neighbourhood, stretching from Afghanistan to Myanmar must be taken up on a war footing. The SAARC forum may appear to be a weather beaten horse but reenergising it with economic prospects even at the cost of India, would be a rewarding investment in larger strategic terms.

The Indian Ocean Region (IOR)

India is uniquely placed in terms her coastline and island territories. This puts her in an enviable position to play a key role in the power games being played in the IOR and the Asia-Pacific Maritime domain. The debate that India may or may not do so is immaterial - what is relevant is the necessity to do so for which building of demonstrable capability is required. By extension, it is axiomatic that India not only nurtures its relations with the maritime nations of the IOR, but also develops its capabilities of operating with friendly foreign forces since their aim in the region would be generally be in conformity with that of India.

Essentials for Evolving the Military Doctrine

Based on the discussion on the preceding paragraphs, ten essentials for outlining a robust Military Doctrine for India to inject dynamism and highlight outcome driven objectives, necessitate consideration of the following:

- The Sea, Air, Space and electro-magnetic domains need to be given priority to be able to strike deep and cause disproportionate damage – technology being the key to gain advantage – the Chinese A2/AD Model being a good example.
- The Army must be tasked beyond territorial defence and structured to cause disproportionate destruction in the battle zone and at the same time, it should be made capable for undertaking 'out of area' contingencies – attrition through unconventional means should be in-built in her tactical responses, especially in the mountains.
- Task of Border (Defence) Forces must be redefined and they should be enabled to undertake effective border management, both in peacetime and war. Such forces should be made capable to provide a sound firm base around which the regular army should be able to mount offensive operations. Apart from a change in tasking, this requires greater inter-operability between the forces.
- Undertaking unconventional operations should be inbuilt at the tactical, operational as well as strategic levels – development of these capabilities should be thrust areas against both Pakistan and China.
- Strategic partnerships with likeminded nations must be nurtured – both within South Asia and for operating jointly in the IOR.

- India's diplomatic overtures in the immediate neighbourhood must offer a 'Win-Win' situation for all.
- India's internal structures must be re-organised in keeping with national security aspirations.
- 'Jointness' at the functional levels must be the key – right from the portals of South Block to the formation level – re-organisation of the NSA, MOD and Theatre Commands being the bare requisites.
- Intelligence agencies and role of think-tanks to promote national interests need redefinition.
- While exploiting the electro-magnetic spectrum should be the aim and ensuring adequate redundancy against enemy cyber-attacks should be built in.

Conclusion

India is passing through historic times and the pace and direction she adopts in the current and coming decade would be defining. India stands at the threshold of a new future amidst a rapidly changing strategic landscape; a future that involves playing a larger role in the strategic affairs of the world. India needs to factor in the changes that are likely to manifest globally, and there are well-researched net assessments who predict the future – 'Long View from Delhi'[2] and 'Next 100 years'[3] being some of them.

The military, which is a major component of the nation's CNP, needs to be contribute meaningfully to this future, for which it needs to be given direction and enabled in terms of capabilities. Evolving a Military Doctrine to channelise its growth and provide direction is, therefore, the need of the hour. This is a national requirement that merits intervention at the highest political levels to prevent turf battles which have proved to be the biggest impediment thus far. At the same time, it is reiterated that providing a Military Doctrine is not the requirement of the military but of the civil leadership and it is they who need to recognise the necessity to change and having done so, provide the necessary direction and impetus. Left to themselves, neither the bureaucracy nor the services or for that matter the Para Military Forces would solicit for change – they would be content with the *status quo* ensconced in the comfort of their respective empires.

Notes

1 Paper Non Alignment 2.0: A Foreign and Strategic Policy for India in the Twenty First century, as available on the net. Its authors Sunil Nilekani, Rajiv Kumar, Pratap Bhanu Mehta, Lt. Gen. (Retd.) Prakash Menon, Nandan Nilekani, Srinath Raghvan, Shyam Saran and Siddarth Varadarajan are eminent thinkers with distinguished track records in public life and recognized as 'progressive' Indians.

2 Menon Raja, Admiral and Kumar Rajiv, The Long View from Delhi: To Define the Indian Grand Strategy for Foreign Policy. Academic Foundation, 2010, New Delhi.

3 Friedman George, The Next 100 Years: A Forecast for the 21st Century, Doubleday, United States, 2009, as available on the net.

REVIEWING INDIA'S FOREIGN POLICY

From Regional Power to Potential Super Power

Anant Mishra

Post Cold War, India's foreign policy was linked closely with her economic policy. During the economic crisis of 1991-1992, the government realised that international relations were better for the nation if economics is added to it, as economics was a crucial element in socio-political equations. Rao's government then introduced the New Economic Policy of 1991. This policy reform was welcomed by the US and other industrialised nations.

The Cold War, Nehru and Non Alignment

AFTER THE END OF WORLD WAR II, the political dynamics of the world changed from a multi-polar to bipolar world. Those nations that were gripped by war were experiencing severe economic hardships and in the midst of this, two superpowers emerged, The United States of America and the then Union of Soviet Socialist Republics (USSR). For decades we witnessed neck and neck competition between the two in every sphere, from sports to military power. The World was thus divided into two blocs - the Western bloc (NATO) and the Eastern bloc (Warsaw Pact). The era was quite passive; mostly warlike, due to its intensity came to be known as the Cold War era.

The first Prime Minister of independent India, Pandit Jawaharlal Nehru equipped the nation not only with a vision for the nation but also for the international arena. He was a national leader with a global view and also the founding father of independent India's foreign policy. His policy and the structured way to interact on the international arena are to some extent, relevant still today. During the Cold War era, India was a newly independent nation whose existence was questioned by many around the world. India was on the verge of establishing her first independently elected government and policies. The viewpoint of India's foreign policy was "no role, no involvement". Hence India distanced herself from any of the major superpowers of the world, USA and the former USSR. This policy came to be known as "Non Alignment".

The Non Alignment movement was founded in Belgrade in 1961, and was attended by Prime Minister, Jawaharlal Nehru; Indonesia's first President, Sukarno; Egypt's second President, Gamal Abdel Nasser; Ghana's first President Kwame Nkrumah and Yugoslavian President, Josip Broz Tito. Many third world nations joined India's initiative. This initiative of Jawaharlal Nehru for India to adopt Non Alignment as foreign policy was important as she did not want to support or be influenced by any power bloc.

Once John Foster Dulles, US Secretary of State, asked Nehru "Are you with us or against us?" Nehru replied "Yes." Non Alignment was not just a policy of neutrality; it was a tool for an independent decision making. India was independent but independence came at a price. India was facing numerous issues. There was the need to rebuild the long-dead economy and the question of unification of the 500-odd princely states. As India was still establishing herself as a free sovereign nation, economic relations with other countries were restricted. Hence, during this time, foreign policy was simply based on morals and ideals.

Indira Gandhi and the Latter Half of Cold War Era

In 1966, Indira Gandhi took over as the fourth Prime Minister of India. She held this office from 1966 to 1977 and again from 1979 to 1984. During her tenure, Mrs Gandhi introduced many changes in India's foreign policy. She used her father's policies as a theoretical base for new guidelines. However, she introduced some notable changes in implementation of these policies. Nehru pursued a "macro" approach

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in foreign policy while Indira Gandhi took a "micro" approach as she was quite determined to establish India as a regional power opposing the role India played as a spiritual leader on international arena. As she did not agree with her father's policy of non-alignment, Indira Gandhi chose to establish close relations with one superpower, while removing the other from the equation. Thus, Indira Gandhi's dream was to make India a strong regional power with a strong military.

Foreign Relations During Indira Gandhi's Rule

Bangladesh

In 1971, India fought its third war with Pakistan, in support of East Pakistan (now Bangladesh). Supported by the Soviet Union, India became victorious in just 11 months and the war resulted in the independence of Bangladesh. Following the war, India enjoyed close ties with Bangladesh. Despite India's contribution in its liberation, many leaders in Bangladesh, especially the military, feared that the intervention had client state of India, antagonised by the Bangladeshi leader Sheikh Mujibur Rahman. The assassination of Mujibur Rahman in 1975 led to the emergence of Islamist extremists who wanted to distance Bangladesh from India. Thus, India's relations with the regimes were quite strained as she was supporting the anti-Islamist forces in Bangladesh.

India's relations with Pakistan grew more intense even post Shimla agreement.

Sri Lanka

In the beginning of the 1970s, India had friendly relations with Sri Lanka. Mrs Gandhi had maintained cordial relations with the Sri Lankan Prime Minister, Sirimavo Bandaranaike and endorsed her socialist government. In the beginning of the Sri Lankan Civil War (1980s), insurgencies were carried out against the Government of Sri Lanka by the Liberation Tigers of Tamil Elam (LTTE). In the wake of Operation Black Serpent in 1983, Mrs Gandhi rejected demands to invade Sri Lanka emphasizing on the territorial integrity of Sri Lanka and expressed that India cannot "remain a silent spectator to any injustice done to the Tamil Community".

Pakistan

Indira Gandhi's armed intervention in the liberation of Bangladesh, created massive dislike in West Pakistan. India and Pakistan fought for the second time in 1971, a war in which India emerged victorious and East Pakistan, or Bangladesh became independent. After the war, tensions between India and Pakistan heightened. To prevent further conflict, Prime Minister Gandhi along with her Pakistani counterpart Zulfikar Ali Bhutto, signed the Shimla Accord in 1972. The agreement converted the cease fire line of December 17, 1971, into the Line of Control (LOC) between India and Pakistan and it was agreed that "neither side shall seek to alter it unilaterally, irrespective of mutual differences and legal interpretations."

India's relations with Pakistan grew more intense even post Shimla agreement. In 1974, Indira Gandhi oversaw the nation's first nuclear explosion in Pokhran. Zulfikar Ali Bhutto perceived this as a threat to Pakistan and an attempt by India to establish her dominance in Asia. In 1976, both the leaders met again in an effort to ease the tensions between the two nations. Relations with Pakistan worsened after the rise of General Zia-ul-Haq in Pakistan. General Zia had ties with Khalistani militants in Punjab, and militant infiltration began after Mrs Gandhi's authorisation of Operation Meghdoot to capture the Siachen Glacier in 1984.

The Soviet Union

The Soviet Union supported the Indian Army and the Mukti Bahini throughout the 1971. The Soviet Union assured India of its extensive support to India even during US and Pakistan face-off. With deep-rooted ties with India, the Soviet Union assured India of its support in the event of the situation escalating. In August 1971, the Indo – Soviet treaty of friendship and cooperation was signed between Mrs Gandhi and Khrushchev. The treaty mainly involved promotion of friendship, peace and security both at bilateral and international levels.

Under Mrs Gandhi's leadership, India's relations with Russia strengthened substantially. Gandhi had a very clear foreign agenda, only "pro-Indian". Indian critics said that she was

very stubborn in her stand, leaning towards Moscow to an extent which was quite difficult and also embarrassing during the Soviet military intervention in Afghanistan.

United States of America (USA)

During Mrs Gandhi's tenure, relations with the US starting souring. Friction between India and the US occurred for many reasons. America's stand on Pakistan was very different from its stand on India. Pakistan and the US were allies throughout the conflict. Hence going for an all-out war against Pakistan was not an option. One of the most important reasons why the US aided Pakistan was India's strengthening ties with the Soviet Union. Mrs Gandhi had a different approach hence she had to deviate from her father's non-aligned agenda, leaning more towards the Soviets and removing the US from the equation. The Americans could not accept the Indo- Soviet Treaty of friendship and co-operation.

Post Cold War (1991-1996)

Following the 1991 parliamentary elections, P.V Narasimha Rao became the tenth Prime Minister of India. The end of the Cold War ushered in many changes in the international order. The era of bipolar world politics and bloc politics in international relations came to an end in 1991. After the disintegration of the Soviet Union, the US retained its position as the sole world power. All the nations including India witnessed this sudden change in international relations. Hence, Indian leaders were now tasked to rethink and reshape their foreign policy.

Indian foreign policy under Prime Minister Narasimha Rao was focused largely on building relations with the US. Many experts believed that Indian foreign policy post-1991 was based on building strong relations not only with the US; but also with the European Union, Russia, China, Japan, Israel, Brazil and South Africa followed by economically stable nations in South East Asia.

Post Cold War, India's foreign policy was linked closely with her economic policy. During the economic crisis of 1991-1992, the government realised that international relations were better for the nation if economics is added to it, as economics was a crucial element in socio-political equations. Rao's government then introduced the New Economic Policy of 1991. This policy reform was welcomed by the US and other industrialised nations.

India's relations with the US gradually improved after 1991. Narasimha Rao also tried to improve relations with "just" neighbours Pakistan, China, Nepal and Sri Lanka. India extended her relations with the NATO member nations and successfully established a formal strategic partnership with Israel in 1992.

The Present

Today, India's foreign policy has enabled better strategic relations with nations all over the globe. Earlier, India's foreign policy was only in principle rather than in practice. India soon became an example for all the emerging economies in the world. Experts believe that India's foreign policy is based on "multi-alignment". It is now more focused on strategic partnership for domestic development. Standing firmly on the values of peace and sovereignty, India shares diplomatic relations with most countries and has attained a prominent voice in global affairs over the years.

Under Mrs Gandhi's leadership, India's relations with Russia strengthened substantially. Gandhi had a very clear foreign agenda, only "pro-Indian".

Fast becoming a leader in the developing world, India is a member of group of nations consisting of Brazil, Russia, India, China and South Africa (BRICS). She is also a member of United Nations, the G20 industrial nations, the World Trade Organisation, the International Monetary Fund (IMF) amongst many others. Territorially, India is a part of the South Asian Association for Regional Cooperation (SAARC) and the Bay of Bengal Initiative for Multispectral Technical and Economic Cooperation (BIMSTEC). India has also established close ties with the Arab League, the Association of Southeast Asian Nations (ASEAN) and the African Union (AU). Today, the nation is building strong relations with USA, China, EU, Pakistan, Brazil, Japan, Israel and Mexico.

Currently, Russia is the leading weapons

supplier for the nation. Israel has emerged as India's second largest strategic and military partner. India also has restructured its foreign policy with the US. India's "Look East Policy" is also reformed, enabling partnerships with Southeast Asian countries. A charter member of United Nations, India is a member of many UN agencies. India has been calling for support for the seat of permanent membership in the UNSC. It is also a member of the G4 groups of nations, constituting Brazil, Japan and Germany, all seeking permanent representation in the UNSC. India justifies her demand for permanent representation on the grounds of being the second most populous country in the world, the world's largest democracy, the third largest in terms of Purchasing Power Parity (PPP), the world's ninth largest economy and maintaining the third largest army in the world.

The UN mandate authorised a plebiscite in Kashmir once Pakistani forces withdrew. Sadly, the UN failed to resolve the issue and till today, Kashmir remains a heated argument between India and Pakistan.

International Stand and Blocs

Pakistan

The joyous moments of Indian independence shall always be tainted with the bloody memories of Partition. After more than six and a half decades, Pakistan continues to be a challenge to India's foreign policy. The two nations are often termed as "blood brothers". Although diluted in a similar ethnic mix the two nations view each other as arch enemies. Pakistan, in spite of being a victim of its own oppression, devotes its resources to undermine India's power.

Kashmir – The Bone of Contention

At the time of Partition, each princely state was given a choice, a choice of joining either one of the two countries. Maharaja Hari Singh of Kashmir took his time in deciding. In 1948, when Pakistani troops and militia invaded Kashmir, Maharaja Hari Singh quickly acceded to India and Indian forces retaliated heavily against the invaders.

Shocked by this action of Pakistan's, India took this matter to the UN only to face disappointment there. The UN mandate authorised a plebiscite in Kashmir once Pakistani forces withdrew. Sadly, the UN failed to resolve the issue and till today, Kashmir remains a heated argument between India and Pakistan. Till now, India and Pakistan have fought four wars and many across the ceasefire line, all initiated by Pakistan.

Terrorism and Cross Border Tensions

India has been witnessing many terror strikes, especially those originating from Pakistan. Terrorist organisations such as Lashkar-e-Toiba are blatantly working for the ISI. 26/11 was one such incident that brought grief to the nation. Besides losing top counter terrorist officers, there was violence and great loss of lives that sent the nation into shock. Terrorism is an issue that demands urgent attention and immediate solution. Besides Kashmir, Indian soldiers have faced numerous provocative rounds of fire from their Pakistani counterparts along the border. There have been many incidents of infiltration from Pakistan.

Relations with the US

India's relations with the US have been quite fragile in the past. The US was not in favour of India's non-aligned stand during the entire Cold War period. To counter our inclination towards a Communist state, Washington leaned towards the Islamic state of Pakistan which in turn pushed India's further towards the Soviet Union. The end of the Cold War also saw a thaw in the relations between New Delhi and Washington. However, India's nuclear test at Pokhran in 1998 brought another twist in the relations as the nation came under heavy sanctions from the US. With the coming of the Bush administration in the 2000s, strategic partnership between the two nations hit the headlines.

Currently, the US provides employment to a large number of IT professionals from India. India and the US have also staged several partnerships in fields such as food security, space technology and civil nuclear energy. The world's largest democracy and the world's oldest democracy are proud sovereign nations and their relationship still has miles to go.

Bangladesh

India is very concerned about Bangladesh. Its rapidly declining economy, growing instability, declining governance and the rising Islamist forces pose a threat to India's national security. China has been influencing the region. India–Bangladesh relations have been quite sour due to the increasing security-related issues such as arms trafficking, movement of people, transit and a gas pipeline, that have not been given importance in Dhaka.

Dhaka wants to address the issues of water sharing of the Ganges, Brahmaputra and other rivers along with trade and variety of border related concerns including smuggling, but internal conflicts preoccupy it elsewhere. To ensure good relations between Bangladesh and India, mutual trust is a must. But in the race of trust, China seems to be forging ahead.

India and the Middle East

The Middle East is a very important region for India especially in respect of energy security and employment. The Middle East is an area of vast ethnic diversity and political instability though influenced by Islamist fundamentalism and terrorism. For India, it is a land of opportunity and terrorism. There are three nations in the Middle East that are of interest to India.

Iran

As a part of the Indus civilization, India has been interacting with neighbouring civilisations for millenia. However, the interaction came to a halt after the arrival of the British. Post Independence, India's relations with Iran revived but during the Cold War, it became complicated. Relations with Iran had been deteriorating due to our talks with the US especially due to Washington's hostile posture towards Iran. Post 1979 revolution in Iran and the hostage crisis, relations between Iran and the US have worsened. Iran's aggressive policy towards Israel and its sympathetic policy with Palestine made it difficult for India to maintain relations with Iran without offending her other partners.

Friendship with Iran has some advantages to look for. India is a developing nation and requires large amount of petroleum to drive the wheels of its economy. Today, energy security is a vital question as most of the petroleum has to be imported and for India, Iran is a vital source. Also, Iran is an influential Islamic state that can counter Pakistan's anti propaganda in the Islamic world. With the recent change of leadership in Iran, there are signs of improvement in its relations with the US. Relations between India and Iran are tangled in a web that may prove difficult to solve.

Saudi Arabia

Due to the nature of politics in the bipolar world throughout the Cold War, Saudi Arabia and India were not technically on good terms. However, by the end of the Cold War, Saudi – India relations improved. Saudi Arabia is one of the largest crude oil exporters, a commodity which India needs the most. Furthermore, a large number of Indians are working there, which adds significance to relations between the two nations.

Saudi Arabia allegedly finances many Islamist and terrorist groups. Hence, terrorism is an issue that India needs to address.

India is home to second largest Muslim population, a nation that sends many Muslims to the holy shrines at Mecca and Medina. Saudi Arabia allegedly finances many Islamist and terrorist groups. Hence, terrorism is an issue that India needs to address. Saudi authorities may also be uncomfortable with improving India - Israel relations.

Israel

There has been a steady strengthening of India's relationship with Israel since the establishment of full diplomatic relations in 1992. Fighting terrorism is a major issue and challenge for both the nations who are democratic, states with large Muslim minorities and face a threat from Islamic terrorism being sponsored by their neighbours. Hence, similar circumstances have created greater understanding between the two countries.

Healthy relations with Israel benefit India in many fields. Huge investments in the field of research and development, Israeli weapons are enabled with "top-of- the-class" technology in the international arms market, even better than European and American products. Israel is ever

ready to supply defence technology to India as it aims at power balance in South Asia. However, bilateral relationship between India and Israel has to be carefully managed as India has to maintain relations with other nations, some of whom view Israel as enemy number one.

The European Union (EU)

India enjoys a healthy relationship with the EU - their friendship dates back to the 1960s. India was also the first Asian nation to establish relations with the European Union. The EU is India's largest partner in trade, accounting for 20 per cent of India's trade. The EU and India have established numerous agreements from nuclear energy to environmental protection. Their strategic partnership is old and deeper ties explain the confidence India has in the EU.

Given the geographical location and ethnic structure of India and Sri Lanka, India cannot turn away from the happenings in Sri Lanka.

Africa

Today, India has ties with almost every nation in the African continent. The Indian government is very active with respect to development in Africa. Indian businesses are very actively assisting African countries in achieving economic stability. Despite competition from China, India plays a very important role in Africa's development.

Sri Lanka

India's relations with Sri Lanka have always been on and off. Being Sri Lanka's only neighbour with enormous presence of Tamil populations, India's ethnic presence has been the only factor for discussion between the two. Both nations have strategic importance in South Asia and have discussed to make common strategic protection on Indian Ocean. Given the geographical location and ethnic structure of India and Sri Lanka, India cannot turn away from the happenings in Sri Lanka. India's intervention in the Sri Lankan civil war had an impact on the latter's attitude towards the former. Sri Lanka is wary of India's motives and fails to understand New Delhi's role of "Good Samaritan".

Despite the maritime agreements between the two, the issue of water boundaries still exists between the two. The main issue is the status of Kachchativu, a small barren island in the Palk Bay area. Through the 1974 agreement, India agreed to Sri Lanka's sovereignty over Kachchativu, but with some safeguards for its fishermen. At times, the Indian fishing boats stray into Sri Lankan waters and have been seized for the transgression. Consequently, indiscriminate firing and killing of Indian fishermen became frequent. On February 24, 2013, politicians from Tamil Nadu accused the Sri Lankan Navy of attacking Indian fisherman near Kachchativu. Hence, a proactive policy towards Sri Lanka is a must not just for the sake of the Tamil population in the country as but also for its own security and to counter the influence of China.

Nepal

Relations between Nepal and India are unique for many reasons ranging from geographical to cultural ties, and extensive institutional and social relationships. A cultural, economic and geographical factor along with the bond of religion greatly influences their bilateral relations. Despite some troubles in the past, India's relations with Nepal are close, stable and mutually beneficial for both the nations. Nepal and India share the "movement of free path" With the Nepal India Peace Treaty of 1950 being the backbone of their relationship. Nepalese enjoy many benefits in India, from educational to employment opportunities equivalent to those that are enjoyed by Indians.

India provides extensive support to the government of Nepal by undertaking development projects in the fields of infrastructure, health, rural and community development as also in disaster relief. India is the largest trade partner and biggest source of foreign investment and tourism. Collaboration between the two on water resources are again an example of their friendship. However, Indo-Nepalese relations are not without difficulties. Nepal professes that India has encroached on its borders, setting up military encampments and other official as well as unofficial settlements at 71 different places. Indian perception is that Nepal is not adequately appreciative of all that India has done and provided for the country.

Today, by all accounts, India and Nepal share a healthy relationship.

China

India and China have both been home to great ancient civilisations. Trade and communication between the countries date back to early history. In the twentieth century, both the nations have emerged as faces of the developing world and are absolute examples of economic growth in the twenty-first century. These two growing powers have had a rocky relationship from the start. Their relationship may be classified into three parts:

Competition – "It's just mine"

Western nations often view India and China as emerging Asian economic powers. Some experts have referred to them as "Chindia". However, the reality is very different. The Chinese economy is far more advanced than that of India's and is the second largest economy in the world, whereas India stands eleventh. China was a part of globalised economy before India gained independence. The 2008 Beijing Olympics was an absolute example of how the "dragon" outdoes our "tiger". The two nations do not even stand together when about it comes to sporting competitions. No meaningful competition exists between the two.

Co-operation: "It's yours and mine"

Without doubt, India and China are the two most populous countries in the world. Hence both the nations require security and cooperation. There are many challenges before they even tend to sign a bilateral treaty. One of the most important challenges is the security. The Border Defence Cooperation Agreement between India and China, signed by at the conclusion of talks between Prime Minister Manmohan Singh and Chinese Premier Li Keqiang at the Great Hall of the People was to ensure peace on the borders. While China has become the sole player in the hardware manufacturing business India has left its mark as the software king. Well, in matters like these, China and India complement each other. Now the question is whether these two countries will cooperate during a politically aggravated conflict.

Conflict – "Not yours, it's mine"

Nehru coined the popular slogan, "Hindi-Chini Bhai Bhai" which quickly changed to "Hindi-Chini Bye Bye" after the 1962 War. India faced a humiliating defeat by the Chinese forces who not only won a decisive victory but also secured 23,200 sq km of Indian territory. India and China share the longest disputed border in the world and the situation became even more unclear post 1962. Recently, Beijing has taken pains to remind New Delhi about its claim over another 92,000 sq km of Indian Territory mainly in Arunachal Pradesh. There have been numerous incidents along the border in the past three years. It seems as if Beijing has made a conscious decision to keep India on her toes.

Without doubt, India and China are the two most populous countries in the world. Hence both the nations require security and cooperation.

But the problems do not end here; Tibet is another major cause of concern between the two countries. Even though, India recognises Tibet as an integral part of China, it provides refuge to Dalai Lama and Buddhist monks. India is quite conscious about offending the Chinese on this subject but has little choice on grounds of its own freedom and principles, India cannot rewrite freedom of speech for the Tibetans. Nor it can play the cards of "offensive and strategic response" against the superpower, which is extremely tricky on the issue of Tibet. A Princeton University Professor once wrote "India's competition with China is not just economic or geostrategic; in a sense it is existential - a clash of two competing political systems, bases of state legitimacy and ways of ordering state society relations."

The PLA Digest

Claude Arpi

PLA Air Force Conducts First Training Stint in West Pacific

Source: Global Times (Date: March 31, 2015)

The PLAF conducted its first military training above the West Pacific Ocean.

"The training was held to promote the air force's combat capability," Shen Jinke, spokesman of the PLA Air Force, said in South China's Guangzhou Province on Monday.

Warplanes flew to the West Pacific for training through the Bashi Channel, an international waterway linking the South China Sea and the Pacific Ocean, and returned the same day after completing the training and achieved their goal, according to Shen.

PLA's J-11 Fighters Carrying Missiles in Drill

Source: People's Daily Online (Date: April 02, 2015)

In this photo taken on March 29, 2015, J-11 fighter jets carrying missiles join an actual combat drill conducted by a division under the Air Force of the Chengdu MAC of the Chinese PLA.

Navy to Get 3 New Nuclear Subs

Source: China Daily (Date: April 3, 2015)

Three cutting-edge nuclear-powered attack submarines have been manufactured and will soon be commissioned by the Chinese navy, according to media reports.

China Central Television showed a satellite picture earlier this week of three submarines anchored at an unidentified port, saying the vessels are China's most advanced Type-093G nuclear-powered attack submarines, just completed by a Chinese shipyard and awaiting delivery.

Birth of Truly Global Chinese Navy

Source: China Daily (Date: April 10, 2105)

It is not difficult to imagine the tremendous relief of the Chinese workers when they got on board the two Chinese frigates that rescued them from war-torn Yemen. The rescue was just a fresh example of the increasingly sophisticated operations of the PLAN in the Indian Ocean.

Apart from its primary mission of fighting pirates, Chinese ships have escorted vessels loaded with chemical weapons out of Syria and helped provide fresh water to people in the Maldives. A submarine joined the Chinese task force in September 2014, and the Chinese hospital ship Ark Peace sailed along the east coast of Africa to provide medical treatment to African people.

Tibetan Soldiers Brave Chill Weather to Guard Border

Source: Xinhua (Date: April 11, 2015)

J-20 to Sacrifice Attacking Power and Range for Stealth

Source: Want China Times (Date: April, 13, 2015)

China's J-20 fifth-generation fighter will likely sacrifice its attacking power and range for added stealth capability, reports the website of China's state newswire Xinhua.

PLA Rear Admiral Yin Zhou said the J-20, currently being developed by the Chengdu Aircraft Industry Group, will install its weapons on the inside of the aircraft to increase stealth, much like the US F-22.

The downside of this decision, Yin said, is that the length and diameter of the J-20's weapons could face restrictions, which could affect the range of its missiles.

Chinese Arms Production to Partially Open to the Market

Source: ECNS.CN (Date: April 13, 2015)

The Chinese government will open part of its weapons research and manufacturing to the marketplace, including military technology transformation and industrialization development, to promote industry resource sharing, the Beijing Times reported.

The State Administration of Science, Technology and Industry for National Defense has issued a document on the transformation of Chinese weapons manufacturing. It stipulates that authorities will encourage the transfer of intellectual property rights related to the science and technology of the national defense industry and promote scientific achievements.

PLA to buy Advanced Missiles from Russia

Source: China Daily (Date: April 17, 2015)

The deployment of the Russian S-400 surface-to-air missile system will substantially improve China's air defense capability, military experts said as Russian media reported that China has bought the cutting-edge weapon.

"The S-400 is definitely one of the top anti-aircraft weapons in the world. It will greatly supplement the PLA's air defense system, which now has some loopholes in long-range, high-altitude defense of airplanes or ballistic missiles," said Wang Ya'nan, deputy editor-in-chief of Aerospace Knowledge magazine.

Is China Planning To Build More Missile Submarines?

Source: FAS Security Blog (Date: April 23, 2015)

Is China increasing production of nuclear ballistic missile submarines?

Over the past few months, several US defense and intelligence officials have stated for the record that China is planning to build significantly more nuclear-powered missile submarines than previously assumed.

This would potentially put a bigger portion of China's nuclear arsenal out to sea, a risky proposition, and further deepen China's unfortunate status as the only nuclear-armed state party to the nuclear Non-Proliferation that is increasing it nuclear arsenal.

Su-27 Fighter Jets in Confrontation Training

Source: China Military Online (Date: April 28, 2015)

A Su-27 fighter jet takes off for confrontation training. An aviation regiment under the air force of the PLA Lanzhou Military Area Command organized its Su-27 fighter jets to

conduct confrontation training at a military airport on the snow-covered plateau, April 26, aiming to enhance its pilots' combat capabilities under complex weather conditions.

China's Pirate Patrol Submarine is too Noisy, say Naval Experts

Source: South China Morning Post (Date: May 3, 2015)

China's recent deployment of a nuclear submarine for an antipiracy mission in the Gulf of Aden may have caused unease among its neighbours, but naval experts say the Type 091 vessel is unlikely to pose any real threat because of the noise it generates.

The experts say the international community should instead keep an eye on China's quieter, more advanced diesel-driven submarines.

'Firepower-2015' trans-MAC Military Exercise Kicked Off

Source: China Military Online (Date: May 5, 2105)

The 'Firepower-2015, a trans-MAC military exercise for the artillery brigades of the Army of the Chinese PLA, was kicked off at the PLA Nanjing Artillery Institute on May 4, 2015.

The seven artillery brigades participating in the military exercise come respectively from the PLA's seven MACs. They will try to enhance their capabilities through the realistic military exercise, including reconnaissance, situational awareness, command, control, fast maneuvering, artillery strike, overall defense and comprehensive support.

Photos of PLA's J-11D Fighter Revealed on Internet

Source: WantChinaTimes (Taiwan) (Date: May 5, 2015)

Photos of the People's Liberation Army Air Force's upgraded D variant of the J-11 fighter, designed based on the Russian-built Su-27, have recently been revealed on the internet, according to the Beijing-based Sina Military Network.

The photos indicated the J-11D, with serial number D1101, had completed its maiden flight. The nose cone of the fighter is more level than its predecessors when inclined downwards at a 10-degree angle, according to one expert on his microblog. The nose conemay house an active electronically scanned array radar instead of the passive variant found in the older J-11B, according to a report from the Moscow-based Russia Today.

China, Russia Boost ties with Naval Drill in Mediterranean Sea

Source: Global Times (Date: May 7, 2015)

Military observers believe the first joint naval drill of Chinese and Russian naval forces in the Mediterranean Sea suggests the two countries' determination to further strengthen their military ties amid potential international conflicts.

Analysts also see the rare Mediterranean drill in mid-May as a sign that China is fully capable and prepared to protect its commercial interests where countries in the region, such as Libya and Syria, have witnessed escalating tensions.

Nation Starts Research on Naval Jet

Source: China Daily (Date: May 13, 2015)

China's aviation industry is working on the development of aircraft with short takeoff and vertical landing capabilities needed for an important role in the Chinese navy's future operations, military experts said.

"Research and development on components of STOVL aircraft, such as the engine, have started," Wang Ya'nan, deputy editor-in-chief of Aerospace Knowledge magazine, told China Daily.

"The aircraft's principles are not new. They have been known for more than 40 years, so our aircraft designers should be able to develop the plane on their own," Wang said.

China Sets Sights on Offshore Military Depots: Analysts

Source: South China Morning Post (Date: May 13, 2015)

China is expected to set up a network of offshore military supply depots in strategic ports to protect its national interests, according to military analysts.

While it was unlikely that those depots would become fully fledged military bases, Beijing did see the need for a stronger presence abroad as it rolled out its "One Belt, One Road" initiative, the analysts said.

"It's inevitable that more overseas supply ports will be set up in Africa and other strategic areas as China's national interests expand," Li Jie, a naval expert at the Chinese Naval Research Institute, said.

Snow Patrol Ensure Border Security

Source: China Tibet Online (Date: May 13, 2015)

Every year during the six-month snow period, Dingga Bolin Border Checkpoint troops and joint defense teams from the Tibet Ngari Public Security Border Defense, stationed at Burang [Purang] County in Tibet's Ngari Prefecture, brave the bitter cold and snow to patrol the mountain pass at an altitude of more than 4,000 meters.

Under their guard there hasn't been a single smuggling case for many years - the border is secure and stable.

Photo taken on May 8 shows that Dingga Bolin Border Checkpoint troops and joint defense teams from the Tibet's Ngari Public Security Border Defense patrol the mountain with dogs.

China to Establish Military-civil Interchangeable Mapping and Geo-info National Standard System

Source: China Military Online (Date: May 13, 2015)

National Administration of Surveying, Mapping and Geoinformation of China (NASG) and the PLA Information Engineering University signed four strategic cooperation agreements in Beijing on May 12, 2015.

In accordance with the agreements, the PLA and NASG will jointly push forward the establishment of a military-civil interchangeable national standard system for mapping and geographic information, marking China's military-civil in-depth integrative development strategy in the field of mapping and geographic information has been initiated in an all-round way.

Fang Fenghui, member of China's CMC and chief of general staff of the PLA, and Minister of Land and Resources Jiang Daming attended the signing ceremony and delivered speeches.

Expert: PLA Navy High Seas Exercises to be a Standard Practice

Source: People's Daily Online (Date: May 14, 2015)

Chinese and Russian naval forces on Monday launched joint naval drills in the southern Russian port city of Novorossiysk. Code-named 'Joint Sea 2015-I', this was the fourth set of exercises since joint China-Russia sea drills began in 2012.

"Both sides have dispatched their battle ships to take part in the exercise, which shows China and Russia have a deep mutual trust", military expert Yin Zhuo told CCTV in an interview. It will be a standard practice for China's navy to cruise on the high seas, he added.

Building of Military Bases Overseas a must for China: Duowei

Source: WantChinaTimes (Taiwan) (Date: May 16, 2015)

China's rapid rise as an economic and military power means it can no longer avoid permanently stationing troops overseas, says a commentary published by Duowei News, a US-based Chinese political news outlet.

On Monday, the Chinese foreign ministry appeared to have indirectly confirmed speculation that China would be establishing a military base in the tiny African country of Djibouti.

"China and Djibouti enjoy traditional friendship. Friendly cooperation between the two sides has achieved constant growth over recent years, with practical cooperation carried out in various fields," said foreign ministry spokesperson Hua Chunying.

Expert: Time still Needed for J-20 Fighter to be Operational Though Trial Flights are Ongoing

Source: People's Daily Online (Date: May 18, 2015)

The J-20 combat aircraft, a new generation of combat aircraft, is currently engaged in intensive trial flights. According to photos circulating online, a newly designed J-20 coded 2013 carried out a series of low altitude maneuvers that demonstrated its relatively advanced performance. Concerning the question of when the aircraft will be on active service, military expert Song Xinzhi said in a Beijing Television broadcast that J-20 is still using an prototype engine and it would be optimistic to expect it to come into service within one or two years.

Concept Art of China's 'Condor' High-altitude Drone Circulates Online

Source: WantChinaTimes (Taiwan) (Date: May 28, 2015)

A diagram charting the development of Chinese military aircraft has been making the rounds of online media publications in the country for some time, according to the military web portal of China's Global Times.

Many of the models shown on the diagram have since proven to be accurate, but one of the most mysterious aircraft shown on the diagram is the one labeled "high-altitude long-range anti-stealth drone."

In the book Ever Onwards-Aircraft: Design Expert Li Ming, published by Beijing-based Aviation Industry Press, appears the line, "At the same time as he was researching combat drone technology, Li Ming also pushed for cooperation with other countries on high-altitude anti-stealth drones, and the fruit of this cooperation was the 'Shendiao' or 'Condor' prototype developed by Unit 601."

Divine Eagle, China's Enormous Stealth Hunting Drone, Takes Shape: What a Big Bird

Date: May 28, 2015

The Divine Eagle is a low observable, high altitude UAV meant detect stealth aircraft at long ranges, using special purpose radars.

Photos have emerged of the Divine Eagle, perhaps China's most ambitious drone design. Planned to hunt stealth planes from afar, it could turn out to be not just the world's largest drone, but one of the most important to the future of war.

PLA Developing Submarines Powered by Lithium-ion Batteries

Source: ChinaWantTimes (Date: May 30, 2015)

China is experimenting with a lithium-ion battery propulsion system for submarines and aims to achieve results within the next five years, according to a report from Tokyo-based international news magazine the Diplomat.

Lithium-ion batteries offer much higher energy density and longer dive times than conventional diesel-powered submarines, which is why Chinese researchers see them as the "wave of the future," says Andrew Erickson, a professor at the Naval War College in Newport, Rhode Island.

The PLA Navy is discussing putting lithium-ion batteries "on a new generation of conventional subs sometime between now and 2020, but there is no indicator as yet of the type of submarine that might be," Erickson said.

The PLA's Type 095 nuclear submarine, for example, is likely to be on par with 1980s NATO nuclear-powered fast-attack submarines. One of the major structural weaknesses is said to be the lack of propulsion engineering because most engines used in Chinese subs are either based on imported foreign technology or built domestically under license.

PLA Could Blockade India with just 10 Submarines: Sina

Source: ChinaWantTimes (Date: June 3, 2015)

The People's Liberation Army Navy could block India's western and eastern coasts with just 10 submarines in the event of conflict in the Indian Ocean, according to the Sina Military Network website on June 2.

An article published last year claimed that a single attack submarine deployed to the Bay of Bengal or Arabian Sea could threaten the entire operations of the Indian Navy. It could even challenge the INS Vikramaditya, the former Russian aircraft carrier commissioned in 2013. This is a primary mission why India decided to build two additional carriers with the assistance of the United States, the piece said.

With the Indian Navy also adding more submarines to its fleet, the Sina Military Network concluded that the PLA's three Type 091 Han-class, four Type 093 Shang-class and two Type 095 attack submarines are not sufficient for a total blockade of the subcontinent.

Is China Making Authorized Knock-offs of Russian Radars?

Source: ChinaWantTimes (Date: June 4, 2015)

China could be manufacturing knock-offs of Russian radars for its warships to supplement authorized versions imported directly or produced under license arrangements, according to Russia's Military-Industrial Courier.

Citing data from the Stockholm International Peace Research Institute, the report said that between 2008 and 2014 China license-manufactured and imported a total of 18 Russian Mineral-ME Band Stand Type 344 Radars for the People's Liberation Army Navy's Type 054A frigate, with another seven for installation in its Type 052C and Type 052D destroyers. The Swedish experts believe, however, that as at the end of last year, China may have produced another three unauthorized versions of the radar.

It was also alleged that China may have produced a number of unlicensed Fregat radars for the Liaoning, the country's first and only aircraft carrier. China ordered a total of 21 such radars from Russia and had received 19 of them by the end of 2014.

Chinese General Luo Yuan Warns India Against 'New Trouble'

Agence France-Presse (Date: June 5, 2015)

An outspoken Chinese general known for his nationalist views warned India on Thursday against stirring up "new trouble" in a long-running border dispute, just as New Delhi's defence minister was set to visit Beijing.

"The Indian side should not provoke new problems and increase military deployment at the border areas and stir up new trouble," Major General Luo Yuan told reporters.

Luo, the deputy-director general of the world military research department at a People's

Liberation Army academy, described himself at a briefing as a "reasonable hardliner".

..."India is the only country in the world that says that it is developing its military power because of China's military threat," said Luo, who was wearing a business suit. "So I believe that India should be very cautious in what it does and what it says."

PLA VTOL Fighter could Turn Reefs into 'Unsinkable Carriers'

Source: ChinaWantTimes (Date: June 6, 2015)

China is planning to continue developing its short-range vertical take-off and landing (VTOL) fighter, according to Russian state-owned news agency Sputnik International, cited by the military news web portal of China's state-run Reference News.

Given the cost of the project, there is seemingly an important strategic decision behind it, according to the report.

Vasily Kashin, a researcher with the Moscow-based non-governmental research organization the Center for Analysis of Strategies and Technologies, said that the aircraft will be mainly used for maritime combat.

Theoretically the fighter could be used in areas without airports, including difficult and mountainous terrain, according to the report. The Soviet Union tried to use vehicle-towed platforms to allow its VTOL Yakovlev Yak-38 strike fighter to operate in Afghanistan in the 1980s. However, in mountainous regions the aircraft's lift jets were ineffective, so such a large aircraft found vertical take-off difficult, according to the website.

PLA's MIRV-equipped Missiles may Pose Threat to US

Source: ChinaWantTimes (Date: June 6, 2015)

As China's missile defense technology develops, the country's anti-ballistic technology has seen a parallel rise, according to Sina's military news web portal.

In the Cold War era the US and Russia armed their anti-ballistic missiles with nuclear warheads. The US Sentinel Program and the Soviet A-35 system were the biggest profile anti-ballistic missile systems of the time. Although these two systems could theoretically intercept ballistic missiles, the nuclear warheads would explode over their home territory at a high altitude, leading to irreparable damage.

PLA Navy Conducts Coordinated Training in West Pacific

Source: China Military Online (Date: June 10, 2015)

The aviation force of the Chinese PLA Navy sent its aircraft on June 10 to the airspace over the sea area in east of the Bashi Channel, West Pacific Ocean, to conduct a coordinated training exercise with a Chinese naval taskforce cruising in that sea area, Chinese Navy Spokesperson Liang Yang said.

The expected goals have been achieved through the training exercise, according to Liang Yang.

Liang Yang pointed out that the PLA Navy's training exercise in the West Pacific Ocean is a routine arrangement of its annual training plan, which is not aimed at any specific country/region or target and complies with relevant international laws and practices. The training exercise hasn't affected the freedom of navigation and flight in relevant sea area and airspace, Liang added.

Latest Test of Hypersonic Vehicle Designed to Reinforce China's Nuclear Deterrent, say Experts

Source: ChinaWantTimes (Date: June 13, 2015)

The defence ministry on Friday confirmed it had tested a supersonic nuclear delivery vehicle in a move the United States has called an "extreme manoeuvre" amid tensions in the South China Sea.

Last Sunday's launch of the hypersonic glide vehicle - which the US has dubbed the "Wu-14" - was the People Liberation Army's fourth test of the weapon in 18 months.

"The scheduled scientific research and experiments in our territory is normal, and those tests are not targeted at any country and specific goals," the ministry said in response to the South China Morning Post's query.

But military observers said the frequency of the tests showed Beijing was reinforcing its nuclear deterrent in response to Washington's continued interference in China's territorial disputes in the region.

China's Air Force J-11 Fighters Conduct Remote Strikes Training in Plateau

Source: Xinhua (Date: June 18, 2015)

New Rules mean Ships can be used by Military

Source: China Daily (Date: June 18, 2015)

The country has approved a set of technical guidelines that require all civilian shipbuilders to ensure that their new vessels are suitable for military use in an emergency, the China Classification Society has revealed.

The Technical Standards for New Civilian Ships to Implement National Defense Requirements cover five categories of vessels - container, roll-on/roll-off, multipurpose, bulk carrier and break bulk. They establish specifications and design requirements that will mean vessels can serve national defense needs if they are mobilized, the society said in a statement.

The document is the result of a five-year joint effort by the society's Shanghai Specifications Institute and ship experts from the People's Liberation Army's Nanjing Military Command, and has been ratified as a national military standard.

China Seeks Well-educated Students for Army

Source: Xinhua (Date: June 19, 2015)

Priority will be given to better-educated young people in army recruitment, according to a national conscription tele-conference.

A recruitment website, gfbzb.gov.cn, run by the Ministry of National Defense, is open for applications, with recruitment procedures including body check-ups beginning on Aug. 1 until Sept.30.

Young people aged between 18 to 22 can apply to join the military, with the maximum recruitment age for college graduates extended to 24.

The army also welcomes high school graduates aged 17 or above.

New Missiles to be Introduced to Chinese Submarines

Source: ChinaWantTimes (Date: June 27, 2015)

The People's Liberation Army Navy has been developing new missiles for its newly developed submarines, according to Moscow-based Military Parade in a June 25 report.

The PLA Navy currently uses Type 093 Shang-class nuclear-powered attack submarines and

Type 039A Yuan-class and Type 039 Song-class diesel-electric submarines. These vessels are all currently equipped with YJ-82 cruise missiles. The YJ-82 is set to be replaced by the SS-N-13, however, which has an operational range of 222 kilometers, according to the website.

China is currently carrying out tests on its Type 096 Tang-class ballistic missile submarine. JL-3 submarine-launched ballistic missiles are also being tested and will likely replace the JL-2 missile. Equipped with a multiple independently targetable reentry vehicle, the JL-2 can carry between three and four warheads. It is estimated to have an attack range of 7,400 kilometers.

Hard Choices

Hillary Rodham Clinton

Simon & Schuster India, New Delhi,
pp. 635, ₹ 999

This book is an autobiographical account of Hillary Rodham Clinton as the Secretary of State during the first tenure of the Obama Presidency. It is divided into six parts; Part One; covers aspect related to assuming office. Part Two; is on Asia to include China, India, Burma. Part Three; focuses on Afghanistan and Pakistan. Part Four; deals with Europe, Russia, Latin America and Africa. Part Five covers the contentious Middle East. Part Six; dwells on the long term issues like –Climate Change, Human Rights and Energy and Jobs as also on the Haiti disaster and its development.

On the very first page in the Author's Note, Hillary Clinton gives a glimpse of her character. When she chose to leave a career as a young lawyer to marry Bill Clinton and start a family, she was confronted by the question "Are you out of your mind?" She was to later face the same question when she took up health care reform as First Lady, ran for Presidency herself and after losing the primaries to Obama, accepted his offer to be the Secretary of State. She states that in making these decisions she "listened to both my heart and my head."

On taking over the post of Secretary of State she received advice from former Secretaries and others recommending not trying to do "everything at once" to another suggesting to "pick a few big issues and own them". The changed world would demand of her to "pay attention to the whole chess board".

The Chapter 2 and 3 deals with Asia: The Pivot and China: Unchartered Waters. The Obama administration had come to believe that the US had to do more to help 'shape the future of Asia and manage its increasingly complex relationship with China.' While the US too has a system of career Foreign Service officers there is no constrain in employing specialists for any task. Hillary Clinton did pick such experts for formalising its strategy to pivot to Asia. Despite some day-to-day differences with India, she opined that "the strategic fundamentals of our relationships with India – shared values, economic imperatives, and diplomatic priorities – were pushing both countries' interests into closer convergence". The major goal of the US strategy in Asia was to promote political reform and economic growth. With regard to China, she observed that it had gone past the wise counsel of Deng Xiaoping of "hide and bide" where an ascendant and assertive China was no longer hiding its resources and enhanced military capabilities, but it was now "show and tell". Its most dramatic assertiveness was at sea. The declaration of "air defence identification areas" over much of East China Sea was a move that could boil over any time.

The Chapter on Burma (yes Burma and not Myanmar) deals with the fundamental change in the policy that she felt was needed. The lifting of sanctions and giving a chance to democracy even in its most rudiment form was the thrust. The visit of the president and the meetings with Aung San Suu Kyi were well described. Af-Pak and Afghanistan make interesting reading. Dealing with Pakistan over a range of issues like – the vital logistical support moving through Pakistan to Afghanistan, drones targeting Taliban in Pakistan and collateral damages, military aid to Pakistan, bracing the back lash post the raid to eliminate Osama bin Laden – all these are what she had to confront when dealing with the Pakistanis. The surge to the drawn down in Afghanistan has been covered too. That America continues to be engaged in the "hardest places with the toughest challenges around the world" is a fact. One may wonder what would be the situation in these difficult zones if no one ventures to take charge.

The super powers involvement in every situation in Europe from Kosovo to Turkey to NATO, to the Balkans, Northern Ireland brings out that the world expects someone to take charge. I would say that Russia and China do not measure up due to ideological constraints – an ideology which is not at all inspirational nor acceptable to all. The Chapter on Russia the Author surmises that Russia wants to reassert its power by dominating its neighbours and controlling energy. Russia's intervention in Ukraine has the world watching of how it plays out with America and NATO watching closely the developments.

The Chapter on Latin America covers the development of American relationships in this region where the Drug Mafias ruled the roost. Dealing with Venezuela, Honduras, Mexico and Cuba reveal interesting facets of US Foreign Policy. Similarly the Chapter on Africa explains the efforts in controlling the guns and trying to get the leaders to concentrate on growth. The Middle East, the southern rim of the Mediterranean, Gaza, Syria, Iraq, and Yemen remains the most unstable and volatile region on the Planet. The diplomatic effort involved in getting China and Russia to agree to sanctions against Iran is an important lesson in understanding super power clout. In the last Part the issues of Climate Change and Human Rights being imposed and monitored again bring out the power wielded by a super power. An interesting episode is narrated where in the heads of India, China, Brazil, and South Africa were holding a secret meeting and Obama and Hillary Clinton surprised them by locating them and forcing their way in and preventing these leaders from scuttling the talks at Copenhagen.

Overall the book is highly readable. What emerges is the spectrum of issues where US as a super power gets involved in. How it protects its interests and values of individual freedom, democracy and human rights. President Obama emerges as a good leader; he inviting Hillary to join his government in the important post of Secretary of State was a sign of his self-confidence. He comes across as being decisive, responsible, protects his team and gave his Secretary of State adequate space to function independently. He also offered the post to her on his re-election. The most intriguing was to understand the inner functioning's of a super power; using enticement, coercion, rewards for compliance, squeezing and crippling through sanctions or threatening use of military force. These were all the strategic instruments deployed to achieve its ends. One can safely conclude that Americas' place as the world's sole super power will remain unchallenged well into the next century.

—Lt Gen JS Bajwa

LEAP ACROSS MEGHNA:
Blitzkrieg of IV Corps 1971

Brig Onkar S Goraya

Chandigarh Creative Crows Publishers,

pp. 214, ₹ 350

The essence of brilliance in wars and battles is mental mobility and physical and psychological agility. This essentially encapsulates what Brigadier Onkar S Goraya has successfully achieved in his second book – "Leap Across Meghna – Blitzkrieg of IV Corps 1971". The book brings out yet another facet of how the Indian Military, especially the army, achieved a great victory in the 1971 War with Pakistan, which also resulted in the emergence of a new nation.

The Indian Army has always been wedded to "set-piece operations" and I dare say so is the Pakistani Army, maybe on account of what both had inherited from the British. However, during the 1971 India-Pakistan War, while the Indian Army changed rapidly and adopted 'mobility' in all its forms as the 'mantra' for winning, the Pakistani Army remained wedded to their erstwhile teachings and lost everything to the mentally and psychologically agile Indian Army. The results are well known. Unfortunately, this major change did not happen in all corps zones. However, in the IV Corps Zone, under the dynamic leadership of General Sagat Singh and ably supported by an equally dynamic Air Commodore Chandan Singh of the Indian Air Force, rapid success became a buzz word.

This is the story that Brigadier Goraya has so skillfully woven in this splendid and highly readable book. That many books have already been written by both sides on this highly successful war from the viewpoint of India, should not be a distraction, because for professionals the more narratives about wars and battles that are written the better. The reason is simple; every book highlights new issues and adds to our knowledge. When a book is as well written as this one, the value is even greater.

Briefly, this book is about how East Pakistan was transformed to Bangladesh by the Indian Military, supported in good measure by the valiant freedom fighters of Bangladesh and especially the officers and soldiers of a hastily assembled force called the Mukti Bahini. It had developed from a rag-tag but brave group of volunteers in a very short time and had fought shoulder to shoulder with the well-trained Indian Military.

Brigadier Goraya, the author of this book, was a young major holding an important appointment –Brigade Major (BM) of the Artillery Brigade of one of the leading divisions of IV Corps. In that appointment he had access, not only to plans of the division, but also those of higher and flanking formations. In addition, he was well placed to know of the advancing units and formations, as he was coordinating the provision of vital artillery support to them. It is these aspects, coupled with his eye for detail and professional ability of a high order that have enabled him to produce a narrative that not only makes for a good story but also one that is militarily authentic.

Perhaps the biggest quality of this book is that although it deals with all aspects of violence in battle, it is tempered with compassion in victory. The latter is usually talked about but rarely practiced. It is to the credit of the Indian Military that in the lightening campaign in the then East Pakistan it did just that. The result was that the global image of India as a laid-back, backward and dithering nation changed overnight. Unfortunately, in the years and decades following this outstanding victory won by the force of arms, the nation reverted back to its 'chalta hai' attitudes, which have been its bane!

It is leadership from the highest in the country to the raw courage of our jawans and officers that brought about this massive change that was applauded by the world. The pity is that the same outstanding war leader –Indira Gandhi, squandered the gains within a few months by listening to inept advisers and keeping the military out of the policy formulation loop. Instead of exploiting the military victory to reshape the regional security environment, our nation reverted to 'business as usual' and failed in solving the major strategic issues besetting the country. This is a major lesson for our political leaders. They must exploit opportunities handed over to them by various instruments of the state - like the military.

The author has divided the book in to 16 chapters, which deal with a particular episode or operation, like the heli-lift to Sylhet or the race to Dacca. The book can also be sub-divided into four larger parts. The first four chapters set the stage, as they deal with the background and preliminary operations. Thereafter, the second part deals with the actual military operations, essentially of IV Corps, but covering operations of flanking formations too, which contribute to the understanding of the overall campaign.

Part III, comprising Chapters 12 to 14, deal with post-operation activities, including the remarkable 'Surrender' by the Pakistani forces, as also a glimpse of spontaneous bursts of joy by the populace. There were some tense moments at Dacca during those fateful days as the long-suffering Bengali populace was bent on taking revenge. It was only the alertness and quick handling by the very small number of Indian soldiers that saved the lives of the Pakistani prisoners.

The last two chapters are both analytical and reflective as they sum up the mistakes and achievements of the Pakistani and Indian militaries. These two chapters should appeal to those who may not be interested in the mechanics of battles and larger operations, but do want to know about policy; strategic; and politico-military issues; at higher levels of planning and execution.

The book also has four explanatory annexure at the end and is illustrated with a large number of maps, sketches and photographs. The photographs however could have been larger as also the titles could have had bigger fonts.

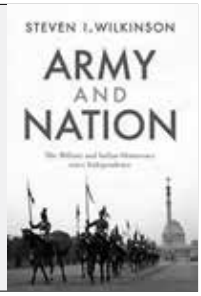
The reason why this book will have a special place amongst the available literature on the 1971 India – Pakistan War in the eastern front is its ability to fuse tactical operations with operational art levels of war seamlessly, while still reminding the reader that the ultimate strategic objective of the war was never lost sight of by the military leaders of India, especially by the GOC of IV Corps, General Sagat Singh, who was without doubt the best field commander of the War.

—Lt Gen Vijay Oberoi

Army and Nation/The Military and Indian Democracy Since Independence

Steven I Wilkinson

Permanent Black, pp. 304, ₹ 795



Why has India never had military rule?

After all, India and Pakistan inherited the same colonial Army, steeped in British traditions. Yet Pakistan has had three long stints of military rule, and several unsuccessful coup attempts, since Independence. India has had none.

Dr Steven Wilkinson's book –Army and Nation- fills that gap brilliantly and comprehensively. Backed by extensive research, Wilkinson begins with a fascinating deep dive into India's colonial military structure. Post the Mutiny of 1857, the British attempted to recruit what they described as the 'Martial castes', mostly the Punjabis and Sikhs, while ensuring that such a mutiny did not recur.

Indian nationalists protested, noting that taxes from across the nation were being used to fund an army which was predominantly from one region of the country. Concerns about the political threat posed by such a 'mercenary force' to a possible democracy were also raised. The Congress Party tabled several detailed policy proposals on military reforms way back in the 1930s, which were to come in handy post independence.

World War II led to a huge conscription drive across India, but Wilkinson, through extensive use of data, shows that this did not impact the composition of the frontline troops. The new recruits from the 'non-martial castes' were mostly assigned to auxiliary administrative and technical services and roles. Post partition, almost all the Muslim officers and other ranks moved to Pakistan.

India's first Congress government led by Prime Minister Jawaharlal Nehru tried to reshape the military to reflect India's diverse population. But the prohibitive cost, both economic and in military terms, put paid to that plan. Raising new units would cost money which Nehru wanted to spend on other social schemes. So instead, the Congress party devised several other methods to pre-empt any coup attempts. These included degrading the army's institutional autonomy, keeping a close tab on all senior officers, serving and retired, and discouraging co-ordination among them. Nehru's decision to convert Teen Murti Bhavan, originally known as 'Flagstaff House' and the residence of theCommander-in-Chief of the British Forces in India, into his personal residence was symbolic of this. Nehru limited the tenures of most senior generals, and packed some of them off on extended diplomatic postings post retirement. But all this had other dangerous implications, which perhaps Nehru had not anticipated. 'The intelligence services still kept tabs on the most senior officers and kept them well away from positions of political influence,' says Wilkinson.

His close confidante and defence minister, Krishna Menon's 'bullying and interference in military decision making .and military's internal hierarchy and organization—for instance by cultivating his own links with favourite officers and encouraging juniors to inform on seniors—was deeply destructive,' says Wilkinson. 'Krishna Menon had in fact superseded, bullied and marginalised several of the army's most capable officers, and this and his control over access to Nehru had weakened the army's ability to respond to threats, communicate with politicians about military realities, and protect the country,' he says. This is precisely what happened in 1962.

The defeat in that brief border war with China led to a 'blank cheque' for the modernisation of the Indian Army. A massive recruitment drive followed, alongside feverish attempts to upgrade weapons and other equipment. But fears of a military putsch ensured that the political checks and balances remained. Another step was to introduce new recruitment streams and various officer training academies, which prevented the bonds that could form if all officers were from a single institution.

At the same time, it was decided to ramp up the paramilitary forces, ostensibly to keep the army free for external threats, but also as a possible hedge, since these forces had a totally different command and control structure. Wilkinson then lauds the army for remaining apolitical 'before, during and after' the declaration of Emergency by Indira Gandhi in June 1975 as a 'major achievement.'

Then came the rise of Sikh militancy in the state, and the mutinies among some Sikh regiments after the Indian Army stormed the Golden Temple during Operation Bluestar in June 1984, followed by the continuing insurgency in Kashmir and in the northeast. The government responded by trying to form mixed infantry battalions drawing on different ethnic groups. But 'this effort ultimately failed because of worries about their military effectiveness compared to the traditional format,' Wilkinson contends.

Continuing political fears of a powerful military, however, has led to a very cumbersome command and control structure, which hinders military effectiveness in times of crisis and strategic development and thinking. This also explains the government's reluctance to appoint a Chief of Defence Staff.

So far, the military top brass has resisted the growing regional demands for representation, including repeated attempts to impose a reservation based on caste or religion. While the 'Sachar Committee's 2006 attempt to highlight the issue of low Muslim recruitment in the army was beaten back on the grounds that it was an attempt to 'communalise' the army…there are indications that the army's autonomy over recruitment is likely lessen in the years ahead.'

Wilkinson concludes with a few lessons that he has drawn while researching for this truly informative and painstakingly documented work. One, that timing is everything when it comes to civilian military control systems. Reforms that might have worked in the 1950s in Pakistan were too late by the 1970s. Two, hedging, both within the military and by inducting paramilitary forces, as well as opening up multiple routes to the officer corps, are effective ways to 'coup proof' a nation.

India and its leaders made a lot of good decisions in the first decade after independence, 'although it is important not to credit Nehru with too much in the way of flawless judgement and foresight,' warns Wilkinson.

He then quotes from Arming without Aiming, by Stephen Cohen and Sunil Dasgupta: "the price of extraordinary civilian control of the military in India is military and strategic inefficiency." Is that a trade off we can live with today?

—Ramananda Sengupta