Contents

FROM THE EDITOR
• DOKLAM: INDIA AT AN INFLECTION POINT IN ITS QUEST FOR REGIONAL/GLOBAL POWER STATUS

INDIAN DEFENCE REVIEW COMMENT
• DIRECTED ENERGY WEAPONS: Game Changer Or A Damp Squib?
  Gp Capt Joseph Noronha

ADVANCES IN TECHNOLOGY: Battlefield Helicopters
Gp Capt AK Sachdev

SPACE: THE FORCE MULTIPLIER FOR AIR POWER
Air Marshal Anil Chopra

MIG-35, F-16, GRIPEN OR BETTER CHOICE?
Sumit Walia

LOOK LONG, LOOK DEEP
China’s Airborne Warning and Control Systems
Gp Capt Ravinder Singh Chhatwal

OUR ARMED FORCES: Do We Take Them Seriously?
Sanjiv Khanna

CHINA’S ‘CONTENTIOUS’ PATH TO WAR?
Anant Mishra

BALANCING POLITICS AND POWER
Prognosis of China’s Military Build-up
Lt Gen Gautam Banerjee

EMBRACE THE FUTURE OF KASHMIR
Lt Gen Subrata Saha

RESURGENCE OF ULFA (I) IN ASSAM: Implications for Internal Security
Indrajit Sharma & Dr N Mohandas Singh

NAVAL COMBAT SYSTEMS: Evolution and Future Perspectives
Cmde Arun Kumar

AEROSPACE AND DEFENCE NEWS
Priya Tyagi

DEEPPENING INDIA-ISRAEL TIES
Changing Landscape of the Indian Defence Sector
Ketan Salhotra

INDO-ISRAEL RELATIONS: Make with India
Tamir Eshel

STRATEGIC PARTNERSHIP WITH PRIVATE PLAYERS: An Overview
Danvir Singh

PAX BRITANNICA WHITTELED DOWN TO AN ISLAND KINGDOM
(Intrigues that Built an Empire: Intrigued by Wheels of History)
Lt Gen PG Kamath

NORTH KOREA – A DELINQUENT STATE?
Air Marshal Dhiraj Kukreja

THE OFFSET POLICY- A DECADE IN RETROSPECT
Dr SN Misra

PAKISTAN FOR BALOCHISTAN, NOT BALOCHIS
RSN Singh

ARMY’S BATTLEFIELD SUPPORT SYSTEM
Fielding Initially Planned by 2017 could take Another Decade
Lt Gen Prakash Katoch

CHINA HAS DONE INDIA A FAVOR
Dr Amarjit Singh

SHEKATKAR COMMITTEE REPORT
Genuine ‘Reforms’ or Cosmetic ‘Re-grouping’?
Gp Capt TP Srivastava

WHO MADE NORTH KOREA A NUCLEAR POWER? DR A.Q. KHAN?
Sumit Walia
Maritime forces from India, Japan, and the United States completed Exercise Malabar 2017, in the Bay of Bengal from 10-17 July 2017. Exercise Malabar began in 1992 and this year marks the 21st rendition of the exercise. The objectives of Malabar 2017 were to improve interoperability between the U.S., Indian and Japanese maritime forces, provide an opportunity to conduct engagements with India and Japan, and demonstrate U.S. naval presence in the Indo-Asia-Pacific region.
WHEN A NATION FEELS SECURE IT SHOWS
DOKLAM
India at an Inflection Point in its Quest for Regional/Global Power Status

Doklam, was an innocuous and routine local initiative by the troops on ground. The commander there felt the need to ensure that the existing Agreements and Treaties between India and China are abided by in letter and spirit. The Chinese road makers were stoutly confronted by this courageous sub-unit of soldiers who stood up to stop any construction in the territory that belonged to Bhutan – despite the Chinese vehemently continuing to claim otherwise. This uncomplicated straightforward military stance taken by India troops has acquired such import that it now signals to the region and the world of the time when India transcends into the realm of a “great power” to be reckoned with.

What India has done displays the Governments ‘steely’ WILL to pursue what it believes and knows is right. Diplomacy, under the sterling leadership of the Minister, has been forthright and firm. Her iteration in the Lok Sabha adequately indicates the sagacity of the government’s actions:

“War is not a solution to anything. Even after war, there has to be a dialogue. So, have dialogue without a war... Patience, control on comments and diplomacy can resolve problems,” the minister said. “If patience is lost, there can be provocation on the other side. We will keep patience to resolve the issue, we will keep engaging with China to resolve the dispute.”

The Chinese, on their part, have let loose a vitriolic diatribe through their state controlled media showing themselves in poor light. The world has been watching and all of China’s neighbours and supporters around the world must have concluded that in future they should not expect a fair deal from a ‘rising China’ which is given to such vituperative bluster. It is unworthy to even bother or recount the didactic statements made in the process and that too in the most patronizing tones. In fact, these could be compiled to illustrate the poorest examples of diplomacy and conduct of international relations at all institutions and universities highlighting this aspect of how diplomacy should NEVER be conducted by mature nations.

India’s maturity stood out in that it did not choose to reciprocate under the Hammurabi principle of ‘an eye for an eye’ to what was being churned out daily in the Chinese media and by the statements of the spokespersons of the Ministries of Defence and Foreign Affairs. It stood firm on the ground for dialogue.

China has been aggressively persistent in its efforts to make strategic inroads in India’s immediate neighbourhood, resulting in India being left with a constricted space to exercise its influence.

China’s needling continued by provocative intrusions in Barahoti in Uttrakhand sector and Pangong Tso in Ladakh sector. It has even raised a bogus dispute with regard to the western tri-junction of India-Tibet-Nepal. In fact, China contends all tri-junctions along India’s northern boundary: India-Tibet-Myanmar in the Lohit sector of Arunachal Pradesh; Eastern tri-junction of India-Tibet-Bhutan in the Tawang sector; Batang La in the Eastern Sikkim (Doklam); Finger in North Sikkim not far from the Eastern
Capacity and capability building do not, by themselves, constitute a tangible threat. Judging the ‘intentions’ of a nation gives the necessary fillip to any notion of a threat. From the above, China’s intentions do indicate a ‘real threat’ to the sovereignty and territorial integrity of India.

It would be appropriate to say here that the Indian policy of ‘Act East’ has been given flesh by India coming to the aid of Bhutan in Doklam. Earlier, Indian diplomacy had compelled Sri Lanka to modify the terms of its lease of the Hambantota Port with China. However, rash statements by China that if India can come to the aid of Bhutan in Doklam, China can also come to the aid of Pakistan in Kashmir cannot be dismissed as a casual analogy. In the first instance the whole of Jammu Kashmir and Ladakh is Indian territory and China needs to clear its mistaken notion of it being Pakistani territory. Pakistan, through armed action by irregulars, had come to illegally control a portion of Jammu, Kashmir and Ladakh which does not make it Pakistani territory. China Pakistan Economic Corridor passing through the Gilgit-Baltistan region of Jammu, Kashmir and Ladakh is a violation of Indian sovereignty. So any intervention to assist Pakistan in Jammu Kashmir and Ladakh will be a direct assault on India’s sovereignty.

China has been aggressively persistent in its efforts to make strategic inroads in India’s immediate neighbourhood, resulting in India being left with a constricted space to exercise its influence. On the other hand, India has seemingly displayed casualness or may be reticence in doing the same in China’s immediate neighbourhood. This reticence, arguably, stemmed from the lack of confidence in India’s own abilities and India’s obsessive and at times, it’s overly debilitating focus on domestic politics. It is also true that often the smaller countries play ‘hard to get’ to extract the most out of these two large countries contenting for influence. Creditably, today it is the same crop of diplomats doing a stupendous job in building India’s image as a staunch ally in the region. Probably it just required political will, vision and strong leadership at the helm to bring about this transformation.

There is a widespread belief in the ‘think-tank’ circles that there has been a global power shift, as long anticipated. China has managed its relationship with the other global power (US of A) through deft jugglery of managing competition and co-dependence. At the same time it seemingly is creating a new world order through initiatives like the Asian Infrastructure Investment Bank and OBOR etc. The “Middle Kingdom” syndrome of Chinese centricity is now manifesting in its behaviour. China looks at the world going back to the period of economic predominance as it existed prior to the exploitation of the ‘planet’ by the colonial powers. But, despite successive dynasties’ efforts to write pacifism and “virtue” into China’s foreign relations, China has often - especially during times of military and political dominance over neighbouring states - behaved in ways that belie its pacifist self-image.

It is worth noting the emergence in recent years of an active discourse of exceptionalism among Chinese policy elite. Invocations of China’s “difference” and “singularity” (to use Kissinger’s term) are presented as exclusive methods/concepts under the banner of “with Chinese characteristics”. China claims that it will not seek, as so many other modern great powers have, to remake the status quo in its own favour. China, they contend, is an exception to the modern international rule that as great powers rise, those that invariably seek to impose their will on the international system, as well as on the individual states that compose it.

National strategy entails an understanding of the nuanced application of elements of national power and that is the hallmark of a great power. Juggling with the need for appropriate deployment of ‘soft’ and ‘hard’ power and/or a combination thereof, to secure a nation’s interest are the strategic games governments play. Diplomacy not backed by hard power will invariably mean that the only fallback option is likely to be an unrequited compromise that is forced upon the weaker nation. But diplomacy backed by hard power has a...
greater chance of securing a solution which furthers the national interest. This formula has been evident in the Doklam episode. China has continued to insist that Doklam is Chinese territory, despite Bhutan emphatically stating that the territory belongs to Bhutan. As a matter of fact by their claim China has willy-nilly increased the length of the LAC by around 20 km (Batang La- Gamochen) and that is a major alteration of the status quo. In fact when a Joint Working Group was set up post 1988 visit of the then Indian Prime Minister to China, both sides accepted and identified eight “disputed areas”. Since then due to the People’s Liberation Army’s aggressive patrolling virtually the whole LAC is being disputed!! If both sides start to consider their claims as final irrespective of the others claims then the situation spirals into a confrontation. China has displayed this unsavoury irredentist propensity too often.

Von Clausewitz had propounded that ‘war is an extension of government policy’. Therefore, war is not simply a clash of two opposing militaries! It is two nations at war. War is as much directed at the mind of the government in power. China has, through its media, generated such hype in the population that, allegedly, some passengers on a Chinese airlines flight from the American continent through Shanghai to India were mistreated and hassled by the Chinese cabin crew during its routine halt at Shanghai. On the Indian side there is an undercurrent amongst the people to boycott Chinese goods and is being done in a big way. A nation at war means more than placard or flag waving crowds on the streets or even fiery debates on television. War strains every sinew of the fabric of a nation. Modern wars start well before the first bullet is fired on the borders. There is therefore the need to activate all such agencies and departments that contribute to the protection of the country both externally and internally. Signs of this activation are not evident. Political one-up-man-ship as indulged by opposition parties and enacted for consumption by domestic audiences is a sign of their abject strategic immaturity. Such groups/parties can be exploited by inimical forces to subvert the WILL of the nation.

What is it that has today positioned India at an inflexion point in its quest for global/regional power status? First, Doklam has brought India and China under the blinding arc lights as regional competitors. Second,
China, the regional hegemon, is meeting a stern unexpected challenge right on its periphery. Third, it has brought forth that historical claims and one sided treaties have only that much cognisance vis-à-vis current agreements and treaties which have been formalised by dialogue. So if China stakes its claim on Arunachal based on the argument that it did not sign or ratify the Shimla Agreement of 1914, then by that very analogy neither did Tibet, Sikkim nor Bhutan (the latter two were not directly under the British rule) sign or endorse the 1890 Anglo-Chinese Treaty. Fourth, the impasse at Doklam has gone on for over 70 days, it is testing the country’s political resolve and ability to continue all other functions of governance as normal. Fifth, there is a realignment of allies and supporters for either side.

The available options to resolve the issue arising from the Doklam impasse need to be weighed and its implications assessed. First, that India is not buckling to Chinese pressure is as important for India as the need to ‘save face’ is for China. Therefore it is essential that both governments continue indirect dialogue on the sidelines of other forums and simultaneously China tones down its undiplomatic tirade against India in its media. Coupled with these moves it must be ensured that there is no change forced on ground by the troops of either side. Second, if China activates sectors in Arunachal Pradesh, Uttarakhand and/or Ladakh, India will be forced to reciprocate in equal measure. In such a situation there is a greater chance of an escalation spiralling into a shooting skirmish or even war. Third, both countries agree to disengage and move back to their original positions as existed before 15 June 2017. It is hoped that such a proposal comes about post the two leaders meeting on the sidelines of BRICS Summit in early September 2017 or may be forced on by onset of heavy snowfall in mid winter. Post winter, having learnt a lesson in 1986 from the Sumdrong Chu instance, the situation is likely to be revert to an impasse if a diplomatic dialogue fails. Fourth, both sides agree to stop all patrolling activity for one year so as to refrain from creating new areas of dispute. Having started with eight mutually agreed disputed areas after 1988 when the Joint Working groups were set up and began meetings, these have multiplied manifold, probably, due to failure of dialogue!! It would be prudent to start discussions on all the tri-junctions on the India-China boundary to pre-empt China’s next move.

India has learnt very bitter lessons from the 1962 war. In a war today neither side will win. It will be seen as an ill-considered rash action and failure of the leadership as neither will have secured anything towards their country’s national interest. Internally the countries will be weakened giving room to fissiparous tendencies to further weaken the fabric of the country. The militaries and the economies of both the countries will be seriously battered and mauled.

So it is evident that if India buckles under pressure, it will, for a long time to come, become a subordinate power in the Asian Region and will have no place on the global arena. On the other hand, China will emerge as the dominant power, a regional hegemon feared by its smaller neighbours and straining at the leash to brandish its power on the global stage and change the world order in a hurry. China needs to remember that by it being a power does not, by default, make the others ‘powerless’!!

Alternatively, if the Doklam issue is resolved amicably without resorting to military force, the stock of both nations will rise regionally and globally. It will pave the way for dialogue to negotiate and resolve the long pending boundary dispute.

India is, thus, at a crucial ‘inflection point’ in its onward march into the future.

**NB.** As the Indian Defence Review goes to print, the Doklam issue has been amicably resolved wherein troops of both sides reverted to their pre 15 June 2017 positions. It led to the Government announcing that the Indian Prime Minister would be attending the BRICS Summit in Xiamen, China from 3-5 September 2017. However, issues brought out in the editorial remain relevant and India needs to stay on course.
After the Chinese invented gunpowder in the ninth century, warfare progressively came to be characterised almost exclusively by explosive weapons. Today, no forceful military action is even conceivable without guns, rockets, bombs, missiles, mines, torpedoes and the like. However, dramatic change may be around the corner in the shape of Directed Energy Weapons (DEW). These non-explosive devices use some of the commonest forms of energy such as light and microwaves to achieve destructive or lethal results. Unlike most kinetic energy weapons, these can be fired with pinpoint accuracy and can also be quickly scaled from the non-lethal to the lethal and achieve effects that vary from merely blinding a surveillance camera or incapacitating a person to disabling the engine of a truck or even blasting an aircraft or missile out of the sky.

DEWs are devices that emit highly focused energy such as laser, microwave, electromagnetic radiation, radio waves, sound or particle beams. However, particle-beam weapons are not true DEWs because they use micro-projectiles rather than pure energy. Of these, low-power lasers have been used for many years to guide kinetic weapons to their targets, but High-Power Lasers (HPL) have now emerged from the pages of science fiction to be employed as destructive weapons themselves. Together with high-power microwaves, HPLs have the greatest promise as weapons of war. And it is no coincidence that the United States (US), which has always depended on advanced technology to win war, is in the forefront of DEW research.

Military Edge
Every nation seeks to remain ahead of its adversaries by deploying numerically larger and technologically superior forces. If the US is the world’s dominant superpower, it is due in large measure to its relentless emphasis on research and development into weaponry. For the last few decades, it has reigned unchallenged thanks to its precision strike capability and its use of space based assets for military operations. If US forces needed to drop one thousand bombs to neutralise a certain type of target in the Second World War, they required perhaps a hundred in the Vietnam War and ten by the time of the 1991 Gulf War. Today, the job can be done by just one Air-Launched Cruise Missile (ALCM) or Precision Guided Munitions (PGM) with a high level of assurance of achieving the desired result.

But now the US is not alone as many other countries have such capability. Russia even claims to have developed a hypersonic missile, so fast that practically, it cannot be targeted or intercepted. That is why technologists are investigating new routes to military superiority, including hypersonic missiles, hypersonic rail guns and DEW. All three technologies improve the attacker’s ability to penetrate heavily defended areas and take on time-sensitive targets, by reducing the time of flight before the weapon strikes the target. All require difficult trade-offs regarding their size, weight, range, reliability and accuracy. All need large investments to reach maturity. While hypersonic missiles and rail guns are limited by the number of weapons a warship or aircraft can carry, a laser DEW is limited only by fuel capacity.

Advantage DEW
DEWs are technologically challenging, but their potential is immense. Laser-based DEWs could dramatically lower the cost of offensive and defensive weaponry and reduce collateral deaths and destruction by virtue of their incredible accuracy. Operating at the speed of light, DEWs can respond to fast-flying targets practically instantaneously, track them and then aim and strike. They can easily switch targets, merely by repointing and refocusing their beam-directing
optical system. They also promise to be far more effective at countering Unmanned Aerial Vehicles (UAV) and ultimately cruise and ballistic missiles than the expensive interceptor aircraft and air defence missiles currently employed for the purpose. Since they function silently and almost invisibly, it is often hard for the victim to tell where the beam came from. This adds the advantage of plausible deniability – very useful in these times when military as well as law enforcement agencies are under ruthless media glare.

LaWS and similar devices may be the best hope to counter the growing threat of UAV swarms...

A major feature of laser-based DEWs is their practically unlimited magazines, unlike the restricted capacity of conventional weapons. For instance, a strike aircraft on a mission over hostile territory, becomes like a flying club aircraft after its munitions have been expended. It regains its lethality only after it lands and rearms. Similarly, a warship, a tank or an infantry soldier must be regularly rearmed to remain potent. In contrast, a laser DEW can store thousands of "shots" and continue to operate till the electricity that powers its electronics or the fuel that generates that electricity, runs out. So a combat aircraft equipped with laser weaponry would have much greater staying power than an adversary armed with kinetic armament. Munitions soon get expended, but if the fuel to fire an aircraft’s DEW runs low, the pilot needs only to link up with the nearest orbiting tanker to refuel as well as rearm before returning to the fray. And the same laser DEW can serve for self-defence, say against shoulder-fired missiles as well as for offensive action against a variety of targets.

**HPL Jets**

The US Air Force Research Laboratory (AFRL) is pinning its hopes on its recently launched five-year Self-Protect High Energy Laser Demonstrator (SHiELD) Advanced Technology Demonstrator (ATD) programme. SHiELD aims to equip a combat aircraft with a small, agile HPL system and so give it an advanced self-defence capability to counter missile threats and enhance its survivability. The programme will need to create adequate on-board power and optics while respecting the weight and size limitations of a combat aircraft.

In a year or so, the AFRL intends to equip legacy aircraft with 50-KiloWatt (kW) pod-based laser systems that can take out soft air and ground targets. To begin with, the launch platform would be the large Lockheed AC-130 Gunship and the Boeing C-17 Globemaster III transport aircraft, both of which have ample space, weight and power supply. The aim of laser DEW would be to shoot down or degrade incoming anti-aircraft missiles or throw them off course by zapping their radar systems or other electronics. This should not be difficult since the most advanced missiles may also be the most vulnerable due to their critical reliance on complex electronics. Depending on the success of miniaturisation, combat jets such as the Boeing B-52 Stratofortress, Boeing F-15 Eagle and even smaller ones like the General Dynamics F-16 Fighting Falcon, may be equipped with...
bolt-on defensive lasers. Ground testing of a weapon called the High Energy Laser (HEL) has already been completed and the first airborne tests are expected to take place by 2021.

By the early 2020s, laser-based DEWs may have increased power (over 150 kW), range and lethality. Stealth fighters such as the Lockheed Martin F-35 Lightning II would perhaps be equipped with an internally mounted HPL weapon so as not to degrade their low-observable characteristics. The same laser device may fire in a low-power mode for defence or boost power output to "fry" sensitive electronics, sensors or engines of airborne as well as ground targets. In the 2030s, the USAF’s sixth generation fighter which is now in the conceptual stage, will most probably have the capability to attack other aircraft and ground targets using laser weapons. If the power of the device can be boosted to around 300 kW, it could even achieve a “kill”.

LaWS of the Sea

One advantage of degrading or disabling the electronics of an aircraft, missile, vehicle or communication system as against destroying it, is that the adversary might suspect simple system failure and hence not respond forcefully as it would in the event of a conventional hostile act. That is one reason why even low-powered laser weapons may have a bright future. In December 2014, the US Navy fielded the world’s first operational Laser Weapon System (LaWS), a 33-kW device, aboard the USS Ponce deployed in the Persian Gulf. LaWS is a solid-state DEW consisting of six commercial lasers that pump energy into a material infused with certain chemical elements. These elements emit light which is amplified by mirrors and directed at the target. LaWS can only tackle soft-skinned boats and small UAVs, that too only at close range. It can also be used as a telescope or range finder.

Although its capability is none too impressive, LaWS and similar devices may be the best hope to counter the growing threat of UAV swarms. For that, they need to be upgraded to 100 kW or more so that they can burn a hole through the skin of their target more quickly. UAVs are becoming ridiculously cheap and even rudimentary ones can carry small munitions. Equipped with improved artificial intelligence, a large swarm of armed UAVs could mount a coordinated attack against a target. And a warship equipped with today’s guns and missiles would be powerless to defend itself against such an assault.

There is also the economic angle. Does it make sense to launch a highly expensive missile against a very cheap UAV? The current defensive systems would either quickly run out of ammunition or neutralise the UAV swarm only at a cost of thousands of dollars per missile. On the other hand, LaWS type of weapons could promptly take out several incoming UAVs at a cost of less than a dollar per shot. And warships would be only too happy to dispense with the explosive laden magazines that currently render them highly vulnerable to a direct hit by a PGM.

Kinetic weapons also offer many capabilities that DEWs probably never will…
heat. HELLADS has achieved 50 kW power output and weapons engineers believe it can be scaled up much further.

**Gas-powered or Solid-state?**

The older gas-powered and chemical-based lasers are high-powered, but do not meet the SWaP requirements to operate from an aircraft or tank. On the other hand, the latest electrically powered solid-state lasers are fairly light and compact, besides being robust and reliable. But since their power output is nowhere near the megawatt level of chemical lasers, they cannot engage distant targets. Hence efforts are on to develop a 100-kW solid-state laser device which would be suitable at least as a tactical weapon. With a range of approximately four kilometres, it could be employed for Counter Rocket, Artillery and Mortar (C-RAM) and counter-UAV tasks.

As a laser beam passes through the atmosphere, it is subject to diffraction, absorption and turbulence. To maintain its effective range and lethality, it must retain its focus and resist being degraded by the atmosphere – also known as good beam quality. Indeed, one of the biggest challenges of laser weapons design is to ensure good beam quality while boosting power output. A large aperture helps shrink the beam focus, but increases the size and weight of the assembly.

Fibre-based lasers that use optical fibres as the lasing medium, are a promising avenue for research; their advantage - superior beam quality and ease of cooling. Irrespective of the type of laser, the ultimate aim is to develop a powerful HPL weapon that falls within the SWaP limitations of a ship, aircraft, tank or other surface vehicle.

**CHAMP – the Microwave Champion**

High-Power Microwave (HPM) devices are second only to lasers as DEW candidates. These focus microwave energy to knock out power grids, disrupt electronics systems or prevent anti-aircraft missiles from locking on to the target. The USAF’s Counter-electronics High Power Microwave Advanced Missile Project (CHAMP) is a technology demonstrator intended to develop an air-launched HPM weapon that can degrade or damage hostile electronics systems. It is planned to be mounted on the Lockheed Martin JASSM-ER cruise missile. This is how it will work. The JASSM-ER will probably be launched from a stealth aircraft, manned or unmanned. Its CHAMP payload will then generate a concentrated beam of microwave energy, directing pulses of thousands of volts towards a target building or small area. This will trigger a deadly power surge in the victim computers, mobile phones, vehicles and even tanks. The damage will occur in seconds and may be permanent.

Another type of HPM weapon under development persuades unruly crowds to disperse without killing anyone by rapidly raising their body temperature. It could be a useful alternative to the reviled pellet guns.

**India Lagging**

India is far behind in the high stakes DEW race. But with the Defence Research and Development Organisation (DRDO) now prioritising DEW development in its technology perspective and capability roadmap, the situation may gradually improve. The DRDO has already built several basic laser systems to disarm mines and Improvised Explosive Devices (IEDs), vehicle-mounted dazzlers to disperse crowds and hand-held devices that can detect explosives or overpower armed intruders. It is currently developing a 10-kW vehicle-mounted DEW for possible use against UAVs at ranges of up to five km. DRDO’s Laser Science & Technology Centre (LASTEC) in Delhi, is responsible for the development of lasers for directed energy applications as one of its major missions. However, most DRDO projects are plagued by huge time and cost overruns so it is anyone’s guess when Indian combat aircraft, ships or tanks will be armed for the foreseeable future, DEWs will complement rather than replace conventional munitions...

For the foreseeable future, DEWs will complement rather than replace conventional munitions...
with indigenous laser DEWs. The budgetary allocation too is nowhere near what the military would like and it is inevitable that tanks, ships, aircraft and explosive weapons will take priority over DEW.

**SPACE WAR**

Apart from the US, several nations including Russia, China, India, UK, France and Israel are now overtly or covertly researching DEWs. Reports from Russia claim that military technologists have developed a DEW powerful enough to destroy or disable the electronic guidance and navigation systems of manned and unmanned aircraft as well as PGMs. China too is making rapid progress in DEW research. And space is an arena driving both nations’ quest for DEW weapons.

Russia and China are aware of the American military’s critical reliance on GPS navigation and tactical battlefield networking that is achieved through a large constellation of intelligence, communication and navigation satellites. Therefore, they are investigating DEW devices specifically designed to take out satellites and render the US “blind” and directionless. It is believed that Chinese military technologists have been trying for over a decade to develop DEWs against space assets in order to neutralise America’s formidable strategic advantage. Since China cannot hope to overtake the US in military hardware for years, if not decades, it is the obvious thing to do. And as China’s space programme is inherently dual use, it would not be difficult to orbit a laser Anti-Satellite (ASAT) weapon in the guise of a peaceful civilian satellite, only to bare its fangs as and when the need arises.

**WONDER WEAPON OR PIE IN THE SKY?**

Many believe that laser DEWs herald the dawn of a new era in military affairs. According to an October 2016 report by Washington-based analysts MarketsandMarkets, the global market for DEWs is projected to grow to $24.45 billion by 2021, at a compound annual growth rate of 28.9 per cent. The main factor driving this impressive growth is the increasing demand for effective defence against missiles and UAVs.

And yet the difficulties facing DEWs should not be underestimated. Apart from the high cost of development, insufficient funding and inadequate testing facilities, they face major technological challenges. Governments too cannot be faulted for being somewhat sceptical of claims of imminent breakthroughs because the billions of dollars already spent on DEW research, have largely failed to deliver. Indeed, laser DEWs may rank among the most over-hyped weapons of war ever. Shorn of the more optimistic claims, their practicality in war is still in doubt. It speaks volumes that the US Navy’s LaWS is still the only operational DEW in the world. Kinetic weapons also offer many capabilities that DEWs probably never will. Therefore, for the foreseeable future DEWs will complement rather than replace conventional munitions.

Finally, every new weapon system attracts a counter sooner or later. The US Office of Naval Research already has a Counter Directed Energy Weapons (CDEW) programme to find new ways of defending against hostile HPL, HPM and other DEW. Given the publicity surrounding US efforts to develop cutting-edge DEW capabilities, it is a safe bet that Russia and China are feverishly trying to develop their own countermeasures. And some may be fairly simple. For instance, since any type of airborne particle diffuses laser energy, heavily polluted air is itself a defence. China reportedly plans to generate copious amounts of black smoke around high-value targets to frustrate American laser weapons. Other measures being contemplated include special coating to reflect or redirect hostile lasers and special materials to dissipate the heat generated by the beam striking the target so as to avoid or delay destruction. Some types of electronic equipment can also be hardened to resist an HPM attack. And just as there are anti-missile missiles, defensive lasers may serve to track the laser emitter and then use a dazzler to disrupt its control system.

DEWs have the potential to be a game-changer as they transform current concepts of warfare and weaponry...
ADVANCES IN TECHNOLOGY

Battlefield Helicopters

— Gp Capt AK Sachdev —

E tymologically, the word ‘battlefield’ owes its origin to Latin battualia meaning ‘the fighting and fencing exercises of soldiers and gladiators’. Cavalry introduced a significant element of speed and manoeuvre and in a process of evolution, was, replaced by tanks, but the stalemate on the Western Front during World War I initiated an intense debate in the years that followed about the use of mechanised forces. The debate continued during the 1930s and was supplemented by another element, the emerging developments in rotary wing aircraft, with noteworthy and self-evident advantages as a combat platform in the battlefield. Since then, the helicopter has developed with profound tempering through significant battle experience in Vietnam, Korea and Iraq into a veritable machine that has performed roles encompassing attack, anti-tank, Suppression of Enemy Air Defences, reconnaissance and observation, airlift of troops and cargo resupply, fire fighting and medical evacuation. Indeed, it has performed all roles a fixed-wing aircraft can, excluding strategic strike.

The battlefield helicopter, belonging to the ‘air forces’ by classification, remains tethered to land forces, making significant contribution in the battlefield. However, development in helicopter technology has not been at the same pace as for fixed-wing aircraft, especially those with combat roles. Higher speeds, precise and incisive fire power, superlative agility and manoeuvrability, stealth and self-protection, high survivability and low vulnerability, with the capability to perform designated roles in bad weather and night conditions, are the badgering challenges that accost helicopter manufacturers. The US and Europe, major users of battlefield helicopters, have taken on these challenges and are working on designs to achieve technological enhancements for battlefield helicopters.

Overview of Ongoing Programmes

Experience of the US military with helicopters is perhaps the richest. Wars in Vietnam, Korea, Iraq and Afghanistan have provided invaluable lessons to the US in the tactical employment of helicopters. The ongoing war against terrorism holds its own imperatives in terms of what is needed in the domain of helicopter technology. The US Army, currently operating close to 4,000 helicopters in various roles, is looking at a combination of rotor and fixed-wing as the possible future solution, the Future Vertical Lift (FVL) with the target date set as 2030. Towards this objective, a US Army-led programme, the Joint Multi-Role (JMR) Demonstrator, has drawn up an ambitious wish-list with inputs from the Coast Guard, Special Operations Command and NASA. The final objective is a design with vastly improved avionics, electronics, range, speed of 200 knots, survivability, operating
altitudes and payloads. The ‘multi-role’ part of the programme alludes to several roles ranging from attack configurations to cargo, medevac, search and rescue and anti-submarine warfare. Originally, three Capability Sets were planned in 2009: JMR Light (scout version to replace the OH-58 Kiowa), JMR Medium-Light, JMR Medium (utility and attack versions). Later on two more sets were added: JMR Heavy (cargo version to replace the CH-47 Chinook) and JMR Ultra (ultra-sized version for vertical lift aircraft with performance similar to fixed-wing tactical transport aircraft). Eventually, these new designs are expected to replace 25 current rotorcraft types in use with the US military.

The focus so far has been on FVL Medium, seen as the replacement for the US Army’s Sikorsky UH-60 Black Hawks and Boeing AH-64 Apaches. The main contenders are Bell Helicopter and a Sikorsky/Boeing team. Bell is offering a next-generation tilt-rotor, V-280, evolved from its V-22 Osprey, which tilts its huge rotor blades between vertical and horizontal positions to gain both the best features of a helicopter (Vertical Take-Off and Landing) and those of a propeller plane (fuel-efficient speed for long range flight). The Sikorsky-Boeing Defiant looks more like a traditional helicopter, but is based on Sikorsky’s “X2” technique of combining two counter-rotating rotors, one on top of the other, with a pusher propeller at the tail. On September 15, 2010, the X2 Technology Demonstrator had unofficially broken the rotorcraft speed record of 250kts. The Defiant is slated to fly in the first half of 2018 while the V 280 demonstrator is to fly in November this year.

A significant, concrete step that has already been taken in the direction of the JMR is a fifty-fifty partnership between Pratt & Whitney and Honeywell Aerospace for developing the Advanced Affordable Turbine Engine (AATE), aimed at providing a 30 per cent increase in horsepower for helicopters while at the same time cutting fuel consumption by 25 per cent. The US FVL programme’s objective of replacing all US military helicopters with a family sharing common technologies, but not common platforms, is laudable and sure to bring remarkable results over the next two decades.

In Europe, Airbus Helicopters’ X-3, “high-speed long-range hybrid helicopter” has a set of propellers for forward motion instead of a tail rotor and is one of the aircraft that have flown under “high-hot” conditions (6,000 feet at 95 degrees Fahrenheit) like a rotorcraft with airplane-like speed. The X-3 demonstrated a speed of 255 knots in level flight and 263 knots in a shallow dive on June 07, 2013, beating the Sikorsky X2’s unofficial record set in September 2010, thus becoming the world’s fastest non-jet augmented compound helicopter. On May 21, 2016, Airbus filed a patent for X-3, claiming it as the world’s fastest rotary wing aircraft. Let us now address some of the challenges for helicopter technology.

**Speed**

Conventional helicopter design has retained its tadpole like shape and remained predicated to a rotor system which restricts maximum speed to around 180 knots due to a phenomenon called “retreating blade stall”. As long as a helicopter design employs a rotor
blade system in which the moving rotors in flight manifest themselves as a ‘disc’ lying in a horizontal plane, speed will be limited due to this phenomenon. Helicopter design is different from fixed-wing inasmuch as the airframe drag and engine power are not the important determinants of forward speed; it is the rotor system that limits forward speed. Higher speed envelopes would help military helicopters to achieve their missions more efficiently, helping them to reach critical targets and destinations in shorter times, while giving them a better edge against enemy fire from the air and ground. Realising that a single rotor system with a complementing tail rotor, is unlikely ever to achieve a breakthrough in forward speed, designers are exploring other avenues which are tending to metamorphose not just the shape and silhouette of the helicopter, but also its name to Vertical Take-Off and Landing (VTOL) craft.

VTOL Technologies
The basic helicopter design has other limitations essentially because the rotor system is not as efficient for forward travel as a fixed-wing one and consumes approximately 15 per cent of total engine power available to run the essential tail anti-torque rotor which is an essential part of the design to keep the helicopter from spinning. The helicopter must also deal with high vibration levels. Higher fuel consumption and is maintenance-intensive. New technologies have permitted them to move away from the original shape while retaining the VTOL characteristic of a helicopter. Developing a practical, hybrid aircraft with a VTOL capability and the performance of a fixed-wing aircraft in forward flight, was a daunting challenge with two fundamental objectives. The first was to accomplish controllable vertical flight using the very same mechanisms and equipment that are required for forward flight. Any weight of exclusively vertical flight mechanisms would be useless during forward flight and would represent a reduction in available payload relative to a comparable fixed-wing aircraft. The second goal consisted of achieving “power matching” i.e. a VTOL design that requires the same power in vertical flight as in forward flight. Any mismatch would represent excess capacity which corresponds to excess weight in one mode of flight. Numerous approaches to VTOL aircraft have been explored over the years; the prominent ones are tilt-rotors, tilt-props and tilt-wings, as well as deflected-slipstreams, deflected-thrust, thrust augmenters, ducted fans, tilt ducted rotors and tail sitters.

As the name implies, a tilt-rotor aircraft uses tiltable propellers, or prop-rotors for lift and propulsion. For vertical flight, the prop-rotors are angled to direct their thrust downwards, providing lift. In this mode of operation, the aircraft is essentially identical to a helicopter. As it gains speed, the prop-rotors are slowly tilted forward, eventually becoming perpendicular to the ground. In this mode the wing provides the lift and the wing’s greater efficiency helps the tilt-rotor achieve high speed. In this mode, the machine is essentially a turboprop aircraft. Bell Helicopter has been dominant in tilt-rotor development and partnered with Boeing on the first production tilt-rotor aircraft, the Bell/Boeing V-22 Osprey. Tilt-rotor prop-rotors require all the fundamental parts of a twin-rotor helicopter. They also have a full set of airplane controls and a tilt mechanism that rotates the lifting rotors. The V-280 design is a successor of the V-22 Osprey but with one major difference from the V-22 Osprey, the engines remain in place while the rotors and drive shafts tilt. It has a maximum speed of 275 knots at sea level and 305 knots at 15,000 feet. While these speeds are much higher than helicopters with rotors, they do not compare well with fixed-wing aircraft.

Bell and Boeing are exploring larger Quad Tilt Rotor (QTR) military models for possible use by the US Army. The QTR has two sets of fixed-wings and four tilting rotors mounted at the tips of the wings. The programme has been nicknamed the V-44 Tilt Rotor for the four tilt-rotor version and V-66 tilt-rotor for the six tilt-rotor version. They would use higher
rated versions of the tilt-rotor engines used on the V-22 Osprey.

From January 01, 2016, Leonardo’s Helicopter Division absorbed the activities of AgustaWestland which is developing AW609 (formerly known as Bell/Agusta BA609) for civilian use and, in an allied development endeavour, working on the world’s first electric tilt-rotor aircraft, as a technology demonstrator termed Project Zero. Each of its two rotors is driven by an electric motor which is powered by rechargeable batteries. The aircraft’s control systems, flight controls and landing gear actuators are also all electrically powered, so there is no need for a hydraulic system. Besides, the aircraft doesn’t require a transmission as well. A first flight was demonstrated in early 2013, and it has made numerous public appearances since then. Flight testing has been carried out on 1:3 scale models due to the limited endurance it has but, in February 2016, it was announced that a hybrid drive system would be installed on the full-scale aircraft so as to extend the flight endurance from 10 to 45 minutes.

AgustaWestland is looking at the possibility of blades that change effective shape during flight much like a fixed-wing does with the aid of flaps. The VTOL experimental plane or VTOL X-Plane programme of US Defense Advanced Research Projects Agency (DARPA) seeks to cross-pollinate fixed-wing and rotary-wing designs to attain sustained flight speed of 300-400 knots. Aurora’s Phase 2 design for VTOL X-Plane envisions an unmanned aircraft with two large rear wings and two smaller front canards - short winglets mounted near the nose of the aircraft. A turbo-shaft engine, the one used in V-22 Osprey tilt-rotor aircraft mounted in the fuselage, would provide three MegaWatts (4,000 horsepower) of electrical power which would drive 24 ducted fans. Flight tests are expected in 2018.

NASA’s Greased Lightning or GL-10 deserves a mention here. It is a battery-powered, 10-engine remotely piloted tilt-rotor and the prototype has a ten-foot wingspan and can take-off vertically like a helicopter as also fly efficiently in forward flight. It is in design and testing phase and flew a series of test flights during 2015, including transition from vertical to horizontal flight. The final version is expected to have a 20-foot wingspan and be a hybrid machine powered by lithium-ion batteries with a pair of eight horsepower diesel engines which will drive ten electric engines, eight on the wing and two on the stabilizer.

The unmanned rotary-wing platform that caught the military planner’s attention first was the K-MAX...
Stealth technology enables a helicopter to minimise detection by radar, but is not a foolproof measure against the amazingly sensitive radars that technology has produced. Passive radars are emerging and stealth does not provide total safety against leading edge radars. Survivability in terms of crash resistance, i.e. the ability to allow minimum damage to the helicopter in case of an uncontrolled or partially controlled contact with ground below, is thus an inescapable criterion for designers to consider. Unfortunately, it comes with a weight penalty.

Unmanned Craft

Undoubtedly, the unmanned rotary-wing platform that caught the military planner’s attention first was the K-MAX. A UAS transformed by Lockheed Martin Corporation and Kaman Aerospace Corporation from an existing helicopter model of Kaman, it enabled US Marines to deliver supplies by day or night to precise locations without risk to life in the process. The K-MAX can deliver a full 2,700-kg of cargo at sea level and over 1,800 kg at 15,000 feet. It rendered laudable service in Afghanistan for the US Marines and has proven the concept beyond any reasonable doubt. The future can be expected to see variations of the concept in optionally manned versions as well.

The GL-10 mentioned earlier is a small tilt-rotor, but is a spectacularly successful drone helicopter that has pioneered its way to fame. Another noteworthy helicopter innovation is the Mars Helicopter being developed by NASA. Due to the large distance from Mars, remote control is not technically feasible in real time as it would take minutes for radio waves to travel one way between Mars and any control station on Earth. As such, the Mars Helicopter is being designed as a totally autonomous craft. The project, called Mars Electric Reusable Flyer, is faced with the challenge of getting a rotary-wing craft to fly in three-eighth of Earth’s gravity with 100 times less atmosphere.

China too is pursuing unmanned rotorcraft programmes and its unmanned V-750 helicopter UAV successfully fired anti-tank missiles at targets in June this year. Certified by Chinese aviation authorities in 2014, the 750-kg platform can carry at least two 50-kg anti-tank missiles, such as the HJ-9 and HJ-10 or rocket pods and has a range of 500 km.

The Fire Scout MQ-8B/C based on the commercial Bell 407 can be used for unmanned helicopter system that provides real-time Intelligence, Surveillance and Reconnaissance, target acquisition, laser designation.
and battle management to tactical users without relying on manned aircraft or space-based assets. It has also demonstrated the ability to operate concurrently with other manned aircraft and, in an offensive role, can carry 8 to 14, 70mm rockets. Meanwhile, Sikorsky is trying to demonstrate that autonomous aircraft can perform complex and life-saving missions with enhanced safety, reduced cost of ownership and superior capabilities through the Sikorsky Autonomy Research Aircraft MATRIX Technology (consisting of a suite of hardware and software systems); a Black Hawk is being converted so that it may be optionally-piloted. The US Army’s next generation helicopter could be “optionally manned” that is, it could be capable of autonomous flight for a full mission or a substantial segment of a mission.

The future of airborne weapon platforms does not only belong to the large but to the very small as well. The Nano Air Vehicle (NAV) programme has an objective of making small airborne vehicles which could be utilised in a variety of applications, including both indoor and outdoor missions. The object is to develop an aircraft smaller than 15 cm in length and 20 gm in weight. Thus in some roles, military helicopters would become invisible to the enemy.

Another variation of the unmanned theme is that in the future, some manned ones could operate in concert with drones. The US Army is already doing this with a Manned-Unmanned Teaming (MUM-T) squadron, combining Boeing AH-64D/E Apache helicopters with Textron Systems RQ-7B Shadow UAVs as a heavy attack-reconnaissance unit as also General Atomics Aeronautical Systems MQ-1C Gray Eagle UAVs. Both UAVs can be operated from the Universal Ground Control Station (UGCS) or by an Apache crew in flight.

**Concluding Remarks**

Vulnerability and survivability apprehensions fuelled by experience in Iraq and Afghanistan, have rejuvenated the debate on the utility of helicopters on the modern battlefield. However, military helicopter industry plods on tirelessly in pursuit of more capable helicopters for employment in the battle area.

Budgetary considerations have relegated helicopter development to a second position behind fixed-wing combat aircraft and so, some expensive technologies such as Fly-By-Wire (FBW) have been comparatively slow in making their presence felt in helicopters despite the advantages of safety, efficiency and weight. An innovative substitute for FBW is the Active Parallel Actuator Subsystem for Boeing Chinooks which is not FBW, but makes some of its capabilities available at a much lower cost.

Technological advances hold out two interrelated promises, the first being new and innovative changes to rotorcraft design that p r e d i c a t e d to new projects and enterprises and the other, the increasing capability to upgrade existing models so as to increase their performance, role capability and utilisation for new missions. Needless to say, upgrades cost a fraction of the outlay on a new helicopter although the upgraded helicopter may not turn into a new helicopter in terms of performance.
As an illustration, the Boeing AH-6 Little Bird has been around since the 1960s; but its current version is substantially superior to the original. It flies higher, has a higher speed range, carries a heavier payload and can be used as a potent light attack helicopter for recce and in the Search And Rescue (SAR) role. Another inspired feature of the AH-6 is the commonality of systems it shares with the Apache AH-64. The two cockpits are strikingly similar.

In a somewhat similar vein, Boeing is in the process of remanufacturing 117 Apache AH-64Ds into the more capable AH-64E model for the US Army. Likewise, Lockheed Martin is offering two options to potential customers interested in an armed UH-60 Black Hawk: either an all-new helicopter or a weapons kit that can be used to upgrade existing aircraft. At Farnborough, it offered an option with UKM2000, M240 or M134 7.62 mm mini-guns, four Hellfire missiles, a 12.7 mm FN-Herstal HMP and an M261 Hydra 70 19-shot rocket pod in addition to a rescue hoist and either a crashworthy external fuel system or weapons pylon. Lockheed Martin made it a point to stress that any new customer could customise its armed Black Hawk to fit its individual needs. Airbus Helicopters too has developed a Generic Weapon System (being marketed as HForce) consisting of two main components – a Thales-produced, helmet-mounted sight display and a Rockwell Collins Deutschland FMC-4212 General Purpose Computer. It will initially be made available for H125M, H145M and H225M. Options include fixed guns, rockets, guided missiles and air-to-air missiles.

Inarguably, the most ambitious programme to design future battlefield helicopters is the US FVL. However, the Dutch Air Chief, Lt. Gen. Alexander Schnitger reportedly questioned the programme thus, “When I look at the Future Vertical Lift designs, I see today’s technology being incrementally improved toward the future. What I would like to see is a disruptive vision of the vertical-lift capabilities that is ready for any operation in 2040. Instead of extrapolating today into the future, I would like to start with the future and then decide how to get there.” Currently, that suggestion appears impossible to comply with as dramatically new designs seem unattainable. Over the next decade and a half, battlefield helicopters appear destined to be incremental progressions of existing models, with no revolutionary enterprise visible on the horizon.

The military helicopter industry plods on tirelessly in pursuit of more capable helicopters for employment in the battle area...
SPACE: THE FORCE MULTIPLIER FOR AIR POWER

Air Marshal Anil Chopra

India needs early warning satellites to monitor ICBM launches and even tactical airspace as an important military asset. Ground/space-based lasers are needed to disable enemy satellites or destroy/degrade attacking ICBM as part of ASAT capability. There is also the need to develop Directed Energy Weapons. India needs a permanent space station. The establishment of tri-services Space Command should not be deferred any further. The space-based systems have enabled dramatic improvement in military and intelligence operations thus enhancing its capability, accuracy and firepower. In the not-so-distant future, wars will again be fought as in the Indian epics. Space is the future for all action and capabilities, the real force multiplier. Time to invest and prepare is now.

Space is the universe starting about 100 km above the Earth where its atmosphere thins down considerably. Aerospace encompasses the Earth’s atmosphere and the space above it. The two separate entities are considered as a single domain for activities of launching, guidance and control of vehicles that travel through both. Ancient India was known to be an aerospace power. Space wars are very explicitly described in ancient Indian manuscripts. The design of modern spacecraft has a lot in common with the ‘Vimana’, or ancient Indian aerospace craft. Similarly, the details of very powerful space weapons such as the ‘Brahmadanda’ of Lord Brahma and the ‘Vajra’ of Indra, the God of Weather and wars are well documented.

Designer Werner von Braun’s ethanol-fuelled rocket A4 launched on October 03, 1942, became the first man-made object to enter space. The 1960s saw humans leap beyond the Earth’s atmosphere. By the late 1960s, the Soviet Union and USA had both deployed military satellites for communications, imaging, reconnaissance and ballistic weapons. Ballistic missile transit through space was tested and soon became a capability with several nations. The ultimate desire of a space power is to dominate the use of space and have space-based systems that allow destruction of enemy targets in space and on Earth and deny the enemy full access to space including preventing the enemy from launching satellites and destroying or degrading enemy satellites in space.

The term ‘Space War’ however is restricted to where the target is in space and is attacked from space or from the ground. While weapons are still to be positioned in space, scientific research is in advanced stage to act as an enabler. Space is thus going to be the force multiplier for military operations.

Evolution of Space Weapons

The US and the USSR began developing anti-satellite weapons in the early 1960s. They were in the form of directed energy lasers to decapitate, kamikaze satellites for hard-kill and possible orbital nuclear weapons. The very long range Inter-Continental Ballistic Missiles (ICBM) spent significant time in sub-orbital flight and was best intercepted in space. The initial US ‘Nike-Zeus’ programme envisaged firing Nike nuclear missiles against incoming ICBMs. Project ‘Defender’ was to destroy Soviet ICBMs at launch with satellite weapon platforms that were to orbit over Russia. Both programmes were abandoned later.

The ‘Sentinel’ and ‘Safeguard’ programmes were designed to use Anti-Ballistic Missiles (ABM) to shoot down incoming ICBMs. The initial plan was to use a nuclear-tipped interceptor missile, but as accuracy improved, hit-to-kill ABMs evolved. In 1983, US President Reagan proposed a space-based Strategic Defence Initiative (SDI) to protect the US from attack by strategic nuclear missiles.

In the 1960s, the Soviets developed a ‘co-orbital’ system that would approach the space target using radar guidance and then explode its shrapnel warhead close enough to kill it. The Soviets evolved a low Earth orbit Fractional Orbital Bombardment System (FOBS) for Earth targets. It would de-orbit for the attack. The SALT II agreement of 1979 prohibited the deployment of FOBS systems. The Polys orbit weapons system was an anti-satellite weapon with nuclear space mines and a self-defence canon. The Soviets also considered the space shuttle as a single-orbit weapon that could manoeuvre to avoid existing anti-ballistic missile sites and then bomb the target and land. The Soviets also experimented with large, ground-based Anti-Satellite
(ASAT) lasers with a number of US spy-satellites reportedly being temporarily 'blinded'.

The Soviets also used a modified MiG-31 as an ASAT launch platform. The end of the Cold War saw new players such as China, Japan, the European Union and India create their own space systems. Spy satellites continue to perform C4ISR missions and are also used to provide early warnings of missile launches, locate nuclear detonations and detect preparations for otherwise clandestine or surprise nuclear tests. In Operation Desert Storm, early warning satellites were used to detect tactical missile launches.

**Non-Weapon Space Enablers**

Global Positioning Systems (GPS) are an important military application in space. US GPS, Russian GLONASS, European Galileo, Chinese Beidou and Indian Regional Navigational Satellite System named 'Navic' are some such examples. India’s is a regional system with seven satellites already in position and should be operational by the end of 2017. All others are global initiatives with between 24 to 36 satellites. They allow precise own location and provide very highly accurate time reference. The GPS system is in operation since February 1989. It also facilitates accurate targeting by smart bombs and cruise missiles. The military doctrine of network-centric warfare also relies heavily on the use of high speed satellite-enabled communications to improve real-time situational awareness. Satellite imagery of enemy position with accurate coordinates of targets can be transferred to bombers and cruise missiles through the military internet connected through satellite communications. Modern military forces including that of India have such secure information grids.

**Weaponisation of Space**

Space weapons can be categorised as those that attack targets in space (anti-satellite) or attack targets on ground from space or attack targets transiting through space (anti-ballistic missile). The Russian space station Salyut-3 was fitted with a 23mm cannon which was successfully test-fired at target satellites. In the 1960s, the US had envisaged a possible airbase on the Moon manned by 21 airmen as part of Project Lunex that was never executed. It is technically possible to position conventional or nuclear missiled in space that could reach targets on the ground. However, these would be expensive and difficult to maintain. Also, carrying heavy missiles would be a logistical nightmare and have only small advantage of saving time vis-a-vis aircraft and submarine-launched weapons. Even for the advantage of guaranteed second nuclear strike capability, it would not be worth the complications. The initial US plan which was later called off, was for a space-based constellation of 40 platforms deploying up to 1,500 kinetic interceptors. Under President Putin, research on ASAT weapons has reportedly been resumed to counter the renewed US strategic defence efforts post the ABM Treaty. The US also continues working on a number of programmes which could be the basis for a space-based ASAT. International space treaties regulate positioning of weapons or conflicts in space. To date, there have been no human casualties resulting from conflict in space nor has any ground target been successfully neutralised from space.

**Ground-Based Space Weapons**

Use of high altitude nuclear explosions to destroy satellites through damage caused by Electromagnetic Pulse (EMP) on electronic equipment was considered. During tests in 1962, the EMP from a 1.4 mt warhead detonated over the Pacific damaged three satellites and also disrupted power transmission and communications across the Pacific. Another area of research was into Directed Energy Weapons, including a nuclear-explosion powered X-ray laser. AGM-69 SRAM carried on a modified F-15 Eagle was successfully tested in September 1985 targeting a satellite orbiting at 555 km.

In February 2008, the US Navy fired a standard ABM to act as an ASAT weapon to destroy an ageing hydrazine-laden US satellite. Russia has reportedly restarted development of a prototype laser system ‘Sokol Exhelon’. Israel’s Arrow-3 (Hetz 3) anti-ballistic missile with exo-atmospheric interception capability,
is in an advanced stage of development. In January 2007, China successfully destroyed a defunct Chinese weather satellite in polar orbit at an altitude of 865 km using a kinetic warhead of SC-19 ASAT missile. The warhead destroyed the satellite in a head-on collision at an extremely high relative velocity.

In May 2013, the Chinese government announced the launch of a suborbital rocket carrying a scientific payload to study the upper ionosphere. The US government see it as the first test of a new ground-based ASAT system. The NASA space plane X-37, now with the US Department of Defense is akin to a space version of Uninhabited Aerial Vehicle and its employability is evolving. Currently, the US has a space strategy to focus on prevention of nuclear blackmail by major players or rouge states. The US National Missile Defense (NMD) programme has no weapon stations in space, but is designed to intercept incoming warheads at very high altitudes with both land and sea-based missiles.

**Complexities of Satellite Intercepts**

The ease of shooting down orbiting satellites and their effect on operations has been questioned by some. Tracking of military satellites with inbuilt defensive measure such as inclination changes will not be easy. The interceptor would have to pre-determine the point of impact while compensating for the satellite’s lateral movement and the time for the interceptor to climb and move. Military satellites orbit at about 800 km above sea level and move at 7.5 km/s and are difficult to intercept. Even if an ISR satellite is knocked out, all countries possess an extensive array of manned and unmanned ISR aircraft that could perform such missions. GPS and communications satellites orbit at much higher altitudes of 20,000 to 36,000 km putting them out of range of solid-fuelled ICBMs. The constellation of 30 GPS satellites provides redundancy where transmission from at least four satellites can be received in six orbital planes at any one time. So an attacker would need to disable at least six satellites to disrupt the network.

**Anti-Space Weaponisation Treaties**

During the Cold War, to avoid extending the threat of nuclear weapons to space, the Partial Nuclear Test Ban Treaty of 1963 and Outer Space Treaty of 1967 prevented detonating nuclear devices in space. The Moon and other celestial bodies were to be used exclusively for peaceful purposes and astronauts were to be treated as envoys of mankind. However, by then, both the US and USSR had performed several nuclear explosions in space. The salient features of the treaties were the exploration and use of outer space for the benefit of mankind and that outer space is not subject to national appropriation. States are not to place weapons in orbit or on celestial bodies. States shall be liable for damage caused by their space objects. India had signed the Outer Space Treaty of 1967.

In 1981, the UN General Assembly proposed a Prevention of an Arms Race in Outer Space (PAROS) treaty to preserve space for peaceful uses by prohibiting the use of space weapons. The treaty would prevent a nation from gaining military advantage in outer space. China and the US prevented consensus. The proposed Space Preservation Treaty of 2006 against all space weapons and 2008 Treaty on Prevention of the Placement of Weapons in Outer Space were vetoed by the US despite the treaty explicitly affirming a State’s inherent right of self-defence. In December 2014, the UN General Assembly passed two resolutions on preventing arms race in outer space, both of which were opposed by the US and a few others. The US, Russia and China are the frontrunners in the weaponisation of space, though no weapons have been formally deployed in space yet.

**Space Command Structures**

The US Space Command, an element of the US Air Force (USAF), is located at Peterson Air Force Base, Colorado. After the reorganisation in 2002, without touching its internal structure, this has been placed under US Strategic Command (STRATCOM). Within STRATCOM, the Joint Functional Component Command for space headed by a USAF General
oversees US military space operations. In December 2011, the Russian Space Forces became the Aerospace Defence Forces, fusing all space and some air defence components into one joint service. In August 2015, they were merged with the Russian Air Force to form the Russian Aerospace Forces. As part of the reforms in December 2015, the PLA Strategic Support Force was created. It includes high-tech operations forces such as space, cyberspace and electronic warfare. The major mission of the PLA Strategic Support Force is to support combat operations so that the PLA can gain regional advantages in astronomic war, space war, network war and electromagnetic space war while ensuring smooth operations.

Indian Space Industry

The Indian space industry is already acclaimed global player, is internationally competitive and maintains international quality standards. The Indian Space Research Organisation (ISRO) was established in 1972 to promote development and application of space science and technology. In the initial years, space applications were for communication, television broadcasting and remote sensing satellites and to perfect satellite launch vehicles. Today, India has an impressive array of satellites covering the entire spectrum. It has a world record of putting in orbit 104 satellites through a single launch. India has had a mission to Mars and has also planned mission to the Moon.

India also has the largest constellation of Earth observation satellites called Indian Remote Sensing (IRS) satellites with under one metre resolution. Larger INSAT series besides TV Broadcasting, telecommunications and meteorological applications, support societal applications such as tele-education and telemedicine. The largest Indian space launch vehicle GSLV can lift up to 5,000 kg payload.

Hindustan Aeronautics Limited (HAL), the Defence PSU manufacturing aircraft, is the premier manufacturing partner of ISRO. It has a dedicated Aerospace Division. Defence Research Development Organisation (DRDO) with a network of 52 laboratories, supports development of critical defence technologies. Other organisations that are active participants in the space programme are the Bharat Electronics Limited (BEL), Bharat Dynamics Limited (BDL), Mishra Dhatu Nigam Limited (MIDHANI) with metallurgical competence in super-alloys and special purpose steels and BrahMos Aerospace with technologies evolved for supersonic cruise missile. Around 40 private sector companies including Larsen and Toubro and Bharat Forge are partners.

South Asian Aerospace Realities

China is a clear leader in space and is investing heavily. The first Chinese manned spaceflight was in 2003. In January 2007, China became the first Asian military space power to send an anti-satellite missile into orbit and destroy an ageing Chinese weather satellite. Anti-satellite technologies to destroy or disable space-based assets are a critical part of the Chinese space programme. These include land-based missiles, experimental lasers and signal jammers. China has successfully landed a rover on the Moon and has plans to put humans on the Moon. China plans to bring a habitable space station Tiangong2 online by 2022 and put Chinese astronauts on the Moon in the mid-2020s. They also have Mars lander mission coming up.

The Chinese space programme is linked to the nation’s efforts at developing advanced military technology. In 2015, China launched ‘DAMPE’, the most capable dark matter explorer to date and world’s first quantum communication satellite ‘QUESS’ in 2016. Pakistan’s very fledgling space programme has Chinese support and stamp. China is averaging 20 space missions a year. As per estimates, China has over 500 ballistic missiles including 100 ICBM, 25 per cent of which are submarine based and some with MIRV warheads, with ranges beyond 13,000 km.

Pakistan’s Karachi-based Space and Upper Atmosphere Research Commission (SUPARCO) is more of a bureaucratic agency with little to show as end products. It is a part of the Strategic Plans Division (SPD) of Pakistani Armed Forces under the control of the Pakistan Air Force (PAF). Pakistan takes Chinese support for satellite launch. They have also joined the Chinese satellite navigation system Beidou. The main focus has been to develop a series of nuclear-capable ballistic missiles for the Pakistan Army with payloads up to 1,200 kg and range of 2,500 km. In January 2017, they tested the Abadeel, a development of the Shaheen-III with Multiple Independently-targetable Re-entry Vehicles (MIRV). The system is meant to counteract the Indian Ballistic Missile Defence (BMD).

India became the fourth space agency in the world
to send a spacecraft to Mars, behind US, Russia and the EU. India launched its first Moon mission Chandrayaan-1 and later in November 2013, its maiden interplanetary mission, the Mars Orbiter Mission which in September 2014, entered its intended orbit around Mars. Indian ballistic defence programme is a multi-layered system consisting of two interceptor missiles, the Prithvi Air Defence (PAD) missile for high altitude and the Advanced Air Defence (AAD) missile for lower altitude interception. It would be able to intercept incoming missiles launched from 5,000 km away. PAD was tested in November 2006, and AAD in December 2007. India thus became the fifth country to have an ABM system after US, Russia, China and Israel.

On March 06, 2009, India successfully tested its missile defence shield when an incoming missile was intercepted at an altitude of 75 km. The ‘Swordfish’ radar for the BMD system currently has a range of 800 km. It is planned to upgrade its range to 1,500 km - 2,000 km. Two new anti-ballistic missiles to intercept IRBMs are being developed to cover a range of up to 5,000 km. India is also planning a laser-based weapon system to destroy a ballistic missile in its boost phase.

India’s RISAT 1 & 2 satellites use Israeli synthetic aperture radar and have significant all-weather surveillance capability. The GSAT-7 or INSAT-4F is a multi-band military communications satellite developed for the Indian Navy. It became operational in September 2013. The IRS series of satellites have a spatial resolution of one metre or below and also have military applications. The CARTOSAT series carry state-of-the-art panchromatic cameras. The data from the satellite is used for mapping and other cartographic applications. The GSAT-6 is the second strategic satellite mainly for use by the armed forces for quality and secure communication.

The Way Ahead

Noted strategist Giulio Douhet said, “Victory smiles upon those who anticipate the changes in the character of war not upon those who wait to adapt themselves after the changes occur.” When Britain dominated the seas, it ruled the world. The Americans have been the leaders of the free world ever since they gained superiority in the air. Now the dominating position will belong to those who gain supremacy in outer space. India is one among the top six space powers in the world namely the US, Russia, China, European Space Agency and Japan. Satellites of several countries are used for variety of military purposes. US, Russia and China have developed and successfully tested ASAT weapons.

With space having emerged as the fourth medium for military operations, the IAF had brought out its blueprint entitled ‘Defence Space Vision 2020’. The Integrated Space Cell under the IDS headquarters in Delhi, is working on furthering joint space strategy. The Defence Space Satellite Centre works closely with the ISRO. India has developed all the building blocks necessary to integrate an anti-satellite weapon to neutralise hostile satellites in low Earth and polar orbits. India is known to be developing an exo-atmospheric kill vehicle that can be integrated with a missile to engage satellites.

India needs early warning satellites to monitor ICBM launches and even tactical airspace as an important military asset. Ground/space-based lasers are needed to disable enemy satellites or destroy/degrade attacking ICBM as part of ASAT capability. There is also the need to develop Directed Energy Weapons. India needs a permanent space station. The establishment of tri-services Space Command should not be deferred any further. The space-based systems have enabled dramatic improvement in military and intelligence operations thus enhancing its capability, accuracy and firepower. In the not-so-distant future, wars will again be fought as in the Indian epics. Space is the future for all action and capabilities, the real force multiplier. Time to invest and prepare is now.

Air Marshal Anil Chopra commanded a Mirage Squadron, two operational air bases and the IAF’s Flight Test Centre ASTE.
MIG-35, F-16, GRIPEN OR BETTER CHOICE?

Sumit Walia

More Rafale jets for the IAF and the IN will reduce logistics burden and increase operational cooperation. Getting the Kaveri and the Uttam fixed in next three or four years is do-able and can be achieved if we closely monitor the development programme and make all concerned parties accountable – DRDO, ADA, ERDE, GTRE, HAL, IAF and SNECMA. We need to have a high powered coordination body that can drive it through. It is a great challenge but we have to answer it for our own good – in the hope of a brighter future for the IAF and for India.

All of a sudden, news of the MiG-35 started rolling in Indian newspapers. It started with the Director General of MiG Corporation, Ilya Tarasenko’s interaction with the press during the MAKS 2017 Air Show where he claimed that India has shown interest in MiG-35, which is 4++ generation aircraft capable of giving the American F-35, a run for its money. He said, “We are in the negotiation stage where talks on technical and technological specifications that the MiG can present to India and the requirements that India has for this aircraft are taking place.” Talking about the aircraft, he claimed that when compared with the ‘basic’ MiG-29, the MiG-35 is a new aircraft with a new airframe, a new and more powerful engine (though it just gives seven per cent more power), fly-by-wire technology, new onboard equipment and weapons. Just about everything is ‘new’. In a nutshell, it is a ‘light’, low-cost and multi-role, easy to handle fighter. We need to see if all these claims are true, and what choice does the Indian Air Force (IAF) have?

Based on the proven and one of the best (and fearsome) fighters in its category, the MiG-29, Mikoyan bureau started developing the MiG-35 in the early 2000s and revealed it to the public in 2007. That explains why it looks very similar to the MiG-29. The MiG-35 is not a new aircraft, but a slightly upgraded MiG-29. By developing the MiG-35, the Russian aircraft industry did what it does best – providing a low-cost, evolutionary improvement to an already-proven design.
The MiG-35 does not offer much in comparison to the MiG-29 UPG that the IAF is operating. It has few clear improvements such as the smoke-free RD-33MKB engine, which gives about seven per cent more thrust, but does not generate smoke. It appears that the Russians have finally fixed that annoying problem of smoke that would give away a fighter’s location within visual range. Due to its thrust vectoring nozzles, the MiG-35 has remarkable manoeuverability, even better than the MiG-29.

At a better price, the MiG-35 will be fitted with a Zhuk-MA AESA radar which has a definite edge over MESA radars. Indian MiG-29s UPG have Zhuk-ME radars. The MiG-35 has a simple state-of-the-art cockpit fitted with three LCD screens that make the pilot’s job much easier. There are few more marginal improvements that give nothing substantial to the IAF. Why should the IAF go in for the MiG-35 if the MiG-29 UPG can be upgraded with both these noticeable improvements – the engine and the radar? The IAF is already in the process of consolidating the types of aircraft it operates. Adding the MiG-35 to the IAF’s inventory will definitely increase its maintenance burden; but then, so would adding the F-16 from Lockheed Martin or SAAB Gripen.

Moreover, the MiG-35 is not a light, single-engine fighter that India is looking for. Perhaps that is why Ilya Tarasenko deliberately called the MiG-35 a ‘light’ aircraft. His claim that India has shown interest appears to be a marketing gimmick. So far, only Egypt has placed an order for 50 MiG-35 aircraft. Mikoyan desperately needs orders to keep the production lines open and the company alive. Mikoyan has produced legendary aircraft such as the MiG-21, the MiG-25 and the MiG-29 which have reserved their place in history forever. But during last 20 years, the Sukhoi Design Bureau has forged ahead leaving Mikoyan behind in this ongoing race for technological advancement. With the Su-27, Sukhoi has taken the development to the next level.

There are few more interesting developments. On 10th August 2017, IAF’s Jaguar, undergoing DARIN III upgrade program, flew with ELTA’s AESA radar. There are 28 other sensors that would enhance the capability of these plans to a whole new level. IAF will fly these Jaguars for another 10 years. The Rafale jet will also come with its AESA radar – RBE2. From a maintenance standpoint, adding a third kind of AESA radar, the ZHUJ-MA, would not be a good decision. In all likelihood, the IAF will try to standardise its radar inventory as well.

Adding Mikoyan MiG-35 or Lockheed Martin F-16 or SAAB Gripen will increase the IAF’s logistics and maintenance burden. Any of these planes can be manufactured in India under the ‘Make in India’ initiative but primarily, they will just bring more jobs into India and not better technology. Only SAAB
has proposed to share technology and to set up a development centre in India. But Gripen is using the GE-414 engine and a Selex Raven ES-05 AESA radar. It relies on foreign partners for two most critical and central components of any fighter. So the question arises - how much technology will SAAB be able to share with India?

Lockheed is less likely to share key technical components and Transfer of Technology (ToT) of engine and AESA radar would be a too far-fetched expectation. Moreover, the F-16 is a 40-year old aircraft that the IAF will need to fly for another 40 to 50 years. In a nutshell, forcing the F-16 down the IAF’s throat will be the worst ever decision in its history of 85 years.

The case of the MiG-35 has already been discussed. So none of these aircraft is likely to meet most of the key requirements of the IAF and the Indian government. The Government of India (GoI) wants leading global weapons manufacturers to make their weapons in India and sell those to the world. The requirement of the Indian armed forces is being used as an incentive to make the offer more lucrative. None of these aircraft will serve the IAF and the GoI’s goals for a long time while the F-16 is almost at the end of its life, the Gripen and the MiG-35 have almost non-existent foreign buyers.

**The Better Choice**

There is a far better option that needs greater attention. Under the offset clause of the 36 Rafale deal, Snecma, a company that builds Rafale’s M88 turbofan engines, is working to sort out indigenous Kaveri engines issues. Readers would remember that Dassault had made a similar offer to invest $1 billion in the Kaveri programme while discussing the original MMRCA tender for 126 fighters. The DRDO has been working on the Kaveri engine for three decades now but developing a jet engine is not an easy task.

Only a few countries in the world have the technical capability to produce credible jet engines for fighter aircraft. If we are able to produce a Kaveri engine that can deliver 90kN thrust and further develop it to deliver 125kN thrust, we will practically be in a position to standardise the entire IAF fleet with indigenous engines. This will save us a huge amount of money and will ensure our self-reliance. We will not have to look towards Russia for engine problems, replacements or spares. We will also achieve all the targets of the GoI’s ‘Make-in-India’ initiative – more jobs, technological advancement and greater chances of export.

As suggested earlier, the IAF and the GoI should consider buying more Rafale jets. In Sep 2016, India placed an order for 36 Rafales, which is too short a number to utilize a fighter platform effectively. It would not make much operational and business sense if we don’t increase their number in the IAF’s inventory. It might prove costly at present but will have long term benefits for us. If we place an additional order of, say three more squadrons for the IAF, they will get delivered by mid-2020s. By this time, the MiG-21 and MiG-27 would already be decommissioned and the Mirage, Jaguar and MiG-29 would be approaching the end of their service life. Additional Rafale jets would be there to replace fill the technological and operational gaps these three types of aircraft will create. During this time, we will have Tejas (with the Kaveri
engine and Uttam radar) to replace the MiG-21 and MiG-27. By the end of the 2020s or mid 2030s, there will be just four types of aircraft in the IAF’s inventory:

- LCA MkI or MkII
- Rafale
- Su-30 MKI
- FGFA

Compare it with the inventory list otherwise – LCA, MiG-29, Jaguar, Mirage, Rafale, Su-30 MKI, MiG-35/F-16/Gripen and FGFA. Scary sight!

Offset clause of the additional orders can be utilized to get French help to fix Kaveri, Uttam AESA radar and any other area like EW or Astra air-to-air missile. We need to understand that we don’t have reinvent the wheel. If we can get Dassault to help us fix these core components in shortest possible time, then why not? These crucial steps will pave the way for smooth and faster development of LCA MkII and AMCA. A fully equipped LCA will give leading aircrafts in its category a run for their money. There will be great chances of export because it will be very cost effective.

Involving Dassault for engine and radar development will make us self-reliant in these two crucial areas...
SINCE THE 1990S, CHINA HAS BEEN ON A quest for indigenously manufacturing modern systems for its military. Its success in mounting airborne warning and control radars on aircraft has been a major achievement of the domestic industry.

Airborne Warning and Control System (AWACS) provides the air force commander the ability to see air activity from low to high levels, deep inside enemy territory. It is like having an Air Defence Direction Centre (ADDC) in the air with a clear view of what is happening up to great distances, thus meeting the age-old requirement of commanders to know what is happening on the “other side of the hill”. The early warning from an AWACS gives a definite advantage to the commander in air battle management and guides friendly fighters to intercept enemy aircraft well in time before the weapon release line. AWACS has changed the way war is conducted. As a force multiplier, AWACS has become so critical in modern war that the side which does not have it will suffer from a huge asymmetry right from the preparatory stage to start of the shooting war.

The Chinese realised the importance of these platforms and after years of effort, they developed their indigenous fleet of Airborne Early Warning (AEW) and AWACS aircraft consisting of four Kong Jing-2000 (KJ-2000), four KJ-200 and two KJ-500 in the People’s Liberation Army Air Force (PLAAF) as per Military Balance 2017. The PLA Navy has its own small fleet of AEW aircraft on the Y-8/Y-9 platform. In addition, China has inducted a new indigenous heavy transport aircraft, the Y-20, and while it has not yet been announced, it can be speculated that this will be the platform for the future AWACS to replace the KJ-2000. This article traces the history and development of China’s AWACS/AEW projects and briefly discusses the AWACS limitations for the PLAAF against the IAF.

BACKGROUND

China’s first attempt to make an indigenous AWACS dates back to 1969. This project called the Kong Jing-1 (KJ-1), was undertaken on a 1950s-designed Soviet TU-4 Bull aircraft. The project was not successful since China did not have the technology, at that time, to overcome ground clutter problems. In airborne radar, the signal return from ground echoes is stronger than the target signal and the radar system must be designed to pick up targets through the clutter. The Chinese were unable to do this and consequently, the project was abandoned.

China, it seems has major long-term plans for future AWACS. Future Chinese AWACS are going to be very cost competitive since major development work has already been done. Dr Wang says, “The KJ-2000 costs billions of RMB and some new systems will spend only thousands or even millions of RMB. Being a large country, in future, China will need more AEW&C systems. We can develop lots of variants or upgraded version from present systems.” With such competitive pricing, China is sure to capture the export market for AWACS. Many countries who would not like to get into the high costs and political strings attached to an American or European AWACS or the costs of a Russian or Israeli system may find the cheaper Chinese AWACS a better option.
Since then, China had been trying to purchase or develop an airborne warning and control capability. In the 1970s, relations between China and USA improved with the express intention of jointly opposing the then Soviet Union as their common enemy. Taking advantage of this situation, China began exploring the possibility of purchase of E-3A Sentry AWACS from USA. This subject was taken up by the Chinese during President Reagan’s visit to China in 1984 but nothing came of it. The Chinese having failed in their attempts to get the E-3A, looked for AWACS from Russia, UK and Israel. The Russian product on IL-76 airframe was rejected as its radar performance did not meet their requirements.

The Chinese also negotiated with a number of Western firms to jointly produce an indigenous AWACS. These firms were Westinghouse (USA), Marconi (UK), Thorn-EMI (UK) and Dornier GmbH (then FRG) but there was no fruitful outcome. The only success China had was with the development of a maritime AEW by its Harbin Aircraft Corporation. Harbin developed an AEW prototype by installing the Thorn-EMI Skymaster radar on the Y-12 Turbo Panda. A small number of these aircraft were used for maritime surveillance. But they still did not have an AWACS. The Chinese wanted to purchase the Nimrod from UK but this project was cancelled by the British. Thus, having been left with no choice, the Chinese decided to develop an AWACS in collaboration with Israel.

In 1992, China and Israel got into an initial agreement for joint development of the AWACS. After four years, in 1996, both sides signed an official contract which defined cooperation in developing an AWACS based on the IL-76 platform. Initially, Israel provided the modified Phalcon radar with antennas mounted on the aircraft fuselage and nose dome. This configuration could provide only 260° coverage which was not acceptable to the Chinese. The Chinese wanted full 360° coverage and suggested stationary radome on top of the fuselage with phased array planar antenna technology. But the Israeli plan to sell AWACS technology ran into rough weather in 2000, when the US forced Israel to cancel the deal. The US did not want AWACS technology to fall in the hands of the Chinese. They saw this deal as a threat to Taiwan and to US interests in the region.

The Chinese were obviously not pleased with this development; but they were determined to have an AWACS. The cancellation of the deal speeded up China’s indigenous efforts. Although the Israelis had removed all Phalcon radar components, the Chinese managed to get some of the technology from them. The two main things the Chinese learnt from the Israelis was firstly, the Transmit/Receive (T/R) module and secondly, the production process for manufacturing the composite material radome with proper specifications to control quality. Israel also helped China to design radar structure based on data bus structure. This knowledge, it seems, enabled the Chinese to develop the AWACS in quite a short time frame. According to Wang Xiaomo, Executive Vice President, China Academy of Electronics and Information Technology, a leading designer of China’s AWACS project, China spent, “only five years to manufacture its own AEW&C system.” The Chinese also overcame other technological challenges in the development phase like design of electromagnetic compatibility to avoid radio interference with other systems in the aircraft, data link with ground stations and target pick up in dense clutter environment over mountainous terrain.

KONG JING-2000
In November 2003, China produced its first AWACS radar on the IL-76 platform, labelled as the Chinese AWACS use Active Electronically Scanned Array (AESA) technology which is more advanced than the technology used in AWACS built by USA and Russia...
The fuselage in an equilateral triangle. Each aerial electronically scans 120 degrees, thus covering full 360 degrees in azimuth. While not many details of the KJ-2000 are available, the radar can be expected to have a maximum detection range of 400 km.

The IL-76 platform was chosen because the Chinese did not have any other choice since Western countries were not willing to sell any platform to them and no comparable indigenous aircraft was available. As per Dr Wang Xiaomo, procuring additional IL-76 platforms also became a problem. In an interview, he said, "Russia doesn’t want to sell China IL-76 after the birth of KJ-2000." Due to shortage of IL-76 aircraft, the KJ-2000 programme ran into delays and at present, only four have entered service with the PLAAF. To overcome these problems, the Chinese developed another smaller version of the AWACS called KJ-200, based on the Y-8 (Chinese copy of Russian An-12) platform.

KJ-200

The KJ-200 with its balance beam-like radar on the back of its Yun-8 airframe is a smaller AEW system which supplements the larger AWACS cover. The planar antenna on the fuselage is dual side linear-shape Active Electronically Scanned Array (AESA) radar similar to the Swedish Ericsson PS-890 Erieye. This shape of the antenna cannot provide coverage in front over the nose or in the rear, but it will provide broadside 120° coverage on each side. The limitation of the 120° coverage is because the highest value, which can be achieved for the Field of View (FOV) of a planar phased array antenna, is 120°. This limitation is there in the Erieye also.

The KJ-200 project was started in 2005, but it received a major setback in 2006, when it crashed in Guangde County in Anhui province of China, killing all 40 people onboard. It was one of the worst disasters in the history of the PLAAF but it did not deter the Chinese from continuing their development work in this field. The KJ-200 finally made its debut in 2009 and was inducted in the PLAAF and the PLANAF.

KJ-500

China has developed another AWACS aircraft, the KJ-500, which entered service in 2015. The KJ-500 seems to be China’s next generation early warning aircraft and will replace the KJ-200. The KJ-500 is based on China’s new transport aircraft, the Y-9, manufactured by Shaanxi Aircraft Company. The Y-9 is an improved version of the Y-8. It is a four-engine
turboprop powered by improved Chinese WJ-6C turboprop engines and has a cruising speed of 550 kmph and range of 5,700 km. It has more advanced avionics and has a “glass cockpit”. The aeroplane is similar to the American C-130J Hercules.

The Chinese have claimed that KJ-500 has a phased array antenna with AESA technology similar to the KJ-2000 AWACS. There is no rotating antenna in the KJ-500. The scanning in azimuth and elevation is done electronically as in the KJ-2000. Since the Y-9 is a turboprop aircraft, its cruising altitude is lower than the jet engine KJ-2000. Consequently, the KJ-500 detection range will be less than that of the KJ-2000. The KJ-500 looks similar to the ZDK-03 Karakoram Eagle AWACS which China supplied to Pakistan Air Force (PAF) in 2011. However, the radar in the KJ-500 is more advanced. The Chinese have not revealed details about the KJ-500, but its maximum detection range can be expected to be around 300 km.

**ZDK-03 Karakoram Eagle**

The ZDK-03 Karakoram Eagle is based on a Y-8 F600 airframe and built by Shaanxi Aircraft Corporation. The radar and onboard systems were developed by China Electronics Technology Corporation (CETC). In 2008, the Pakistan signed a contract with China for four ZDK-03 AWACS systems to be built as per specifications and requirements of the PAF. The first aircraft was rolled out for testing in November 2010, and delivered in October 2011. The ZDK-03 radar has an electronically steered antenna based on the KJ-2000 radar which electronically scans the airspace 360 degrees in azimuth. The radar antenna is installed in a radome mounted on the dorsal side of the airframe. Performance of the ZDK-03 radar is expected to be better than the one in the KJ-200 but since both the ZDK-03 and KJ-200 are mounted on turboprop aircraft. They are likely to be operating at lower heights compared to the jet engine powered KJ-2000.

**China’s AWACS Capabilities against India’s**

Against the PLAAF’s ten AWACS/AEW aircraft, the IAF has three AWACS with two more in the pipeline. In addition, the IAF has inducted one Embraer EMB-145 AEW&C in February 2017, and has two more in the pipeline. The rectangular dual side airborne radar on this aircraft has been developed indigenously by DRDO and is similar to China’s KJ-200.

As in the case of the Chinese KJ-2000, IAF AWACS are also based on the IL-76/A-50EI airframe but the Phalcon radar is from Israel. The airborne radar in the IAF and Chinese AWACS is of similar design with both having Active Electronically Scanned Array (AESA) radar. Both the PLAAF and the IAF will suffer performance limitations of the AWACS in the mountains since undulations in the terrain will create detection problems for aircraft masked behind the hills. The laws of physics are universally applicable and requirement of Line of Sight condition has to be met for radar pick up.

The Y-20 will be a major boost for the PLAAF’s strategic and early warning capabilities...
back safely when under threat from IAF fighter aircraft. Another limitation of deploying AWACS in the mountains is that due to terrain masking, AWACS may not be able to pick up any attackers heading towards it. The attackers can easily launch sneak attack taking advantage of hill shadows in the area.

China’s Future AWACS Plans

China, it seems has major long-term plans for future AWACS. Future Chinese AWACS are going to be very cost competitive since major development work has already been completed. Dr Wang says, “The KJ-2000 costs billions of RMB and some new systems will spend only thousands or even millions of RMB. Being a large country, in future, China will need more AEW&C systems. We can develop lots of variants or upgraded version from present systems.” With such competitive pricing, China is sure to capture the export market for AWACS. Many countries who would not like to get into the high costs and political strings attached to an American or European AWACS or the costs of a Russian or Israeli system, may find the cheaper Chinese AWACS a better option.

China’s new heavy transport aircraft, the Y-20, has been inducted in the PLAAF in June 2016...

China’s new heavy transport aircraft, the Y-20, has been inducted in the PLAAF in June 2016. Once these aircraft are available in sufficient numbers, they are likely to be developed as a platform for AWACS radar. Designed and built by Xian Aircraft Corporation (XAC), the Y-20 first flew in January 2013 and the Zhuhai Air Show-2014 was the first time it was on public display. The Y-20 is powered by four Russian Saturn D-30KP2 (same engine as in IL-76), turbofan engines and has a maximum payload capacity of 66 tonne which places it between the larger Boeing C-17 Globemaster (77 tonne) and the lesser capacity IL-76 (43 tonne). The Chinese government newspaper Global Times, quoting Wen Wei Po, a military expert, said “China’s air force needs at least 100 large transport aircraft of the Y-20 class to enhance its global power projection ability. Another 90 are expected to be modified into tanker aircraft, electronic warfare aircraft and early warning and control aircraft.”

Another report by China’s National Defence University (NDU) has recommended a fleet of 400 Y-20s for the PLAAF which will include variants for various roles. In the coming years, the Y-20 will be a major boost for the PLAAF’s strategic and early warning capabilities. China’s other plans are to develop conformal phased array airborne radar. If China can make a breakthrough in this technology, it will be a big leap forward for the nation in the regime of advanced technologies.
OUR ARMED FORCES
Do We Take Them Seriously?
— Sanjiv Khanna

India can be surely proud of its disciplined, apolitical and brave armed forces. Our military not only represents a potent force, but is a unique force in the world that is constituted by the amalgam of various races and religions held together by their loyalty to the nation and pride in their service. It is incumbent upon the nation and its leadership to nurture and conserve this national treasure, and be profoundly discrete in its application.

Quartered in snow, silent to remain. When the bugle calls, they shall rise and march again.

— The Scroll of Honour at Siachen Base Camp

The Instrument of Last Resort

We as a nation are at the intersections of a wide array of consequential geopolitical changes occurring both within and without. The complex conflict system situated in our West remains a perennial source of serious concern and an incessant drain on our military resources. It is not only the Line of Control (LoC), but also has various forms of insurgencies that put onerous demands on the military. Although both India and China have learnt to manage the difficulties in the Himalayas, the unresolved border remains pregnant with immense disruptive potential.

Our geographical location and our growing economic and military heft, will catapult us into a situation that will impose a crucial role on India in finding an answer to the famous conundrum - whether the world falls into the Thucydides trap or not? National security issues have entered the popular consciousness due to a growing number of terror related incidents, thus making national security an important electoral issue and a subject of, not always very well informed, intense media debates. This makes apportioning the glory of success of the armed forces quite irresistible for the political classes. The military will be asked not only to perform the conventional security role it has played so far, but also to play a greater role in future geo-political dynamics in the making of our international aspirations and countering the associated challenges.

As the military’s role will undergo both qualitative and quantitative changes, a case for profound reorientation in perspective of our military cannot be overstated. There is no argument against the civilian control of the armed forces. Even Clausewitz argues that maintaining political control is not a question of values, it is in effect the key to success. Nevertheless, we need to re-evaluate our accountability mechanisms related to deployment of the armed forces. We need robust structures that ensure that our young men are put in harm’s way only when all other alternatives are exhausted. Therefore, given the growing complexities of the role the military must play, it is incumbent upon the political leadership to articulate the national goals (or the grand strategy) and clearly outline the expectation from the military thus enabling the military leadership to evolve appropriate military strategy.

Furthermore, we need to evolve a new framework for national defence that allows the military leadership direct access to the decision and the policy making processes of the Ministry of Defence (MoD). This hinges not only on the structural changes in the defence establishment, but also demands domain expertise from amongst the political leadership.

Democracy, Media and the Overstretch of the Military

The strange dynamics of democracy, as illustrated by the examples from the world over, (e.g. the second win of George Bush following the Iraq War or as some term it as the ‘only win’), gives rise to a situation what economists call a ‘moral hazard’ – a situation in which the risk taker does not pay. This means that those who decide to go for war have the least to lose, because unlike in the past when the Kings decided to go to war they had to put their own lives and those of their kin and even their kingdoms in the line of fire. Although nowadays, it is the soldiers who fight the wars, the decision makers, the political and the bureaucratic elite, have almost no skin in the game.

The paradox of modern democracy is that it fully
The state exchequer offers the treasure while it is the armed forces that contribute their blood in the accomplishments of national goals...

force are increasingly emphasized regardless of the long term consequences. Heavy dollops of rhetoric and sentimentalism employed by the media in order to raise their Television Rating Points (TRP) completely edge out the need for objective analysis of the reason for deployment of forces and whether the strategic objectives were achieved.

The onset of social media is, to a significant degree, responsible for greatly diminishing our sensitivity towards the consequences of loss of lives of our soldiers, an illusion of having fulfilled our duty as citizen is accomplished by clicking ‘like’ or ‘share’ on the pictures of funeral pyres of the martyred soldiers or their wailing kith and kin left behind. Without really experiencing the actual pinch of the situation, the Facebook warriors emerge thirstier for masculine action and revenge, and are ever willing to fight to the last drop of the soldiers’ blood. It might appear a bit exaggerated, but the 24x7 TV coupled with social media has reduced the LoC to an arena with our soldiers as gladiators.

Lack of robust oversight mechanism over deployment of forces, and the enabling space, created by the advent of the new media that allow easy appropriation of the successful operations, raises a genuine question. Does this scenario enhance the propensity to deploy the armed forces as an alternative to diplomacy or as an instrument for addressing internal security problems arising out of inadequacies in civilian governance? Doesn’t this predicament compel one to believe the saying, “Wars are created by politicians, compounded by diplomats, and fought by soldiers?”

Is Blood Less Precious than Treasure?

The ease with which the executive deploys the army can be aptly described by the so-called ‘Law of Maslow’s Hammer’ which states, “...it is tempting, if the only tool you have is a hammer, to treat everything as if it were a nail.” Therefore, from the boy ’Prince in the Pit’ (the child who fell into a borewell in Haryana) to Pakistan, it is the Army that has to act. All other organs of the state appear almost dysfunctional in periods of crisis, be it acts of terrorism, communal riots or natural disasters.

Are We Discrete in Using Our Armed Forces?

An honest look at what our nation-building project costs in blood and treasure will not be misplaced when it comes to comprehensive national power. To that end, the state exchequer offers the treasure while it is the armed forces that contribute their blood in the accomplishments of national goals.

For enforcing the accountability on the use of treasure, we have the Comptroller and Auditor General (CAG) and the Public Accounts Committee (PAC). The CAG audits the revenues and expenditure of the Government. Its report is not only taken up by the Public Accounts Committee of the Parliament but is also available in the public domain. In the recent past, it was the CAG report that brought out the 2-G and Common Wealth Games (CWG) scams thereby placing the massive financial demeanours of the then government into the national focus.

Furthermore, the PAC not only discusses the CAG reports, but also goes beyond examining cases involving losses, nugatory expenditure and financial irregularities. Thus we can say a high-powered mechanism is in place that has the capacity to raise the red flag when the executive falters and squanders national treasure.

The question is, do we have such a mechanism for ensuring accountability of how we expend the priceless national resource - the blood of our soldiers? We need to remind ourselves with all seriousness at our command that the money squandered, although not permissible, can still be earned back with some hardship and pain, but a dead soldier cannot be brought back to life. Will it be wrong to infer that we are far more concerned about the treasure and very nearly indifferent when it comes to putting our soldiers in harm’s way?
Parliamentary Oversight

It is high time we have a debate as to when and where we need to deploy the military, so that checks and balances could be imposed on the executive decision making process in order to ensure greater accountability. As discussed above, we must have enhanced oversight and scrutiny of the executive when it comes to the use of the Armed Forces of the Union.

This is not to restrain in any way the ability of the executive to take decisions on deployment of the armed forces to defend national interests. The executive has to act in fast moving situations with ample amount of uncertainty, so large room to manoeuvre is indispensable. But oversight on the deployments is more important to check the tendency of looking at the armed forces as the most reliable back stop – thus relieving the civilian governance structure from remaining alert and serious enough and so prevent the situation from spinning out control to such an extent that it cannot be controlled without the deployment of armed forces.

Also, a fresh look into the eternal stalemate we have had with Pakistan may be in order. Would it be out of place to see parallels between our LoC and the trench warfare of World War I (WWI) that saw incessant bloodletting without any strategic outcome for a very long period? Isn’t the time ripe to revisit this problem and the strategy of continuously sending our bravehearts into harm’s way? As the former National Security Advisor Shiv Shankar Menon rightly points out, India-Pakistan relations are one of the few major failures of India’s foreign policy. A natural corollary to this conclusion could be that the nation perpetually pays for this failure with the blood of its soldiers.

Here the blame would not just rest with the diplomats; the political leadership must bear the greater burden of retrieving the situation. It is primarily the responsibility of political leadership to challenge the simplistic narrative that induces a sense of belief that disputes can be settled by use of force. We must remember that foreign policy can be as intelligent as the people’s ability to understand the nuances of it, and here the role of political leadership becomes crucial in educating the masses.

The following are the major imperatives that necessitate a debate on oversight:

- Frequency of deployments of the armed forces in internal security roles
- Number of casualties of the armed forces
- Cross border terrorism

Frequent resorting to use could be leading to overstretched of the armed forces and this might have a potential of internal haemorrhaging. It is time we start looking at this tendency from the prism of quality of governance and inadequate policy responses. Therefore, a parliamentary mechanism must be created that oversees the working of the armed forces. A standing committee on the lines of US Armed Services Committee of the Senate could be explored. This committee could oversee the functioning of the armed forces, provide guidance for the evolution of the military strategy and above all, ensure that precious national treasure is properly conserved and discretely applied in service of overall national goals (or the ‘grand strategy’). There is actually a Parliamentary Committee on Defence, but neither any salience to its conduct, nor to its recommendations are accorded by our governing system.

Involvement of the Armed Forces in Policy Making

Civilian control of the armed forces in any democratic set up is a foregone conclusion. However, in our case, the evolution of the civil-military relationship in the backdrop of dominant narrative of pacifist, although anti-status quo, its foreign policy of Nehru somewhat obfuscated the real significance of the armed forces. This resulted in the military being pushed to the sidelines from the standpoint of policy making. The situation was been further aggravated by the happenings in the neighbourhood where the army has never desisted from overstepping its mandate and taking over the leadership of the country. This is the backdrop that spawns an environment of trust deficit between the political and the military leadership. Furthermore, the complex, technologically sophisticated and interconnectedness to a vast canvas of geopolitics, makes the subject of defence quite unwieldy for the usual politicians. As Field Marshal Sam Manekshaw had to say, “I wonder whether those of our political masters who have been put in charge of the defence of the country can distinguish a mortar from a motor; a gun from a howitzer; a guerrilla from a gorilla...!”
So we rarely have the leadership of the MoD in the hands of ministers well versed with the subject. This creates the need of utter reliance on generalist civil servants for running the affairs of the Ministry. Thus the intended civilian control gets reduced to civil service control of the armed forces. Unlike in other democracies such as the US where even the civil servants of the Department of Defence possess adequate domain knowledge, the MoD is generally manned by personnel with a background not particularly suited for the highly complex and dynamic needs of managing the armed forces.

This predicament of defence planning is further depicted by the definitions in vogue till recently in the ‘Business Rules of the Government of India.’ These rules defined the Service Headquarters (of Army, Navy and Air Force) as ‘subordinate offices’ of the MoD. According to these rules, the Secretary MoD was assigned the ‘responsibility’ of the defence of India and thus responsible for the armed forces of India. This setup introduces another anomaly that whereas the Service Chiefs hold the same status in the order of precedence as that of Cabinet Secretary, but functionally they are subordinated by the Defence Secretary’s authority! Hullabaloo raised some years back has caused to Government to remove, on paper, such banal anomalies, but the ‘system’ remains unmoved.

The effect of this archaic structure almost insulates the leadership of the three Services (Army, Navy and Air Force) from the policy making process. The ensuing situation is not optimal because the professional inputs necessary for decision making are not directly accessible to the political leadership. This set up has the potential of not only delays in decision making, but is also inherently incapable of critical evaluation of the working and needs of the military.

We need to recognise the fact that the conventional role of military is undergoing a sea change; its role is no longer confined to the territorial domain. In case of India, this aspect is further important because of the rising power of India and the fast changing geopolitical landscape where we are situated. In the years to come, our traditional problems with Pakistan will be less and less demanding and the military will be called in more often to chart the turmoil induced by resurgent China.

Furthermore, in the backdrop of nuclearisation of our region, the possibility of protracted conventional military conflict has receded. Of course, the deterrence value of powerful armed forces cannot be overstated. However, the application of force will be more often for power projection, securing Sea Lanes Of Communication, fighting piracy and other out-of-area operations. This reorientation of the role of the military will demand increasing jointness in operations.

Therefore, the importance of a unified military in the furtherance of our foreign policy can hardly be overstated and an overhaul of the MoD is long overdue. One of the possible models that could be adopted could be the UK model of Chief of Defence Staff (CDS). This will ensure that the CDS works side by side with the Secretary MoD and will be professional head of India’s armed forces. The CDS will be the single point of Military Advice to the Government. The creation of the CDS will also adequately address the ‘jointness’ or the unified operability needs of our times.

**Political Leadership and the Necessity of Domain Knowledge**

Going back to Clausewitz’s famous postulation that, “war is merely the continuation of policy by other means,” this establishes the dominance of political goals and defines the role of the military as an instrument for achieving the said goals. The government of the day has to enunciate the grand strategy outlining the political and economic goals essential to safeguard national interests. It is the responsibility of the military leadership to determine military strategy in consonance with the grand strategy of that government.

These formulations of the strategy and the working thereof can be realised only when the political leadership is adept in handling the complexities of the subject. As discussed above, India’s rising power under a challenging geo-political backdrop puts onerous responsibility on our political leadership. If we aim to secure for ourselves a global positioning commensurate with our power, then the political leadership will have to develop the knowledge and expertise to establish civilian (political) control in the real sense. This implies that they should be able to
succinctly define national goals and have direct and intensive discourse with the military leadership, so that an enabling military strategy could be developed.

The leadership will be more often confronted with difficult policy choices both in terms of the massive fiscal commitments and the efficacy of choices in addressing the critical challenges to our security. A classic example would be our problems in the Himalayas - is raising a Mountain Strike Corps more effective than enhancing the naval capabilities in the Indian Ocean that could pose credible interdiction capabilities in the approaches to choke points of Malacca Straits or will it require both in some proportion? These choices will impose costs of billions of dollars and years of lead time and the right choice holds a key to the attainment of national goals.

One way of fostering the domain knowledge for the future political leadership could be to have ‘shadow ministers’ for the key ministries such as Defence, Home, Finance and External Affairs, as it is in the UK. These shadow ministers should be not only critiquing the policies and working of the concerned ministry but also offer alternative policies. Furthermore, as discussed above, parliamentary functioning along the lines of US armed services committee could also provide a pool of would-be defence ministers conversant with the intricacies and complexities of the defence portfolio. A collateral benefit of this will be that the Parliament could witness more vigorous and informed debates. This could elevate the general awareness levels about the needs and the working of the armed forces.

**Conclusion**

India can surely be proud of its disciplined, apolitical and brave armed forces. Our military not only represents a potent force, but is a unique force in the world that is constituted by the amalgam of various races and religions held together by their loyalty to the nation and pride in their service. It is incumbent upon the nation and its leadership to nurture and conserve this national treasure, and be profoundly discrete in its application.

We are at the cusp of tectonic shifts in global geo-politics. Therefore, the real challenge for our leadership will be to skilfully leverage our military power in such a way that victories are achieved with the least suffering and attrition – or better still, the adversary finds discretion as a better bet. Thus, our leaders can ensure that the nation moves steadfastly towards realising Mahatma Gandhi’s dream of wiping tears from the eye of every Indian, without compromising on strategic autonomy.

And then we will not have to echo what The Atlantic magazine said, “The American public and its political leadership will do anything for the military except take it seriously.”

**Notes**

1. Thucydides trap: the resultant dangers when an existing power perceives a rival in an emerging new power, US-China for example.

2. ‘jointness’ is an expression coined by US to describe inter service cooperation running through various elements of the military processes, ranging from research to operations.

Sanjiv Khanna, an Engineer and MBA from University of St. Gallen (Switzerland) is an Indian citizen working in the Energy Sector, and is currently based in Switzerland. An avid observer of Indian politics and geopolitics of South Asia in general and China and Pakistan in particular.
CHINA’S ‘CONTENTIOUS’ PATH TO WAR?

Anant Mishra

The traditional US foreign policy of ‘preserve and protect’ could instigate some issues between Washington and Beijing but experts argue that Washington would maintain close proximity with Japan and South Korea, the two key regional partners in Asia. In the years to come, Washington would face some major challenges, particularly with respect to its policies in Asia, especially from its relations with Taiwan which, Washington needs to ensure, does not pose a challenge or response to China’s contentions and modernisation of its military.

Is China’s rise ‘contentious’? The question seems to have instigated a new debate between security experts and foreign policy gurus, making it a key chapter in the history of international relations, particularly in this century. However, without sheer optimism or a contrast to the debate with no absolute clarity, the end remains a mystery. Does the escalation in China ‘packing’ for war, prove its might in the world? Particularly during the post-Cold War, will US-China tensions be dangerous? Or will it be far worse than a Cold War? Especially China armed not just with an economic might prove to a tough contender to the US, tougher than the former Soviet Union? Will this fight be a geo-political one? Issues at this stage have been deliberated by experts from every kind of domain, be it regional centric experts, conflict historians or economic gurus; all those who share a theory different from one another, angled not only on the ‘might have been’ but ending inconclusively. Although, China’s past behaviour and economic growth may just be a few factors to predict its contentions since the key elements that depicts the nation’s superpower in the context of war with other nations not just rely on its ability to survive the end of the battle, but also on regional strength to embrace the impact of post-war scenario. Such deliberations, in the context of a nation right from its military might to survival a post-war scenario have encouraged the contribution of international theories, which too are inherently contradictory.

Today, the rise of China and its contentions to an all-out-war has drawn a line between the arguments of international theorists, some optimistic, realistic and some pessimistic. The liberals, on the other hand, support their arguments by citing the foundations of international relations - economic and political growth. They cite the peaceful and resilient rise of China while limiting the deliberations of their counterparts to mere exaggeration. According to them, the United States and other power nations, particularly in the EU, will go ‘all-well’ with China and she would ‘prosper’ within the ranks of these nations instead of launching an expensive war which even a country such as China would find ‘costly’ in an effort to establish order and control in Asia.

The realists however, base their arguments on the contrary of liberal arguments, while citing possibilities for an intense competition. China’s rapidly growing economy and military might, they argue, will put her in an aggressive position, especially when it comes to achieving her own interests, which will force Uncle Sam and other nations of the West to take appropriate measures. This will initiate a chain of events, which would be quite intensive, similar to those of early US-USSR relations in the initial days of Cold War, which would escalate into a war of hegemony. In light of China’s pressing and repetitive claims over East and South China Seas along with the proximity in relations between India and the United States, the time for checks and balances has begun.

Moreover, an evolved version by realists opens the door for much-anticipated optimism in an intense conflict such as this. The rise of China’s economic and military might may not be as great as the neo-liberals predict, as the acting forces, which are directly involved in play, if a conflict happens, are quite structurally weak. The eminent threat is not just related to a nation’s military might and economic strength, it is the global roles of actors in international relations which will force China to play defence rather than instigate conflict. This would further assist nations such as US and those with the EU, to maintain a balance of power. Moreover, at a later stage, it will be primary role on the actors in international relations to mediate a scenario which
the top leadership in China could effectively and peacefully manage.

It would be too naïve to declare the conflict as predetermined - however, with the United States along with its international partners in geo-politics could be forced to make some uncomfortable decisions without posing a direct threat, to prevent a major clash.

**In-security Dilemma?**

Many realists have opined on the nature and behaviour of actions previously taken by the state. It is important for an individual to keep in mind national/local/regional factors to better understand international relations, considering the aforementioned statement, certain actions carried out by a state, irrespective to its routine or not, may result in 'In-security' situations, and if the state runs under absolute anarchy, it might result in an all-out war. However, scenario such as this is not regular, and security concentrated nations sometimes end up in war, is quite surprising, as they could have opted for a peace and cooperation instead of war. The solution to this complex situation lies in the ‘In-security’ of a nation, which experts define as a situation where a nation increases its own security or reduces the security of others.

The ‘In-security’ situation remains fluid for a state, as it increases or decreases depending upon the actions taken by other states. When there is a window of opportunity for an attack, nonetheless how small the target be, the state’s ‘In-security’ decreases the security of the rival state, creating horror and instigating fear. Moreover, defending a state’s security is easy, whereas, a neutral approach will never pose a threat to any state, not even to itself, opening a window of opportunity to strengthen ties and relations with multiple actors in the system.

It is also important to understand that, due to the fluid movement, the intensity of the ‘In-security’ also depends upon the perception of one state towards another. To begin with, if one state, presumes the actions of the other state to not just be intimidating or violent but, on a quest or desire to dominate, then it would remain alarmed and restructure/re-configure the security mechanism of its own country while keeping a tight vigil on the actions of the rival nation. This scenario would not only haunt the former of any possible strike, which the former would have to be prepared while preparing a response. There would be fear in the aura along with a sense of ‘In-security’ created by the latter, thus initiating a whirlwind of political and military stresses.

Due to its fluidity, the possibility of mixed or multiple response in an 'In-security' scenario is quite high, further complicating the situation with presumptions, assumptions and dilemma. When the 'In-security' situation is high, contentions will surely be high and so will be the possibility of war. The scenarios aforementioned are rightly cited by pessimistic realists, but they draw a line by arguing on the fact that a state will always live in security as the probable contentions are mild and fades away in time. Moreover, when the 'In-security' scenario is, let us say, for the sake of argument, is mild, the window of opportunity for an international system to interfere opens, which then enables the international system to mediate peace and security. However, traditional concepts of security states that, a state would be secure only when its rival state is secure, as 'In-security' would force the former to adopt competitive and effective security mechanism. This further compromises the chance for any open communication or cooperation even during mitigation. If the latter, during mitigation is persuaded to hold off an offensive, the former may get an opportunity to ease.

Why are the discussions above relevant to China? On the whole, the scenario is quite clear. Today, with the presence of international systems and their active and resilient mitigation processes, China and the US both can secure their vital assets without posing a threat to each other. In light of heavy nuclear arsenal and a race to develop new ones, both the countries have established forces and mechanism to prevent any nuclear use. Although, at some point, if China is on any level able to exceed the US, the latter would still be able to retaliate with nuclear arsenal, if engaged in a scenario, let us say, like a nuclear war and massively compromise China's ability with one major blow. A large scale attack by China on US is practically impossible, because of the vast distances between them, plus the vast Pacific waters which act as a natural barrier. There is absolutely no possibility of the PLA overpowering the US military. However, the same factors that protect the US from a Chinese invasion also assist China in preventing a probable...
first response. Although speaking of military units, China is vulnerable, but it would sooner or later realise this clause and build an active nuclear force or a digital army and challenge US on other fronts. Although for China, conventional warfare with US would not pose a strain, as the majority of US forces have their logistics stationed across the Pacific.

The objective of these aforementioned scenarios would force both nations to keep vigil on each other’s security mechanisms. Both the nations will be on high alert now and Uncle Sam would prevent China’s contentions by remaining at least a step ahead. This would force Beijing and Washington to open communication lines, which would further de-escalate the stress while opening doors for international systems to mitigate a peace, probably through a treaty or a joint-cooperation summit. The United States would then restrain from using pre-emptive strikes against China’s nuclear establishments. This would further promote China to de-escalate military preparation, as promised by US, it would not pose a threat to its security and hence, de-thrusting the escalated nuclear politico-military fuelled nuclear war.

WHERE ARE THE ALLIES?

The arguments made in the aforementioned paragraphs miss an element that has been a part of American foreign policy – the allies. Uncle Sam maintains close relations with Japan and South Korea, particularly with agreements ranging from maintenance of military bases to the deployment of nuclear-capable warships along with some major military and strategic commitments in South and East Asia. However, in such a complex scenario, it would not be incorrect to include the US allies extending their support to Uncle Sam. However, after careful analysis it still does not make China, the underdog. Rather, it enhances the importance of alliances in regional security along with its appropriateness in a scenario such as this.

The allies share a remarkably stable relationship ever since the Cold War began but with a new player in this scenario forces foreign policy gurus to re-align the benefits of partnerships. One argument can be made along the same lines stated above. Uncle Sam will not have any difficulty in securing borders solely using its power, natural geographical barriers and nuclear capabilities. Neo-liberals arguing on the same lines, take a little extra leap by arguing that there is absolutely no need for allies and Uncle Sam is already equipped and ready for this scenario. If Uncle Sam already is prepared, then why go to lengths and join alliances that are across the Pacific?

Defending strategic positions and key allies would not only encourage China into politico-skirmishes but also instigate a conflict that would seem to occur on distant lands. Skirmishes such as these would not only encourage China but also strain relations with them. According to them, China’s rise does not pose any threat to the US, but maintaining and strengthening allies in Asia does pose a grave danger to China.

Those realists who support selective engagement, similar on the lines of the US foreign policy - their approach is on the lines with neo-liberals. However, neo-liberals support their arguments by stating an immediate withdrawal from its policies in Asia, in an effort to getting caught in a whirlwind of regional conflicts, whereas those in favour of selective engagement support the neo-liberals by arguing that there is absolutely no need for the US to protect the commitments of their allies as it is the only way to maintain peace in the area.

Today, the need for the US to protect commitments made by them and their allies in Asia is an issue which will be crucial in understanding effects of China’s response, as it is going to determine the impacts of regional strategic policy. If Uncle Sam goes with the natural regional policy and defends its strategic allies such as Japan and South Korea, then they could be challenged by the large conventional forces of the PLA. Nonetheless, with its prior experiences of the Cold War, China’s contentions will not come to the US as a surprise and it would be incorrect to say that, the US will be unprepared for it. During the beginning of the Cold War, both the nations were armed with nuclear capability, whereas experts advised the then POTUS, of the Soviet Union’s conventional weaponry which was advanced enough to occupy Europe.

In the wake of an early Soviet invasion in Europe, experts in the State Department regularly calibrated US capabilities in an effort to identify an appropriate response against what seemed at that time, the high probability of massive Soviet conventional armies entering Europe. The officials of the State Department and security experts at Langley unanimously disagreed...
on NATO’s responsiveness in such a scenario, particularly when the Soviet conventional forces are backed by nuclear arsenals forcing the US to counter Soviet Union only on nuclear terms. Experts, at that time, were quite optimistic. They were confident about the Soviet Union complying. However, strongly arguing on the Soviet’s compliance, US strategy did keep the Soviet Union at bay, as the large arsenal of nuclear weapons did prove to be overwhelming even for the Soviets. Interestingly, the same logic can be replicated in case of Chinese contentions. Armed with commitments with international systems, followed by, with readily deployable conventional armies, reinforced by arsenals of long-range ballistic nuclear war heads, the US could prevent China from infiltrating a first attack on South Korea or Japan.

However, keeping the conflict at bay would be factors such as long-standing trade relations between China and the US. Many experts, however, feared that, the Soviet Union, which created a situation of complexity in light of frequent, rampant and unpredictable decisions Moscow took in the early days of Cold War, Beijing would be careful. The argument can be supported by a fact that, Beijing has no such expansionist goals, so for Uncle Sam, it would be quite an ease. Moreover, even if China does show signs of expansionism, the US is prepared to counter that.

Many pessimistic-realists argue that, in an effort to remain ‘In-security’, Beijing will look towards regionalism, while creating a scenario of hegemony and fanning an already infuriating situation. Although, considering the geographic location, power along with nuclear warheads, would pose a serious challenge to itself. China then would not be in a position to directly engage conventional forces of US stationed at forward operating bases in South Korea and Japan, as they would naturally be prepared to respond to a nation’s conventional force of that size. Under no condition would US conventional forces undermine Chinese PLA. More importantly, a retreat from a key strategic position by US conventional forces would definitely not be a result of Chinese hegemony, because by that time, Japan and South Korea would be well armed with conventional forces of their own along with an arsenal of nuclear warheads, inflicting heavy damage to China’s ambitions of hegemony. Hence, Beijing’s plan for regional hegemony would no longer be feasible.

The presence of US conventional forces stationed at forward operating bases does give an edge to US military capabilities, which would directly challenge China’s security at the seas along with its frequent coercion of Taiwan. Moreover, US advance would hinder Japan’s ability to keep a high military budget. Looking at the combined military capability, the US is more powerful than Japan, which China would consider as a position of strength, since it fears more than from Japan than the US. While achieving greater power, China would rapidly diminish Uncle Sam’s influence in Asia. However, China would not act in a hurry and until and unless China and the US have strained relations, China will not poke the American bear.

**What about Taiwan?**

Realists argue that Uncle Sam’s policy in Asia should not invite China for a power play, as the latter’s phenomenal growth over the years and its typical habit of keeping a country hostage would force the State Department to reform US foreign policy especially when it comes to Taiwan. However, losing Taiwan during the Chinese Civil War over eight decades ago, China continues to consider Taiwan as an integral part of it, as for Beijing, unification continues to be top on the agenda. China, on numerous occasions, dares nations to sever ties with Taiwan while warning others to follow a strict ‘One-China’ policy, which also explains the rush in the PLA’s massive budget, which China not only uses to coerce Taiwan but portrays strength in an effort to keep the US at bay. With Taiwan, always a priority on the list for China, it continues to play a key role in US-China foreign relations.

With clouds of uncertainty over Taiwan, experts point to this as a ‘principle of uncertainty’ for nations’ foreign relations, especially when it becomes a probable epicentre of a conflict. Today, the US foreign policy routes out the possibility of a Taiwanese independence any time soon while stating clear that, even if Taiwan does become independent, Uncle Sam will play no role. Nonetheless, the US would not want to jeopardise its relations with Taiwan, and will defend it, from any attack, foreign or domestic. With unpredictable circumstances and Taipei’s history of erratic decisions, the US could have a conflict on its hand, especially when it finds itself leading one.
Conflict builders such as these have been around for decades now but now, armed with nuclear arsenal and advanced conventional forces at its disposal, Beijing is better prepared to handle it should a Taiwan crisis occur. Along with its advanced conventional PLA, China, in an effort to inflict deep wounds in battle, Beijing is preparing its nuclear forces for a long battle against the US, particularly developing and enhancing its weapons in case of a second response. Going by the traditional defence mechanism of Washington, US forces seem to have an edge. However, with China modernising its nuclear arsenal, this equation could become more complex. With Beijing rapidly advancing its nuclear arsenal, it will respond more aggressively in comparison to previous responses.

With the US opening doors for a combat insertion in an effort to defend Taiwan, it could eventually kick off a conventional and a nuclear war. With enhanced nuclear ballistic programme, along with long range reconnaissance capability, China could view it as a threat, which would further sour already deteriorating relations. In light of such misguided assumptions, Washington should steer way from Taiwan. This would then dissolve China’s presumptions towards her ‘In-Security’ principle while making a way for a wide and prosper relations in the near future. Critical-realists argue that, this would not only result in a lost opportunity for Washington or Taipei; but would also affect Beijing’s appetite. China would want more and a meagre steering from traditional US foreign policy will not fill its appetite; rather Beijing would be pleased to see Washington’s inability to defend its allies. However, rationalists critical of such theory consider this a meagre dream which would not come true. It is not necessary for only Mussolini or Hitler or Tojo to have expansionist goals. Neo-liberalists argue that by having limited expansionist goals, allowing them would not necessarily mean hunger for further territories, rather a satisfaction of its appetite.

What should Washington’s policy be on Taiwan or, how to steer way from Taipei, whether to, is a complex issue, demanding a more complex solution. If Washington does, let us stay steer way from its traditional policy, it would not be as simple as a break in relations. Although, Beijing and Taipei have strengthened their relations over the years, it would give plenty of time for Washington to formulate a strategy and recalibrate its policy depending upon the current situation.

**A Stressful Environment?**

Realists analyse the threat perception on the basis of the nation’s past encounters such as a direct conflict such as a war. Realists particularly optimistic put their arguments are purely on the decree of the nation’s ‘In-security’ concept. If, under any circumstances, the assumptions turn out to be untrue and Washington’s threat perception of China turns out to be over-anxiety, the intensity of the conflict will be unimaginable.

However, there are certain doubts about the theories regarding a possible US-China clash. To begin with, the widely assumed argument that China’s contentions in Asia along with its modernising the PLA, pose a grave threat to US strategic assets. If the State Department and the White House fail to interpret the rise of China opposite to a threat, Washington would enforce over-consciousness over its forward operating bases in Asia, which Beijing may view as preparation for war. If China too, feels insecure, it will further apply extra-precautionary measures which Washington, through Langley, would perceive as a threat. It will then initiate a negative chain of events, which even the international system will find it difficult to prevent.

Experts deny the possibility of any large-scale retaliation, which would compromise the nuclear retaliation by the US. The most workable scenario for China is to destroy the major portion of nuclear capability of the US in order to maintain a large portion of PLA active, thus, making it difficult for US nuclear warheads to pose a threat to the PLA.

It is without a doubt that China’s nuclear and conventional forces will give a tough response to US conventional armies. However, it is important for Washington to understand the aggression of the PLA or the conventional forces as a desire to secure their boundaries. However, in future years, if China is able to maintain a fleet of large aircraft carriers or battle groups and deploy them in the Southern Coast near Washington, the White House would definitely look for options, in an effort to respond. If the PLA attacks first with long range bombers and if those bombers ever make it to the nuclear strategic locations, Washington would like to keep all options open, even using the...
nuclear warheads to defend its boundaries. These are certain scenarios which both Langley and Washington should carefully evaluate.

The question remains the same, can Chinese contentions be peaceful? Peaceful or not, there is no straight answer and the scenario needs to be evaluated, with multiple simulations and there are numerous responses, some even becoming a victim of over-anxiousness. Nonetheless, the presence of strong international system would prevent the US and China from preparing for a war. Nuclear arsenals, along with the vast Pacific Ocean, followed by a certain level of stable foreign relations would ensure security whereas both White House and Beijing would prevent a military entanglement.

However, the traditional US foreign policy of ‘preserve and protect’ could instigate some issues between Washington and Beijing, but experts argue that Washington would maintain close proximity with Japan and South Korea, the two key regional partners in Asia. In the years to come, Washington would face some major challenges, particularly with respect to its policies in Asia, especially from its relations with Taiwan which, Washington needs to ensure, does not pose a challenge or response to China’s contentions and modernisation of its military.

Anant Mishra is a former Youth Representative to United Nations. He is an expert on geopolitical issues in Asia with special focus on SAARC and ASEAN. Mishra is currently serving as Visiting Faculty at Gujarat Technological University.
The best way to predict the future is to invent it.
—Alan Kay

Equation of State Policy and Military Power

In the post World War II era, most of the stable and mature states have, as far as possible, preferred to sequester the option of military intervention in pursuance of their international and domestic policies. Accordingly, the trend in the modern world has been to keep military power reserved for use as an instrument of ultimate and mostly reluctant recourse for the preservation of their national interests against stubborn and intransigent enemies who might resort to intolerable armed provocation. In the case of the People’s Republic of China (PRC), however, traditional inclination enjoins it to derive a somewhat different equation between state policy and military force.

The Hans are endowed with great cultural traditions and are the inheritors of hoary wisdom that emanates from such traditions. More importantly, China’s ruling regimes have been rather rigid in nurturing such traditions and wisdom in matters of statecraft, both external and internal. In purport, a naturally ordained sense of ‘superiority’ is intrinsic to that statecraft when it enjoins China to sanction to itself unilateral authority to make its own rules and arbitrate over even universally recognised conventions according to its imperialist interpretations.

Proclamations over China’s ‘lost territories’ and the self-promise of ‘recovery’ of these, description of its military aggression as ‘counter-attack in self-defence’, staking ownership over all of the China Seas and nonchalant display of double standards in bilateral issues of diplomatic, territorial or commercial contention are fallouts of that sense of superiority of the ‘nature mandated’ rulers of China. In that context, articulation of military power has to be an accessory to China’s imposition of hegemony, even if it causes much consternation in a sovereignty-sensitive international order.

The ruling establishment’s claim of nature-mandated ‘superiority’ is evident in China’s domestic realm too - in the forms of autarkic imposition of social, religious and even professional codes upon its ‘subjects’ as its people are viewed.

The ‘Barrel of Gun’ Experience

After capturing power in 1949, Mao Zedong had famously declared, “Power flows from the barrel of gun.” Thus having tied China’s national interests with
possession of robust military power, the Mao regime sought to wipe clean the ‘century of humiliation’ that imperialist China had the morbidity to suffer at the hands of the Western colonising powers and the Japanese aggressors. Chairman Mao and his coterie then proceeded to invest in conventional and nuclear military power even at the cost of putting the Chinese citizens through abject hardship and misery. Having invested so much on building up military power, it is difficult for the Communist Party of China (CPC) to deny itself the accruing dividends of hard power through which it upholds its ‘assertiveness’. Indeed, the CPC’s practice of military power backed governance stands vindicated by China’s subsequent rise against severe international rejection as also economic and technological sanctions, before finally elevating it to the status of a global power. For the CPC, China’s national power has really and comprehensively emerged from the ‘barrel of gun’ – not only in the external arena, but internally too. Therefore, there is every logic for the CPC to assign prominent roles to the People’s Liberation Army (PLA) in the fulfilment of its ‘Chinese Dream’.

To elaborate, in the CPC’s policy articulation, military considerations have always been intrinsic to the pursuit of international relationships, domestic governance and commercial ventures. In consequence, while considering the profitability and advantages of civil, economic or industrial development schemes, accrual of military advantages get invariably factored into the PRC’s overall calculus. The ‘One Belt One Road’ (OBOR) or the ‘Belt and Road Initiative’ (BRI), the ‘Maritime Silk Route’ (MSR), territorial expansionism in the China Seas, arms and investment diplomacy and ambition in the Indian Ocean Region, all are evidently tested against that calculus. Thus when the consequential gains of military leverages are factored in, the statistically adjudged ‘debits’ of economic un-viability of such schemes turn into an overall long term profitability for a rising or already risen China.

Arguably, there may be much wisdom in PRC’s subscription to that kind of ‘policy-force equation’. As business grows and stakes rise, multilateral economic ventures stoke higher expectations, which in turn give rise to cut-throat profitability and political manipulations among the real and expectant stakeholders. History indicates that such instances come invariably sooner or later, when even ‘eternal friendships’ are liable to be vitiated. It is at that time when military power comes in to protect investments, distant assets and profitability of economic partnerships from usurpation or strangulation by dissent, even animosity. Britain’s rule over India, Japan’s pre-World War II ‘Greater East Asia Co-Prosperity Sphere’, the erstwhile Soviet Union’s economic web and the United State’s Middle East leverages are just some manifestations of that theme.

Notably, the aforementioned theme of backing policies with force applies in equal measure, to PRC’s policies of domestic governance too. Thus the entire gamut of technological, industrial, infrastructural and to some extent, even educational and health-related ventures has incorporated strong military components. The theme of militarisation is, however, best demonstrated in the manner PRC seeks to maintain its internal societal order and stability. In PRC, the usual leeway of citizen’s choice, voice, culture and calls, should these be in even remote contradiction to the official diktats, are ruthlessly and demonstratively suppressed in order to instil fear of the state. On the other hand, people are permitted to have a good time, even raucous ones, within the reasonable norms of conduct, thus encouraging the citizens to remain within limits set by the Party. The world is aware of Chinese highhandedness in Tiananmen, Xinjiang and Tibet, but there is no gain-saying that the state’s rule is equally testing in rest of PRC, the only difference being that people there have found expediency in amenability with the Party’s regime.

The salience of the ‘power of the gun’ in Chinese scheme of things, having been recounted thus, we may proceed to evaluate the indicators that emanate from the PLA’s modernisation schemes. Since military policies require decades of gestation period before fructifying, these indicators give a fair idea as to the course the PRC is likely to adopt in its journey to global stardom.

**Military’s Role in the ‘Chinese Dream’**

It needs no reiteration that the CPC nurtures a majestic ‘dream’ for China...
if the Communist regime continues to steer China's
destiny – by past evidence that conviction too seems to
be quite right. Next, taking cue from historical lessons,
the CPC accepts that finding economic satisfaction
for its people is imperative for the continuation of its
autarkic rule and that kind of perpetual economic
progress cannot be sustained just by its indigenous
resources – it would require access to the nature's
resources across the globe. Thus while the PRC takes
challeges economic initiatives to rise to its rightful
'high-chair’ and makes those initiatives attractive for
potential stakeholders, it simultaneously prepares the
PLA to stand by as an insurance should some event
or some troublemaker, external or internal, threatens
to derail the dream. It is so that the PLA is nurtured
as a fallback instrument of the Party that overarches
the Chinese state.

In linking the Party rule with furtherance of
economic interests, it is expected that sooner or later,
the PRC would encounter hurdles. In the competition
for self-interests, no nation gives way without being
obliged to do so. Therefore, even if by all past evidence
it may not be a war monger per se, China believes that
when intransigence of any satellite power goes beyond
its limits of tolerance, a mild military nudge – a lesson, so to say - helps is
bringing the trouble maker to its senses. At the same
time, a military nudge could always escalate and
that calls for possession of enough muscle to secure
a satisfactory end state. Obviously therefore, PLA’s
modernisation and re-structuring must conform to
the creation of that capability which the PRC might
need to advance its interests against any opposition
that its policies might provoke.

As a corollary, since military structures take decades
to build, it may be possible to postulate the kind of
military opposition the PRC expects to be confronted
with, say, a decade or more away. Inter alia, such an
evaluation is likely to offer hints regarding the kind of
policies that the PRC might propagate in the regional,
global and internal arena, policies which it expects to
trigger opposition.

**Features of China’s Military Build-up**

This is a sphere of deliberate examinations, astute
analyses and professional foresight. However, for the
purpose of this paper, it would suffice to identify the
indicators which help in adjudging the goals of the
PLA’s massive restructuring. To start with, let us first
look at the force-structure of the PLA.

The modernised PLA Ground Force (PLAGF)
is being organised into three categories. The first
category consists of forces organised for modern
conventional warfare against advanced militaries. It is
based on manoeuvre brigades, modular combat units,
combined arms and inter-services integration, joint
command and control and rapid reaction capability.
Concurrent retention of the ‘Line’, ‘Garrison’ or
‘Reserve’ divisional and regimental formations, duly
upgraded with modern war paraphernalia to engage
in third generation version of ‘active defence’, makes
the second category. The third category consists of the
‘Category B’ units and formations that are meant to
undertake moderate level operations while shaping
the battle zone for the other two categories to exploit.

Conceptually on similar lines, key components
of the modernised PLA Naval force-structure are to
be its three carrier-based fleet, a naval air arm and
a coastal defence force each five brigades strong. A
marine corps of three amphibian marine brigades -
that is slated to be expanded to a dozen or so – adds
to that sea power. Corresponding to the other two
services, the modernised PLA Air Force is organised
into air regiments, divisions and corps of balanced
composition, for it to be effectively packaged for
strategic offensive air warfare in joint services battle
spaces. That capability is bolstered by the grouping of
an airborne corps of three parachute divisions and an
air-lift capability of at least one division across a range
of over two thousand kilometres.

Elevation of the PLA Rocket Force to an autonomous
Service and bringing science, technology and industry
of nuclear, missile, space and information warfare
under the single umbrella of PLA Strategic Support
Force are the other indicators of the PRC shaping
its future international postures. Lastly, configuring
the People’s Armed Police Force (PAPF) into a
distinct para-military organisation and placing its
employment in internal conflicts as well as rear area
military support under the CMC-PLA, offers insight
into the manner the CPC plans to control any internal
situation.

Notably, PLA dedicates all the above mentioned
categories of its military machine to fight under what
it describes as the ‘conditions of informationisation.’ This description, in spite of its usual ambiguity, actually implies the harness of modern command, control, intelligence and communication systems in the prosecution warfare. Similarly, its description of ‘warfare under localised conditions’ cannot be, as usually inferred, an intent to cap operations to local and limited actions. It actually implies deployment of forces that are composed as relevant to the theatre-matrices of terrain, tactics and strategic objectives to be attained. In other words, war may be prosecuted in different theatres, simultaneously if necessary, with forces customised and deployed to the achievement of political objectives. Notably, the concept of deploying overwhelming force remains salient, the difference being a deliberate boost of military manpower through mechanisation and fire power.

Delving further into the recent revamp of the military command and control set up in the forms of Headquarters Combined Corps, Headquarters Joint Theatre Operational Commands and the CMC with its direct control over PLA Rocket, Strategic Support, Reserve, Militia and People’s Armed Police Forces, we may proceed to translate the PLA’s force-structure into its force-capabilities.

**PLA Force Capabilities**

According to its own admission, “China faces no threat.” It is, therefore, a matter to consider as to why China requires such a massive military establishment, a humungous power-bank which, even if intrinsic to its ‘barrel of gun’ ideology, far exceeds its reckonable defence needs - unless it is to provoke, dominate or impose over other nations’ sovereignty. Besides, there are the other considerations.

Firstly, military force-capabilities are organised based on four factors, namely, Aim, Terrain, Enemy and Objective. Notwithstanding that, field forces organised for one set of factors do adapt albeit with some compromise with capability, to varying conditions of terrain and opposition. It is, therefore, a matter of consideration that the manoeuverable-mechanised-informationalised category of the modernised PLAGF would have to be optimally modified to fight across the terrain that obtains along the Indo-Tibet, Sino-Myanmar, Gilgit-Baltistan or Sino-Afghan Borders. That would require some preparation and practice exercises to strengthen operational confidence. More suitably, this category of forces are better deployed for engagement along Sino-Russian, Sino-Mongolia, Sino-Central Asian States or the East Coast terrain or even the hinterland areas of Manchuria, Xinjiang and Greater Tibet. When connected with the build up of air and sea borne transportation capability, these forces assume further applicability in the sub-continental and out-of-area context. Coming to the second and the third categories of the PLAGF; when duly bolstered with additional combat power of the first category, these are best suited to undertake invasion across the rugged mountainous terrain that separate the PRC with some of its neighbours.

Secondly, the structure of the PLA Navy is definitive of its overwhelming domination over the blue waters of the ‘First and ‘Second Island Chains’, even to the extent that the superpower, the United States, would be circumspect in its indulgence over these waters. Further, the brisk build-up of PRC’s naval power is unambiguously aimed at registration of not just a bona fide presence, but its leverage across the Malacca Strait, beyond the Andaman and Nicobar Islands, further across the Indian Peninsula and right up to the East Africa Coast and the two Gulfs, may even be across the African continent where much of Chinese investments are coming up. In this context, it is too obvious to reiterate that whatever shape the Chinese footholds over port facilities all across the waters of the China Sea-Indian Ocean might assume in the coming days, in the forms of operational halts, harbours, hubs or bases, the PLA Navy is fast configuring to be active over a vast and distant operational beat. Thus having secured its space within the Sea of Japan, Taiwan Strait, Yellow Sea and East and South China Seas, the second and the third stages are clearly aimed at domination over the South East Asian island chain, followed by acquisition of naval power projection capability in the Pacific and Indian Oceans. Indeed, it will require a couple of decades’ gestation before the PLA Navy can flex its muscles in the Indian Ocean. But what is certain that it will definitely achieve that end.

Thirdly, corresponding to the other two Services, the PLA Air Force is being built up for joint operations across a regional arena that extends through the Sea of Japan, the China Sea and to the chain of islands on the Eastern periphery of the Indian Ocean. By the creation of far away naval-air operating and logistic bases as also composition of an airborne corps of three...
parachute divisions, the strategic reach of China’s air power is expected to be further extended across the Indian Ocean to the Malabar and the East African Coast and to the Chinese economic acquisitions of faraway lands. Even among the five Joint Theatre Operational Commands, the inter-theatre air transportation capability would boost the deployment and redeployment of forces as necessitated by localised-theatre war situations.

With a formidable conventional force at its disposal, PRC needs no nuclear-missile cover, unless it is to deter the super power from ‘meddling’ in its sphere of hegemony or to prevent a victim of its aggression from retaliating too hurtfully. Fourthly therefore, reconfiguration of the Service status as well as command and control over the PLA Rocket Force and the PLA Strategic Support Force are clearly aimed at - one, political posturing to impose threat and two, employment in distinct stand-alone mode, not necessarily as a part of military campaign.

Lastly, unstated though, the CPC remains anxious of internal opposition to its autarkic rule. The Han state’s instinctive reaction to internal uprisings in the past has been to suppress these in a ruthless manner. Indeed, re-configuration of the PAPF addresses that concern regarding outbreak of people’s revolt against the regime, occurrence of which is not difficult to visualise. Designation of the reconfigured PAPF as a ‘police force’, but with para-military characteristics and the CMC-PLA’s control over it are indicative of a well-deliberated policy of decimating challenges against the regime without having to invite a Tiananmen Square kind of universal abhorrence of its military highhandedness. Besides, suppressing internal disturbances, this force would also be well utilised in low intensity and rear area tasks during hot wars and out-of-area policing duties.

Based on the above discussion, we may now examine as to how the PRC might wield the PLA’s force-capabilities in order to back its political articulations in the coming decades.

**Application of Military Force Capabilities**

The Chinese leadership believes that economic progress fosters internal stability, which by implication ensures the continuation of the CPC regime. Furthermore, it is also believed that progress and stability are best catalysed by the possession of strong military power that would favourably arbitrate over inter-state differences which are bound to crop up against China’s march to the status of global leadership – read hegemony. However, in deference to its hoary wisdom, it is to be appreciated that China, by nature, seeks to secure its inter-state claims and demands, arbitrary and hurtful as these are wont to be, through the offer of minor concessions and incentives to the extent that the quarry finds it expedient to give-in. PRC’s ‘settlement’ of border disputes with its ‘lesser’ neighbours is an example of that policy.

Like many hegemonic powers, China too detests war and would like the objects of its consternation to submit to its will without a fight...

China too detests war and would like the objects of its consternation to submit to its will without a fight...
• One, diplomatic demonstration of a powerful military and the political will to unleash it. The pugilistic approach to United States’ South East Asian engagements and implied admonition of Taiwan are examples of this step.

• Two, undertaking of ‘push actions’ with Category B and militia forces – violation of the Indo-Tibet Border and occupation of South China Sea Islands, for example.

• Three, sharp ‘trailer actions’ with overwhelming strength to incentivise accommodation of the demands - of the kind displayed during invasion of Tibet and the Sino-Russian confrontation on the Uri River.

• Four, demonstrative military build-up to offer a final opportunity to the adversary to back-off before launching well planned, meticulously prepared and competently executed ‘counter-attack in self defence’. The purpose here is to gain negotiated settlement from a dominant position, as it was in the case of the Korea and Vietnam Wars.

CONCERNS REGARDING PLA’S CAPABILITIES

A huge empire in possession of formidable military establishment, deep in a sense of humiliation at the hands of imperialist powers and consternated by the peripheral nations’ repudiation of what it claims as its naturally ordained superior entitlement, is a neighbour to be wary of. The wariness is exacerbated when that empire happens to be a revisionist and claimant power who declares that it faces no threat, is known to be militarily aggressive and commits to humungous military build-up.

In general terms, China’s schemes of military build-up are indicative of the following possibilities:

• Establishment of firm and unchallenged sovereignty over all waters and territory that China claims. China’s military build up is organised to immobilise any regional opposition against the Chinese Dream into helplessness before hurling military power at them.

• Naval and air power put together serves the PLA’s intent to prevent the superpower and its allies from coming to the rescue of the targeted trouble maker at a cost that they would not like to suffer.

• Establishment of effective control over the Japan-China Sea waters in a manner that the island or coastal states in the region are obliged to let China have her way as the first claimant over the region’s natural resources. Besides military usurpation, swarming the islands with civilian stakeholders – the Militia actually - would be one of the ploys.

• To bind the neighbouring nations into an economic monopoly in a manner that these nations are obliged - with expedient reasons, under compelling circumstances, to link their survival to economic interdependence with the PRC.

• Projection of military power as an insurance in favour of economic colonisation of the Indo-Pacific Region, the rest of Asia and Africa.

• Finally, assumption of the role of regional hegemon to replace the US which many political analysts believe to be on the decline.

In more regional-specific terms, it may not be beyond the realm of reckoning that (exaggeration of worst case scenarios is intended):

• In the coming years, passage of lesser powers across the China Seas might need China’s custom clearance, while the Indian Ocean Region, including the East African Coast and the Arabian Sea Gulfs could come under China’s Navy-Marine baton-beat.

• As for Taiwan, the PRC is apparently sanguine that given the latter’s vulnerability to blockade, gradual isolation from the American guarantee and strong economic bindings, it is a matter of time before ‘Hong Kong’ is replicated without having to shed much Han blood.

• Over the years, through incremental and innocuous ‘civil activism’, duly backed up with military ‘protection,’ the claimed islands and territories could be dissolved into Chinese sovereignty. In that usurpation, the policy would be to apply incentive and persuasion of the opponent with the backing of implied military threat or even demonstration and skirmish actions.

• As the China Pakistan Economic Corridor assumes the Central Asian centre stage, there
China’s military build-up is organised to immobilise any regional opposition against the Chinese Dream...

China’s military build-up is organised to immobilise any regional opposition against the Chinese Dream...

would develop intra-state linkages between the fiercely autonomous and deeply conservative indigenous societies habiting in the Pakistan Occupied Kashmir-Gilgit-Baltistan-Baluchistan regions and the Chinese conglomerates. It would be a matter of time before such linkages would morph into stiff competition into the entitlement of profits. Situations of that kind have the potential of triggering internecine disturbances and eventual Chinese arbitration of political and military kind. A new chapter of colonisation might be in the offing.

China and the Asian comity of nations, therefore, have to work together to see that another era of internecine conflict does not interfere with the universal path of progress.

Super Power Attributes
So far we have attributed the PRC’s military build-up to its likelihood of turning into a regional tormentor. Indeed, it is wise to be circumspect. Besides, in the entire pan-Asian region, there prevails an innate apprehension of Han highhandedness. Over a period of time thus, the incongruities in cultural make-up of rest of the Asian nations, including the people of Bangladesh, Pakistan and Afghanistan, with that of the Chinese methods of functioning might surface. The Asians would, therefore, be wise to girdle up in any way they can to live through the times ahead that might be fraught with dangers of being pushed into subservience with occasional administration of small concessions, and punitive measures reserved for the defiant.

Conversely, Providence might come to the rescue of the weaker, particularly when either better sense prevails over the hegemon or its torment causes the coalescence of a coalition of the oppressed. On the positive side, rise to superpower status requires mutual accommodation, solidarity with justified international causes and the benign use of power. The Chinese know that well.

Notes
1 The PRC’s hapless quarries prefer to use that softer euphuism for ‘aggressiveness’, to avoid provoking the imposing hegemon.
2 Notably, there have been many exceptions when military back-up has failed to protect economic interests against popular uprising against exploitation.
3 It is altogether a different matter that to a reckonable extent, the PRC itself sows the seeds of such opposition when it asserts its ‘entitlement’ to have the first pick of all that the region has to offer, and then acting magnanimous, as a show of grace, in ‘allowing’ its lesser partners to partake in residual benefits. In the domestic front too, the CPC stokes misgivings among its citizens by their absolute exclusion from voicing opinions or participating in any matter of governance.
4 China’s outlandish claim over the seas enclosed by the so called ‘nine-dash line’ is unparalleled in its brazenness. Similar is the case with its claims over ethnically, culturally, linguistically, geographically – indeed, by every yardstick of nationhood – different regions of Tibet, Xinjiang and Arunachal Pradesh (India). To make matters worse for its intended victims, China reiterates often its stance of having already ‘given up’ much more, and that it will not compromise with the ‘rightful’ claims any more!

Lt Gen Gautam Banerjee, former Chief of Staff, Central Command & former Commandant OTA Chennai.
EMBRACE THE FUTURE OF KASHMIR

Lt Gen Subrata Saha

In the present circumstances, where vicious propaganda is clouding and vitiating young minds, the nation, as the Prime Minister says, needs to embrace the people, help the youth to get their lives back on track. An effective outreach with the 4Es of Engagement, Education, Empowerment and Employment, is the key. And it has to be sustaining. The effort has to be collaborative, providing opportunities for both local talent and local leadership to flourish. This requires imagination, innovation, perseverance and mutual accommodation.

In Kashmir, the third-quarter of the year, i.e. from July to September, is typically characterised by a ‘back to business’ mood. The euphoria of the spring after the harsh winter comes down, the summer vacation tourism tapers off giving way to work in the fields, preparations for the apple harvest, examination in schools and colleges and so on. For the security forces with the snow having melted, the entire length of the Line of Control is open for the contest between the terrorists and their handlers in Pakistan and the counter-infiltration forces. The Valley is lush green with scenic views, ironically though for the security forces the dense foliage adds a tactical challenge as it mars visibility. The Amarnath yatra brings in good revenue even if it is a major administrative and security challenge. On these more or less constant fundamentals, a different set of variables play out each year depending on the political and other circumstances.

This year the second quarter from April to June was bad with protests, stone pelting, appalling low voter turnout in the by-elections and several attempts within and without, to destabilise the situation. The third quarter commenced on a sombre note with a dastardly terrorist attack on July 08 this year on a bus carrying Amarnath pilgrims from Gujarat on their way back home, leaving eight people dead and several others injured. The horrific attack was condemned the world over, but more significant was the outrage from virtually all quarters in Kashmir. Efforts of the Hurriyat and terrorist leadership, to give the attack a conspiracy spin, did not succeed. On the contrary, there was strong outrage over the killing and disfiguring of SHO Feroz Ahmad Dar along with five policemen of Jammu and Kashmir (J&K) at Achabal, lynching of Deputy Superintendent of Police Mohammed Ayub Pandit and the killing of Lt Umar Fayaz.

Despite all the domestic media hype and Pakistani propaganda to make an event out of ‘One Year after Burhan Wani’, it did not evoke a worthwhile response as the situation remained well within control. For the first time, there are visible efforts directed against terrorist and separatist activity funding. This is complementing the relentless operations of the security forces. The positive results are evident as the number of terrorists eliminated this year crossed the 130 mark, including over 90 from across the border. The security situation appears to be getting stable enough for the other dimensions i.e. political, economic, social to do their share of due deliverance.
On the eve of the Independence Day, Home Minister Rajnath Singh reiterated that the Government is working on a permanent solution to Kashmir issue. That is exactly where the challenge and vexation lies. The security situation has been stabilised several times in the past but unfortunately, the security stability does not transition to political stability, economic growth and development. The gap between this phase and the next, never gets bridged as spoilers jump in and the cycle of stability-instability is witnessed over and over again.

Right now there are two potential spoilers threatening to vitiate the environment, one internal and the other, external namely, Article 35A and the Call for a Caliphate. There is a third factor too that must not be lost sight of, some thoughts expressed in the Chinese state-sponsored media trying to draw Jammu and Kashmir as a parallel in the Doklam discourse.

**Article 35A**

The politics surrounding the legality of Article 35A is threatening to disrupt public order with threats of a potential “public uprising”. Many mainstream political parties are openly indulging in separatist rhetoric and the distinction between separatist and mainstream is getting blurred. This issue has vested economic imperatives, as it hurts the ‘have’ of the state more than the ‘have-nots’. No surprise that the Kashmir Traders and Manufactures Federation, All Parties Sikh Coordination Committee and many others are throwing their hats in the ring.

Recently, Chief Minister Mehbooba Mufti laid the foundation stone of the Wuyan Industrial Area in Pampore on August 09, 2017. The other industrial areas in Kashmir such as Lassipora near Shopian and others are lying virtually unused as they fail to attract investment and industry to the state. Despite all the abundant resources of water, agro, forests, herbal and minerals besides the unparalleled natural beauty, industry in J&K remains an unattractive proposition due to such constitutional provisions that benefit only a few. Unless pre-empted, the politics of Article 35A will be manipulated politically to manifest as bandhs and street protests clamouring for Azadi without understanding what the issue is.

The majority of the people assume that ‘Azadi’ as the word literally suggests means ‘freedom (from India)’. It may be instructive to recapitulate the understanding of Azadi articulated by the Group of Interlocutors that was appointed in 2010 by the Government of India. Their charter was to undertake wide ranging discussions with all sections of the population in J&K and propose the contours of a political solution. This is how the Group of Interlocutors defined Azadi:

- Freedom from all forces of religious extremism, ethnic or regional chauvinism and majoritarian conceits that disturb communal and inter-regional harmony.
- Freedom from an opaque and unaccountable administration.
- Freedom from economic structures, policies and programmes that frustrate efforts to promote inclusive economic growth and balanced development of all parts of the state.
- Freedom from social structures and policies that are detrimental to disadvantaged social groups, minorities and women.
- Freedom from harsh laws or laws harshly applied and judicial delays that curb the space for legitimate dissent.
- Freedom from the kind of intimidation and violence that compel people to flee their habitat.
- Freedom from threats to the religious, linguistic and cultural identity of all communities.
- Freedom from pressures on the media and on media persons, RTI activists, civil rights group and cultural organisations.

It is not uncommon to find protests against erratic power supply, corruption, medical negligence, road accidents and termination of services - all ultimately ending up with slogans of Azadi. Relatively speaking, Article 35A is a lot easier to give an emotive spin and provoke protests. With so many powerful individual stakes converging with politics, it’s a potentially explosive mixture.

**Caliphate Inspired Militancy**

The Caliphate-inspired militancy is like a venomous cobra spreading its hood, striving hard to capture the imagination of the people and gain legitimacy. To put things in perspective, it may be recalled that the ISIS...
came into being ostensibly as Abu Musab Al-Zarqawi and his ilk were frustrated with the force and speed of the Al Qaeda, indeed some called them moderate. The appeal of the ISIS to the youth in particular and their deft manipulation of the internet and social media outwitted and outpaced established powers for long. In Kashmir, the first signs of the ISIS flag were seen in 2014, when perhaps in haste it was described as the handiwork of “some idiots” and the tailor who stitched the flag was claimed to have been arrested. Even as the establishment’s preferred stance was ‘ISIS – not in Kashmir’, the appeal of the Caliphate did spread its tentacles more so with the internet-savvy youth. The ISIS flag started appearing more frequently through 2016 and during the current year.

Most recently, one of the terrorists eliminated was draped in the ISIS flag for his funeral. Incidentally, he was one of those pro-Al Qaeda terrorists accused of lynching Dy SP Mohd Ayub Pandit, deputed to provide security to Mirwaiz Umar Farooq’s sermon on Shabe-Qadir, the holiest night during Ramzan, in the Jama Masjid in downtown Srinagar. On August 08, three terrorists, all local, belonging to the Ansar Gazwatul Hind were eliminated in Tral, South Kashmir. This is Zakir Musa’s group that has proclaimed Islam over Azadi as the motive and ideology. As per media reports, a couple of days later, Zakir Musa too was trapped by security forces in Tral but managed to escape with the help of some local supporters.

As of now, the appeal of the Caliphate-inspired militancy is divided as Hurriyat and Hizbul Mujahideen are both quick to criticise the acts of these Caliphate-driven groups and distance themselves. This is not for any altruistic reason but because of the fear of losing relevance and consequently, the power and funds. This situation could change, with such a large idling young population spending hours on the internet. Even if there is an overall weakening of ISIS in West Asia, its mutants pushing for the Caliphate need immediate focus.

**Who Pays the Price?….The Youth!**

So whether it is the public uprising that some mainstream leaders are threatening or the stone pelting that is the forte of the separatist leaders or the terrorists being recruited by the religious-terrorist-separatist-ISI nexus, the price ultimately is paid by the youth. Like always, the manipulative leaders will light the fire, sit back and watch destruction and death as well as add fuel to the fire with their rhetoric. Ironically, the leadership that is exploiting the situation has its progeny progressing in life securely in other parts of the country and abroad.

**Securing the Future of Kashmir**

On August 15, 2017, the 71st Independence Day, Prime Minister Narendra Modi in his address from the Red Fort said, “On Kashmir there is rhetoric and politics. But I am clear in my belief on how to win the war against separatism, which is spread by a handful of people. The problem will be solved neither by abuse nor bullets (Na Gaali se Na Goli Se) – it will be solved by embracing all Kashmiris (Gale Lagaane Se). Such is the legacy of 125 crore Indians. Hence, neither by abuse nor by bullets, the change will come only by embracing all. And we are moving forward with this resolve. We shall take strict steps against terrorism. There is no question of being soft on terrorism or terrorists. We have been asking the extremists to join the mainstream. Democracy provides for all, an equal opportunity and rights to be heard. The process of engagement can take place only by their joining the mainstream.”

In order to secure the future of Kashmir, the topmost priority has to be to wean away the youth from these ‘icons of violence’ and ‘manipulators of violence’ who have misguided them for long and whom the Prime Minister alludes to as a “handful of people” spreading separatism. They are driven either by narrow vested interests or they are acting on behalf of Pakistan to ‘bleed India by a thousand cuts,’ by damaging the psyche and prospects of the future generation.

It is possible to turn the situation around by focussing attention towards the positives of the youth of Kashmir. Like anywhere else, they are impressionable, risk-taking, seeking challenges and opportunities. They have proven their worth in fields ranging from frontline soldiering, sports, music, films, art, photography and so many more.

**Some Vignettes about the Youth in Kashmir**

Next month it will be three years since the devastating floods struck Kashmir. On September 06, 2014, an Army boat on a rescue mission in the
vicinity of Pampore, capsized as it got entangled in electric cables and poles that had fallen in the Jhelum torrent. Unfortunately two soldiers, one from Kashmir and the other from Uttarakhand lost their lives in the accident. There were several others in that boat who were rescued in time, thanks to the prompt action of some gutsy youngsters at the scene. Incidentally, it is not uncommon to see the same youngster who is at the forefront of a rescue mission, also leading stone pelting. Fundamentally, this character-type enjoys daring, more often than not, he is a natural leader too. If they joined the Indian Army, with such traits, they would perhaps be volunteers for the Ghatak platoon (Commando) and be at the forefront of operations. Ultimately for the daring to manifest positively, it is about circumstances and opportunities.

In January 2015, a youth cycle expedition was launched from Srinagar to Delhi, ‘Sailaab se Salaamati’, from ‘Floods to Wellbeing’. Their mission was to encourage the people to visit the Valley again through the ensuing winter and summer. En-route they were hosted by the Governor in Jammu, Army Commander in Udhampur, Corps Commanders in Punjab and Haryana and the Army Chief in Delhi. In Delhi, the Hindu College hosted the group in their Annual fest ‘Mecca’ with a special evening called ‘Mushaira’. These messengers of ‘wellbeing’ of Kashmir showcased their talent, spread their message, received huge applause and returned overwhelmed with the goodwill they received everywhere.

Some months later, a group of twenty young men from different engineering institutes of Kashmir, went on a tour to IIM, IIT and MCTE at Indore/Mhow. In the feedback session of the tour in SSM College of Engineering and Technology Pattan, while the boys were all excited, the girls appeared rather glum. The reason was not difficult to find - the tour was for boys only. Within a month, a tour exclusively for girls was launched to the same institutions in Indore plus Delhi. This tour was led by a Lady Officer and accompanied by another officer with his wife. At the feedback session of the girls’ tour one participant said, “You know what? My Dad wants me to join the Indian Army!” Her next question and answer was more interesting. You know where I belong to? Habba Kadal, (in downtown Srinagar), once the forte of artisans and traders, now unfortunately decried by many out of ignorance and fear of unknown! Two observations, first she was both surprised and excited that her father was asking her to join the Indian Army, which is exactly what she wanted to do after what she saw in the trip. Second, she was making a larger point, Habba Kadal in downtown Srinagar has aspirations like anywhere else. And like her, there were several others who had made great career choices based on their experience of the tour.

**Embracing the Youth has to be a National Priority**

In the present circumstances, where vicious propaganda is clouding and vitiating young minds, the nation, as the Prime Minister says, needs to embrace the people, help the youth to get their lives back on track. An effective outreach with the 4Es of Engagement, Education, Empowerment and Employment is the key. And it has to be sustaining. The effort has to be collaborative, providing opportunities for both local talent and local leadership to flourish. This requires imagination, innovation, perseverance and mutual accommodation.

Some cues can be found in events from the past such as ‘Bandipur has Talent,’ ‘Kupwara Municipal Football,’ ‘Sukoon the Pahalgam Fest,’ ‘Zahanat – Ganderbal,’ ‘Seminar on Inclusive Education at Kashmir University’ and so many others. Renowned artists such as Sudip Roy, sportspersons such as Mihir Ranjan Negi, actors such as Rani Mukherjee and singers such as Anand Raj Anand, to name a few have happily joined efforts in the past to promote talent.

Getting the youth in J&K to follow their talent has to be a national priority. Everyone has a stake in this pursuit. It is a social responsibility where everyone can make a difference whether one is a sports person, film personality, artist, industrialist, politician, administrator or part of the security forces. The bottom line is that ‘icons of violence’ have to be replaced by ‘icons of talent’ that abound albeit untapped.
RESURGENCE OF ULFA (I) IN ASSAM
Implications for Internal Security

—— Indrajit Sharma & Dr N Mohandas Singh ——

To infer that India’s COIN campaign in Assam is successful is not justifiable yet as the conflicts have not been resolved; rather they have been contained or managed to a great extent. Conflict resolution is not just the surrender of arms of or signing of agreements. Assam is a multi-ethnic society, which means accords and agreements should be inclusive in nature whereby the involvement of civil society is a must in the process of negotiation. The Indian state should look beyond accords and agreements and give priority to seek conflict resolution while simultaneously sustaining COIN operations to reduce the level of violence. Currently, the state of Assam has been put on track for development where its role in foreign policy has been growing.

ASSAM REPRESENTS ONE OF THE CONFLICT ridden volatile zones in contemporary South Asia. Since India’s independence, armed conflicts in the form of insurgencies have broken out in undivided Assam, leading to the formation of present day Nagaland, Mizoram and Meghalaya. The State of Assam continued to witness the emergence of a number of insurgent movements with varying demands and goals. Today, many of these have died down and an analysis of the security situation in Assam indicates India’s campaign for containing insurgencies in the State has been commendable as the level of fatalities and insurgency related violence have come down (see Table 1.1). Also, many of the insurgents are in peace talks with the Government and some of the prominent insurgencies have been neutralised.¹

However, amidst the ongoing peace process, the state has shown signs of renewed insurgent activity in the form of United Liberation Front of Asom (ULFA – I) where ‘I’ stands for Independent which was hitherto perceived to be an insignificant force following the losses incurred in its cadre strength, popular support including its major members coming to the negotiating table with the Government of India (GOI). Over the past few years, the hard line faction of the ULFA renamed as ULFA (I) has shown a resurgence to upsurge attacks on the Army personnel, civilians, including a series of IED explosions that took place on Republic Day this year.² In ULFA (I), related violence in the year 2016, there have been casualties of six civilians and three security forces personnel including a kidnapping.³ Such resurgent activities of the ULFA (I) have generated cause for some worry for the advocates of peace in Assam. In view of such renewed insurgency, what concerns Assam more is that it could witness the terror back in the state. Other than ULFA (I), the state has a number of militant groups that are

<table>
<thead>
<tr>
<th>Years</th>
<th>Incidents</th>
<th>Extremists Arrested</th>
<th>Extremists Killed</th>
<th>Extremists Surrendered</th>
<th>Security Forces Killed</th>
<th>Civilians Killed</th>
<th>Persons Kidnapped</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>474</td>
<td>408</td>
<td>122</td>
<td>229</td>
<td>27</td>
<td>287</td>
<td>89</td>
</tr>
<tr>
<td>2008</td>
<td>387</td>
<td>403</td>
<td>110</td>
<td>724</td>
<td>18</td>
<td>245</td>
<td>102</td>
</tr>
<tr>
<td>2009</td>
<td>424</td>
<td>359</td>
<td>194</td>
<td>616</td>
<td>22</td>
<td>152</td>
<td>91</td>
</tr>
<tr>
<td>2010</td>
<td>251</td>
<td>370</td>
<td>109</td>
<td>547</td>
<td>12</td>
<td>53</td>
<td>72</td>
</tr>
<tr>
<td>2011</td>
<td>145</td>
<td>378</td>
<td>46</td>
<td>789</td>
<td>14</td>
<td>18</td>
<td>72</td>
</tr>
<tr>
<td>2012</td>
<td>169</td>
<td>412</td>
<td>59</td>
<td>757</td>
<td>50</td>
<td>27</td>
<td>79</td>
</tr>
<tr>
<td>2013</td>
<td>211</td>
<td>348</td>
<td>52</td>
<td>92</td>
<td>52</td>
<td>35</td>
<td>125</td>
</tr>
<tr>
<td>2014</td>
<td>246</td>
<td>319</td>
<td>102</td>
<td>102</td>
<td>44</td>
<td>168</td>
<td>94</td>
</tr>
<tr>
<td>2015</td>
<td>81</td>
<td>645</td>
<td>49</td>
<td>30</td>
<td>-</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>2016</td>
<td>75</td>
<td>366</td>
<td>51</td>
<td>15</td>
<td>4</td>
<td>29</td>
<td>14</td>
</tr>
</tbody>
</table>

Source: Annual Reports of Ministry of Home Affairs, Government of India

³ Source: Annual Reports of Ministry of Home Affairs, Government of India
still active and continue to resort to violence from time to time. This calls for a revisit to India’s approach to counter insurgency in Assam and to look for the underlying issues that needs to be addressed.

**Resurgence of ULFA (I)**

The armed insurgency by ULFA is located from the popular Assam Movement, out of which it emerged as an insurgent organisation demanding creation of a sovereign socialist Assam from the Indian Union. After a prolonged Counter Insurgency (COIN) campaign, the outfit entered in peace talks with the Government of India in 2011. The peace talks with the group saw a split in the organisation in the form of an anti-talk faction, the ATF led by Paresh Baruah, the Commander-in-Chief of the ULFA and the Pro-Talk Faction (PTF), led by Arabinda Rajkhowa, the Chairman of the group. While the outcome of the peace talks are still awaited, it is observed that the ULFA (I) has been successful in gaining its strength after the organisational split and currently with nearly 300 cadres, it operates at the inter-state border areas along the Nagaland and Arunachal Pradesh.

It is argued that the ULFA (I) is no less than a criminal organisation as there is hardly any ideological base left in the organisation. Nonetheless, the outfit still poses a threat and cannot be taken lightly.

Although the ULFA (I) represents more than three-decade old insurgency in Assam, in due course of the ULFA's quest for sovereignty, the organisation shifted from its ideology when it established its linkage with the Pakistan’s Inter-Services Intelligence (ISI) and started operating from Bangladesh. The outfit also continued to remain indulged in killing civilians and harassing population through extortion in the name of protection money or business tax from the business houses. Since 2011, the hard line faction of ULFA became dormant or it can be said that there was a temporary lull in the outfit's activity. While in dormancy, as security analysts put, the outfit remained busy in regaining its strength through recruitment drives, gathering finance through extortion and abductions.

The period of dormancy could be seen from 2011 to 2015 after which the organisation showed signs of resurgence through fresh attacks as mentioned earlier. The recent reports also indicate a fresh recruitment drive by the outfit in the districts of upper Assam. It could be said that in its period of dormancy, the outfit was playing a wait-and-watch game revamping its strategies while peace talks between the PTF and the GOI took its normal course.

A deeper analysis of the armed conflicts in the state brings several issues that warrant introspection in India’s approach in dealing with the issue of insurgency in the state and raises questions relating to the aspects of conflict resolution. It is in this connection that present situation where there is a resurrection of the ULFA and its renewed insurgent activity could be located. In Assam, it could be observed that newer domain of conflicts have emerged in the state as older ones are ‘contained,’ thereby giving rise to the fact that major conflicts in the state have been managed, but not resolved yet. Apart from the ULFA (I), other active insurgent outfits are the National Democratic Front of Bodoland (NDFB-S), Kamtapur Liberation Organisation (KLO) and Karbi People’s Liberation Tiger (KPLT). These outfits have also been the major elements in derailing the ongoing peace process in the state.

Recent reports indicate that the ULFA (I) has formed a nexus with the National Socialist Council of Nagaland – Khaplang (NSCN-K) and the present areas where the ULFA (I) operates fall under its (NSCN-K) jurisdiction. Furthermore, what is more critical is the fact that the ULFA (I) is also a member of the newly formed conglomerate of the militant groups in the Northeast – the United National Liberation Front of Western South East Asia (UNLFWSEA) and thereby adds to the renewed dimension of threat perception for the Indian State. This suggests that the centralised command control system in the state has not been promising in resolving conflicts. Does this indicate a counter insurgency failure in the state of Assam? Or whether the counter insurgency strategy in Assam is unraveling? To answer these questions, it is necessary to look at the very approach of countering the insurgencies by the security forces as well as the efforts by the GOI towards ushering conflict resolution in Assam.

**India’s Counter Insurgency Approach in the State**

In Assam, the GOI follows a multi-pronged strategy to deal with the insurgencies and extremist conflicts. According to the seventh report of the Administrative Reforms Commission (ARC), such strategies could
be seen through (i) security forces and police action (ii) granting local autonomy through mechanisms such as the conferment of statehood or autonomous district councils under the Sixth Schedule and through ‘tribe specific accords’ (iii) negotiations with insurgent outfits and (iv) development activities including special economic packages. Thus, a mix of various strategies combines India’s COIN approach. All such strategies have the same objective – to help the Government reasserting its control over its territory and population.16

Most of the ideas of India’s COIN measures are derived from the Indian Military Doctrine developed in 2004 and the Indian Army’s Doctrine on Sub Conventional Warfare (DSCO) developed in 2006. Although the framing of such doctrines have an influence from the counter insurgency approaches of British and US, where there is the primacy of use of force, the case for Indian COIN approach is different. Unlike the counter insurgency operations by British or the US which were outside their territory, insurgencies in Assam or North-East region are homegrown. Thus, for India, fighting insurgents is against fighting fellow Indians and hence the use of heavy artillery is not exercised. Scholars like Goswami17 term this as the Army’s proportionate use of force against internal armed rebellion.

Today, the idea of COIN is not just containing or subduing the insurgents militarily, but employing a wide range of strategies other the militaristic. Such a mix of strategies defines the comprehensiveness of COIN approach which includes all the aspects of military, political, economic and psychological or the civic action programmes. The latter is related to the term ‘winning hearts and minds’ which has got significance considering the fact that fighting an insurgency is as much political as they were military and the military apparatus has to play a role other than just combat.18 This aspect is a part of modern COIN strategy as devised in the Indian Army’s doctrine of sub-conventional operations.19

**Assessing the Approach**

For long, the Indian state relied heavily on the security-centric approach when it comes to respond to the insurgencies in Assam. This indicates that there has been a preference of a military offensive which seeks to contain the insurgencies. In fact, it has mostly been containing rather than resolving the insurgencies. The COIN campaign starts with this approach and following which subsequent efforts are made to resolve the conflicts. It suggests that containing insurgencies and resolving insurgencies are two different things, similar to the differences between conflict management and conflict resolution. In conflict management, conflicts are controlled in such a way that the level of violence does not escalate or conflicts are no more a major problem, whereas in conflict resolution, deeper issues are addressed for a lasting solution in a society.

India’s prolonged campaign in subduing or dealing with the issue of insurgencies in Assam does not reflect the aspects of conflict resolution; rather it reflects conflict management. However, the GOI has been using a mix of various strategies such as the use of force, dialogues and negotiation, structural changes including economic development which have gained prominence in relation to India’s consciousness to renewed geo-strategic aspirations towards the East.20 Nonetheless it is the military dimension that has got weightage above all the other strategies. The presence of the Armed Forces Special Powers Act (AFSPA) and the Unified Command Structure in the state validates this argument. While the presence of the AFSPA is a matter of security assessment of a disturbed area,21 the preference of a militaristic approach is seen in other instances also. For example, while negotiating with insurgencies, the Indian state first corners down the insurgent group through a military offensive during COIN operations which weakens the organisation and then efforts are made to bring the organisation to the negotiating table.22 The strategy of negotiation is also seen to take place bilaterally and in a selective way where there is no official involvement of civil society which could expedite the peace process and help overcoming procrastination.

For India, the ultimate objective in negotiation has always been to achieve peace. With the ULFA, as the outcome of the peace talks are awaited, it is to be noted that in Assam, accords and agreements are seen to be exclusive in nature and have given rise to fresh challenges. The case of Bodoland Territorial Area Districts (BTAD) is an example which has been witnessing periodic inter-ethnic violence. Also, one...
aspect of accords and agreements is that they act as snowballs leading to demands from other ethnic groups. Furthermore, it is seen that the development intervention by the state has been considered to be the ultimate panacea of all sorts of issues surrounding insurrections and various social insecurities. But it is a recent affair that the development paradigm has been made a part of the COIN strategy in the state. Besides, in the wake of a neo-liberal era, the state’s development intervention has garnered a lot of criticism as there have been new challenges relating to internal displacement, social movements and environmental concerns.

It is high time that the GoI needs to reconsider its approach from just containing or seeking conflict resolution... means accords and agreements should be inclusive in nature whereby the involvement of civil society is a must in the process of negotiation. The Indian state should look beyond accords and agreements and give priority to seek conflict resolution while simultaneously sustaining COIN operations to reduce the level of violence. Currently, Assam has been put on track for development where its role in foreign policy has been growing.

The state, other than being a foreign policy connector, can cater to the needs for development and peace, the success of which depends upon the internal security environment as security and development mutually reinforce each other. Therefore, it is high time that the GoI needs to reconsider its approach from just containing or seeking conflict resolution. This implies that focus should be made to merge the priorities of containing the level of violence and addressing the deep rooted issues such as inclusive growth, generating employment opportunities and addressing ethnic aspirations within the mandate of the Indian constitution. Also, the state should not delay further in finalising the outcome of the peace talks with the pro-talk faction of the ULFA.

**Conclusion and Suggestions**

To infer that India’s COIN campaign in Assam is successful, is not justifiable yet as the conflicts have not been resolved; rather they have been contained or managed to a great extent. Conflict resolution is not just the surrender of arms or signing of agreements. Assam is a multi-ethnic society, which

**Notes**

4. With the fear of being culturally and politically ‘swamped’ by the growing influx of populace, resentment built up among the local pollution of Assam which has escalated into one of the independent India’s most prolonged and vigorous agitations in the form of Assam Agitation or the Anti-Foreigners Movement, which had escalated into one of the independent India’s most prolonged and vigorous agitations in the form of Assam Agitation or the Anti-Foreigners Movement or the most prolonged and vigorous agitations in the form of Assam Agitation or the Anti-Foreigners Movement or the Assam Movement in 1979.
9. “ULFA(I) on overdrive to recruit fresh cadres”, The Shillong Times, APRIL 17, 2017. Available at...
RESURGENCE OF ULFA (I) IN ASSAM


10. Author Interview with Wasbir Hussain, Director of Centre for Development and Peace Studies, Guwahati, Assam.


12. United National Liberation Front of Western South East Asia (UNLFWSEA) was formed in the year 2015. It is an umbrella organization with some prominent insurgent groups of northeastern states. For details see Times of Assam Available at: https://www.timesofassam.com/headlines/ulfai-ndfb-nscn-klo-gets-united-as-unlfw/


14. In the year 1997, a ‘unified command structure’ was introduced in Assam with the purpose to facilitate coordination of all security agencies deployed in the State during counter insurgency operations.


20. India aspires to integrate the Northeast region with the economies of ASEAN through regional connectivity. The Act East Policy is the post-cold war strategic foreign policy that has been devised considering India’s interest towards East.

21. According to the Disturbed Areas (Special Courts) Act, 1976, an area can be stated as disturbed when “a State Government considers that (i) there was, or (ii) there is, in any area within a State extensive disturbance of the public peace and tranquility, by reason of differences or disputes between members of different religions, racial, language, or regional groups or castes or communities, it may ... declare such area to be a disturbed area.”


24. Author Interview with Wasbir Hussain, Director of Centre for Development and Peace Studies, Guwahati, Assam


NAVAL WARFARE HAS ALWAYS BEEN AND will be unique and distinct from the other two viz land and air. This is simply because of the medium in which it is conducted and also has the necessity and ability to influence the warfare in the other two dimensions. The weapons platform in the maritime domain experiences far more dynamic conditions as compared to the other two mediums which make the resolution of the problems in effective delivery of the ordnance much more complex. This is just stating the obvious. The solutions call for intricate and complex mathematical and trigonometric applications. Before the advent of computer science and electronics, the mariner relied on pre-computed tables giving solutions.

The problem gets even more compounded in the undersea dimension where submarines operate. The two dimensional approach changes to a three dimensional one with attendant complexities of axis stabilisation.

In essence, the problem is of delivering the ordnance on the target whether stationary or mobile, with accuracy using available inputs. This implies solving the basic problems by Inputs (Surveillance) - Processing (Computation of Data & Weapon) - Delivery (Weapon System). Let us dwell on this:

- **Surveillance.** This is the starting step for any action towards neutralisation of threat. This process could be by way of visual means, radar, sonar, satellites, drones, Electronic Support Measures (ESM) and communication (direction finding). The objective is to detect the threat and transmit the data of target coordinates to the processing system.

- **Processing Systems.** The data on target coordinates and its motion needs to be processed to assess the value of threat and choosing a weapon system to neutralise it. This could be by mathematical tables, by stand-alone computer systems analogous/digital to work out the solution for delivering the ordnance from the chosen weapon system.

- **Delivery.** This comprises the weapon delivery system be it a gun, torpedo, missile or decoy to engage the threat. A system could be a decentralised fire control system controlling only its integral ordnance delivery mechanism or it could be a part of an integrated combat system managing the ordnance delivery of a number of systems constituting the combat system.

- The sequence of events in the above three is surveillance, detection, classification, identification, tracking, indication (to the processing system), processing the solution, direction (to the FCS/Director), refining the solution and engagement. Usually this could be a closed or open architecture depending on the sophistication of the technology.

Simple as this may appear, it is a complex process depending on the nature of surveillance, sensors, nature of target, processing hardware, weapons system and delivery mechanisms and target parameters. Consequently, the Naval Fire Control Systems have evolved over a period of time in consonance with the sophistication of the technological environment. Accordingly, this paper attempts to portray the evolution of Naval Combat Systems and is restricted to general principles and concepts without detailing specific systems, as those by themselves constitute separate studies.

**Historical Background**

In pre- and post- WW II, the design philosophy of warships was mainly centered on countering a perceived threat with a weapons system and building the platform around that system. It was for this reason, that we had specialised platforms such as Air Defence (AD) Frigates, Anti-Submarine Warfare (ASW) Frigates and Anti-Surface (ASU) Warfare Ships. For example,
there were Whitby Class Frigates which were ASW Frigates, Leopard Class Frigates, which were Air Defence Frigates, Blackwood Class Frigates which were purely ASW Frigates. The template of the Royal Navy is being used here, as during those times, it was the most powerful and evolved maritime force. Even in smaller Corvettes, this philosophy was followed.

**Fire Control Systems (FCS)**

Consequently, the primary weapon systems were meant for those functions and these systems were mainly stand alone and decentralised ones on the ship, having their own dedicated Fire Control Systems. This arrangement allowed for greater focus and accuracy of such fire control systems to counter the threat against which they were designed. Surface warfare ships were heavier, such as the colony class cruisers with heavier six inch guns and some air defence capability in four inch guns. These ships had virtually no ASW capability. These systems were more reliant on electronic valve-based analogous systems and magnetic amplifiers, which were bulky and occupied large volumes of space on the ship. Although such arrangement provided for a more focused and efficient way to counter a threat, it was an expensive one and led to multiplicity of platforms in the composition of a maritime force.

**Electronic Revolution: Developments Post WW II**

The onset of the electronic revolution and consequently, miniaturisation brought in a phase of immense change in not only the design of warships but also for sensors, information processing and weapon systems. The energy requirements for operation of such systems saw a sharp drop, the capacity and volume of information management saw a quantum leap, which permitted multiple weapon systems to be accommodated on a single platform, thereby giving rise to general purpose ships. It became possible to design ships with multiple capabilities wherein all major capabilities such as ASU, ASW, AD (indeed - AAW- Anti Air Warfare) could be incorporated on a single platform. Leander Class Frigates was such a design in the Royal Navy, Spruance class followed by the Arleigh Burke in the US Navy and Kashin Class in the Russian Navy. These were multi mission capable ships.

**Onset of Anti-ship and Anti-Air Ship launched missiles.**

The arrival of ship-launched, anti-ship cruise missiles and anti-aircraft missiles added a totally new dimensional capability to ship designs, integral to which is the evolution of Naval Combat Systems.

**Appearance of Ship-Borne Helicopter**

Another significant development post- WW II was the appearance of ship-borne helicopters. These added an entirely new horizon to ship design and extended the capability against threats, especially in anti-submarine warfare. An ASW Helicopter with its dunking sonar and anti-submarines torpedo/depth charge delivery capability gave an extended reach to a ship against a submarine.

**Multi-Function Radars and Consoles**

In similar fashion, multi-function radars with track-while-scan capabilities, phased array antennae also opened up newer vistas in a platform’s surveillance capability. Finally, advances in information processing capability in the form of first/second generation computers linked to multi-function consoles enabled processing of the information in quick time in order to counter, air, submarine and surface warfare threats, against which reaction time had been shortened considerably.

**Computer Aided Action Information Systems.**

The first step to a modern Naval Combat System was the concept of Computer Aided Action Information System (CAAIS). However, even at this stage, a CAAIS was a centralised fire control system and not a modern Naval Combat System. The CAAIS was still a central processor of information given from the sensors such as radars, sonars, ESM systems and work out the motion parameters of the threat and generate the coordinates to be fed to the concerned FCS/weapons system to effectively liquidate that threat. Working regimes to manage the combat readiness such as Command, Control, Communication and Intelligence (C3I) systems which had been in force gave rise to a new regime C4I in which in addition to the existing Cs, the fourth signified Computers, came into vogue. The collection and processing of the entire spectrum of the information from sensors could be managed with greater accuracy, speed and integrity in order to direct the weapon systems to execute assigned tasks.

In this initial stage, the system was connected to the analogous FCS, integral to each weapon delivery system. However, with the digital revolution in Information Technology, the CAAIS could be integrated seamlessly with digitised weapon systems.

**Data Links**

With multi-mission helicopters integral to ships,
operating at extended ranges from their mother ships, requirement of transfer of information, led to the development of data links which in real time enabled the picture available on the concerned sensor to the mothership or vice versa, permitting optimum deployment of weapons in the ultimate objective of destruction of the threat. The data link would also be used to share information between constituent ships of a formation to synergise the resources available both in respect of sensors and ordnance. This became the precursor to network-centric warfare which will be discussed later in this paper.

**Developments in Submarine Warfare**

In parallel to the developments herein enumerated, great strides were being made in enhancing the potency of the submarine, which till the end of WW II, was more of a submersible, capable of diving for a short period whilst spending most of the time on the surface. It was the developments Post WW II that the submarine has come of its own as the most potent offensive platform both in the conventional and the atomic applications. The modern stealth submarine has made the task of its detection extremely difficult, which has a bearing on the development of the Naval Combat Systems that have to be arraigned against it. At the same time, the development of submarine-launched weapons including long range tele-guided smart torpedoes and missiles fired at stand-off ranges, also contributes to the evolution of combat systems in the overall maritime framework of such systems.

**From CAAIS to Combat Systems**

Whereas CAAIS architecture used a central processing unit to collate, process the data from the peripherals (mainly the data links & surveillance sensors) and transmitted the final parameters to the Directors/FCS (including analogous) of the designated weapon system to neutralise the threat, the Naval Combat System, with the onset of digitisation and digital processing, evolved to encompass the entire chain in its ambit. A modern NCS includes sensors, radars, sonars data links, the closed/open architecture of the central processor and the array of weapon systems, almost all digitised, as one comprehensive unit. It also includes the inputs from ships navigation and motion systems including essential parameters from the Platform Management Systems (PMS) required to achieve stabilisation of the axis relevant to the solution of the problem to effect quick, accurate and efficient delivery of the ordnance be it torpedoes, guns, missiles, passive/active counter-measures, decoys and ASW rockets.

**The Modern NCS**

The modern NCS encompasses the entire gamut of equipment in its ambit from sensors (radars, sonars, ESM, visual, laser range finders, infra-red and thermal imaging), data links, fibre-optic links, interface equipment and black boxes, central processors and servers, data bank and libraries, multi-function consoles to weapon control and delivery systems.

The digitisation of the data in the entire chain of events from the surveillance stage to the engagement of the target has enabled a centralised architecture, obviating the need to have a separate FCS/Directors for each weapon system, except in anti-missile missile systems using wave-riding techniques for their guidance. This architecture permits the optimisation of the systems consequently leading to economy of scales, not to forget standardisation.

**Fast Decision Making**

As a consequence of the sophistication of the incoming threats, fast decision making in real time is the most important aspect in countering threat. Human intervention is no longer capable of coping with the mass of information flow and the modern NCS enables this to be achieved with least human intervention. The only aspect where human intervention is still present is in command and sequencing functions. Typical examples of modern NCS are Aegis, (USN), ATHENA (Europe, North Africa and Middle East), SUBTICS (France-on board submarines) and SAAB NCS.

**Network Centric Warfare**

With the rapid advances in Information Technology (IT), logical follow up evolution of the combat systems evolution is the Network Centric Warfare (NCW). This concept emerged at the turn of the century and is transforming the conduct of warfare; in particular of the maritime dimension by linking together ships, aircraft, submarines and shore operations control facilities into a highly integrated computer/telecommunications networks. Such networking can lead to the following advantages:

- Real-time intelligence and information sharing.
- Synergising the resources of each integrated unit in the management of combat functions and operations of the network units.
- Precision and accuracy of operations.
- Disruption and degrading of the adversary’s...
strategy by bearing upon him the weight of the combined units instead of stand-alone platforms. This is also known as Cooperative Engagement Capability (CEC).

- Enhance the radius of the theatre of operations.

**Cyber Security and Warfare**

NCW is still a work-in-progress although many of the major navies have already incorporated it in their plans for 21st century operations. However, there are aspects which need critical attention and refinement, primary among them is cyber security. In stand-alone platforms, data links to their integral units were still a safe bet and difficult to interfere with, unless one interposes in their Line Of Sight (LOS) communications. However, in an NCW environment, electronic and cyber-attacks are a real possibility which need to be taken care of. At the same time, one’s own NCW Systems should be able to degrade the adversary’s capabilities using cyber warfare. This aspect calls for an entirely new discipline and the requirement of highly trained personnel in cyber warfare. The beauty is that this art can be practiced 24/7 throughout the year. The NCW will have an impact on:

- Tactics, doctrine and organization.
- Overall fleet design and composition.
- Interoperability.

**FUTURE PERSPECTIVES**

**Advent of Unmanned Vehicles**

The development and deployment of unmanned surveillance and combat vehicles is significant as it will have a transformational effect on Naval Combat Systems. We already have surveillance drones operating, as also offensive drones as part of war on terror. Underwater unmanned vehicles are already available for mine sweeping operations and in the same sphere, such vehicles are under advanced stages of development for harbour defence and efforts are also underway to use them from ship-borne platforms for submarine detection. Unmanned ships are almost on the horizon, DNV – GL is seriously working on autonomous ships.

A thesis study was undertaken to examine this proposition in its application on the AEGIS Combat System, at the Naval Post Graduate School, Monterey, California, authored by Eric S Roberts in September 2011. The paper looked at all aspects some of which included life-cycle costs, shelf life and obsolescence.

**Cloud Computing or Virtualisation of Data**

Whilst the digitisation has eased the solutions in combat operations, there is a case to find venues for storage of data, which keeps increasing in volume by the hour. Relatively, the processing speeds slow down. In addition, the rising costs of specific equipment, draws on the limited resources from other projects. Consequently, interest is being evinced in finding venues for storage of data, as if in a bank, to be drawn upon at the time of need. Cloud computing or virtualisation of legacy data are the options.

- **Cloud Computing:** Cloud computing has been defined as the practice of using network of remote servers hosted on the internet to store, manage and process data, rather than on a local server. More specifically, the US National Institute of Standard and Technology (NIIT) defines it as “a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources e.g. networks, storage, servers, applications and services that can be rapidly provisioned and released with minimal management effort or service provider interactions.” (Mell & Grance, 2009 P 1)

- **Virtualisation:** This on the other hand, is an abstraction of computer resources to allow a single physical resource such as a server, an operating system, an application or a storage device appear to function as a multiple logical resources, designed to deliver on demand, data to specific users. This is somewhat analogous to the internet and the World Wide Web, where the web comprises a subset of all services available to users via the internet. This provision gives the advantage on ship-borne environments in that it reduces the physical foot prints of the combat system’s architecture as also optimises the need for large computers, thereby reducing heat and noise signatures. It also reduces the load on energy requirements for cooling.
The evolution of Naval Combat Systems has had a chequered history with more successes on the board…

and related industry support over long periods of service life, (Gap in shelf life of equipment and production lines), availability of trained, in-house manpower for technical support and maintenance, advantages of reduced footprint of proprietary equipment and concluded that employment of open architecture technology and maximising the use of shared resources through virtualisation was a viable option. Work on this avenue is continuing and holds promise for the future trends of Naval Combat Systems.

**Trends and Analysis**

The market and the need for Naval Combat Systems is alive as host navies seek to modernise and upgrade their existing systems to keep pace with fast-changing technology in keeping with the evolving threat spectrum. Defence IQ had undertaken a survey in first half of 2016 to assess the factors that would impinge on the continuing evolution of NCS, in a potentially game-changing technology environment including the use of Commercially Off The Shelf (COTS) equipment and components to secure long term solutions in this field. The survey was undertaken across, users, commercial industry, government organisations, academia and the media. The survey has identified significant challenges for modernisation for NCS.

- **Obsolescence:** The militaries rated obsolescence (44 per cent), academia rated budgetary limitations (74 per cent) whereas the industry considered lack of direction from users and Government (36 per cent) and issues of interoperability (40 per cent) as the most significant challenges.

- **Game Changing Technologies:** The industry saw unmanned underwater vehicles (63 per cent), whereas the military (users) saw interoperability and open architecture systems as most potentially game-changing technologies. The Academia (48 per cent) thought Directed Energy Weapons would fit this bill.

- **Prioritisation of Elements of Combat Systems:** The Academia (65 per cent) rated surveillance Systems, whereas the Industry considered Combat Management Systems (42 per cent) and Weapons and Missile Control Systems (34 per cent) would hold sway, the Military however, rated Cyber security (64 per cent) in its priority list. Electronic Warfare also rated high at 48 per cent.

- **Interoperability:** Majority (59 per cent) of the respondents across the spectrum, thought that inter-operability would play an important part in the future NCS. However, most felt that it would be majorly in place only in the next two decades.

- **COTS:** Opinion was divided on the use of Commercially Off The Shelf (COTS) equipment and hardware as an economical and accessible solution. Aspects of associated risks on mil-specs vis-a-vis commercial specs precluded a decisive verdict.

**Conclusion**

The evolution of Naval Combat Systems has had a chequered history with more successes on the board. Their evolution has responded to the evolving nature of maritime combat operations. Technological, electronics and information technology revolutions have shaped their growth and evolution. The ever-changing nature of threats in terms more sophisticated and smart weapons too have played a significant part in shaping the configurations of Naval Combat Systems.

The spectre of obsolescence and rapidly changing technology, especially the advent of unmanned vehicles, will drive the future trends of NCS. Open Architecture and Cyber Security will take centre stage. Aspects of inter-operability, commercially viable substitutes and budgetary constraints will also play a significant role. All in all interesting times are ahead in the continuing development of Naval Combat Systems; we may see smart phones, in not so distant future, being used in Combat Operations Management.

**Notes**

1. CRS report to US Congress of June 2001
2. The Maritime Executive
5. Wikipedia.
AEROSPACE AND DEFENCE NEWS

—— Priya Tyagi ——

MILITARY AVIATION

Apache Attack Helicopters for the Indian Army

On August 17, this year, the Defence Acquisition Council under the Ministry of Defence (MoD), cleared the case put up by the Indian Army for the procurement of six AH 64E Apache attack helicopters from Boeing Defense Space and Security (BDS) of the United States. The deal is valued at Rs 4,168 crore and has been contracted for under the option clause in the terms of purchase of 22 AH 64E Apache attack helicopters for the Indian Air Force (IAF) under which India can buy 11 more choppers at the same price. These six helicopters would be in addition to the 22 contracted for in 2015 that the IAF is to receive from the US aerospace major.

The Indian Army is expected to acquire more of these platforms in the near future. Apart from the Apache attack helicopters, the Indian Army is also looking at the indigenous Rudra, the armed version of the Advanced Light Helicopter designed, developed and manufactured by the Indian aerospace major Hindustan Aeronautics Limited (HAL). HAL has already handed over 22 of these platforms to the Indian Army for flying and weapon integration trials. An army aviation base is coming up in the North East and efforts are on to set up another composite aviation base in the Northern part of West Bengal.

48 Mi-17 Helicopters for the IAF

Russia and India are holding techno-commercial negotiations for the supply of 48 Russian Mi-17 military transport helicopters, with Moscow hoping to seal the deal by the end of this year. Designed to transport cargo inside the cabin and on an external sling, the Mi-17V-5, supplied to India, ranks among the most technically advanced helicopters of the Mi-17 type, incorporating the best engineering solutions of previous generations. In 2008, Rosoboronexport signed a contract for the delivery of 80 Mi-17V-5 to India, which was completed in 2011-2013. In 2012-2013, three additional contracts were signed to supply a total of 71 Mi-17V-5 helicopters to meet the needs of the Indian Air Force.

Last year, Russia had handed over to India the final batch of three Mi-17V-5 military transport helicopters under a previously signed contract with Rosoboronexport, a company of the Rostec State Corporation that entailed a total of 151 units of the Mi-17V-5 helicopter, produced by the Kazan Helicopter Plant. India now has more than 300 helicopters belonging to the Mi-17 family, which are deployed in troop and arms transport, fire support, convoy escort, patrol and Search-And-Rescue (SAR) missions.
New Generation’ European Fighter Jet

Germany and France have agreed to develop a ‘new generation’ European fighter jet in an effort to strengthen the European Union and increase cooperation between the two countries. The announcement was made by France following talks between German Chancellor Angela Merkel and French President Macron in Paris. French President Emmanuel Macron called the plan a ‘profound revolution’. “The two partners hope to finalise a joint roadmap by mid-2018,” the French President said in a statement. The new fighter jets will replace the fleets of combat jets currently being operated by the armed forces of the two nations and will not only result in huge savings, it will also remove competition between different jets that are currently on the market. “The aim of this fighter jet for a new generation is first to launch a common research and development programme to be able to plan it together, and then for our two armies to be able to use it together. I confirm to you, it’s a profound revolution, but we are not afraid of revolutions,” Macron said. The two sides also agreed to develop a cooperation framework for the next model of the Tiger attack helicopter and for tactical ground-to-air missiles.

Hypersonic Attack Drones by 2040

Air Force weapons developers expect to operate hypersonic intelligence, reconnaissance and surveillance drones by the 2040s, once scientific progress with autonomy and propulsion technology matures to a new level. The advent of using a recoverable Drone able to travel at high altitudes at speeds higher than Mach 5, will follow the emergence of hypersonic weapons likely to be operational in the mid-2020s, according to the Air Force Chief Scientist Geoffrey Zacharias. Describing the trajectory of hypersonic technology in terms of ‘stair steps’, Zacharias said, “Incremental progress will require decades of continued technological development. While unmanned hypersonic surveillance flight is on track for the 2030s, launching recoverable hypersonic Drones is not expected to be possible until the 2040s,” Zacharias said.

Hypersonic SR-72 - Successor to Blackbird Aircraft

Lockheed Martin’s Skunk Works has made public its plans to build the SR-72, a hypersonic spy plane successor of the SR-71 Blackbird reconnaissance aircraft. As per Lockheed Martin’s advanced aircraft division, the SR-72 hypersonic jet will have a combined cycle propulsion system that combines a supersonic jet engine with a rocket engine. According to specifications, the SR 72 will be able to handle and exceed speeds of Mach 6. DARPA and the United States Air Force (USAF) have had plans to develop a hypersonic aircraft to succeed the SR-71 since the early 2000s, but have been kept details under wraps since 2013, when USAF announced it had started a scaled successor to the famous aircraft. Lockheed Martin reports they plan to fly a Flight Research Vehicle (FRV) of the model in the early 2020s. They have plans to build an FRV the size of an F-22 that can be flown either manually or remotely. Due to the secrecy surrounding the programme, it may not be until the 2020s that further details are available.
Reliance Defence- Thales JV for Production of Rafale

French defence firm Thales, a supplier of radar and electronic warfare, display systems, software, communication solution for Rafale jet fighters is to set up a Joint Venture (JV) with Reliance Defence to integrate India-specific capabilities on the 36 Rafale jet fighters, maintain radars and manufacture high-performance airborne electronics. The Indian government signed a contract for 36 Rafale fighter jets for the IAF in 2016 for $8.8 billion. The JV will also serve to leverage Dassault’s offset commitment as part of the deal.

The Rafale deal with French aerospace major Dassault has an Offset obligation of 50 per cent which means that Indian companies will get businesses in goods and supply. The company in which Reliance Defence will hold 51 per cent stake, will develop the technology at their facility at Mihan Special Economic Zone near Nagpur. Indian defence firms are setting up joint ventures with foreign firms to benefit from the Make in India programme. Under the new strategic policy, the government has decided to increase participation by private parties in defence production related to helicopters and fighter jets. For instance, Tata Advanced Systems has formed a JV with US firm Lockheed Martin to produce F-16 Block 70 fighter jet in India.

China Developing Hypersonic Missiles for Jet Fighters

Beijing has claimed a successful test of new engine technology will soon allow it to develop hypersonic missiles. If the ramjet engine is successfully miniaturised, it will allow Chinese air-to-air missiles to strike their targets at more than 4,000 mph, well into Mach 5. The successful test is a milestone in the field of engine research, which has been a bottleneck for China for quite a while. It will increase the firing range and mobility for both air-to-air and anti-ship missiles used by China’s stealth aircraft such as the J-20 and J-31 stealth fighters.

A team from a research institute affiliated with the China Aerospace Science and Technology Corporation, the state-owned contractor behind the Chinese space programme, made the announcement. They reported that two flight tests with the solid-fuel variable flow ramjet engine were completed in May 2017. Solid fuel ramjet engines have the ability to burn oxygen from the atmosphere, rather than carry their own oxygen supply. The hypersonic engines could potentially triple the range of existing missiles, allowing China’s J-20 and J-31 stealth fighters to carry six of the weapons with the ability to hit targets 200 miles away.

Russian Fighter Jet Intercepts US Bomber

The Russian Ministry of Defence (MoD) said that one of its fighter jets intercepted an American strategic bomber that was flying near the border of Russian airspace. The statement from the Russian MoD said that it had to scramble an Su-27 to the area over the Baltic Sea on the morning of June 06 this year when Russian radars spotted an aircraft flying along the border. The Ministry said the Russian jet identified it as a US B-52 bomber and escorted
it until it flew further away from the border. The Russian MoD did not specify where exactly the intercept happened.

In a separate incident, a Russian MiG-31 was dispatched to intercept a Norwegian maritime surveillance aircraft flying over the Barents Sea near the Russian border. Similar incidents have happened close to Russian airspace in the past. In September last year, a Russian fighter jet flew within ten feet of a US Navy surveillance aircraft, in what American officials called “an unsafe intercept over the Black Sea”. In another dramatic incident last year, Russian jets buzzed over the USS Donald Cook in the Baltic Sea, coming within 30 feet of the American warship.

**Turkey, Pakistan to Jointly Manufacture Attack Helicopters**

Pakistan has entered an agreement with Turkey to jointly manufacture T-129 attack helicopters. The agreement was signed by Pakistan Minister for Defence Production Rana Tanveer Hussain and his Turkish counterpart Fikri Isik in Istanbul on the sidelines of the 13th International Defence Industry Fair 2017. The assembly line of the T-129 is to be established at Pakistan Aeronautical Complex in Kamra. The TAI/AgustaWestland T-129 is a twin-engine, tandem seat, multi-role, all-weather attack helicopter based on the Agusta A-129 Mangusta platform.

Under another agreement between the two countries, Pakistan will sell 52 Super Mushshak trainer aircraft to Turkey. Speaking on the occasion, Rana Tanveer Hussain said closer mutual collaboration between the defence industries of Pakistan and Turkey will help them realise the full potential in an optimal manner. Turkish Defence Minister said Pakistan is a true friend and strategic partner and these agreements will further intensify bilateral collaboration in the field of defence industry.

**Maiden Flight by New Chinese Attack Helicopter**

In May this year, the Z-19 helicopter conducted its maiden flight in the city of Harbin in North-Eastern China. State-owned VIC Harbin Aircraft Industry developed the Z-19E attack chopper with the intention of selling it to foreign clients. The Z-19E is ‘the first export-oriented helicopter made especially for attack purposes’. It will mainly fill capabilities gaps for foreign militaries seeking ground-target strikes. The helicopter is armed with anti-tank and anti-armoured personnel carrier munitions. It will also be able to work with Special Operations forces in reconnaissance missions. China demonstrated that it was willing to provide arms to both combatants in the Iran-Iraq war in quantity and without conditions. Historically, Pakistan has been China’s biggest client for defence equipment. Most Chinese weapons for export are less advanced and less sophisticated than weaponry available from Western suppliers or Russia.
Lockheed Martin F-35 Stealth Fighters for Israel

At a price tag of $100 million each, Lockheed Martin F-35 Lightning II is the latest addition to Israel’s fleet of combat aircraft. Israel has received the initial five jets since December 2016 with the aim of allowing it to maintain its military superiority in the turbulent Middle East, particularly regarding its arch foe Iran. It plans to purchase a total of 50 F-35s. Its first jets are to be operational this year. While other countries have ordered the planes, Israel which receives more than $3 billion a year in US defence aid, says it will be the first outside the US with an operational F-35 squadron.

Among its main features are advanced stealth capabilities to help pilots evade sophisticated missile systems. The single-pilot jets can carry an array of weapons and travel at a supersonic speed of Mach 1.6. The pilot’s ultra-high-tech helmet, at a cost of about $400,000 each, includes its own operating system, with data that appears on the visor and is also shared elsewhere. Thermal and night vision as well as 360-degree view is possible with cameras mounted on the plane.

F-35As Deploy to Estonia for the First Time

On April 25, 2017, two F-35A Lightning II aircraft and 20 supporting airmen arrived at Ämari Air Base from Royal Air Force Lakenheath, England to participate in their first training deployment to Europe. The aircraft and total force Airmen were from the 34th Fighter Squadron and the Air Force Reserve’s 466th Fighter Squadron at Hill Air Force Base, Utah. The deployment was conducted in close coordination with Estonian allies. It allowed the F-35A to engage in familiarisation training within the European theatre while reassuring allies and partners of US dedication to the enduring peace and stability of the region. This deployment provided training opportunities with allies and partners and served as a visible demonstration of the US resolve to support NATO.

This was the first overseas flying training deployment for the F-35A, signifying an important milestone and natural progression of the Joint Strike Fighter Programme. It was the perfect opportunity for the combat-ready aircraft to train alongside US and allied aircraft in a realistic training environment while demonstrating its operational capabilities. Also, it helped to integrate with NATO’s infrastructure and enhance fifth-generation aircraft inter-operability.
Saab and Adani Announce Collaboration Plan for Aerospace and Defence in India

Defence and security company Saab and Indian infrastructure conglomerate Adani Group announced a collaboration plan within aerospace and defence in India, aligned with the Government of India’s Make in India initiative. The intended collaboration would encompass design, development and production of Gripen for India and other high-tech products of national importance for India and also the creation of joint ventures in India in line with and in support of the Make In India policy.

Saab, in partnership with Adani Group, will discuss possibilities to offer solutions to bring required design and manufacturing capabilities in defence and aerospace to India. A collaboration between Saab and Adani will combine the technical and product excellence of Saab, along with the industrial engineering, system integration and mega project execution capabilities of Adani with the intention to manufacture defence systems locally in India.

With India’s focus on creating future-proof and home-grown capabilities across all industries, Saab and Adani will explore how to cooperate to develop a wider aerospace and defence ecosystem in India. A critical part of a joint roadmap would be to encourage the development of small and medium sized enterprises along with a robust national supply chain.

“We are committed to the India-Sweden relationship and in bringing the latest technology and skills to India,” says Håkan Buskhe, CEO and President of Saab AB. “The Adani Group is one of India’s largest global conglomerates. Adani Group has a long history of entrepreneurship, spanning through decades of dynamic growth.”

“Our plans in India are to create a new defence eco-system that would involve many partners, vendors and suppliers. To achieve this, we need a strong Indian partner who can help create the framework for the infrastructure and eco-system to come into place,” says Håkan Buskhe, CEO and President of Saab.

“In continuation of our vision of nation building, we are keen to play an instrumental role in helping transform India into a destination for world class high-tech defence manufacturing,” says Gautam Adani, Chairman of Adani Group. “We are proud of our enduring relationship with Saab and look forward to partnering in major projects such as Gripen. Our various collaborations in aerospace and defence sectors will help establish new production lines in India, generate employment and build sustainable skills.”

The intended collaboration would include Gripen for India. Gripen would be offered to the Indian Government as the best solution for India’s single-engine fighter aircraft programme. The collaboration...
would also include projects, programs and technologies of national importance to India. The parties’ plan to develop the relationship into a structure of joint ventures in India for execution of the programs, including the single engine fighter program, in order to support the Make in India policy and exhibit the parties long term commitment to be jointly successful.

Gripen is a modern multi-role fighter aircraft featuring state-of-the-art technology, including advanced data links and sensors plus a unique extensive electronic warfare suite. Gripen can perform all air-to-air, air-to-surface and reconnaissance missions with the most modern range of weapons and systems.

**MAHINDRA DEFENCE SYSTEMS, LOCKHEED MARTIN COMMEMORATE C-130J TRAINING CENTER AT HINDON**

Mahindra Defence Systems dedicated its state-of-the-art C-130J Super Hercules simulator training center in service to the nation at a commemorative event at the Air Force base at Hindon. With a full motion simulator, the C-130J training facility offers complete training solution of training aircrews who operate the C-130J special operations aircraft acquired from Lockheed Martin in 2011.

“We are delighted to partner with Lockheed Martin in this venture in service to the Nation,” said S. P. Shukla, Group President, Aerospace & Defence Sector, and Chairman, Mahindra Defence Systems. “We believe this will help deliver the objectives of the Government of India and the Indian Air Force of building indigenous military capabilities. Mahindra Defence Systems, in its endeavor to support the Make in India initiative of the Government of India, is consistently building the ecosystem through similar programs towards a mission ready IAF,” he added.

The center will deliver qualitative and quantitative training to hone the tactical and operational skills of the C-130J pilots, combat system operators and loadmasters to conduct special operations across National and International boundaries. Towards this end, the state-of-the-artfull motion simulator offers realistic and holistic learning environment through day and night training scenarios.

“The commencement of formal training on the C-130J Weapons Systems Trainer demonstrates our commitment to meet the defence needs of the Indian Government,” saidPhil Shaw, chief executive, Lockheed Martin India. “In partnership with Mahindra Defence Systems, Lockheed Martin is meeting the increasing global demand for C-130J military flight training with a new training center in India. Lockheed Martin’s Rotary & Mission Systems division will provide lifecycle support to C-130J Super Hercules pilots and aircrew”
LAND SYSTEMS

EXTENDED RANGE BRAHmos TESTED SUCCESSFULLY

After India became a member of the Missile Technology Control Regime, in March this year, scientists successfully tested a 450-km range Brahmos missile from the Integrated Test Range at Chandipur, Odisha. Because of the restrictive export control regime, the previous version of the cruise missile, developed with Russian collaboration, had a maximum range of 290 km as export of missiles with more than 300 km range was prohibited under the MTCR rules. Based on the Russian technology, the missile was jointly developed by DRDO and Russia agency NPOM for launch from land, sea, sub-sea and air against surface and sea-based targets.

For two days, Southern and South Western Army Commands successfully fired Brahmos Block-III land attack cruise missile in the Andaman and Nicobar Islands. In both cases, the missile demonstrated an accuracy of less than one metre. While the Army is using Brahmos since 2007, the new version has several advanced features besides its extended range. These missiles are capable of riding crest-shaped obstacles and pick up the target for precision strike. This is the fifth consecutive time when the Block-III version of Brahmos has been successfully launched and hit the land-based target in ‘top-attack’ mode, an incredible feat not achieved by any other weapon system of its genre.

THAAD MISSILE DEFENCE SYSTEM OPERATIONAL IN SOUTH KOREA

Despite objections from China, the US controversial THAAD missile defence system has become operational in South Korea. According to a US official, the Terminal High Altitude Area Defence (THAAD) has reached initial intercept capability. In July last year, Washington and Seoul agreed to the battery deployment in the wake of missile tests by North Korea, deemed to be threatening by the West.

Tensions with North Korea and the US have soared in recent weeks. Washington has repeatedly warned that all options are on the table regarding Pyongyang. Washington has voiced a commitment to the Status of Forces Agreement under which Seoul would only provide location and infrastructure for THAAD. The US missile system, installed in Seongju, in South Korea’s North Gyeongsang Province, has been designed to intercept ballistic missiles inside or just outside the atmosphere during their final phase of flight. Other hardware and components are supposed to be added to the system later this year, so as to boost its initial capability. Russia and China have expressed deep concern over the controversial deployment of the American missile system on the Korean Peninsula, with Chinese officials arguing that the US system would interfere with their radars and could pose a threat to Chinese security.
**Contract for Self-Propelled Gun to L&T**

With a contract worth Rs 4,500 crore for Self-Propelled (SP) guns for the Indian Army, L&T may be finally scripting its defence story. The current financial year and the next may be significant for the company with the expected new defence manufacturing policy, fresh orders and rising defence exports. In April this year, the company signed a contract with Hanwha Techwin (HTW) of South Korea for execution of the 155mm/52 Cal Tracked Self Propelled Gun programme for the Indian Army.

Both company officials and analysts feel this development may prove to be a harbinger for better order inflow for the company. “Scenario change over the next five years would be that sizeable number of orders would have been booked and revenues would have started to grow dramatically,” Jayant Patil, Head of Defence and Aerospace, member of Heavy Engineering Board, L&T said.

**New Artillery Guns for the Indian Army**

As part of a deal struck with the US government to buy 145 M777 howitzers, the Indian Army received two artillery guns in the third week of May this year. These howitzers are the first artillery guns to be inducted into the Indian Army after it bought artillery guns from the Swedish company Bofors 31 years ago and got mired in ugly controversy. In December 2016, India had signed a deal for about Rs 4,700 crore with the US to purchase 145 M777 howitzers from BAE Systems in a government-to-government contract. While 25 guns will be imported in the next two years, the rest will be assembled at a factory in Faridabad that Mahindra has set up in partnership with BAE Systems. The entire order will be executed in 54 months.

At half the weight of 155 mm towed howitzers, the ultra-light howitzers have a range of 30 km and can provide rapid reaction capability to the Indian Army. Since the M777 can be carried by Chinook helicopters which India will be receiving from the US in the near future, the M777 can be moved quickly to areas close to the border. It can also be carried by the C-17 Globemaster and the C-130J Super Hercules aircraft and on trucks, providing easy mobility in the mountains.

**S-400 Missile Systems to India**

Russia is preparing to supply S-400 Triumf anti-aircraft missile systems to India and both sides are discussing the terms of the sale, Russian Deputy Prime Minister Dmitry Rogozin has said. Pre-contract preparations are underway on the supplies of the S-400 anti-aircraft missile complexes to India, Rogozin said. On October 15 last year, India had announced a deal on the Triumf air defence system from Russia, worth over $5 five billion. The S-400 Triumf long-range air defence missile system has the capability to destroy incoming hostile aircraft, missiles and even drones at ranges of up to 400 km.
The S-400 Triumph is Russia’s latest mobile long-range multiple anti-aircraft missile system, which came into service in 2007. It is meant for destroying aircraft as well as cruise and ballistic missiles including medium-range missiles and ground targets. China was the first foreign buyer of the S-400 anti-aircraft missile systems. India and Russia have been in talks for over a year for the purchase of at least five systems of S-400 that will be a game changer in the region. It is capable of firing three types of missiles, creating a layered defence and simultaneously engaging 36 targets. The S-400 is considered to be one of the best SAM systems in the world.

Pakistan Test Fires Short-Range Ballistic Missile

On July 05 this year, Pakistan successfully test fired short-range surface-to-surface ballistic missile ‘NASR’, which Army Chief General Qamar Javed Bajwa said has put “cold water” on the Indian military’s “Cold Start” doctrine. Cold Start is a military doctrine developed by the Indian Armed Forces for use in a likely war with Pakistan. ‘Nasr’ is a high-precision weapon system with the ability to be deployed quickly, the army said.

The Pakistan Army has conducted a series of training launches and tests for validation of new technical parameters of ‘NASR’ with enhanced range from 60 - 70 kilometres and flight manoeuvrability. President Mamnoon Hussain, Prime Minister Nawaz Sharif, and Service Chiefs congratulated the scientists and the nation over successful launch of the missile. Speaking on the occasion, the Army Chief said war must be avoided at all costs and “our strategic capability is a guarantee of peace against a highly militarised and increasingly belligerent neighbour.”

Long Range Surface-to-Air Missile for Indian Army

In a symbolic gesture, the indigenous Long Range Surface to Air Missile (LRSAM) was handed over to the Indian Navy by the Minister for Defence, Finance and Corporate Affairs Arun Jaitley, at Bharat Dynamics Limited (BDL), Kanchanbagh here on Sunday, August 27, 2017. The LRSAM is an advanced combat suit for missile defence against air targets, missiles and includes air and surface surveillance, threat alert and fire control.

The LRSAM is a DRDO-IAI Joint Development Contract with defined work-share. BDL is the Missile Production Agency to deliver and support the Indian Armed Forces in country’s Defence preparedness. The missile is same for the tri services viz., the Indian Navy, the Indian Air Force and the Indian Army.
Chinese Navy Eyes Indian Ocean to Extend Reach

The People’s Liberation Army Navy (PLAN) of China wants to join hands with India to maintain security of the Indian Ocean, amidst growing concerns in New Delhi over the increasing presence of the Chinese PLAN fleet in India’s backyard. Throwing open its strategic South Sea Fleet (SSF) base in the coastal city of Zhanjiang to a group of Indian journalists for the first time, PLAN officials said the Indian Ocean is a common place for the international community.

“It is my opinion China and India can make joint contributions to the safety and security of the Indian Ocean,” Captain Liang Tianjun, Deputy Chief of General Office of China’s SSF said. His remarks came as the PLAN embarked on a massive expansion to extend its global reach. Liang also explained the growing forays of the Chinese warships and submarines into the Indian Ocean, where China for the first time established a naval base at Djibouti in the Horn of Africa.

Defending the first Chinese overseas naval base against criticism that it would amplify China’s growing influence, he said it will act as a logistics centre and support anti-piracy, UN peacekeeping operations and humanitarian relief missions in the region. The Djibouti base will also provide a resting place for Chinese navy personnel, he said. But analysts feel the opening of the first Chinese military base abroad was in tune with PLAN’s ambitions to expand its global reach amidst China’s growing economic and political footprint.

Nuclear Attack Submarine for India

Reports in the Russian media in the last week of June this year speak of India and Russia reaching an agreement to lease a second ‘Akula’ class nuclear-powered attack submarine (SSN) from the Russian Navy at a cost of around $2 billion. The Russian Navy will transfer the second ‘Akula’ class SSN after repairs and modernisation to meet India’s specifications. The Indian Navy (IN) currently operates two SSNs, the older of which is the INS Chakra, formerly the Russian Navy’s K-152 Nerpa, commissioned into the Indian Navy in April 2012.

India’s second SSN, INS Arihant, is an indigenously-built nuclear-powered ballistic missile submarine commissioned in August 2016. Reports suggest the delivery date for India’s second SSN is set some time in the early 2020s, and will potentially include torpedoes and surface-to-surface missiles. However, the lease for India’s INS Chakra is also set to expire around that time, which would leave the IN with just one Russian SSN. India has long been looking to develop its SSN fleet, and had recently set its mind on Russia’s more advanced ‘Severodvinsk’ class SSN developed by Russia’s Malakhit Central Design Bureau.
Indian Navy Gets High-Tech Floating Dock from L&T

In a bid to enhance the technical repair infrastructure for ships based in the Andaman and Nicobar Islands, the Indian Navy inducted a high-tech Floating Dock (FDN-2) that has been designed and built by Larsen and Toubro specifically for the Indian Navy at the company’s Greenfield shipyard at Kattupalli in Tamil Nadu near Chennai. The Floating Dock is 185 m long and 40 m wide and is designed for docking with Indian Naval ships and submarines of up to 8,000-tonne displacement with draughts of up to seven metres during both day and night. Simultaneous docking of multiple ships and off-centre docking options are also feasible.

The dock, which conforms to internationally accepted norms, incorporates a fully automated ballast control system, state-of-the-art technology in its equipment. L&T has also been mandated by the Indian Coast Guard to design and build seven Offshore Patrol Vessels (OPVs). Two of these OPVs are to be launched in the second half of the current financial year and are on schedule. L&T was mandated by the Ministry of Defence in May 2015 to design and build the FDN-2 for an order value of Rs 468 crore.

Aircraft Laser-Based Missile Defence from Northrop Grumman

Missile-defence experts at Northrop Grumman Corp will provide electro-optical equipment for laser-based missile-defence systems aboard large military aircraft under terms of a $99.5 million US Navy order. Officials of the Naval Air Systems Command at Patuxent River Naval Air Station, Md, are asking the Northrop Grumman Mission Systems segment in Rolling Meadows, Ill, to provide the Large Aircraft Infrared Counter Measures (LAIRCM) for a variety of US Navy and Air Force aircraft. Northrop Grumman will provide weapon replaceable assemblies and support equipment; 302 advanced threat warning sensors; 41 control indicator units; 41 to 2103 signal processors; 82 Guardian Laser Transmitter Assemblies (GLTA); 82 GLTA shipping containers; 16 multi-role, electro-optical, end-to-end test sets; and 14 smart connector assemblies. The LAIRCM system uses lasers to confuse electro-optical seekers on incoming anti-air missiles. LAIRCM automatically detects a missile launch, determines if it is a threat, and activates a high-intensity, laser-based countermeasure system to track and defeat the missile.

LAIRCM focuses high-intensity laser energy at the infrared seeker head of incoming missiles to blind the missile and force it off its target. The system is designed to protect large aircraft from shoulder-fired, vehicle-launched, and other infrared-guided missiles when the planes are operating close to the ground, such as on takeoff and landing, as well as during low-level operations and aerial refuelling.
$7.8 Billion Tender for IN’s Submarines

The Request for Information (RFI) has been sent to six selected overseas naval shipbuilders asking for details about locally building six diesel-electric submarines under newly-formulated strategic partnership model under which India’s private defence shipbuilder will collaborate with a foreign manufacturer. The Indian Navy had issued an RFI on July 19 to Russia’s Rosoboronexport Rubin Design Bureau, France’s Naval Group, Germany’s ThyssenKrupp Marine Systems, Japan’s Mitsubishi Heavy Industries and Kawasaki Heavy Industries, Spain’s Navantia, and Sweden’s Saab.

This project will provide a major boost to the country’s private defence firms such as Reliance Defence, Larsen and Toubro, who are waiting since long for this delayed project.

Presently, the Indian Navy has 13 diesel-electric submarines in service—9 Kilo-class and four Shishumar (Type 209/1500)-class, but only half of them are operational at any time.

India has planned 18 conventional submarines apart from the current 13 which are 17 to 31 years old. Two P-75 submarines are expected to join the Indian Navy this year.

Nuclear and Space

India Successfully Launches South Asia Communication Satellite

In the first week of May this year, Indian Space Research Organisation (ISRO) added one more feather to its cap by successfully launching South Asia Communication Satellite, the GSAT-9. This was another step forward for ISRO in the regime of space technology. India’s Geosynchronous Satellite Launch Vehicle (GSLV-F09) carried the GSAT-9 from the second launch pad at the Satish Dhawan Space Centre at Sriharikota. GSAT-9, a geostationary communication satellite, is configured around ISRO’s standard I-2K bus, with lift off mass of 2,230 kg. With a mission life of more than 12 years, the GSAT-9 has the potential to be utilised for various broadcasting and interactive telecommunication applications.

The GSAT-9, which costs about Rs 230 crore, would strengthen the regional cooperation among the member countries. In addition, the satellite will also be used for supporting applications that include disaster management support, broadcast of meteorological data, networking of academic, scientific and research institutions. These applications would benefit the member countries to address their specific needs. Prime Minister Narendra Modi has termed the satellite as India’s space gift for South Asia. GSLV-F09 mission is the eleventh flight of GSLV and its fourth consecutive flight with the indigenous Cryogenic Upper Stage (CUS). The vehicle is designed to inject up to 2.5-tonne class of satellites into Geostationary Transfer Orbit.
**ISRO’S Mars Orbiter Mission Completes 1000 Days in Orbit**

India’s indigenous Mars Orbiter Mission (MOM), the maiden interplanetary mission by ISRO, which was launched on November 05, 2013, has completed a thousand earth days in orbit. MOM is credited with many laurels like cost-effectiveness, a short period of realisation, economical mass-budget and miniaturisation of five heterogeneous science payloads. The Satellite is in good health and continues to perform as expected. Scientific analysis of the data received from the Mars Orbiter spacecraft is in progress.

ISRO has also launched MOM Announcement of Opportunity (AO) programmes for researchers in the country to use MOM data for R&D. The success of MOM has motivated the student and research community in India in a big way. Thirty-two proposals were supported under this AO. A planetary data analysis workshop was also conducted to strengthen the MOM-AO scientist’s research interest. First-year data from MOM was released to the public on September 24, 2016. The Mars Colour Camera, one of the scientific payloads onboard MOM, has produced more than 715 images so far. Mars Atlas was prepared and made available on ISRO website.

**Unmanned US Space Plane Returns after Two-Year Mission**

In the second week of May 2017, the US military’s experimental X-37B space plane landed at NASA’s Kennedy Space Centre in Florida, completing a classified mission that lasted nearly two years. The unmanned X-37B, which resembles a miniature space shuttle, touched down on a runway formerly used for landings of the now-mothballed space shuttles. The Boeing-built space plane had blasted off in May 2015 from Cape Canaveral Air Force Station aboard an Atlas-5 rocket built by United Launch Alliance, a partnership between Lockheed Martin and Boeing. The X-37B, one of two in the air force fleet, conducted unspecified experiments for over 700 days while in orbit. It was the fourth and lengthiest mission so far for the secretive programme managed by the Air Force Rapid Capabilities Office.

The Secure World Foundation, a non-profit group promoting the peaceful exploration of space, says the secrecy surrounding the X-37B suggests the presence of intelligence-related hardware being tested or evaluated aboard the craft. The X-37B, also known as Orbital Test Vehicle, first flew in April 2010, and returned after eight months. A second mission was launched in March 2011 and lasted 15 months, while a third took flight in December 2012 and returned after 22 months.

**China Prepares for Manned Lunar Mission**

According to Chinese state media, China is making preparations for manned lunar mission. However, no time frame for the mission has been specified. China’s first manned space mission, Dawn-1, was abandoned in 1971 due to a shortage of funding. Its leaders were also arrested on charges of conspiring against Chairman
Mao. While the origin of the Chinese space programme can be traced back to the 1950s, the country began making significant progress in the 2000s.

In 2003, it became the third country in the world after the US and the USSR, to send a man into space on a domestically manufactured rocket. In 2013, it completed its first soft lunar landing. In 2018, China plans to send a probe to the dark side of the moon. Last year, the state media reported that the country wanted to put humans on the moon by 2036, indicating China’s lunar exploration plans. Despite having only one-tenth of US space budget, China’s expanding space programme has become an issue of concern for the US. While China has insisted that its space programme is for peaceful purposes, the US Defence Department thinks otherwise. After Beijing tested anti-satellite missiles, the US banned NASA from co-operating with its Chinese counterpart.

**Setback for Chinese Space Programme**

In the third week of June this year, China’s ambitious space programme suffered a major setback when the country’s first indigenous communications satellite for live radio and TV broadcasts failed to enter its preset orbit. With a take-off weight of more than five tonne, Zhongxing-9A was launched from the South West Xichang Satellite Launch Centre. Abnormal performance was identified during the third phase of the rocket launch, according to the China Aerospace Science and Technology Corporation (CASC).

The exact reason for the failure of Zhongxing-9A, launched from the Long March-3B carrier rocket is under investigation and related parties are taking measures to address the problem and send the satellite into the correct orbit. The solar panels and communication antennae, however, have been deployed and the satellite system is operating under normal conditions, CASC said. The Long March-3B has been one of the main carrier rockets for China’s high-orbit launch missions. Zhongxing-9A is the first China-made satellite for live radio and television broadcasts.

**Japan’s Plans to Put a Man on the Moon by 2030**

Japan plans to put a man on the moon by 2030, according to a new proposal by Japan Aerospace Exploration Agency (JAXA). It is the first time that JAXA has announced its intentions to explore the lunar surface and will most likely form part of an international mission, the agency said. JAXA’s plans mean that Japan is joining a host of other Asian nations in what is being dubbed the ‘Asian space race’.

JAXA’s moon mission was proposed to a panel at Japan’s Ministry of Education, Culture, Sports, Science and Technology which is responsible for directing the country’s space exploration. A JAXA spokesperson told the media that the plan was not to send an exclusively Japanese rocket to the Moon, which would be extremely costly. They said the proposal was for JAXA to contribute to a multinational manned lunar probe by contributing technology, which would grant Japan a spot on the mission. The spokesperson said that the plan for Japan’s future space exploration would be released by the panel in time for Japan’s International Space Exploration Forum in March 2018.
US Reviews Iran Nuke Programme, Implements Missile Sanctions

The US has said it will continue to waive certain economic sanctions on Iran’s nuclear programme while simultaneously implementing a new set of sanctions related to the country’s ballistic missile programme and monitoring its human rights abuses. “As we continue to scrutinise Iran’s commitment to the Joint Comprehensive Plan of Action (JCPOA) and develop a comprehensive Iran policy, we will continue to hold Iran accountable for its human rights abuses with new actions,” Stuart Jones, the Acting Assistant Secretary of State for Near Eastern Affairs Ambassador, said. It will implement a new set of sanctions related to Iran’s missile programme continuing participation in the JCPOA.

“This ongoing review does not diminish US resolve to continue countering Iran’s destabilising activity in the region, whether it is supporting Syria’s President Bashar al- Assad’s regime, backing terrorist organisations like Hezbollah, or supporting violent militias that undermine governments in Iraq and Yemen,” Jones said. He said the US will never allow the regime in Iran to acquire a nuclear weapon.

India, Russia Sign Pact for Two Nuclear Plants

On June 01, 2017, India and Russia signed the much- awaited agreement on setting up of two more units of a nuclear power plant, Units 5 and 6 of the Kudankulam Nuclear Power Plant (KNPP) in Tamil Nadu and decided to give a new direction to the defence cooperation between the two great powers. The reactors will be built by India’s Nuclear Power Corporation of India Ltd (NPCIL) and Russia’s Atomstroyexport company, a subsidiary of Rosatom, the regulatory body of the Russian nuclear complex. Each of the two units will have a capacity to produce 1,000 MW of power.

“We welcome the conclusion of the General Framework Agreement and Credit protocol for Units 5 and 6 of the Kudankulam Nuclear Power plant,” said a vision document issued after the Modi-Putin talks. The document titled “A vision for the 21st Century” said the economies of India and Russia complement each other in the energy sector and both countries will strive to build an “energy bridge”. It said the future of Indian-Russian cooperation holds great promise across a wide spectrum covering nuclear power, nuclear fuel cycle and nuclear science and technology.
DEEPENING INDIA-ISRAEL TIES
Changing Landscape of the Indian Defence Sector

Ketan Salhotra

Israel has become a prominent defence partner for India in recent times. A string of defence deals between the two countries have benefitted Indian companies seeking advanced manufacturing technologies and Israeli companies looking at new defence markets. Israel has also been able to provide the Indian armed forces with weapons which it could not directly buy from its usual defence partners - Russia and US.

INDO-ISRAEL RELATIONSHIP IS BOOMING like never before. Prime Minister Modi’s recent visit to Israel was termed historic by many observers and was much talked about in the global media. After all, this was the first visit by a serving Indian Prime Minister to the Jewish stronghold after 70 years of Indian independence. During the visit, India signed several agreements with Israel on science, agriculture and technology. The agreements also included the decision to create a bilateral technology innovation fund worth $40 million for research in industrial development, among other deals.

Though India formally recognised Israel after independence in 1950, it followed a balanced foreign policy towards West Asia with a pro-Palestine stand. India’s full diplomatic relationship with Israel was established only in 1992. The Kargil War in 1999 was a landmark moment in India-Israel defence cooperation as Israel supplied India with mortar ammunition, drones and laser-guided missiles along with intelligence inputs. In 2003, Ariel Sharon the then-President of Israel visited India becoming the first Israeli President to do so. Multiple bilateral visits by Ministers of the two countries have also happened in the last 15 years to discuss mutual areas of cooperation - defence, agriculture, science and technology.

A number of bilateral agreements and institutional arrangements have been executed between India and Israel over the years. The Table below lists out some important commercial and economic agreements between the two countries.

<table>
<thead>
<tr>
<th>Year</th>
<th>Agreement/Arrangement/Memorandum of Understanding (MoU)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>Agreement for cooperation in agriculture</td>
</tr>
<tr>
<td>1996</td>
<td>Agreement for Promotion and Protection of Investments</td>
</tr>
<tr>
<td>1996</td>
<td>Avoidance of Double Taxation and for the Prevention of Fiscal evasion with respect to taxes on Income and Capital</td>
</tr>
<tr>
<td>1996</td>
<td>Agreement for cooperation in agriculture</td>
</tr>
<tr>
<td>2002</td>
<td>Agreement on space cooperation between the two countries</td>
</tr>
<tr>
<td>2005</td>
<td>MoU on India-Israel Research and Development Fund Initiative</td>
</tr>
<tr>
<td>2008</td>
<td>Two nations started a $50 million shared agriculture fund, focusing on dairy, farming technology and micro-irrigation. This constituted the Agriculture Cooperation Agreement.</td>
</tr>
<tr>
<td>2011</td>
<td>Signed an agreement to foster cooperation on urban water systems</td>
</tr>
<tr>
<td>2014</td>
<td>Signed an intelligence-sharing agreement</td>
</tr>
<tr>
<td>2017*</td>
<td>MoU signed for setting up of USD 40 million India-Israel Industrial Research and Development (R&amp;D) and Technical Innovation Fund</td>
</tr>
<tr>
<td></td>
<td>Two agreements signed to increase cooperation on water conservation and state water utility reform in India</td>
</tr>
<tr>
<td></td>
<td>India-Israel Development Cooperation — a three-year work programme in agriculture from 2018 to 2020</td>
</tr>
<tr>
<td></td>
<td>Agreement regarding cooperation in atomic clocks</td>
</tr>
<tr>
<td></td>
<td>MoUs signed on cooperation in GEO-LEO optical link and cooperation in Electric Propulsion for small satellites</td>
</tr>
</tbody>
</table>

*Signed during PM Modi’s Israel visit in July 2017

There has been a substantial growth in trade, economic ties and cooperation between the two countries since the establishment of formal diplomatic ties in 1992. Bilateral trade (excluding defence) has grown from $200 million in 1992-1993 to $6.1 billion in 2012-2013. Trade has come down slightly in the last four years with $5 billion worth of bilateral trade in 2016-2017. The trade balance stood in India’s favour at $1.1 billion in 2016-2017. Mineral fuel/oil (33 per cent) and pearls/precious stones (33 per cent) were the major items exported by India to Israel in 2016-2017. India majorly imported pearls/precious stones (57 per cent), electrical machines (11 per cent) and fertilizers (nine per cent) from Israel in 2016-2017.

INDIA-ISRAEL DEFENCE TIES

India is the sixth largest country in terms of defence spending, with defence sector accounting for two per cent of India’s GDP. However, due to
lack of indigenously designed weapons, India has to primarily rely on imports for meeting its defence capital acquisition requirements. India is currently the world’s biggest importer of defence equipment. As per the Stockholm International Peace Research Institute (SIPRI), India accounted for 13 per cent of global arms import during the period 2012-2016.

Defence has traditionally been the biggest area of cooperation between India and Israel with annual defence deals worth over $1 billion in the last few years. Israel has emerged as the third biggest supplier of defence equipment to the Indian armed forces after USA and Russia. For Israel, India is the top destination for its arms exports.

**Recent Defence Deals between India and Israel**

Israel is especially well entrenched in the areas of Air Defence Systems, Unmanned Aerial Vehicles (UAV), Electronic Warfare equipment and Special Forces equipment. “The Big 4” Israeli Defence companies - Elbit, Israel Aerospace Industries (IAI), Israel Military Industries (IMI) and Rafael have in recent years signed numerous defence projects for the Indian armed forces.

- In July 2017, the Indian government was looking to purchase Spike, an Israeli anti-tank guided missile, designed and developed by Israeli company Rafael Advanced Defence Systems. Spike LR II is an advanced multi-purpose missile and can be launched from any Spike launcher. The estimated worth of the deal is $1 billion. Under the deal, the Indian Army will procure 321 Spike ATGM launchers, 8,356 missiles, 15 training simulators and associated accessories from Rafael on a single-vendor basis.

- In May 2017, the IAI was awarded a $630-million contract for the supply of Barak-8 Long-Range Surface-to-Air Missile System (LRSAM) for four Indian Navy (IN) ships.

- In May 2017, the Indian Air Force (IAF) conducted successful tests of the Israeli-made Surface-to-air Python and Derby (SPYDER) missile system. The SPYDER missile system also features an onboard radar for increased accuracy.

- In April 2017, India inked a $2-billion missile defence contract with Israel for supplying advanced Medium-Range Surface-to-Air Missile Systems (MRSAM) to India. Barak-8, also known as MR-SAM/LR-SAM, is designed to defend against any kind of airborne threat - aircraft, helicopters, anti-ship missile and UAVs as well as cruise missiles and combat jets. It is equipped with advanced phased-array radar, command and control, mobile launchers and missiles with...
advanced radio frequency seekers. This deal was the single largest contract in Israel’s defence industry’s history.

- In February 2017, ELTA Systems (subsidiary of IAI) designed Integrated Underwater Harbour Defence and Surveillance System (IUHDSS) was strategically installed around the Mumbai Naval Harbour to deal with asymmetric threats and to provide comprehensive, real-time situational awareness for monitoring and analysis. IUHDSS consists of integrated radars, electro-optic cameras and sonars.

- India ranks first among drone-importing nations with 22.5 per cent of world’s UAV imports between the period 1985 to 2014. India has relied almost completely on Israel for its UAV needs over the years. Of the 176 UAVs imported by India, 108 are Searcher UAVs and 68 are Heron UAVs. The Indian government had cleared a deal for the procurement of ten-armed Heron TP UAVs worth $400 million from Israel Aerospace Industries in September 2015. The Heron TP is a Medium-Altitude, Long Endurance UAV with a range of around 7,400 kilometres and a maximum flight time of around 36 hours.

**Data and Intelligence Sharing**

Defence ties between the two nations also extend to intelligence sharing on terrorist groups and joint military training. On the counter-terrorism front, both countries face significant terrorist threats, particularly after the 2008 Mumbai attacks in which several Israeli citizens were also killed. Both the countries are today sharing real-time intelligence on issues crucial to national security and boosting the counter-terrorism cooperation.

- Recently both countries signed a “white shipping” agreement for data sharing on non-classified merchant navy ships or cargo ships.

The agreement was signed during the meeting of the Chief of Indian Navy with Israel Defence Forces (IDF) Chief of Staff in June 2017.

- Starting from 2017, IAF fighter aircraft will join Israel and five NATO air forces in the so-called “Blue Flag” joint air force exercises, one of the biggest multinational aviation exercises in West Asia. Israel will host air forces from France, Germany, India, Italy, Greece, Poland and the US.

- Indian and Israeli government officials signed an intelligence-sharing agreement in July 2014, to fight radical Islamic extremism in the region together.

- The Barak 8 long-range surface-to-air missile, developed jointly between India and Israel, was successfully tested on December 30, 2015. The test of the missile system was carried out on the Indian warship INS Kolkata. India again successfully tested the Barak 8 on June 30, 2016.

- India has been holding regular talks with Israel on counter-terrorism within the framework of a Joint Working Group set up in the year 2000.

**Recent Defence Joint Ventures/Manufacturing Alliances**

Israeli defence companies have also emerged as the preferred partners for private Indian companies looking to expand their presence in the Global A&D supply chain. Many joint ventures/technology alliances have been inked to produce small arms and defence systems in India in accordance with the ‘Make in India’ policy.

<table>
<thead>
<tr>
<th>Date</th>
<th>IndianPartner</th>
<th>Israeli Partner</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul-2017</td>
<td>Kalyani Strategic Systems Limited (KSSL)</td>
<td>IAI</td>
<td>MoU signed for expanding existing JV for Advanced Air Defense Systems Two companies also agreed on expanding their joint operations for development, manufacturing and marketing of precise ammunition systems</td>
</tr>
<tr>
<td>Jul-2017</td>
<td>Mahindra Telephonics Engineering</td>
<td>Shachaf Engineering</td>
<td>MoU signed to collaborate on the design, development &amp; manufacture of strategic electronics Both companies to jointly develop strategic electronics subassemblies and systems for aerospace, marine &amp; automotive applications</td>
</tr>
<tr>
<td>Jul-2017</td>
<td>Garware - Wall Ropes Ltd. (GWRL)</td>
<td>Aero-T</td>
<td>MoU signed to explore mutual co-operation for manufacturing advanced aerostats for the Indian Defence industry Aerostats are tethered balloons and have capabilities of operating at altitudes of up to 15,000 feet</td>
</tr>
</tbody>
</table>
Table:

<table>
<thead>
<tr>
<th>Date</th>
<th>Indian Partner</th>
<th>Israeli Vendor</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul-2017</td>
<td>Dynamatic Technologies and Elcom Systems</td>
<td>IAI</td>
<td>Strategic cooperation for local manufacturing of Medium Altitude Long Endurance (MALE) UAVs</td>
</tr>
<tr>
<td>Jun-2017</td>
<td>Mahindra Aerostructures</td>
<td>Elbit Systems - Cyclone</td>
<td>MoU signed to collaborate on the production of aerostructures parts and assemblies. Under this arrangement, Cyclone will source content for their existing work packages from Mahindra.</td>
</tr>
<tr>
<td>May-2017</td>
<td>Punj Lloyd</td>
<td>Israel Weapon Industries (IWI)</td>
<td>Collaboration to manufacture small weapons like the X95 carbine and assault rifles, Galil sniper rifles, Tavor assault rifles and Negev light machine guns etc in India under a complete technology transfer arrangement. First private sector small arms manufacturing plant has been set up in Madhya Pradesh, to produce equipment for both local use and export.</td>
</tr>
<tr>
<td>Feb-2017</td>
<td>KSSL</td>
<td>IAI</td>
<td>MoU signed to develop, build, market and manufacture selected Air Defense Systems and lightweight special purpose munitions for the Indian Air Force.</td>
</tr>
<tr>
<td>Feb-2017</td>
<td>Dynamatic Technologies</td>
<td>IAI</td>
<td>Signed a cooperation agreement regarding the production, assembly and support of mini UAVs in India.</td>
</tr>
<tr>
<td>Feb-2017</td>
<td>Taneja Aerospace and Aviation Ltd</td>
<td>IAI's Golan Industries Division</td>
<td>MoU signed to cooperate in the development, production, marketing and/or sale of civil and military aircraft crashworthy seats.</td>
</tr>
<tr>
<td>Nov-2016</td>
<td>Adani Enterprises Ltd</td>
<td>Elbit Systems</td>
<td>Adani Enterprises Ltd and Israel’s Elbit Systems India Ltd have formed a JV company, Adani-Elbit Advanced Systems India Ltd (AEASIL), to manufacture unmanned aerial vehicles in India. While Adani will own 51% stake in the JV, Israeli counterpart will hold the balance stake.</td>
</tr>
<tr>
<td>Mar-2016</td>
<td>Reliance Defence</td>
<td>Rafael Advanced Defence Systems (RADS), Israel</td>
<td>Reliance Defence and Israel’s RADS agreed to set up a JV in the specialized areas of air-to-air missiles, air defence systems and large aerostats.</td>
</tr>
<tr>
<td>Jan-2016</td>
<td>Premier Explosives</td>
<td>IAI</td>
<td>MoU signed for exploring potential business opportunities.</td>
</tr>
</tbody>
</table>

**DEFENCE OFFSET CONTRACTS**

Indian Defence Offset policy was formally announced for the first time in 2005. Over the period 2005 to 2016, the Defence Offset Guidelines have been revised multiple times based on feedback from various stakeholders.

**CURRENT DEFENCE OFFSET GUIDELINES (AS PER DPP 2016)**

- The current DPP 2016 lays down various categories of procurement processes namely, in priority, Buy Indian – Indigenously Designed, Developed & Manufactured (IDDM), Buy Indian, Buy & Make (Indian), Buy & Make (Global) and Buy Global*
- Offset clause is applicable for ‘Buy (Global)’ or ‘Buy and Make’ categories of procurements where the indicative cost of acquisition is Rs 2,000 crore or more.
- 30 per cent of the estimated cost of the acquisition in ‘Buy (Global)’ category acquisitions and 30 per cent of the foreign exchange component in ‘Buy and Make’ category acquisitions will be the required value of the offset obligations.
- The offset condition forms a part of the Request for Proposal (RFP) and subsequently, of the main contract. A separate offset contract is executed simultaneously with the main contract.

With India signing multiple deals with Israel to procure military platforms, A&D players in India also benefit from the Offset obligations for the global vendors. Recently awarded offset contracts by Israeli vendors to Indian players include:

<table>
<thead>
<tr>
<th>Date</th>
<th>Indian Partner</th>
<th>Israeli Vendor</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul-2017</td>
<td>Wipro Infrastructure Engineering (WIN)</td>
<td>Israel Aerospace Industries (IAI)</td>
<td>WIN, part of Wipro Enterprises (P) Ltd and Israel’s state-owned IAI announced a strategic alliance for manufacturing composite aero-structure parts and assemblies. The facility will make composite structures for global markets and address the compliance requirements of IAI, other OEMs and Tier-1 suppliers to meet Defence offset guidelines</td>
</tr>
</tbody>
</table>
**Deeper India-Israel Ties**

**BEL** received an offset contract from Elbit Systems Electro Optics (ELOP), for the supply of 10 CoMPASS Systems to be used in Light Combat Helicopters (LCH) manufactured by Hindustan Aeronautics Ltd (HAL). BEL has absorbed transfer of technology (ToT) for production and maintenance of CoMPASS in India.

**Alpha Design Technologies Pvt Ltd** signed a USD 30 mn contract with Elbit Systems for the IAF’s Mi-17 helicopter upgrade programme. Programme involves upgrading of 90 Mi-17 helicopters and Alpha Design will be manufacturing all key sub-assemblies at its Bengaluru factory.

**Conclusion**

Prime Minister Modi’s historical trip is likely to give an unprecedented push to the efforts in building new bilateral relations and further solidify defence ties between the two countries. While security partnership may not be the only factor binding the two countries, it is the most important considering the alarming regularity of terrorist attacks taking place in India. Prevailing security dynamics and challenges in both the countries, clubbed with the rising forces of anti-state actors and terrorism, will in all likelihood, make the relations stronger.

Israel has become a prominent defence partner for India in recent times. A string of defence deals between the two countries have benefited Indian companies seeking advanced manufacturing technologies and Israeli companies looking at new defence markets. Israel has also been able to provide the Indian armed forces with weapons which it could not directly buy from its usual defence partners - Russia and US.

Future defence cooperation between India and Israel is expected to focus on the joint development of military products that includes Transfer of Technology (ToT) and R&D from Israel, emphasising Modi’s ‘Make in India’ initiative. In fact, Israeli and Indian companies can also explore joint production of arms and ammunition for other countries. Indian companies looking for high-end defence technologies could also look at acquisitions in Israel. In 2016, Wipro Infrastructure Engineering (WIN) acquired Israel-based HR Givon, supplier of metallic parts and assemblies to the aerospace industry. More such acquisitions may take place over short to medium term.

Rapid digitisation in India has also made it susceptible to targeted cyber attacks. With advancement in technology, India should also look at institutionalising cooperation in the field of cyber security with Tel Aviv. This could especially help India meet its immediate goals of securing its cyber infrastructure and expanding opportunities for the country’s technology sector.

**The Barak 8 long-range surface-to-air missile, developed jointly between India and Israel, was successfully tested on December 30, 2015...**

Ketan Salhotra
Principal at Aurum Equity Partners LLP
INDIAN DEFENCE REVIEW 32.3-Jul/Sep '17

INDO-ISRAEL RELATIONS: MAKE WITH INDIA

Tamir Eshel

Rafael is also creating another JV company in Hyderabad-Astra Rafael Communications (ARC) with Astra Microwave, this enterprise is needed to enable it to maximize the indigenization of its Software Defined Radio (SDR) and EW systems selected by the Indian Air Force.

India, the world’s second largest nation, and Israel, among the smallest on the globe, have much in common. Both are young and old, with historical roots thousands of years old. Both emerged from British colonial rule to become independent states about 70 years ago. Both struggled in their first years of nationhood, in their pursuit of an independent economy and national sovereignty.

Both countries carved their national identity as a fragile balance of cultures, religions and minorities. Both have significant expatriate communities in foreign countries, giving significant contribution to the country’s wealth, and international influence.

For India, it was a struggle for unification and defending the borders from external threats. For Israel, it was the epic culmination of immigration movements that began in the 18th century, gathering the Jewish people from diaspora. The Jewish immigrants that returned to their homeland after 2000 years in exile established their homeland in the promised land, in the heart of a hostile region.

The First Years

In their first years India and Israel were far apart, but in the 1990s bilateral relations were crafted, first in secrecy and later in broad daylight, leading to the first presidential visit of Israel’s president Ezer Weizmann in India in 1996. India returned with a presidential visit to Israel 20 years later, with the historic visit of Prime Minister Narendra Modi in Israel earlier this year. Apart from the frequency of visits, the bilateral relations between the countries continued and improved over the years.

It was the Indo-Pakistani war in 1999 that brought the two countries together, as Israel rushed to supply India with critical military supplies for the war effort, at a time when India’s main provider - the Soviet Union - practically ceased to exist.

The generous helping hand offered by Israel during the Kargil War opened the doors for closer cooperation, mutual trust and deeper alliance between the military forces of the two countries. Following years of military buildup that relied on indigenous capabilities, in the early 2000s, Israel was well positioned to provide India with defense systems that could fulfill some of the needs the Russians were unable to deliver at that time. Modernization of Russian tanks and Russian produced helicopters and planes, conversion of aircraft into aerial refueling tankers and development of early warning radars denied by other suppliers were only the tips of the iceberg. The Indian side was keen to obtain and locally produce sophisticated systems, such as Electro-optical, communications and electronic warfare equipment, considered as strategic capabilities that Russia or other suppliers could not deliver at that time, and Western suppliers were not willing to provide.

RAFAEL’S Air Defense Systems
Since those days the geopolitical map changed. India established its position as a dominant military and economic power, and, with ongoing modernization of its huge military force, evolved as the world’s largest defense importer. Now as Russia recovered its defense industry, both in the level of sophistication, production scale and competitiveness, India’s biggest suppliers are the world’s two superpowers. The USA that was reluctant to export to India in the past have entered the market with full swing driving billions in annual military sales. European manufacturers that went through conglomeration in recent years are now larger, hungrier and more powerful and influential, leveraging political pressure by European leaders to promote military sales. Can Israel maintain its position facing these odds?

While the Indian defense market is huge, it is also complex. Endurance needs extreme patience and commitment, to walk the long way with the customer, particularly in the changing landscape created by the new reforms. Overall, Israel welcomes the new regulations under the ‘Make in India’ since the new rules enable Israeli companies to operate in India with more confidence. The successful maturation of major projects, including the Phalcon AWACS and LRSAM naval defense systems, proved how Indo-Israeli development programs are overcoming obstacles and succeed when both sides join in true partnership.

These programs were launched in times when Joint Ventures (JVs) were more challenging but culminated in a market environment much more hospitable for business as foreign companies can set up JVs in India with almost equal shares (49:51), in compliance with Indian rules on foreign direct investment (FDI). With a bigger stake in the business, foreign partners are more comfortable in sharing and transferring sensitive technologies needed by the Indian side, enabling the JV to leverage the full potential of future sales.

In the past, locally produced weapon systems were considered inferior and costlier to those produced by Original Equipment Manufacturers (OEM). Moreover, Transfer of Technology (TOT) demanded by the Indian authorities as part of major programs was never easy to fulfill, since foreign suppliers were reluctant to release technologies that could turn today’s partners into future competitors. Today, as the foreign side keeps an almost equal ownership in JVs, TOT can be done with more confidence. Furthermore, joint procurements, where both sides share the production and support, assure that manufacturing and supply chain will be efficient and meet the quality on both sides.

The Indian market remains very attractive for the Israeli offerings, as, unlike its competitors from East and West, Israeli companies offer upgrades and enhancements to all types of equipment, from east, west as well as indigenous Indian systems. Combat aircraft, helicopters, vehicles and vessels, electronic equipment and air defenses, can all be improved with Israeli know-how. In the past, such upgrades relied primarily on Israel’s own combat experience, but today, many programs use research and development invested jointly by India and Israel, to field the most suitable equipment to fulfill the customer’s requirements.

**MAKE WITH INDIA**

As a small country, export is what makes Israel unique. Unlike its competitors, that consider export secondary to their domestic and regional activities, Israel’s defense companies are all export oriented, with share of export ranging from 75% to 50% of their annual sales. On the other hand, research and development (R&D) is often oriented to address local needs. Leveraging joint research and development programs Israel could benefit from R&D cost sharing, with industries leveraging the follow-on sales and support of such products through their JVs with Indian companies.

Israel’s defense establishment has recognized this opportunity and Israel’s Ministry of Defense (MOD) named the cooperation with India in the highest priority, by streamlining the activities of Defense R&D Agency (Mafat), Defense Export Control Regulator (API), Security and Defense Export and International Cooperation Directorates. All these stakeholders are brought together to speed up permissions and...
processes and minimize bureaucracy to promote Israeli-Indian cooperation.

As an important and trustable ally, India has access to most of the technologies, systems and capabilities Israel can export and is now sharing research and development of future systems and capabilities that will gain their military forces an overmatch over future adversaries.

**MAKE IN ISRAEL – LESSONS LEARNED**

In the 1950s – 1970s Israel went through government directives that imposed ‘Made in Israel’ policy, aimed to encourage the use of domestic products and establishment of local industrial ventures regardless of efficiency or scale. This policy came to a climax in the 1970s, under the international embargo that followed the Six Day War in 1967, when Israel was cut off its defense suppliers in France and the UK and had to develop self-reliance in major weapon systems over a period of few years. This dramatic turn caused government owned companies to expand and scale up their operation, and also encouraged the private sector to join the supply line as subcontractors and manufacturers of specialty products, creating a new industrial ecosystem that supported Israel’s rapid military growth. The Yom Kippur War, the war that followed in six years accelerated this process added to Israel’s accepting the need for self-reliance but also realizing its costs and limits.

By then Israel was producing its combat planes, missile boats, and armored vehicles. A decade later, Israeli government canceled the Lavi - Israel’s indigenous fighter program. Israel decided to buy combat aircraft off the shelf from the USA, and shift investments to new areas that would provide overmatch over its adversary well into the future.

**The IAI Example**

With nearly US$ four billion in annual sales, Israel Aerospace Industries (IAI) reported US$2.5 billion new sales in India in the first half of 2017, as multiple projects of large scale mature after years of negotiations. “We look at India as one of the most dominant markets for IAI,” said Eli Elfassi, VP Marketing of IAI. “Our goal is to continue and strengthen our position in this strategic market, despite the growing competition,” Elfassi added that the excellent reputation and confidence IAI have won over the years with the Indian customers are instrumental in continued success.

Over three decades of operation in India IAI now serves all the Indian military branches and many government agencies throughout the sub-continent. As and some of the world’s biggest markets are closed to Israeli exports makes Israel a major competitor in the markets it is active in – Asia, Europe, and North and Latin America.

Excellence and innovation are among the main drivers of this competitiveness and success. Embracing the digital revolution and technological race, Israel no longer seeks a ‘Made in Israel’ attitude for everything, but rather those that are truly unique and superior over what can be obtained abroad. This attitude is more suitable to Israel’s typical innovative character and is what makes Israeli products competitive abroad. As such, Israel acts as a ‘testing lab’ for new products, enabling local companies to expand overseas with a competitive advantage that bigger and slower companies rarely have. On the national level support is given to certain areas deemed critical for national defense or other priorities, in investments, regulation and other forms of assistance, nurturing “centers of excellence” for the defense industry, electro-optics, security and cyber, as well as agro technology, water, and health.

Israel decided to buy combat aircraft off the shelf from the USA, and shift investments to new areas that would provide overmatch over its adversary well into the future.
a global leader in air and missile defense, IAI's systems now protect Indian naval vessels and are becoming part of the country's air defense system. Airborne Early Warning aircraft, ground and naval based radars are among the building blocks of major defense systems developed for use with India’s and Israel’s defense forces. IAI and its Indian partners are extending those mature systems, introducing more models, tailored to discuss specific customer requirements.

With nearly US$ four billion in annual sales, Israel Aerospace Industries (IAI) is looking at around one billion US$ Billions of sales per year in India, as multiple projects of large scale mature after years of negotiations. “We look at India as one of the most dominant markets for IAI,” said Eli Elfassi, VP Marketing of IAI. “Our goal is to continue and strengthen our position in this strategic market, despite the growing competition,” Elfassi added that the excellent reputation and confidence IAI have won over the years with the Indian customers are instrumental in continued success.

Over three decades of operation in India IAI now serves all the Indian military branches and many government agencies throughout the sub-continent. As a global leader in air and missile defense, IAI’s systems now protect Indian naval vessels and are becoming part of the country’s air defense system. Airborne Early Warning aircraft, ground and naval based radars are among the building blocks of major defense systems developed for use with India’s and Israel’s defense forces. IAI and its Indian partners are extending those mature systems, introducing more models, tailored to discuss specific customer requirements.

Other projects IAI fielded in India include sales of Heron and Searcher unmanned aerial systems. Foreign sources also reported on the sale of Harop and Harpy loitering weapons. The latest addition to IAI’s offering is the UAV operation center, giving operators at the territorial command or national level with the ability to manage, control and support a large force of drones.

Satellites are another area of leadership for IAI; satellites developed and produced here are orbiting in space supporting remote sensing and communications for national security and commercial users. IAI also offers unique payloads for satellites, enabling users to conduct reconnaissance missions in day or night, and during monsoon season, regardless of cloud coverage.

Projects worth billions need significant local work share and, over decades of cooperation with the Indian industry, IAI was the first foreign company to fulfill offset obligations and have spent over US$800 million buying in India. The company has excelled in developing close relations with local contractors, suppliers, and partners. “Through the years, we developed a network of subcontractors and partners. We found here all the necessary technologies; there is a mature infrastructure, suppliers have the will and technical and quality levels to enter development and production of advanced systems, we transfer more orders with time,” Elfassi said.

To make the most of the new MAKE IN INDIA policy IAI is planning to expand its operation here. “We plan to go beyond the JVs we already have here and expand our partnerships to JVs established on a divisional basis, with different Indian partners. This will enable us to better compete for specific opportunities and broaden the cooperation within our Indian JVs.” Elfassi said that new JVs are not replacing existing partnerships and cooperations. “Each model has its benefits and strengths, and our ongoing activities will continue to prove themselves,” he noted. This is particularly true in the new and uncharted waters of Make-in-India regulations, Elfassi added that new JVs the company plans to launch under IAI’s divisions, will diversify the company’s activities and benefit from wider access to opportunities and capabilities in the country.
Early Adaptors

The Israelis were among the first to spot the change of the wind in the Indian market and, as early adaptors; they set up local JVs and partnerships even when the formation of such enterprises was not too attractive from a business perspective. In fact, Israel was first to endorse ‘Make in India’ schemes in its business in India, even before this strategy was announced. Soon after the official establishment of relations between the two countries leading Israeli companies recognized the advantages of established subsidiaries in India to outsource and produce in the country. Some involved transfer of technology to Public Sector Undertaking (PSU) and others moved production lines to Joint Ventures with companies in the private sector. Among the products were radars, electro-optical devices, electronic warfare and avionics that were developed in Israel and produced and supported in India for the local market.

The first cooperation between Indian and Israeli companies was formed with PSUs, primarily BEL, HAL and OFB.

The first cooperation between Indian and Israeli companies was formed with PSUs, primarily BEL, HAL and OFB. Only recently, having almost equal ownership in partnerships enabled the Israelis to set up JVs with the private sector, and once the gate was opened, there is a flood of opportunities.

As ‘Make in India’ policy came into place it found Israel’s defense industries more than prepared and Indian partners, from giants mega corporations to Micro, Small and Medium Enterprises (MSME), are happy to cooperate. Since the beginning of 2017 many JVs were announced, by large and small companies, many programs are already set to produce products and services for ongoing programs, other still idling in anticipation of new programs. Following is a selection of some of these announcements:

IAI, Israel’s largest exporter to India, is already associated with hundreds of Indian suppliers and partners and runs several JVs on different programs with major private sector companies in India. In February 2017 the company announced an agreement with the Kalyani Strategic Systems (KSSL), the defense arm of a Kalyani Group, to develop, build, market and manufacture selected air defense systems and lightweight special purpose munitions. A few months later the two companies expanded this cooperation to operate a maintenance center in Hyderabad for the air defense systems they intend to offer.

IAI/ELTA also has HELA Systems as a joint venture company with TATA Advanced Systems. HELA specializes in the development and manufacturing of defense electronics in India, combining ELTA’s latest technologies with TATA Advanced System’s experience and resources including radar, communications, electronic warfare, and homeland security and surveillance systems.

The LRSAM missile is an excellent example of such process, developed under a cooperative program lead by IAI, with DRDO, RAFAEL and Bharat Dynamics, resulting in one of the world’s most advanced weapon systems, offering a highly versatile point and area defense system that has already found new customers worldwide. While IAI is the prime contractor for the program, and is aggressively marketing it worldwide, India handles half of the program and will benefit from the program success in India and abroad. Indian industries are already producing significant parts of the systems, including the serial production of missiles celebrated at BDL in Hyderabad recently.

While IAI was the prime contractor for the weapon systems’ development, once the system enters production IAI becomes a subcontractor under the Indian partner. In May 2017 BEL received the first order to deliver four LRSAM for the Indian Navy.

A similar undertaking follows the manufacturing of Spike missiles. The missiles were developed in Israel, but BDL will assemble, and integrate the missiles for the Indian Army. To bring more content to its local operation and meet ‘Make in India’ guidelines RAFAEL wanted to do more and entered an agreement with Kalyani to produce systems and components for its missiles.
In August 2017, the JV inaugurated a modern production facility in Hyderabad where the JV intends to produce components and subsystems for guided missiles. Kalyani Rafael Advanced Systems (KRAS), is India’s first private-sector defense sub-systems manufacturing entity. Spread across an area of 24,000 sq.ft., the facility will enable the production of high-end technology systems for the Spike systems and other munitions, for use by the Indian Armed Forces. It will be engaged in the development of a wide range of advanced capabilities like Command Control and Guidance, Electro-Optics, Remote Weapon Systems, Precision Guided Munitions and System Engineering for System Integration. The facility will also target to export products to other countries. For Air Defense and Air to Air domain, both products selected by the Indian Air Force, Navy and Army, Rafael is forming a JV company with Reliance, Rafael Reliance Advanced Defense Systems (RDS). The JV will be able to support the Indian customer an indigenous manufacturing and support for ongoing programs as well as new ones.

Rafael is also creating another JV company in Hyderabad-Astra Rafael Communications (ARC) with Astra Microwave, this enterprise is needed to enable it to maximize the indigenization of its Software Defined Radio (SDR) and EW systems selected by the Indian Air Force. RAFAEL is also producing LITENING weapon designation pods for the Indian Air Force. In its delivery of Litening targeting pods, Rafael went above the expectations of merely providing 30% offsets, and is now producing the majority of the pod in India through a tech tie-up with DEFSYS located in Gurgaon. DEFSYS will also start manufacturing various Israeli designed EO systems under another JV struck with RAFAEL’s part-subsidiary Controp.

Other JVs recently announced by Israeli and Indian companies include the inauguration of a small arms factory in Malanpur in Madhya Pradesh under a JV between India’s Punj Lloyd and Israel Weapon Industries (IWI) to produce firearms in anticipation for the selection of a new close combat weapon for the Indian Army. The plant will produce parts for IWI’s X95 and Tavor carbines and assault rifles, Galil Sniper Rifles and Negev light machine guns. At a later phases, it would be expanded to manufacture complete small arms, thus becoming India’s first private sector small arms manufacturing plant. IWI sister company Meprolight has already established JV with Rolta to produce advanced weapon sights.

Israel’s largest privately held defense company Elbit Systems is also involved with some JVs in India, some, established years ago with PSU such as BEL and HAL are operating successfully for many years. Others, announced more recently, include entries into new fields. A JV with private sector enterprises included Bharat Forge, of the Kalyani Group, eying major land systems including artillery and mortars. Another, with Adani and Alpha Design (“Alpha-Elsec”) focused on unmanned aerial vehicles (UAV), electronic and EO systems.

**Why is it important to India**

Israel is not the only foreign player in the Indian market. In fact, the major competitions for fighter aircraft, submarines or helicopters are competing ‘over the head’ of the Israelis since Israel is not competing to sell major platforms. However, when specific capabilities of weapon systems, command and control or cyber warfare are considered, all those programs become relevant. That is where Israel’s offerings excel.

Indo-Israeli JVs also become relevant to the adaptation, indigenization and upgrading of such platforms to maximize performance and value, relying on domestic skills, know-how and support with access to the design innovation and accelerated development offered by the Israeli side. It is relevant particularly with complex systems, as demonstrated in the recent wins of LRSAM, MRSAM and SPIKE programs.

The close cooperation between the defense R&D establishments of the two countries help formulate new, classified programs to offset and overmatch adversaries in defense, HLS and the cyber domains.

---

**A defense analyst and writer specialized in defense technology and Israeli affairs, Tamir Eshel is the editor and publisher of Defense-Update, published in Israel since 1978**
STRATEGIC PARTNERSHIP WITH PRIVATE PLAYERS

An Overview

—— Danvir Singh ——

There are two concerns which need to be addressed to make Strategic Partnerships contribute in a meaningful and time-bound manner. The first and foremost concern is the lack of institutional capacity and ability to guide the new process to its logical conclusion. In the past, several promising measures, especially those connected with the ‘Make’ and ‘Buy and Make (Indian)’ procedures, have failed to yield the desired results because of these shortcomings. Although the new Chapter VII of DPP talks of “an appropriate institutional and administrative mechanism” besides “adequate expertise in relevant fields of procurement, contract law and Transfer of Technology (ToT) arrangements”, much would depend on how they unfold. Needless to say, it is the lack of reforms in the structures and decision-making processes surrounding procurement and production that have inhibited the development of a strong defence industry.

On May 31, 2017, in a major policy reform intended to promote ‘Make in India’ in defence manufacturing, the Ministry of Defence (MoD) announced the much-anticipated Strategic Partnership model for the Indian private sector. The model, whose concept was first suggested by the Dhirendra Singh Committee in its July 2015 Report, populates Chapter VII of the Defence Procurement Procedure 2016 (DPP 2016). It visualizes designating a few private companies as Strategic Partners (SP) that would not only assume the role of system integrators, but also lay a strong defence industrial foundation by making long-term investment on production and R&D infrastructure, creating a wider vendor base, nurturing a pool of skilled workforce and making a commitment to indigenisation and technology absorption.

The aim of this model is to enhance India’s self-reliance index in defence procurement. This continues to remain at an abysmally low level, despite a huge defence industrial complex, much of which is managed by state-owned Defence Public Sector Undertakings (DPSUs) and the Ordnance Factory Board (OFB). The strategic partnership model seeks to identify a few Indian private companies as Strategic Partners who would initially tie up with a few shortlisted foreign Original Equipment Manufacturers (OEMs) to manufacture big-ticket military platforms. In the initial phase, the selection of SPs would be confined to four segments: Fighter Aircraft, Helicopters, Submarines and Armoured Fighting Vehicles (AFV)/Main Battle Tanks (MBT). In each segment, only one SP would generally be selected, as per the revised DPP. However, going back in time, the manufacture of components, assemblies and sub-assemblies was thrown open to the private sector in 1991.

With a view to promote defence-industry partnership, in 1998, the MoD constituted six Joint Task Forces in collaboration with Confederation of Indian Industry. Consequent to their recommendations, the Government opened up defence production to the private sector in January 2002. It allowed 100 per cent private equity with 26 per cent Foreign Direct Investment (FDI). It was a major policy change. Subsequently, the Department of Industrial Policy and Promotion (DIPP) issued detailed guidelines for the issuance of licence for the manufacture of arms and ammunition.

Constituted in 2004, the Kelkar Committee made several radical recommendations. The Government had accepted a majority of them but their implementation somehow lacked earnestness and focus. And the DIPP in consultation with the MoD, had issued 37 letters of intent for the manufacture of various types of military hardware which included armoured and combat vehicles, radars, electronic warfare equipment, warships, submarines, avionics, military aircraft, safety and ballistic products, armaments and ammunition.
Despite the above measures, there was no discernible change in the ground situation. Only a handful of India’s top companies got involved in small value defence contracts. The private sector had to remain content with the supply of some low-tech items to the public sector. Their supplies to DPSU and Ordnance Factories grossed over ₹1,200 crore and ₹1,900 crore respectively in the year 2013-2014, the last year the previous government was in power. However, while these figures do signify the contribution made by the private sector, they also highlight the fact that the private sector continues to be merely an outsourcing base for the public sector. Given decades of insulation and prejudices, this was no small achievement. But old mindsets, complexities of complex procurement procedures and clout wielded by the public sector, have been acting as major deterrents to any meaningful participation of the private sector. New aspirants in particular, find the whole regime to be highly forbidding. However, there was seen a renewed interest and this was stoked by the government’s ‘Make in India’ campaign. Prime Minister Narendra Modi and the previous Defence Minister and now, Goa Chief Minister, Manohar Parrikar’s statements about the manufacture of defence equipment were at the core of this initiative.

In February 2015, Prime Minister Modi said at the Aero India Airshow in Bengaluru that the country imports nearly 60 per cent of its defence equipment, spending tens of billions of dollars. Even a 20 to 25 per cent reduction in imports could create additional 100,000 to 120,000 highly skilled jobs in India, he had stated. Since then, the private sector has shown vigour and initiative for this national dream. Private players such as Larson & Tubro, the Tata Group and Reliance Industries are just a few leading examples amongst many in the defence industry undertaking joint ventures with Original Equipment Manufacturers (OEMs) to manufacture weapons and platforms in India. Have they assumed the role of systems integrators to lay a strong defence industrial foundation by making long-term investments in production and R&D infrastructure, creating a wider vendor base, nurturing a pool of skilled workforce and making a commitment to indigenisation and technology absorption as envisioned in the new policy of May 2017?

In times to come, these leading conglomerates will definitely assume the role of systems integrators provided the Government of India carries out structural reforms and enhances the capacity of the MoD to handle ‘Make in India’ earnestly. A brief overview of the initiatives, undertaken by the private players, in the arena of defence manufacture and R&D, will help build perception on both, the contemporary position and future trajectory.

Larson & Tubro

155mm/52 Cal Tracked Self Propelled (SP) Gun: On May 12, 2017, Larsen & Tubro announced that they have entered into a contract with the MoD for supply of 100 units of 155mm/52 calibre Tracked Self-Propelled Gun Systems to the Indian Army.

The K9 VAJRA-T 155mm/52 Cal: Tracked Self-Propelled Howitzer meets the requirements of 21st century warfare, which is based on the following missions - deep fire support with its longer firing range, qualitative superiority to overcome a numerical disadvantage with its higher rate of fire and accuracy and effective and reliable fire support in all kinds of circumstances with its higher mobility and protection.

The K9 VAJRA-T is a variant of K9 Thunder which is inarguably the world’s best 155mm/52 Cal SPH in terms of number of systems in active service. Currently, K9 Thunder is serving as one of the main conventional deterrent forces for a number of armies including the Korean Army. The K9 Thunder has established its superiority through demonstrations and evaluation tests at various proving grounds in extreme weather conditions, jungles, barren deserts and extremely cold areas. By demonstrating its ability to handle Indian as well as all NATO standard ammunitions, the K9 VAJRA-T has proven its excellent conformability to any field artillery unit.

155mm/52 Cal Towed Gun System TRAJAN: The 155 mm/52 calibre Towed Gun System jointly developed by L&T and Nexter Systems, France for the Indian MoD is under User Evaluation by the Indian Army. L&T is responsible for development of the mobility system of the gun, whereas Nexter provides the Ordnance System.

Pinaka Multi-Barrel Rocket Launcher (MBRL): The Pinaka Multi-Barrel Rocket Launcher (MBRL) System is a high-tech, all-weather, long-range, area fire artillery system built on an 8x8 chassis with high cross-country mobility. It is fitted with electro-
mechanical outriggers with an auto-levelling feature which stabilises the launcher. The Pinaka, currently in serial production, has been designed and developed by L&T in association with the DRDO.

**Medium Range Surface to Air Missile Launcher:**
This is a trailer based, platform independent, all-electric mobile launcher configured for launching eight canisterised missiles in vertical mode. The system is a self-sustaining unit, equipped with wireless communication to facilitate remote firing in single/ripple mode. It is fitted with electro-mechanical outriggers with auto-leveling feature with an additional option to level with or without trailer. The electronics of the system is based on VME 64-bit architecture with MIL grade electronics. The system is provided with multiple power sources, with battery back-up of seven minutes.

**Mobile Autonomous Launcher - Four Missile Configuration:** This an all-electric mobile launcher designed for launching four containerised/canisterised missiles in vertical mode. It is fitted with electro-mechanical outriggers with an auto-levelling feature, which stabilises the launcher. The launcher is equipped with a unique sliding feature to adjust the position of missiles and provide ground contact for Jet deflectors during launch. The electronics of the launcher have been designed using VME-based MIL grade electronics and provide multiple power sources with battery back-up of 15 minutes.

**Universal Launcher:** The Universal Launcher is a multi-role, modern launcher designed and developed by L&T jointly with DRDO/R&DE (E). The all-electric system designed for a payload of over 2,000kg is configured on a TATRA vehicle. The system is designed for vertical launch as well as for tracking and launching of missile in inclined mode. It is fitted with electro-mechanical outriggers with an auto-leveling feature, which stabilises the launcher. This Universal Launcher can be configured for a range of containerised/canisterised missiles.

**Mobile Launchers:** L&T has partnered with Indian defence for development of various land-based systems of different missile launchers under the DRDO’s IGMDP programmes. These integrated weapon systems include the development and production of land-based platforms on both road-based and rail-based systems. Based on this association, L&T has successfully contributed to the development of multiple Strategic Missile Launcher Systems in collaboration with the DRDO. Some of the successfully developed systems have been the Prithvi-II Launcher and Rail and Road Mobile Launchers for Strategic Missiles.

**RELIANCE**
Reliance Shipyard is the first private sector shipyard in India to roll out indigenous warships for the Indian Navy and enter the elite group of Government-owned shipyards in the indigenous construction of warships. These NOPVs would add tremendous strength to the Indian Navy in ensuring maritime security of the Indian Ocean Region (IOR).

NOPVs are designed to support coastal and offshore patrolling, securing offshore assets and performing escort duties and fleet support operations. The state-of-the-art warship is 105 M long with a displacement of 1,500 tonne. It would be propelled by two diesel engines which can deliver speeds up to 25 knots and has an endurance of about 6,000 Nautical Miles.

Reliance Defence and Engineering Ltd. (RDEL) has also submitted bids for two prestigious programmes of the Indian Navy which includes design and construction of four Landing Platform Dock (LPD) and eight warships of the Anti-Submarine Warfare Shallow Water Craft (ASW SWC). The combined value of these Projects is approximately ₹30,000 crore and bids are expected to be opened in a few months. RDEL’s shipyard has also been considered by the MoD under the new policy of Strategic Partnership model for design and construction of six submarines of Project 75i (worth more than $10 billion) under the ToT from OEMs. In February this year, Reliance Shipyard became the first shipyard in South Asia to sign the Master Ship Repair Agreement (MSRA) with the US Navy to perform complex repairs and alternation services for the US Navy’s Seventh Fleet. The fleet has around 100 vessels and has huge business potential.

RDEL is also executing a contract to build 14 Fast Patrol Vessels (FPVs) for the Indian Coast Guard at a cost of ₹920 crore. The FPVs are primarily for Patrolling within the Exclusive Economic Zone (EEZ) and are engaged in coastal patrol, anti-smuggling, anti-piracy and Search and Rescue Operations. The...
RDEL is also constructing a Cadet Training Ship (CTS) for the Indian Coast Guard. Apart from design and construction of warships for the Indian Navy and Coast Guard, RDEL has also built ships for varied clients including Ice Bulk Carriers for Norwegian company, Offshore Support Vessels (OSVs) for ONGC and Deck Cargo Barges for NPCC-UAE. The company has also repaired and retrofitted commercial and defence ships as well as mobile oil drilling platforms for international clients.

TATA GROUP

Armoured amphibious platforms, blast-proof vehicles, Unmanned Aerial Vehicles, multi-barrel rocket launchers, electronic warfare systems and nuclear submarine control centres - all are products of a long-standing public-private partnership between the Tata Group and the MoD. Tata Advanced Systems Ltd (TASL) operates India’s largest private sector, integrated, detailed part manufacturing facility for fixed wing aircraft and helicopters in a joint venture with Sikorsky. They are the single global source for the assembly of helicopter fuselage for one of the best-selling helicopters, the Sikorsky S-92, used for VVIP transport. The company has three different units producing globally-competitive products for helicopters and the aerospace sector. TASL is also the single global source designated for the empennage (tail and tail assembly) and centre wing box structures for Lockheed Martin’s C 130J military transport aircraft. Another major area of business for the company is missiles. TASL is the lead integrator for the development and assembly of command and control systems for India’s major missile programmes and has created a design and development centre for indigenising missile sub-systems and mini-UAVs. TASL is the lead integrator for the development and assembly of command and control systems for India’s major missile programmes.

In addition to the Indian Army, Indian Navy, Indian Air Force and para-military forces, the company now also supplies to the defence forces of other countries including that of Sri Lanka, Bangladesh, Nepal, Tanzania and to the UN peace-keeping forces in conflict zones in Africa. The company showcased two new combat vehicles at the Defexpo 2014 at New Delhi, the Kestrel, a wheeled, armoured amphibious platform providing mobility to troops in the battlezone with armour protection backed by fire support and a light-armoured, high-mobility reconnaissance vehicle that will move ahead of armoured columns.

Tata Power SED: One of the largest prime contractors in the Indian defence sector, Tata Power SED has partnered the MoD, the armed forces, defence public sector undertakings and the DRDO for over 40 years. It has executed projects of national importance such as Pinaka, a multi-barrel rocket launcher, the Akash launcher systems for the Indian Air Force
and the Indian Army, the integrated guided missile development programme, the Samyukta electronic warfare system and the Arihant nuclear submarine control centre.

Global Interest

On August 20, 2017, the Agence France Presse reported that India has drawn up a shopping list for tens of billions of dollars of foreign fighter jets, armoured vehicles, submarines and helicopters but it will only sign the cheques if they are made in India...

Europe’s Airbus Group, angling to sell its Panther helicopters, has said that if it wins a contract worth several billion dollars and expected to span at least a decade, it would make India its global hub for the manufacture of multi-purpose choppers. The company currently builds these at Marignane in France. Lockheed Martin says if its F-16 fighter jet is selected (it is likely to compete with Saab for that order of close to $15 billion), it will “support the advancement of Indian manufacturing expertise.”

Germany’s ThyssenKrupp Marine Systems and France’s Naval Group are eager to compete for a contract of up to $10 billion to build submarines in the country. Luring foreign defence companies to build in India would be a major and much-needed boost to the economy. Prime Minister Narendra Modi, with less than two years to national elections, faces pressure to create more jobs for the hundreds of thousands of people joining the workforce every month.

Conclusion

Dr Lakshman Kumar Behera of IDSA, who specialises in matters related to defence procurement and production, believes that, despite the potential benefits, there are two concerns which need to be addressed to make SPs contribute in a meaningful and time-bound manner. The first and foremost concern is the lack of institutional capacity and ability to guide the new process to its logical conclusion. In the past, several promising measures, especially those connected with the ‘Make’ and ‘Buy and Make (Indian)’ procedures, have failed to yield the desired results because of these shortcomings. Although the Chapter VII of the new DPP talks of “an appropriate institutional and administrative mechanism” besides “adequate expertise in relevant fields of procurement, contract law and Transfer of Technology (ToT) arrangements”, much would depend on how they unfold. Needless to say, it is the lack of reforms in the structures and decision-making processes surrounding procurement and production that have inhibited the development of a strong defence industry.

Darvir Singh, Associate Editor Indian Defence Review. Author of Kashmir’s Death Trap: Tales of Perfidy and Valour.
PAX BRITANNICA WHITTLED DOWN TO AN ISLAND KINGDOM

(Intrigues that Built an Empire: Intrigued by Wheels of History)

——— Lt Gen PG Kamath ————

India, even after 70 years of independence, is still floundering to identify her strategic goals. Our national vision can be gleaned from the oath taken by the Constituent Assembly on August 15, 1947, where it pledged that this ancient land attain its rightful and honoured place in the world and make its full and willing contribution to the promotion of world peace and welfare of mankind. Furthermore, we identified our core national values from the Preamble of our Constitution adopted on November 26, 1949. What next? Isn’t there anything after seven decades to guide the country in a dynamic geo-political environment?

Britain once ruled the world and one would be intrigued how this ‘nation of shopkeepers’, as Napoleon had referred to it disparagingly, could achieve such an enormous feat? I am no lover of that nation; rather still my heart and spirit revolts at the thought that my country was enslaved by them for nearly two centuries. Frankly, I don’t care whether Britain exits the European Union or the White House misspells Prime Minister Theresa May’s name thrice in one memo. I also drew a vicarious pleasure, when her visit to India did not go too well. Leaving my personal indifference to Britain aside, it still stirs a thought; how did this little island kingdom build an empire where the sun never set? After some cerebration, I come to the conclusion that it is her strategic vision that had made her great and ensured that her greatness lasted well over three centuries.

Strategic Vision

Strategic vision encapsulates the ability to identify national interests in a dynamic geo-political environment. It also means the ability to modify one’s national interests in light of national sentiment and strategic requirements. Ultimately, it is the ability to forecast the volatile geo-politics of the world and the sagacity to pursue one’s national interests with the instruments of national power at one’s disposal in the present and future geo-political environment. This could be done through mediation, loans, grants, aid, allurements, gratification, coercion, extortion, threat, intrigue, duplicity and wars. It can take the form of pacts, treaties, accords, entente, conventions and the like. While engaging in these manoeuvres, there should be a clear cold-blooded, single-point intent to pursue one’s national interest passionately, even mercilessly. Britain assiduously pursued her national interest by colonisation, wars, exploitation, enslavement, oppression to achieve her great power status. Bereft of her colonies and her accumulated wealth, she now basks in the limelight of her past glory and hankers after the patronage of US to be heard in the international fora.

Pursuit of National Interest by Britain

Britain had a well-crafted strategy in the 19th and 20th centuries to curb Russian influence or in specific terms, to stem the expansion of communism from Russia into India. Fear of Russia and the threat of communism was the gravest in those times. Britain was clearly concerned about India, the prized jewel in her crown, going the Russian way. Even the remote threat of communism finding its way into India was unthinkable. Her strategic compulsions forced her to give some strategic depth to India against the spread of communism. Her strategy was to create a belt encompassing the Middle East, Iran, Afghanistan and Tibet to keep communism at bay.

Afghanistan

In the mid-19th century, Britain waged two wars to tame Afghanistan. The First Afghan War ended in a disaster for Britain and in the second, she tried to redeem her lost prestige. Never could they completely subdue the turbulent Afghans. However, the country remained under her influence, adequate to give them a semblance of security against Russia. In the Third Afghan War, in 1919, whatever rudimentary control they had over Afghanistan, was lost. As World War I had ended, Britain lost her zest to continue another war in Afghanistan. However, she was able to keep her contact alive only to ensure the Soviets did not get a foothold there. The Soviets were also consolidating after the October Revolution in 1917, and did not
have the time, inclination or resources to bear her fangs at Afghanistan, which she ultimately did six decades later.

**BRITAIN SELLS A DEAL WITH JAPAN TO NEUTRALISE RUSSIA**

In 1900, Russia had occupied Manchuria at the expense of a weak China, in the midst of her century of humiliation. British had trade interests in China. The victories in the Opium Wars had enabled Britain, France and the US to maraud China of her resources. Russian incursions into Manchuria had alerted the British and for the first time, Britain, a European power, concluded an agreement with the Japanese in 1902 against a rival European power, Russia. The broad features of the agreement recognised that Korea was under Japanese influence and in their war with Russia, if any European powers supports her, then Britain will support Japan.¹ It was an invitation for Japan to fight the Russians to serve indirectly British commercial interests in China. The Japanese prevailed in the Russo-Japanese War of 1905 and British interests in China remained unharmed. Instead of Britain having to fight Russia to protect her commercial interests, she cajoled Japan to do her job, though Japan gained her own dividends out of the victory.

**BRITAIN SELLS A DEAL WITH RUSSIA**

After colluding with Japan to defeat Russia, Britain further exploited the opportunity to seal a deal with the Russians as well! It was a time when Russia was at the nadir. The humiliating defeat at the hands of Japan had broken her confidence in the Romanov dynasty and sowed the seeds for Russian Revolution. It was the first time that a rising Asian power had defeated a European power. Seeing the weakness of the Russians, the British concluded the Anglo-Russian Convention in 1907 at St Petersburg delineating their respective areas of influence with the strategic aim of keeping Russia away from India. Northern Persia was to be under Russian influence and the Southern portion was to be under the British influence.

Afghanistan was to be completely under the British influence. Both the countries were to desist from interfering in Tibet and any contact would be through the Chinese.² The British could continue with their commercial relations with Tibet. However, even before the enactment of the Convention, Britain had already signed the Lhasa Treaty with the Tibetans in 1904. As per the treaty, Tibet acquiesced to allow cross border trade in Tibet, formalised the Sikkim-Tibet border, agreed to pay penal indemnity and were forbidden from having any relations with any foreign country other than Britain.³ This effectively ensured only the British influence prevailed in Tibet. While Tibet was tied to Britain as per the Lhasa Treaty, Russia was kept out as per the St Petersburg Convention. It was a strategic masterstroke by Britain that ensured that Tibet provided strategic depth to India.

**CREATION OF IRAQ**

At the end of World War I, the defeated Ottoman Empire broke up as it had sided with Germany. As per the Sykes-Picot Agreement in 1916, Britain and France were to share the fragmented Ottoman Empire. The British got the mandate to run Palestine and Iraq as the spoils of war vide the Treaty of Versailles. The British ran the mandate till 1932, after which the Kingdom of Iraq was created under a Hashemite ruler. Mesopotamia, a geographical entity was converted into a political entity of Iraq, an Arab nation that would challenge Iran in times to come and also give Britain a permanent foothold in the energy well of the world, besides access to Persian Gulf.

No doubt, the Baghdad Pact was enacted later to become CENTO, a defence and security pact in the region to contain communism emanating from the Soviet Union. Iraq played a major part with the CENTO headquarters being located in Baghdad, thus justifying its creation. Britain had no love lost for the people of the region, however the strategic location of the country was so critical to her, the nationhood of Iraq was only a by-product in the Great Game.

**ISRAEL**

Similarly, with the mandate in Palestine, they managed to carve out Israel, a home for the Jews in the heart of Palestine. On May 14, 1948, Israel was created and the British mandate ended the same day. Again in one stroke, Britain orchestrated unrest in the region with all the surrounding Arab nations trying to remove Israel from the map. The Arab-Israel Wars took place in 1948, 1956, 1967 and 1973. If one has to attribute altruism to the British, this one act of granting homeland for the Jews says it all! I am ready to overlook any other collateral benefits that might have incidentally accrued to her in the creation of Israel. For the Arabs, it was a stab in the back by Britain. For
them, an oppressive Ottoman Empire was an angel rather than a liberal Britain, who had foisted a militant Israel on them. The Arabs lost faith in Britain but for the latter, unrest in any part of the world meant more trade and arms exports. The move by Britain was truly a game-changer notwithstanding that the region is smouldering to this day and anytime the embers could fulminate into a raging conflict.

**INDIA**

Zorawar Singh, a General under Maharaja Gulab Singh, brought Ladakh under the domain of a future India in 1841. He had gone on an expedition to Leh - Ladakh, and then along the River Indus to Rakhas Tala and died in the Battle of To-yo at Taklakot. A quarter century later, Johnson, a British Cartographer, demarcated the boundary between British India and Tibet in 1865, what is now referred to as the 'Johnson Line'; the officially claimed border of India. From 1865 to 1899, a number of other lines - the Johnson Ardagh Line and the McCartney-Macdonald Line running along the Lakhtsang Range were drawn. Ultimately, when China was weakened after the Xin Hai Revolution in 1911, the British stuck to the Johnson Line as the boundary between British India and Tibet, as it gave the maximum territory to British India.

In the beginning of the 20th century, Britain had already set her eyes on Tibet as a buffer between Russia and India, and not China and India. China was a very weak power, not formidable enough under the Qing Dynasty and hence the need to carve out a buffer with the mighty British. In 1903, Younghusband led an expedition that ended in the Treaty of Lhasa in 1904 literally bringing Tibet under the influence of Britain. A quarter century later, Johnson, a British Cartographer, demarcated the boundary between British India and Tibet in 1865, what is now referred to as the 'Johnson Line'; the officially claimed border of India. From 1865 to 1899, a number of other lines - the Johnson Ardagh Line and the McCartney-Macdonald Line running along the Lakhtsang Range were drawn. Ultimately, when China was weakened after the Xin Hai Revolution in 1911, the British stuck to the Johnson Line as the boundary between British India and Tibet, as it gave the maximum territory to British India.

In the beginning of the 20th century, Britain had already set her eyes on Tibet as a buffer between Russia and India, and not China and India. China was a very weak power, not formidable enough under the Qing Dynasty and hence the need to carve out a buffer with the mighty British. In 1903, Younghusband led an expedition that ended in the Treaty of Lhasa in 1904 literally bringing Tibet under the influence of Britain. The terms of the Treaty have been referred to earlier. In 1911, China erupted with Xin Hai Revolution and Republic of China was proclaimed in January 1912. The Manchu Forces in Tibet were disarmed and Tibet declared her independence in the summer of 1912. In the following year, Mongolia and Tibet signed a treaty wherein they recognised their respective independence. The Mongolians threw their lot with the Russians and Tibet hesitatingly threw her lot with the British, both fearing China in the long run. Thus, the whole of Tibet provided strategic depth to India.

In 1914, Britain, Tibet and China had a tripartite agreement defining Tibet's boundary with India in the Northeast. All three were independent powers and were on equal footing. Britain had invited China for the Shimla Accord considering that Tibet was under the suzerainty of China, as it also served her purpose of binding China into a Treaty, with the aim of keeping the Russians at bay. It also served the provisions of St Petersburg Convention with the Russians, as they would not have any excuse for intervening in Tibet citing its violation. The Chinese plenipotentiary did not sign the Treaty as China did not have any locus standi on the issue, as Tibet had been an independent kingdom since 1912. As the Chinese did not sign the Treaty, the British presumed that China's suzerainty over Tibet was not valid anymore. The Chinese themselves did not consider it relevant as they did not have any control over Tibet. The Republic of China was just three years old and was still consolidating, as the warlords continued to hold sway over their territories. Thus the Accord was signed as a bilateral agreement between Britain and Tibet giving recognition to the McMahon Line that separated Tibet from India's North East Frontier Agency (NEFA) now known as Arunachal Pradesh. McMahon marked the boundary with a red thick line on a very small scale map (one inch to 8 miles), thus ensuring its ambiguity. It roughly ran along the Himalayan crest line. However, it did not follow the watershed principle. In some places, it was thick enough to cover the ridge line as well as the valley down below leaving it open to varied interpretations. The ripples of history have their own ways to becoming waves. Otherwise who would have thought that a small oversight in drawing a thick red line would end in a war half a century later?

Britain's exit from India was also a master stroke. She divided the country in order to cut India down to size, who would definitely be her rival in years to come. She knew India's enormous potential, hence dividing the country on religious lines ensured that the countries of the subcontinent would boil in their own stew, mired in conflicts and remain poverty stricken for ages. She ensured that the enmity is long lasting, given the post-Independence partition carnage. She also ensured the Jammu and Kashmir (J&K) dispute fester as an open wound for both the countries. It was Mountbatten's last vile act, enacted through a gullible Nehru, who went running to the United Nations (UN) with a complaint and accepted an untimely ceasefire.
on January 01, 1949, even when a third of J&K was still under the illegal occupation of Pakistan.

It was again Britain as one of the permanent members of the UN Security Council, who masterminded the problem of J&K to make it a Gordian Knot unresolved to this day. It is sad that both India and Pakistan instead of carving out a path of mutual development ensured the success of Britain’s vile strategic plan to make South Asia a region of instability. Rather, the two countries improved upon British plan to ensure the region remains volatile and hostile enabling Britain as an erstwhile colonial power to fish in troubled waters.

On January 20, 2017, I was smug to read the news that UK was seeking Indian help in resolving the dispute on the Chagos Archipelago with Mauritius, as the latter had asked for its return and had threatened to take the issue to the International Court of Justice. She wants good offices of India to resolve the issue.7

Wheels of history indeed do take a complete turn and the role reverses.

**KOWTOWING TO CHINA**

In the latter part of the 20th century, Britain began appeasing China once she knew that the Chinese economy was growing and started playing second fiddle to her. First came the betrayal of people of Hong Kong. The island of Hong Kong and Kowloon were leased to Britain by China for perpetuity and only the ‘New Territories’ were leased for 99 years. Even in Hong Kong, Britain did not set up any democratic institutions prior to her departure in 1997. As early as 1958, Zhou Enlai had warned Britain that any attempt of having ‘self-governance’ in Hong Kong, would be regarded as an unfriendly act.8 Despite having waged war against communism for a century, Britain buckled under the Chinese threat. The first elections, that were held in Hong Kong, was after 150 years of occupation, in 1991, even that in a limited way, always fearing Chinese reaction. The 1995 elections were more democratic, but the elected legislature was dissolved by China once the island reverted to them in 1997, and a China-controlled Provisional Legislative Council was formed.

The 1984 Anglo-China Treaty was a big giveaway to China by Britain...
immediately, unconstitutional may take a little longer.” Though these words were meant for the US, they are equally applicable to the UK. This was less than 200 years ago, when Britain, France and USA had allied, fought the Opium Wars and subjugated China. They had arm-twisted her, occupied her coastline, forced unequal trade terms and sold them opium instead of silver for silk, pottery and tea. The addicted populace gave them a steady market for opium. Now, the wheels of history have taken a full turn in less than two centuries. Kissinger had said, “China has five thousand years of turbulent history where she has used patience as her weapon and time as her ally.” How true!

Conclusion

Today, Britain is in crisis. In a referendum held in 2014, Scotland had voted to remain within the UK. Scotland, which voted overwhelmingly in 2016 to remain in the EU, is not comfortable with Brexit. Same is the case with Northern Ireland. Scotland has already prepared a draft legislation on a second Independence referendum. If not now, in a couple of years, most likely Scotland could vote to remain independent in case the Brexit dampens her economy. Nothing can be said of Northern Ireland as well. UK could further get whittled in times to come. I have no doubts that UK would go full steam ahead to make Brexit a success, so that she can at least be a shadow of her former self.

Even after 70 years of independence, India is still floundering to identify her strategic goals. Our national vision can be gleaned from the oath taken by the Constituent Assembly on August 15, 1947, when it pledged that this ancient land attain its rightful and honoured place in the world and make its full and willing contribution to the promotion of world peace and welfare of mankind. Furthermore, we identified our core national values from the Preamble of our Constitution adopted on November 26, 1949. What next?

Isn’t there anything after seven decades to guide the country in a dynamic geo-political environment? To this day we do not have a National Security Doctrine. Our national interests are as yet not defined. Our country is moving ahead by the sheer prowess of her people without defining her coordinates. Today, we are the fastest growing economy with projected growth of 7.2 per cent. The growth is in a general direction. How much better it would have been if we had identified specific goals to enhance all our instruments of national power; economic, political, diplomatic, science and technological, soft and military to finally boost our Comprehensive National Power? I have no doubt it is happening slowly but how long will this nation of over a billion people need to wait?

Notes

3. Legal Material on Tibet; Treaties and Conventions Relating to Tibet; (1904) http://www.tibetjustice.org/materials/treaties/treaties10.html
4. Ibid.
5. Ibid, N2.
7. Vidya Ram; UK Seeks Indian help in resolving Chagos Archipelago Dispute: The Hindu, 20 Jan 2017 (Edition; Bangalore)

Lt Gen PG Kamath, a veteran of Indian army; was the former Commandant of Army War College, Mhow. Currently, he writes on Ethics, Leadership Strategy and Current International and National issues.
NORTH KOREA – A DELINQUENT STATE?

—— Air Marshal Dhiraj Kukreja ——

Diplomacy has failed because North Korea remains determined to build its nuclear arsenal. Resuming talks would achieve nothing, when it is so close to attaining an effective arsenal. North Korea now says that it will denuclearise only after USA and South Korea negotiate a peace treaty with it to end the Korean War formally. The only remaining hope for denuclearising North Korea peacefully lies in convincing it that it must disarm and reform, for continuing on the chosen path could lead to unimaginable consequences for it. Political subversion and financial isolation, through the latest sanctions, have to be backed with secondary sanctions against Chinese financial institutions and other institutions, which have been, on the sly, continuing trade and financial deals with North Korea.

NORTH KOREA, THE NAME OF THIS country causes alarm and confusion. Is it a democracy, oligarchy, an autocratic nation – one really cannot give an accurate description; it can probably be best described as a hereditary Marxist monarchy! The supreme leader of North Korea is the youngest in the world; it also has the oldest! The reigning ruler, Kim Jong-un, is in his 30s, while his grandfather, Kim Il-sung, who died in 1994, is called as the “eternal president”. To celebrate his grandfather’s birthday, a parade with hundreds of soldiers and truck-mounted missiles, was held with a flypast in a ‘105’ formation, signifying the grandfather’s age! Its present leader calls for ‘peace guaranteed by arms’, for which he is developing nuclear weapons and delivery systems to cause destruction on the country’s enemies – Japan, South Korea and USA; the pace of development is alarming and nations are worried about his next move.

The country’s leadership, therefore, has been described as an evil, blood-drenched dictatorship. Any hint of a display of disloyalty or dissent is punishable by confinement to a gulag or death. Kim Jong-un, has put children to death on the suspicion of their parents’ crimes and has had his own relatives murdered on a whim! Such a leader, who is now threatening USA, has to be taken with some seriousness, for the very thought of a nuclear strike is distressing.

HISTORY

In 1910, the Empire of Japan annexed Korea, and it continued to remain under occupation until after the Japanese surrender at the end of World War II in 1945. The two major nations of the Allied Powers, USA and USSR, divided Korea into two zones along the 38th parallel, with the Soviets occupying the north while the south was occupied by USA. Negotiations on reunification failed, leading to the formation of separate governments in 1948: the socialist Democratic People’s Republic of Korea (DPRK) in the north, and the capitalist Republic of Korea (ROK) in the south. On 25 June 1950, North Korea invaded South Korea, and swiftly overran most of the country. The US Army, under the sponsorship of the United Nations intervened to defend the South, primarily to stop the spread
of communism, and achieved successes to rapidly advance into North Korea. China intervened on behalf of North Korea, as the UN/US forces neared its border, thus shifting the balance of the war again. The Korean War ended on 27 July 1953, with the signing of an armistice that restored the original boundaries approximately. The Korean Armistice Agreement brought about a cessation of hostilities, but no peace treaty was signed between the two nations; technically, thus, the two nations continued to be at war, and are still at war, even after all these years! The truce established the Korean Demilitarized Zone (DMZ), a 2.5-mile (4.0 km) - wide fortified buffer zone between the two Korean nations, which currently, is the most heavily defended national border in the world!

North Korea has often announced that it would no longer abide by the terms of the armistice at least six times, in the years 1994, 1996, 2003, 2006, 2009, and 2013. In 2013 North Korea argued the Agreement was meant to be transitional, and put forth a number of proposals for replacing it with a peace treaty; USA, as alleged by it, did not respond positively. The US position, as expressed in 2010, in a letter from President Obama to the then leader, Kim Jong-il, father of the current leader, states “negotiations for a peace treaty can only be done when North Korea takes irreversible steps towards de-nuclearisation”.

North Korea further argues that the annual US - South Korea military exercises, ‘Key Resolve’ and ‘Foal Eagle’ are provocative and pose a nuclear threat to it. As a consequence of the perceived provocations, North Korea, in 2013, announced its withdrawal from all non-aggression treaties with South Korea, and the closure of the direct phone-line between the two. As a safeguard against any US led attacks, nuclear or conventional, it also announced its right to conduct a pre-emptive nuclear strike on South Korea, keeping the window open, however, to enter into negotiations for a peace treaty to replace the Armistice.

**Relationship with Some Major Countries**

China’s support for North Korea dates back to the Korean War (1950–1953), when Chinese troops flooded the Korean peninsula to aid its ally. Since the war, China has lent political and economic support to North Korean leaders, starting from Kim Il-sung, Kim Jong-il, and Kim Jong-un. The relationship developed strains when North Korea tested a nuclear weapon in October 2006 and China supported the UNSC Resolution, which imposed sanctions on North Korea. With this resolution and others that followed in quick succession, China’s relationship appeared to shift in tone and tenor from being patronising, to one of punishment, but it has also stymied international punitive action against North Korea for its human rights violations. China’s punitive steps have, thus, been restrained, and it continues to have wide-ranging ties with North Korea, including economic exchanges and high-level state trips such as the visit of a senior Chinese Communist Party member to attend the seventieth anniversary of North Korea’s ruling party in October 2015.

The Chinese actions indicate its reluctance to impose any further sanctions, and that it would rather engage the regime to make it mend its ways.

The Chinese actions indicate its reluctance to impose any further sanctions, and that it would rather engage the regime to make it mend its ways. The reasons for China’s reluctance seem to reflect national interests within its foreign policy establishment. Some analysts believe that China views North Korea as a strategic asset; the continued existence of North Korea is preferable to China rather than a unified Korea, which then would provide greater proximity to the Chinese border for South Korean and other capital and democratic forces. A unified Korea could also create uncertain effects on China’s provincial economic interests, by carrying the risks of large population movements, should the North Korean economy unravel quickly.

Diplomatic relations between North Korea and the USSR, were first established in October 1948, shortly after the proclamation of the new nation. Though the two were close allies all through the Cold War, relations between them have not been the same since the breakup of the Soviet Union; after 1991, the new Russian government under Boris Yeltsin refused to provide support for North Korea, favouring South Korea instead. Relations picked up momentum after Vladimir Putin came in as the Prime Minister and a major ‘friendship treaty’ between the two nations was signed in early 2000. Thereafter, relations have followed a ‘now-on-now-off’ status, with some high-level visits by North Korean ministers, which have not been reciprocated by Russia at similar levels; Russia has also been participant to all the UNSC Resolutions against North Korea, but has stressed to avoid the use of force.

Even though Russia has consistently supported sanctions against North Korea for its nuclear weapons programme and publicly criticized the regime’s belligerent foreign policy, it has also played a significant role in ameliorating North Korea’s economic isolation. The contrast between Russian rhetoric and policy towards North Korea has been most stark in the spheres of infrastructure and energy. As China’s oil supplies to North Korea have been periodically disrupted due to tensions between the two countries, Russia’s importance as an investor in the energy sector has increased markedly. Siberian oil companies have sold fuel to North Korea via a supply route linking Vladivostok to Rajin. These fuel supplies have provided the North Korean regime with vital hard currency, as it has processed Siberian oil in chemical plants and resold it to Chinese consumers!

Notwithstanding the Russian participation in the Six Party Talks, from 2003-2007, on North Korean nuclear disarmament, many analysts have argued that Russia’s influence over the security situation in the Korean peninsula is minimal. Apart from China, Russia is the only other great power, which has direct influence over the stability of the North Korean regime, while maintaining reasonably good relations with South Korea too. It is making sincere efforts to boost its image in the international comity as an influential and major power of the region, as a counter to both USA and China. Since North Korea’s April 2017 ballistic missile tests, Russia has consistently argued that its strategy, to continue favourable relations with both North and South Korea, is more likely to yield results in the Korean crisis than USA’s aggressive posturing.

For the United States, North Korea has long been a secondary problem. Although the country has been an uninterrupted source of impending regional instability, its neighbours, and its own economic limitations, have so far managed to keep it restrained.
North Korea’s nuclear program was one of USA’s first major post-Cold War crises. The US general policy towards North Korea has been to manage any arising issue and put off conflict. Deft use of diplomacy in 1994 and subsequent years, whenever North Korea threatened irrational action, has so far avoided any use of force. Confronted with the price of military intervention, the US has preferred declaring moratoriums on the missile testing, isolating North Korea financially and making the occasional diplomatic deal. USA has always expected North Korea to implode, so waiting a while longer has been the more logical approach.

In recent times, however, especially after President Trump taking over reins, the policy has seen changes, since sanctions and severe indictments from UNSC have hardly slowed North Korea’s nuclear and missile programme. USA now views North Korea as unacceptable with the probable acquisition of nuclear-tipped missiles that can target its cities. It, therefore, feels that the window for further diplomatic engagement with North Korea is closing. The US missile strike in Syria and the “mother of all bombs” strike in Afghanistan are indicators of US resolve to resort to military action, should other avenues close. Such strikes could also be indicators to North Korea to mend its ways, to China, which is North Korea’s primary economic support, and to Russia that it still carries enough conventional firepower to cause untold destruction, which USA would not hesitate to use, if the need arises.

**India and North Korea**

As per its policy of non-alignment, while India condemned North Korea as an aggressor in the Korean War and supported the UN Resolutions against it, India did not support the arming of South Korea, and called for a unification of the two nations. India’s support to the country then was more humanitarian, sending medical supplies and food to the beleaguered population.

Surprisingly though, India has continued to maintain reasonably good trade and diplomatic relations with North Korea; both countries maintain embassies in each other’s capital cities; India established consular relations with North Korea in 1962 and in 1973, established full diplomatic relations. India is one of the biggest trade partners and a major food provider to North Korea. As per data available from the GoI, Indian exports to North Korea in 2015-16, were more than $100 mn, while the imports totalled about $88 mn.

It may be of surprise and, some embarrassment, to the readers to learn of technical assistance provided by India. The Centre for Space Science and Technology Education in Asia and the Pacific (CSSTEAP), an institute located in the foothills of Dehradun and established with the UN in 1995, has been training North Korean students since its inception. The trainees in CSSTEAP have been students, scientists and space agency employees, most of who have participated in the space, missile, and nuclear programme of North Korea. What is disconcerting is that the continuation of training was exposed only in 2016 in an annual report, despite the first set of sanctions imposed by UN in 2006!

Where does India fit in this extremely complicated jigsaw puzzle of North Korea? In the preceding decades, the relationship has been frosty, to say the least, between the two nations due to North Korea’s links with Pakistan. Then in 2006, India joined the world chorus in condemning the nuclear test by North Korea; it had its geo-strategic compulsions, for the nuclear test had immensely complicated India’s quest for integration in the then existing nuclear order. Nevertheless, the Indian Government of 2006 did play some deft diplomatic moves to ensure the success of the Indo-US nuclear deal.

Notwithstanding the trade links, cordial diplomatic relations, and technical training, India has always voiced its disapproval of North Korea’s nuclear proliferation record. Regardless of maintaining such a ‘meaningful’ relationship with India, North Korea, however, has been continuing to help Pakistan’s nuclear missile programme and maintain military relations! The current tensions in the Korean peninsula, due to North Korea’s stubbornness in continuing nuclear and ICBM tests have made India take a relook at its relations. The Indian government has, since April of this year reduced its trade with North Korea, and now, has halted all trade, except for food and medicine; as part of the new ban, all military, police, scientific, and technical help is also barred. The Indian Government has also announced the freezing of all funds and financial assets held on its territory by the North Korean government.

North Korea’s nuclear program was one of USA’s first major post-Cold War crises.
The Current Situation

China can apply immense influence over North Korea; it accounts for 85 per cent of North Korea's foreign trade and could shut off its oil supply, but Chinese interests are not the same as those of America. North Korea is China's ally; even if the Chinese leadership disapproves of the North Korean regime, it would not appreciate unification of the two Koreas, which, in its opinion would lead to the loss of an important buffer. China, therefore has been going slow to exert pressure on North Korea, much to the annoyance of USA. President Trump, in end-July 2017, fired the first salvo in an effort to arm-twist China in exerting more pressure on North Korea, through announcing an examination of US-China trade policies.

On 05 Aug 2017, with an unanimous vote the tougher measures proposed in early July, after North Korea's first ICBM test, were accepted by the UNSC. This marked a symbolic victory for the Trump administration, which had been pushing China to apply pressure on North Korea, and had signalled its intentions to unleash severe trade measures against China. Would these fresh sanctions discourage North Korea from its continued goal of attaining a deliverable nuclear device? It appears not, for as with all previous sanctions, enforcement is the key issue.

All UNSC imposed sanctions, have had implementation and monitoring as the key issues. Member nations would now have to submit a self-raised report within three months, on implementation measures taken by them to the Security Council. As mentioned earlier, to safeguard their own interests, neither Russia nor China would want to see a collapse of the North Korean government, and both have numerous hidden openings to ensure its continuance. In the past too, Russia and China have passed sanctions, not exercising their veto powers, only to undercut them in practice. This three-month reporting deadline gives them a great leeway, as does the fact that member countries will be self-reporting on implementation.

North Korea’s reaction to the newly imposed sanctions have been on the expected lines. It has escalated its criticism of USA and the neighbouring allies – Japan and South Korea, and is now threatening to attack Guam – a US territorial island in the Pacific Ocean. The Korean State-run News Agency, has been quoted as saying, “Packs of wolves are coming in attack to strangle a nation....they should be mindful that the DPRK’s strategic steps accompanied by physical action will be taken mercilessly with the mobilisation of all its national strength.” (Hindustan Times, ‘Pyongyang threatens Physical Action’, 09 Aug 2017) In a display of its commitment to side with the international community in opposing North Korea's sabre-rattling, China has carried out live-fire drills with its navy and air force, off the Korean peninsula.

Further Course of Action

For all his eccentricities, Kim Jong-un, the ruler of North Korea, is behaving rationally. He has seen what fate befell Gaddafi of Libya in return for giving up his nuclear programme for better relations with Western nations. For him, the country’s nuclear arsenal is essential for his own survival, and President Trump’s ranting can do little to change his mind.

China would like to carve its regions of influence in the world, along with other great powers. While USA has long considered itself as the guardian of a rules-based world order, which applies to all nations, big or small, since the end of WW II, it is a different issue that the rules have been made by it, and also flouted by it! President Trump appears to scorn this rules-based order, which could make the world a dangerous place if China is permitted to defy the rules, as in South China Sea, as barter for leaning on North Korea.

China would gain if North Korea continues with its nuclear missile tests, and the two Koreas do not unite. It, however, would not gain if Japan and South Korea begin their own nuclear weapons programme, an unlikely proposition though. What USA should do is to reassure its allies of its protection, while addressing China's concerns too. To that end, President Trump should make it unambiguously clear to China that only the freezing of North Korea’s nuclear programme is its primary objective, and USA is not seeking a regime change. Should the two Koreas move towards reunification, USA, to allay Chinese, and to some extent Russian fears, must announce that its troops
along the DMZ would be withdrawn further south of the 38th parallel.

Russia voted in favour of the June sanctions in the UNSC, but vetoed an earlier April statement condemning North Korean tests and reportedly also blocking a 06 July 2017 statement, insisting that the term ICBM not be used. This was considered as a sign of further acrimony to follow, making USA directly warn Russia not to veto further sanctions on North Korea. Russia may provide some cover for China, which does not want to pressure North Korea too much but which also must also be seen to be cooperating with USA.

Diplomacy has failed because North Korea remains determined to build its nuclear arsenal. Resuming talks would achieve nothing, when it is so close to attaining an effective arsenal. North Korea now says that it will denuclearise only after USA and South Korea negotiate a peace treaty with it to end the Korean War formally. The only remaining hope for denuclearising North Korea peacefully lies in convincing it that it must disarm and reform, for continuing on the chosen path could lead to unimaginable consequences for it. Political subversion and financial isolation, through the latest sanctions, have to be backed with secondary sanctions against Chinese financial institutions and other institutions, which have been, on the sly, continuing trade and financial deals with North Korea.

In the current imbroglio, India needs to join hands with South Korea, Japan, China, and Russia to ensure that the lessons of the North Korean fiasco are properly understood by the Western nations. North Korean dictator Kim Jong-un has enjoyed the traditional protection of China, whose support is crucial to the survival of his regime. President Trump has been seeking China’s assistance, as have previous governments, with not too much of success. Although China has shown itself as making some efforts, which obviously are clearly not enough. The sharp US-China divergence on North Korea gives India a diplomatic opportunity as it seeks to counter China on several fronts for its support to Pakistan’s sponsorship of terrorism against India. As far as India is concerned, both China and Pakistan should be called to explain their past and present collusion with North Korea’s nuclear and missile programme.

As long as nuclear weapons exist and are legitimised in the doctrines and force postures of a handful of states, the “world nuclear order” will never be stable. Force and sanctions cannot deter a country from developing nuclear weapons. If anything can work, it is diplomacy and dialogue. Building of trust is a two-way street. In Korea, the international community seems to have missed the bus. The current GoI made some efforts to thaw relations with North Korea, when, in 2015, a cabinet minister attended North Korea’s independence-day celebrations at the embassy in New Delhi; India should build on it, even though trade ties have come under current sanctions.

There are no magic keys to solve the North Korea problem. Despite the constraints and compulsions that may arise from such an approach, one cannot eliminate every possible challenge, but, at least, the delinquent nation would get a message.

The current tensions in the Korean peninsula, due to North Korea’s stubbornness in continuing nuclear and ICBM tests have made India take a relook at its relations.

Air Marshal Dhiraj Kukreja, former Air Officer Commanding in Chief of Training Command
THE OFFSET POLICY- A DECADE IN RETROSPECT

Dr SN Misra

The offset policy is an important policy statement for the conservative defence manufacturing sector. It has to embrace design, development and manufacturing in its scope and encourage OEMs, design houses to have long-term partnership with the Indian defence industry. The private sector player must play a more dynamic role in this. The government should hand hold them in the matter of transfer of critical technology, and give tax relief for research activities. Brazil’s successful experiment with Embraer aircraft, where massive government support was provided in terms of galvanizing the scientific pool of the country and providing subsidy for research, should hold a useful template for India to emulate.

IN FEBRUARY 1991, DR MANMOHAN SINGH as Finance Minister had quoted Victor Hugo in his budget speech, “No one can stop a moment, whose time has come,” to usher in the economic liberalisation for the country. The defence production sector, a monopoly of the Public Sector Units (PSUs) and Ordnance Factories (OFs), took a decade more to unveil liberalisation by permitting 100 per cent private sector participation and 26 per cent Foreign Direct Investment (FDI) from foreign companies. All the same, the private sector was still treated as a contractor, and not as a partner. The credit for sowing the seeds of Public Private Partnership (PPP) goes to the Kelkar Committee (2005), which recommended the introduction of an offset policy, to bolster indigenous manufacturing capability. This policy which is in vogue in 130 countries, aims at leveraging big ticket acquisition in defence to inveigle the OEMs to (a) outsource orders to the importing country (b) prop up their export (c) encourage FDI inflow and (d) transfer key technologies.

The Defence Procurement Procedure (2005) included this policy to take advantage of large arms acquisitions, with Rs 300 crore as the minimum threshold and direct offsets as the preferred option. Offsets accounted for 30 per cent of the contract order. The policy has been tweaked several times since then. The FDI policy, in particular, has been significantly liberalised after the NDA government has taken charge in 2014. Presently, the FDI limit has been put at 100 per cent, without the necessity of having to obtain CCS approval. The MOD and the MHA would take such decisions in tandem, as the internal security products now come within the ambit of offset criteria.

This paper takes kaleidoscopic view of the offset policy over the last decade, its impact on bolstering indigenous defence manufacturing capability and the road ahead.

Offset Policy Over the Years

The literature on the subject has been rather wafer-thin, with a collection of articles edited by Stephen Martin (1996), recounting the experience of several countries. Subsequently, several articles and a pioneering book by the author on the offset policy and its impact in India have appeared. The focus of economists on this seductive public policy, given the scanty information base in the public domain, has been on four areas viz its impact on overall cost reduction, general economic development, ability to generate additional employment and quality of technology transfer.

The overwhelming view has been that implementing the offset policy entails an additional cost of three to ten per cent of the contract value (Brozoska). The benefit is limited to indigenous arms industry and not general economic development. The job opportunities are extremely limited (Skons) and generally helpful to the SMEs. Technology transfer is generally of low quality (Hartley).

However, the development of the Embraer aircraft by Brazil has been the clearest example of a successful offset policy through which Brazil has become a world leader in the regional jet market. Parlo Breeman brings out how massive government interest and subsidy have helped to forge a synergy between military and civil technology to make the offset policy a real success in Brazil. On the other hand, Bhaskaran brings out how India’s experience of technology transfer in areas such as fighter aircraft (1960s), frigates and tanks, has built
substantial indigenous military industry capability without “failing to close the technology gap.” The dependence on Original Equipment Manufacturers (OEMs) for even upgrades is perennial.

The offset policy since 2005 has been significantly amended to include areas such as (a) civil aerospace and internal security, (b) providing multiplier of 1.5 for investment in MSMEs and three for high technology areas (c) inclusion of eligible ‘services’ such as Maintenance Repair and Overhaul (MRO), upgrades, software development and (d) allowing investment in kind ‘TOT’ through the non-equity route. Most importantly, it now allows the private sector to compete in the production of surveillance vessels such as IPV and OPVs with defence shipyards. This has certainly brought in a whiff of fresh air in terms of timeliness in delivery, cost competitiveness and a level playing field in the shipbuilding sector. However, in the domain of aerospace, the private sector players are yet to play a definitive role in production of helicopters, trainers and transport aircraft.

The Impact of Offset Policy

Six years after the offset policy was introduced, there was cynicism from acknowledged experts on the subject that, “the economic benefits are unproven” (Paul Dunne). John Brauer was of the view that, “it is doubtful if relevant technology will be transferred by the OEMs.” Ron Mathew, drawing from the experience of the UK which allows 100 per cent FDI and China which allowed 51 per cent FDI to Embraer, concluded that India’s offset policy is, “overly prescriptive, complex and increasingly confused.”

Apart from the academics, acknowledged practitioners of offset such as M/s Lockheed Martin of the US was of the view that, “there is no real appetite within the Indian MoD to change the offset rules such that they achieve the goal of increasing indigenous capability of the Indian defence industry” (Philip Gergiaous).

The year 2011 witnessed a spate of new policy initiatives. The Defence Production Policy (2011), recommended simplification of procedure of the “Make” category giving preference to indigenous design and development, involving private sector in design and development of equipment and providing separate funding to academics and scientific institutes. The Rama Rao Committee (2011) advocated for the creation of a Defence Technology Fund. The Parliamentary Standing Committee (2011) also recommended the creation of National Design Institute in areas such as aerospace, naval and land systems.

Despite such enticing policy postulates, India’s dependence on arms imports continue to be humming at 70 per cent. Our design and development capability in the areas of sensors, propulsion and state of art weapons continue to remain abysmally low. No wonder that India is the largest importer of arms, weapons and platforms globally, as the following table will show:

The policy on FDI has been liberalised significantly over the years, with 49 per cent in 2014 and 100 per cent now…
Table 1: Main Importers Globally: Trends

<table>
<thead>
<tr>
<th>Country</th>
<th>Import %</th>
</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>14</td>
</tr>
<tr>
<td>South Arabia</td>
<td>7.6</td>
</tr>
<tr>
<td>China</td>
<td>4.7</td>
</tr>
<tr>
<td>UAE</td>
<td>4.6</td>
</tr>
<tr>
<td>Australia</td>
<td>3.6</td>
</tr>
<tr>
<td>Turkey</td>
<td>3.9</td>
</tr>
<tr>
<td>Pakistan</td>
<td>3.3</td>
</tr>
<tr>
<td>USA</td>
<td>2.9</td>
</tr>
</tbody>
</table>

Source: SIPRI Year Book (2016)

FDI Inflow

The policy on FDI has been liberalised significantly over the years, with 49 per cent in 2014 and 100 per cent now. The FDI has largely flown into sectors such as the services (18%), construction (1.3%), telecom (7.1%), computer software (5.7%) and drugs (5%). However, FDI inflow till 2011 for the defence sector was paltry. The total inflow of FDI to all sectors of the Indian economy and the defence sector in recent years is shown below.

Table 2: Total FDI Inflow and Inflow into Defence

<table>
<thead>
<tr>
<th>Year</th>
<th>Total FDI Inflow (In Billions)</th>
<th>Inflow into Defence (In Lakhs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013-14</td>
<td>$32</td>
<td>$8.22</td>
</tr>
<tr>
<td>2014-15</td>
<td>$45</td>
<td>$0.8</td>
</tr>
<tr>
<td>2015-16</td>
<td>$60</td>
<td>$0.95</td>
</tr>
</tbody>
</table>

Source: DIPP

It would thus be seen that increase in FDI cap to 49 per cent has come a cropper. India has finally adopted the right global model of allowing more than 50 per cent FDI into the defence sector. This will hopefully entice the OEMs to have a long term stake to invest in India and nurse India as part of the ‘global supply chain’. This can also spur them to bring in critical technologies, since they will have a major say in the management of the production entity and IPR.

Multiplier

A novel feature of the DPP-2016 has been to afford a multiplier of one and half times to SMEs and three to critical technology to DRDO where there is no restriction. The DPP (2016) brings out some of the areas where a multiplier of three can be afforded.

Table 3: Critical Technology Areas

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>System/ Sub System</th>
<th>Critical Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Gas Turbine Engines</td>
<td>Single Crystal, Special Coaling</td>
</tr>
<tr>
<td>2.</td>
<td>Missiles</td>
<td>FPP Seeker</td>
</tr>
<tr>
<td>3.</td>
<td>Aeronautics</td>
<td>Stealth, Smart Aero Structure</td>
</tr>
<tr>
<td>4.</td>
<td>Naval System</td>
<td>Super Cavitations Technology</td>
</tr>
<tr>
<td>5.</td>
<td>Sensors</td>
<td>AESA Radar, RLG, SAAR, Nano Technology</td>
</tr>
<tr>
<td>6.</td>
<td>Material</td>
<td>Carbon Fibres</td>
</tr>
<tr>
<td>7.</td>
<td>Avionics</td>
<td>Gen III Tubes</td>
</tr>
<tr>
<td>8.</td>
<td>Surveillance</td>
<td>UAVs, AESA Radar</td>
</tr>
</tbody>
</table>

Source: DPP 2016

Dr APJ Abdul Kalam, as Special Advisor to the Raksha Mantri, chairing a committee for improving Self Reliance Index for India, had identified all the above technology areas way back in 1992. He had
suggested substantial investment in these technology areas by having partnership with reputed OEMs and design houses. The Committee had expected the SRI to go up from 30 per cent (1992) to 70 per cent (2005). Sadly, the SRI for India remains glued at 30 per cent even now. The Dhirendra Singh Committee (2015) on strategic partnership model hopes that India would achieve SRI of 70 per cent by 2022!

Offset Contracts

12 offset contracts were concluded during the period 2005 to 2012 with a value of $1.5 billion. Subsequently, ten more contracts have been concluded in the period 2013-2016 with a value of $1.5 billion approximately. The experience so far has been that OEMs outsource low-end manufacturing and machining jobs to private and public sector companies in India. The offset limit has now been increased from Rs 300 crore (2005) to Rs 2,000 crore (2016).

One of the major contracts where there could be a major offset spin off is the contract for 36 Rafale fighter jets with Dassault Aviation of France with a contract value of Rs 39,000 crore. Of this, close to Rs 22,000 crore worth of offsets would be discharged by Reliance Defence which has formed a JV with Dassault. This would indeed be a major trigger for private sector investment in India in the defence sector. The Tatas have also been eyeing the UAV segment and Mahindra and Mahindra is looking at armoured vehicles.

However, the “Make” procedure is still limping as the DRDO’s record in delivering critical prototypes such as the Kaveri Engine, FPA, AESA radar, Ring Laser Gyro and Astra has been poor. However, in ‘Buy’ (India) and ‘Buy & Make’ category a healthy trend is noticed in recent years as compared to the ‘Make’ category, as the following Table shows.

<table>
<thead>
<tr>
<th>Year</th>
<th>Buy (India)</th>
<th>Buy &amp; Make</th>
<th>Make</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-11</td>
<td>60839</td>
<td>16710</td>
<td>15845</td>
</tr>
<tr>
<td>2013-14</td>
<td>21001</td>
<td>2733</td>
<td>0</td>
</tr>
<tr>
<td>2014-15</td>
<td>3838</td>
<td>72750</td>
<td>0</td>
</tr>
</tbody>
</table>

Source: Dhirendra Kumar Committee Report (2015)

The Way Forward

From a conservative cautious hobble, the offset policy has become more robust with a liberal FDI policy (100 per cent), inclusion of multiplier for MSMEs and critical technology and allowing offsets for services and synergistic sectors like civil aerospace and internal security. All the same, the mood of the Foreign OEMs and design houses to invest on a long term basis in India is not particularly upbeat. A number of MoUs have been crafted but in concrete terms the JV of Reliance Defence with Dassault is the most promising development.

A few concerns would need to be grappled by the government in order to galvanise the indigenous military industry. Defence manufacturing is not about manufacturing fuselage for aircraft or a hull for the frigate and tanks. It starts with major design capability and culminates into bulk production. Most of the defence PSUs such as HAL and MDL have become a system integrators, but they remain assemblers of imported parts rather than being significant value adders.

The following three areas would need to be addressed for revamping and bolstering defence manufacturing in India.

Busting the Public Sector Monopoly

The 1956 Industrial Policy resolution made the DPSUs and OFs the sole recipient of technology from abroad and nominated as production agency. This has constantly disheartened the private sector players who have built significant sinews over the year to manufacture, integrate and deliver major weapon systems and platforms in time. The Kelkar Committee (2005) set the tone for PPP and the Dhirendra Singh Committee (2015) has also triggered a real hope of kick-starting a strategic partnership model. This will enable identification of private sector players who would be on a par with Navratna Defence PSUs. The OEMs are generally keener to partner with such private sector players, given their reputation of being technically fleet footed, dynamic and time as well as cost compliant. The fillip to the MSMEs by the present government through the Mudra initiative for funding, IT relief the sector in the last budget and allowing a multiplier of one and half times are in sync with best global practices. The MSMEs indeed play a critical supportive role to the big manufacturing hubs. The government must ensure that the strategic partnership model is taken to its logical conclusion, without being waylaid by vested interests in DPSUs and OFs.

The 1956 Industrial Policy resolution made the DPSUs and OFs the sole recipient of technology from abroad and nominated as production agency...
Bolstering Indigenous Research Capability

The record of DRDO for delivering critical platforms such as the LCA and MBT has not been edifying. The failure of the Kaveri engine for powering the LCA has been a major setback in our ‘propulsion’ programme. The ‘Make Procedure’ envisages providing 80 per cent funding to private entity which makes a successful prototype. This has so far come as a cropper. The major ‘Make’ programme for communication links up to the unit level is the field areas is still caught up in the tussle between private and public sector to be implemented. The suggestion for creating a National Institute for Design is yet to be operationalised. India spends around 0.8 per cent of its GDP on R&D compared to five per cent by most developed countries. The major private sector players hardly spend money on research. The design capability of Navratna PSUs such as HAL and BEL is wafer-thin. The Navy has some design capability but not in state-of-the-art areas like nuclear submarine technology.

It is high time that the suggestion of the Rama Rao committee for creating a Defence Technology Fund and setting up a National Institute for Design on Aeronautics, Naval and Land Systems be put in place. India can ill afford to be an assembler of critical subsystems imported for abroad. It must ink partnerships with major design houses for bolstering design capability.

Including Indirect Offset and Civil Ship Building Sector

It is important that the offset policy allows indirect offset in its ambit. It would help investment in sectors such as education, health and infrastructure. Countries like Germany, South Korea, Brazil, Australia, Turkey, Spain, Poland, Israel and Canada profit substantially from indirect offsets. The Make-In-India initiative has fortunately brought the defence manufacturing as part of national manufacturing momentum. Fortunately, the policy makers in defence, who have looked at defence manufacturing as a water tight compartment, have realised the imperative to work in synergistic sector and dual use technology items.

It is surprising how the civil ship building segment has not been made part of the synergistic sectors, unlike aerospace. During the 10th Plan, a subsidy scheme was introduced for the ship building sector as per which 30 per cent subsidy was being given for export order. This increased India’s global share for 0.2 per cent (2002) to 1.3 per cent in (2007). This scheme was withdrawn in 2007, plummeting exports to 0.01 per cent, while countries such as South Korea and China are out competing their Western counterparts. The government needs to revisit its policy on ship building sector in a synergistic manner.

Dual use technology such as laser, cryptology, nano technology, Artificial Intelligence, sensors would have a cascading impact on all sectors. Investment in biotechnology, energy, higher education and agricultural research, investment in infrastructure are where India is seriously lagging behind. Indirect offsets to these sectors would go a long way in bolstering the overall manufacturing and design footprint of India.

The offset policy is an important policy statement for the conservative defence manufacturing sector. It has to embrace design, development and manufacturing in its scope and encourage OEMs, design houses to have long-term partnership with Indian defence industry. The private sector player must play a more dynamic role in this. The government should hand hold them in the matter of transfer of critical technology and give tax relief for research activities. Brazil’s successful experiment with Embraer aircraft, where massive government support was provided in terms of galvanising the scientific pool of the country and providing subsidy for research, should hold a useful template for India to emulate.

South Korea and China, who have became major manufacturing hubs in areas such as shipbuilding and aircraft manufacturing have struck viable partnerships with OEMs and design houses. India must close the technology gap and overcome the impression of non-Indian defence contractors that it is not keen to bolster its indigenous manufacturing capability and be policy friends. The present policy on offsets need to be further revamped to give more meaningful role to the private sector, encourage dual use technology and improve the design capability of India in critical subsystems.

Dr SN Misra, former Director DRDO and Joint Secretary - Aerospace, MOD
PAKISTAN FOR BALOCHISTAN, NOT BALOCHIS
——— RSN Singh ———

Just as Pakistan is not interested in Kashmiris but the territory of J&K because of its innate desire to control the complete Indus River system, it is also not interested in Balochis but the land of state for its mineral resources and strategic location. Pakistan in a way has sold both the Gilgit-Baltistan in POK and Gwadar port in Balochistan to China by way of China-Pakistan Economic Corridor (CPEC).

BALOCHISTAN PROVINCE OF PAKISTAN constitutes nearly half of country’s landmass, i.e. 347,190 sq km. This province has never accepted the Pakistani framework of nation-state. Most Balochis maintain that they have been Balochis for three thousand years, Muslim for maybe thousand years and Pakistani for 70 years, therefore, the Pakistani identity means nothing to them. The Balochis straddle the Iran and Afghanistan border, at least 30 percent are in these countries.

The contrast between Balochistan and Kashmir Valley in geopolitical terms is telling. While Balochistan which is half of country has been in incessant struggle to secede from an artificial nation-state entity, the separatists in the Kashmir Valley that comprises less than seven percent of the geographical area of J&K are clamouring for Pakistan.

Just as Pakistan is not interested in Kashmiris but the territory of J&K because of its innate desire to control the complete Indus River system, it is also not interested in Balochis but the land of state for its mineral resources and strategic location. Pakistan in a way has sold both the Gilgit-Baltistan in POK and Gwadar port in Balochistan to China by way of China-Pakistan Economic Corridor (CPEC).

Some Punjabis in Pakistan have told this author that they do not even switch off the gas during winters for the to obviate the sacrifice of a matchstick. Pakistan’s three nuclear weapon sites are also located in the province. And yet, 85 percent of the population in the province does not have access to safe drinking water, some 80 percent do not have electricity, 63 percent are below poverty line and 70 per cent of the children do not have access to education.

The Baloch are Hanafi Sunnis. A strong group of Zikri Baloch, having a population of about 700,000 inhabit the Makran area. They believe in the 15th century teachings of Madhi Nur Pak – an Islamic Messiah of the 15th century. They have their own prayers and do not fast during Ramadan. Significantly, Hindu Shrines in Balochistan continue to be revered and zealously preserved by the Balochis, the most important being the Hinglaj Mata Temple, one of the major Shakti Peeths in Hindu religion. Despite every kind of exertion by radical organizations like Jamait-ul-Dawa, the Baloch people have fiercely resisted the spread of Wahabi brand of radicalized Islam. Balochistan has so far not produced one suicide bomber. But unabashedly Kashmir Valley has allowed itself to be radicalized by killing Kashmiriyat.
The province comprises four erstwhile princely states of Kalat (largest), Makran, Kharan and Lasbela. In the second half of the 18th century, the Khan of Kalat, Naseer Khan, had unified most of Balochistan. During the British rule, Balochistan was divided into British Balochistan and Native Balochistan, having control over 25 percent and 75 percent of the total territory, respectively.

The British Balochistan primarily constituted the Pathan belt. In Native Balochistan, most tribal leaders paid tribute to the Khan, who in turn paid royalty to the British. The tribal sardars (leaders) continued to exercise overwhelming political, economic and social influence over their tribe. Just after Pakistan came into being, Mir Ahmad Yaar Khan, descendent of Naseer Khan, declared independence in accordance with the three options given to the princely states before partition -- independence, accession to India, or accession to Pakistan. To facilitate independence, Yaar Khan had also appointed a Briton, Douglas Fell, as his foreign minister.

In April 1948, the army was deployed in Kalat, and the Khan was forced to accede to Pakistan. The Khan’s brother did not agree to the accession and established himself in the border regions in Afghanistan from where he launched an armed campaign against the Pakistan troops in Balochistan. By June 1948 Balochistan was merged with Pakistan. The rebellion against the merger was not countrywide, but it did add to the serious doubt about the capability of any religion to be the sole cohesive force to hold a nation together.

While Indian leaders were busy issuing contradictory statements, Pakistan acted swiftly. According to human rights defender Waseem Altaf in Viewpoint: “On orders emanating from Mr Jinnah, Balochistan was forcibly annexed to Pakistan on 28th March 1948 when on 27th March 1948, Lt Colonel Gulzar of the 7th Baluch Regiment under GOC Major General Mohammad Akbar Khan invaded the Khanate of Kalat. General Akbar escorted the Khan of Kalat to Karachi and forced him to sign on the instrument of accession while Pakistan Navy’s destroyers reached Pasni and Jiwani.”

The criminality and immorality of Jinnah lies in the fact that he had been hired by the Khan of Kalat to negotiate the ‘Independent Status’ of Balochistan with the British, and indeed three months before partition he mooted an ‘An Independent State of Kalat’. As per a communiqué of 11 Aug 47 sovereignty status was conferred to Kalat. Baloch activists have told this author that the Khan weighed Jinnah in Gold and his sister, Fatima, in Silver for the legal services that he had provided. The same Jinnah by Oct 47 decided to betray and eventually invaded Balochistan. For seven months, i.e. August 1947 to March 1948, Balochistan was a free country. The comparison between Balochistan and J&K is again tempting, i.e. while Balochistan was annexed by Pakistan, J&K acceded to India.

Even as the Pakistan Army invaded Balochistan, none of the Congress leaders including Gandhi as well as the then Governor General Lord Mountbatten made a whimper of protest or condemnation. Maulana Azad, it is said was steeped in Arab version of Islam and therefore considered all other brands like Balochi brand as inferior.

Former R&AW Chief, Vikram Sood, in an article in February 2006 said that the Baloch leaders visited India and wanted to draw attention to the fact that their state was different and wanted to be treated on par with Nepal. He further maintains that the new Indian rulers Delhi were too preoccupied with Kashmir to realize the strategic significance of a sovereign Balochistan.

The upheaval being witnessed today in the Islamic world is largely due to the struggle between Islam and ethnicity. This has been endemic in Islamic countries right from the beginning. Islam actually encountered some very superior civilizations in Byzantine (present day Syria), Persia (present day Iran), Central Asia and of course the Indian subcontinent. The Arab forces could impose religion but could never conquer ethnicity, culture and language. Ethnicity in case of Pakistan triumphed over religion and consequently Bengali speaking East Pakistan became an independent country, Bangladesh. The same narrative continues to struggle with Islam in states of Pakistan like Khyber-Pakhtunkawa, Sindh and Balochistan.

To forge national unity on basis of geography and Islam, the rulers of Pakistan introduced the one-unit scheme in West Pakistan, thereby
merging Khyber-Pakhtunkawa, Sindh, Balochistan and Punjab. It triggered violence throughout Pakistan including Balochistan. The Balochis considered this as a ploy of Punjabi domination. Punjab with 56 percent population, the Punjabis are seriously afflicted with the attitude that they are the sole owners of Pakistan. 70 percent of the Pak Army is Punjabi and even in Baloch regiment, Punjabis comprise 80 percent personnel. Even in POK, the area which Pakistan designates as Azad Kashmir, there are no Kashmiris and the Kashmir narrative is scripted by Punjabi politicians, Punjabi Army and Punjabi jihadi organizations like LeT and JeM.

When under the One-Unit Scheme all the provinces were dissolved in West Pakistan in Oct 1954, entire Balochistan rose against it. More than 1000 army troops were deployed to quell it. The violence came to an end only after the one-unit scheme was abolished in 1970. After the loss of East Pakistan in 1971, Bhutto considered Balochistan to be the greatest threat to national integrity. A new wave of unrest was sparked off by the dismissal of a non-PPP government by Bhutto. He justified his action on the grounds that there were serious designs to dismember the country, as evidenced by large cache of arms and ammunition (350 Soviet sub-machine guns and 1000 rounds of ammunition), which were recovered from the house of Iraq’s political attaché in Islamabad.

It may be mentioned here that until 1973 Balochistan did not have an elected body and was ruled by the Governor General. This is the reality of democracy in a Pakistani province which constitutes nearly 50 percent of the territory. Even before Pakistan had recovered from the loss of East Pakistan, a full-fledged insurgency broke out in 1973 in Balochistan. The Shah of Iran was highly apprehensive that the Baloch insurgency would encompass the Baloch population in Eastern Iran. He even sent 30 Cobra helicopter gunships with Iranian pilots to help Pakistan.

In the four years (1973-77) that the insurgency lasted more than 80,000 troops were deployed to suppress the rebellion, and 5,300 Balochis and 3,300 army personnel were killed. Ironically, a large number of troops that were deployed against Balochis, their own countrymen, were the ones who had been repatriated from India as POWs in 1971 war. There were 93,000 of them.

At one stage in 1974, Mirage aircraft and helicopters were also used, when some 15,000 rebels took on the army and a pitched battle ensued. The Baloch insurgency did peter out, not only because of the army action, but also due to the lack of coordination among various groups. The most important groups were Baloch Peoples Liberation Front (BPLF) and Baloch Students Organisation (BSO). The leftist elements played a key role in this insurgency, but later split up into pro-Soviet and pro-China factions.

The Zia regime can be credited with bringing a fair degree of stabilisation in Balochistan. He appointed Lt Gen Rahimuddin Khan as martial law administrator and Governor. During the eight years that Gen Rahimuddin presided over Balochistan, he acted like a dictator of the province, almost independent of Islamabad. His authoritarian style of governance, coupled with good administration did bring about social stability to the province.

With the restoration of parliamentary democracy in 1988, the Baloch leaders began to participate actively in politics. The two important parties were the Balochistan National Movement of Sardar Akhtar Mengal, and the Balochistan National Alliance of
Nawab Akbar Bugti. Gradually, these political outfits began to be ridden with factionalism, and many splinter groups arose. Each splinter group made alliances with one mainstream party or the other like the PPP, PML (N), as well as the JUI.

The Baloch, who in general had supported the overthrow of Bhutto by Zia-ul-Haq, have not actually let their struggle die. Army and Frontier Corps personnel continue to be deployed in large numbers. The insurgency under the leadership of Bugti intensified soon after Musharraf’s coup in 1999. Nawab Bugti was killed in Bhamore Hills of Balochistan on 26 August 2006 in a military operation, in which helicopter gunships reportedly fired cluster bombs and laser guided missiles to target him. The killing was in retaliation to the firing on Musharraf’s helicopter by Bugti’s lieutenants, when the former was carrying out aerial survey of the area a few days earlier.

During the annexation of Balochistan and thereafter the Pakistani military has used every conceivable arsenal against the Balochis, this includes fighter aircraft, tanks, armoured personnel carriers and helicopter gunships. In contrast, India has also tackled many insurgencies including the Pak-sponsored proxy war in Kashmir but has never used such arsenal against its own people.

The Baloch oppose the establishment of army cantonments at Kohlu, Dera Bugti and Gwadar. In Balochistan, with its highly inhospitable landmass, daily subsistence is itself a stark, tough problem. Quite naturally, they resent its energy supply serving the rest of Pakistan with no real benefits accruing to the Balochis. Nor are they happy about the Centre’s appropriation and gifting of Gwadar Port to China as part of China-Pakistan Economic Corridor.

There was a significant escalation of violence in the region after Musharraf signed a deal with China in March 2002 for the development of Gwadar port. The Baloch people lament that the Gwadar area had been appropriated by the Generals and sold to Karachi and Punjabi business magnets at astronomical prices. The Gwadar city, 650 km from Karachi with a population of 100,000 became part of Pakistan only in 1958.

In the late 18th century the local ruler had ceded Gwadar to the ruler of Muscat, who used its port for trade with Central Asia, which included slave trafficking. The progeny of some African slaves continue to be a part of the ethnic fabric of Balochistan. All the 22 districts of Balochistan have been impacted by insurgency. Gas supplies from Sui, Loti and Pir Koh gas fields have been disrupted on several occasions. So far nearly two lac people have been displaced in Balochistan due to the ongoing insurgency.

The Pakistani establishment has been unleashing suicide bombers to tackle the insurgency in Balochistan. Its actions have become more desperate in view of the pressure to remove obstacles in the implementation of the CPEC. Recently, on 08-August-2017, 54 lawyers became victim of suicide attack in a Quetta hospital. They had gone to the hospital’s emergency ward to lookup one senior lawyer, Bilal Anwar Kasi, who had been killed earlier in a suicide attack. Most Balochis are of the firm belief that the killings were handiwork of the Pakistani State as many of the lawyers were Baloch activists - supporters, and very much vocal against the interference of the Pakistan military in affairs of the state. Thus an entire generation of young Balochi intellectuals was wiped out.

Balochistan under the present military, Islamic and historical narrative will continue to defy the idea of Pakistan.

RSN Singh is a former military intelligence officer who later served in the Research and Analysis Wing, or R&AW and author of books Asian Strategic and Military Perspective and The Military Factor in Pakistan. His latest book is The Unmaking of Nepal.
The relationship between information and combat is well known. However, the challenge has always been as to how it can be maximized. All military operations are conducted in three domains. Two of these – the physical domain and the domain of the mind are well known and understood.

The physical domain is where attack, defence and manoeuvre occur – on ground, sea, air or space. Elements of this domain are easy to measure, like lethality and survivability. The domain of the mind is where battles are won and lost. This is the domain of the intangibles: leadership, morale, unit cohesion, level of training and experience, public opinion and so on. Key attribute of these intangibles have remained relatively constant.

The third domain is that of information. It is this domain which is now increasing combat power in a broad range of operations. It is Network Centric Warfare (NCW) capable forces that help us to share a common operational picture, resulting in a very high level of shared situational awareness. In its effort for capacity building in NCW, the Army has been working to develop its Tactical Command, Control, Communications and Information (Tac C3I) System. Within the Tac C3I, the subsystems of Command Information Decision Support System (CIDSS), Battlefield Support System (BSS), Artillery Command Control and Communications System (ACCCS), Air Defence Control and Reporting System (ADC&RS) and Battlefield Management System (BMS) are all bound by the CIDSS as the backbone, also configured to integrate systems like the EWS and ELINT. Sub-systems of Tac C3I are in varied stages of implementation. The only information system fielded is the ACCCS.

Battlefield surveillance relates to the ability to obtain real or near-real time all weather picture of battle space. This encompasses human intelligence (HUMINT), technology related imagery intelligence (IMINT) and signal or communication intelligence (SIGINT) together with intelligence, surveillance and reconnaissance (ISR).

The basic concept of battlefield intelligence is to obtain knowledge of the battle space enabling detection of changes to interpret intention, actions and deployment of the enemy, to enable pre-emptive action.

Indian Army’s BSS, named ‘SANJAY’, was conceived to develop an automated system with dedicated intra-communication, which involves integration of surveillance sensors at Division and Corps level on a customized Geographical Information System (GIS) platform with multi sensor data fusion undertaken at the Surveillance Centre for providing inputs to the CIDSS. The requirements at Brigade level were included later in 2008. Phase 1 involved provision of the concept by developing a test bed system, which has been completed and operational validation accorded. The system was developed on turnkey basis by BEL in collaboration with Centre for Artificial Intelligence and Robotics (CAIR).

Phase 2 of Project Sanjay involves equipping all Corps of the Army after successful completion of ‘proving phase’. Responsibility for development of the system in Phase 2 is also with BEL and is behind schedule by many years. As per initial plan, equipping was to commence in 2010 after the ‘proving phase’, however, BEL had been facing problems in the development, akin to the case of the Artillery Command, Control and Communications System (ACCCS) of limited indigenous capacity in applications, design and software customization though bulk hardware and technology was imported. Also the initial contract for BSS having been concluded for Rs 1,035 crore, development was delayed since it is linked with the application of the under development CIDSS.

Along with the contract for equipping the CIDSS, a second contract of Rs 2.635 crore for the BSS was also signed but the system is yet to take off. There were also delays in procurement of hardware (data radios, tactical computers) plus the Army’s reluctance to sign ‘End User Certificate’ and delay in selection of a ‘Common GIS’. The initial PDC of 2008 having been delayed it was later hoped that the test bed for ‘proving phase’ of Phase 2 was to get going by mid 2012 and the complete fielding pan-Army was to be completed by year 2017 but this has not taken off yet.

Meanwhile, the Army introduced another battlefield communication system for use on the Line of Control (LoC) as also other tactical and operational situations in August 2016; by developing its own 3G network-based technology where smartphones could be used to capture and share live images and videos for operational purposes. The upgraded 3G version named Mobile Cellular Communication System (MCCS) was launched in the Srinagar-based Corps. MCCS is a cellular system and offers enhanced security, better voice quality and high data rates.

As per media, quoting Army sources, sharing images and videos could be done only by using a monitor which is connected to the internet through optical fibre, which has limited scope but makes it possible to share images using smart handsets. MCCS is reportedly secure and dependable since it uses Arm’s own algorithm. This system also aids Army’s Long Range Reconnaissance and Observation System (LORROS).

For Phase 2 of Project Sanjay, the Army was to supply the vehicle, which is part of the contract between the MoD and BEL. However, this has not been done so far. While the deliberations continued, last year Tata Motors bagged an additional order for supply of 619 numbers of 6x6 High Mobility Vehicles (HMVs), multi-axle vehicle with material handling cranes, for the Indian Army, which was the single largest order to an Indian private Original Equipment Manufacturer (OEM). This was a follow on order to an earlier order received by Tata Motors in year 2016 for 1,239 such HMVs. The Army has now identified this 6x6 HMV as the vehicle required for the BSS.

The Directorate General of Information Systems (DGIS) has written to the Master General of Ordnance (MGO) to procure the vehicles. How much time the MGO Branch will require to complete the procurement process is not known. However, once the vehicles are procured and handed over to BEL, the requirement will be to mount the system onto the vehicle and produce a prototype. How much time BEL would take to do so is not known. The prototype, once developed, will then need to undergo extensive trials including its integration with the CIDSS which to has not been fully developed and fielded yet. It is only after these trials are successful that the fielding of the BSS pan-Army can commence; completion of which could well take anything up to a decade or more.

The irony in all this is that technology is developing at such fast pace that information systems get outdated before a two-year period elapses. The danger always is that state-of-the-art systems being provisioned, older systems can be provided to make additional money through ‘upgrades’ moment the system is fully fielded, and this unfortunately has precedence in development of systems by DRDO-DPSUs.

Lt Gen Prakash Katooch is a former Director General Information Systems, Indian Army.
China did India a favor in 1962 by waking up the Indian government, especially the deceptive Prime Minister of the time, though it really killed him very quickly after. The conflict brought the Prime Minister to his senses about the reality of defense, military, and the realpolitik. The conflict made India to consequently invest heavily in defence. This came after 15 years of denial of growth to the Indian military. The massive re-militarization drive and expansion of the armed forces, especially to mention the massive expansion of the Border Roads Organization of that time, was a godsend for India when Pakistan attacked in 1965. Had China not attacked India, Kashmir and more might have been in Pakistan’s hands in 1965. The continued attention to military matters at the time, largely as a result of the 1965 war, helped in the liberation of Bangladesh in 1971. The boundaries of India could well have been different today, i.e., worse, had it not been for the wake-up call of 1962. Let’s thank the Lord God for what we must thank Him for.

The Pakistan invasion continued to keep India awake. But, the victory of 1971 and the emergency that followed, lulled India to sleep and put military innovation on the back burner, exemplified by the submarine-manufacturing program being shelved in the 1970s.

**Kargil**

Through all of the 1970s and 1980s India was being considered by the West as a Soviet-camper, the blatant Kargil operation by Pakistan brought world attention to the aggression by Pakistan, and built world sympathy in India’s favor. The world got more impressed by India after India showed immense political restraint, though many at the time argued for a stronger response, such as crossing the LOC, even though the Indian Chief of Army Staff at the time resoundingly stated that - “we will fight with what we have” – a sharp dig at the Indian government, politicians, and IAS babus that had denied India military modernization for two decades. Now, India began to modernize with greater earnestness, though that was probably still not enough.

In any respect, India gained great goodwill around the world as a responsible nation, a development that led to George W. Bush opening up to India in only after a year, as soon as he was elected. This cozying up by USA to India has had its own dividends for India that benefited by receiving modern armaments, new defense technologies – and most importantly – moral support and an alliance as a “natural partner” with USA. Kargil was a great favor to India, mainly because India came out on top after adversity.

**ATTACK ON PARLIAMENT**

The attack on Parliament in 2003 further did another great favor to India, as it strengthened India’s resolve to combat terrorism, improve military logistics and troop movements, and developed the cold start doctrine. But then, stupid Indian governments continued to drag their feet on aircraft replacement/replenishment, submarine manufacture, indigenous defense manufacture, or in improving the capabilities of the infantry soldier.

However, major strides came in other areas – aircraft carrier development, raising of a new mountain strike corps (still going slow), and procurement of assets from Israel and USA. In the last three years, major initiatives at military modernization are seen visible.

**Doklam**

The Doklam incident has made China look like a fool and a bully around the world. Next, India’s strong resolute stand has earned it great respect around the world, and for the first time in a long time, the world has come to recognize that India is no pushover anymore. A new India has emerged. This has further nuzzled China, which is already losing face on the incident – something that the Chinese feel very sensitive about. That Chinese pride has been blunted is good for India and all of China’s neighbors that feel threatened by China.

While Philippines and the world could not stand up to China’s aggression in the South China Sea, and China’s Air Defense Zone is still active around the Senkaku islands, China has drawn no gains from the present episode in Doklam.

China would do India an even greater favor if it were to militarize the Doklam incident, much as it threatens to do within two weeks. First, a bold India could do more than give China a bloody nose – it could maul China.

The roads that China has made on its side are also good for India, because an attacking Indian army can use those very roads to reach Lhasa and other strategic bases. India must actually thank China that China’s roads will make it easier for India to go deep into Tibet, which is not Chinese territory.

**WAR WITH CHINA**

A war with China will give the Indian Navy a golden opportunity to interdict all supplies going to China via the Malacca Straits and knock around the PLA Navy in the Indian Ocean – something the Indian Navy has been itching for a long time. India will also have a great opportunity to attack Chinese assets in Hambantota, Bangladesh, Maldives, and Myanmar – and wherever else in the Indian Ocean. In addition, the Chinese soldiers in Baltistan are sitting ducks for Indian aerial attacks.

A war with China where India comes out better, will be a great boost to India’s morale, avenge the 1962 setback, and make the world pay heed to India as a great power. As such, confidence of the world will restore in India, resulting in an even further increase in FDI coming to India, and boost Indian manufacturing and exports. The confidence of Indians will also be restored, which will have the effect to increase industrial labor productivity in India.

Already, China has done India a favor by making itself look diplomatically insolent. If it is not content with that, it can do India another favor by getting a bloody nose from India, as well. And, if China is still not content with that, India’s contingency plans could include capturing valuable real estate in Tibet and declaring a Free Tibetan government in Lhasa. China will lose great international respect at that time. That will be a windfall for India.

Should some think that China will get into a cyber war and a war of missiles aiming to damage Indian infrastructure and industry, let them not forget that two can play the game. The falsity of Chinese military superiority in Tibet may be exposed. Its airfields are far and at high altitudes, restricting the range of their fighter aircraft. Its soldiers will be at the mercy of the Indian air force, and this time around India will use its air force. Chinese tanks and artillery are not of the high quality that would bring fear to India.

China’s diesel submarines are mostly old, many getting obsolete, and easily picked off by Indian submarine-hunters, if China ever decides to be brave enough to front them. But, India’s aircraft carrier can cause havoc for Chinese shipping and the PLA Navy in the Indian Ocean. China’s economy will take a huge hit because of the interdiction of shipping and will feel the effect after only five days of war. So, let’s hope that Xi Jinping is irrational enough like his younger half-brother Kim Jong-un. A Chinese war with India will be a favor to India.

**Closure**

And, let’s remember that Chinese pride and arrogance will bring about its downfall. A war with China will vindicate India and remove India’s shackles. A successful war will enable India to advance and progress at galloping speed in its economy, industry, and innovation. The moment in history, and the opportunity of a century is in the waiting for India should China be foolish enough for an misadventure with India.

Of course, I feel for the brave Indian soldiers and officers, and have great pride and respect for them. And, I feel anger at the politicians and former Indian diplomacy that take away India’s pride and honor. Yet, let’s not be scared to face the mythical dragon, and let’s thank the dragon for having a conflict with India, and thus doing a rare favor to India.
EVERY SOLDIER MUST READ THE
Shekatkar committee report submitted to the
government in December, 2016.

Committee, indeed, burnt the proverbial ‘mid-
night oil’ in making recommendations covering
a vast canvas viz higher defence organization, re-
structuring/staffing of defence ministry, performance
audit of ordnance factories and DGQA to name a
few. Almost deliberately the committee ‘Failed’ to
corner the government on the following major issues
afflicting the Indian Military. These are:–

• Crying need to re-write the Defence Procurement
Policy, wherein the executive body the Defence
Procurement Board must be headed by the
Respective Service Chiefs and not by Defence
Secretary as at present, which remains the
biggest bottleneck and delays virtually every
single acquisition, be it indigenous or from a
foreign vendor.

• Omission by choice of not even mentioning the
acute shortfall in our War Wastage Reserves
(WWRs) and emergency measures required to
bridge the gap on priority.

• Welfare measures for our soldiers viz housing,
children education and rationalization of grant
of Military Service Pay to soldiers.

Indeed the committee will rebut the above
inconsistencies by merely saying that these issues
were outside the terms of reference given. May I,
for the benefit of all soldiers, Shekatkar Committee
members in particular, submit the operative directions
given by the government to the committee.

GOVT OF INDIA HAD CONSTITUTED
Shekatkar Committee

“To recommend measures for enhancing combat
capability and re-balancing defence expenditure of
the Armed Forces with an aim to increase “Teeth To
Tail Ratio”.

Readers are requested to digest the government
directive to the committee. It simply meant the
following:-

• Existing Combat Capability is not in consonance
with the strength of the Military.

• Government perception, rather belief was that
there are far too many individuals (read able
bodied soldiers) involved in so called “Non-
Combat Related” activities.

• Suggest measures to “Re-Balance” (read make
do with 1.6% of GDP as Defence Budget) the
Defence Expenditure.

Military has been castigated by one of our own. The
operative part of the committee report reads:-

“…proposed Reforms (read re-grouping) will
improve operational efficiency of the Army by
‘pushing soldiers from Non-Operational Duties to
Operational Tasks’.”

As a soldier I wish to ask Lt General Shekatkar a
fundamental question.

“Is an ill equipped soldier deployed on Line of
Control performing an operational task?”

The bane of Indian Military is poorly equipped
soldiers and not utilization of able bodied men for
sundry duties. The committee in recommending
withdrawal of 57,000 men from so called non combat
duties and arriving at savings of Rs 25,000 crore is an
hogwash.

A three star officer headed committee has
unequivocally stated that the past and present military
leadership is oblivious of the fact that ‘able bodied’ soldiers are employed in ‘non-operational’ duties and goes on to add that it is happening with their tacit approval, albeit in not so many words as I have stated.

Salient highlights are:-

• The committee made a total of 188 recommendations, which in itself is an ‘auditor centric approach’.

• Defence Ministry has selected 99 of these recommendations dealing directly with Air Force, Army and Navy (Services are mentioned in correct Alphabetical order) for implementation.

• The Defence Ministry has deliberately not included any recommendation dealing with Re-Structuring of the Ministry, at least for now.

• As of now 65 of the 99 recommendations pertaining to Army have been approved for implementation.

• A strategic decision of far reaching consequences has already been taken by the ‘cosmetic’ Raksha Mantri by approving the closure of 39 Military Farms in a time bound manner. Such decisions of extra ordinary valour will improve and enhance the overall military capability overnight. What an outstanding humour, Mr Minister!

Unless we accept and take the challenge that reforms in the military must be genuine and not merely cosmetic, Indian Military Capability will continue to diminish with every passing year. Sticking to age old crib of 3% of GDP defence budget would get us no where unless we can prove to ourselves that the Military Establishment comprising of Raksha Mantri, Service Chiefs and Defence Secretary is capable of ‘spending’ the entire annual allocation on account of “Capital Expenditure”. We have failed to do so for past two decades.

The Defence Ministry has deliberately not included any recommendation dealing with Re-Structuring of the Ministry.

Committee’s ‘silence’ on improving/reforming/re-structuring the ‘R&D’ is deafening. Unless we help and create a vibrant “R&D” establishment, we cannot expect to acquire advanced and modern fifth generation weapon platforms and systems. It is ironic but true that the committee has deliberately failed to address the Macro-Issues. Merely recommending re-grouping of few services does not enhance overall operational capability of the military.

Combat effectiveness as I understand can be stated thus:-

“If our soldiers are adequately equipped to counter, challenge and face the adversary when the need arises, they are ‘combat ready’ even if engaged in so called non operational duties. To further illustrate the point if our soldiers are equipped with a rifle having a kill range of one km and the adversary is equipped with a rifle having a kill range of 1.5 km, our soldiers are not ‘combat ready’ entirely due to failure on part of the agency (read MoD) to equip them with a rifle of kill range greater than 1.5 km.” Does it leave any doubt in anyone’s mind as to what we imply when we use the term ‘combat ready’?

In my view the Committee discussed the ‘daily chores’ and ‘house keeping’ rather than the issues of far reaching consequences. Current dispensation in Government of India dealing with military affairs is neither capable nor desirous of implementing genuine reforms such as disbanding the Ordnance Factory concept. If any institution of the country, which has failed the nation in acquiring self sufficiency in military hardware, it is the Ordnance Factories. These mammoth organizations are an outstanding example of inefficiency, incompetence, corruption, non accountability and indecision. For how long would the nation carry the burden of the ‘Garbage’ in form of Ordnance Factories? Committee’s deliberate failure to address the issue is unfortunately their tacit approval for rewarding incompetence and inefficiency at the highest level.

Comment by civilian at IDSA sums up recommendations of Shekatkar Committee most aptly “Measures are welcome but fall short of drastic measures required to enhance combat effectiveness of Army (read Military). Pay and Allowances of Indian Army (read military) are simply unsustainable”.

How did a three star General heading the committee missed the obvious is a moot point?

**FORECAST**

• Shekatkar Committee report will be consigned to the proverbial ‘DUST BIN’ in the Ministry of Defence as it did to the Late Subrahmanyam committee report post Kargil fiasco. Under no circumstances will the bureaucracy allow...
lateral/direct induction of a serving/retired military officer in the inner ‘sanctum-sanctorum’ of Ministry of Defence. The temporary political boss, the Raksha Mantri (permanent boss is the defence secretary as told to me by a former Chief, who used to play Golf with the then Minister of State for Defence), will sing the same tune. Ministry will not even discuss/deliberate recommendations regarding ‘their’ re-structuring, the most important and rational recommendations made by the committee.

- In fact on the basis of Shekatkar Committee report, which essentially has delved on regrouping, the Service HQs would be burdened with sending monthly/quarterly feedback to the ministry regarding implementation of recommendations.

- There will be no change in the Defence Procurement Policy. Defence Procurement Board, the executive body responsible for weapons acquisition will continue to be headed by the Defence Secretary as at present.

- Ordnance factories will continue their normal business wasting thousand of crore annually with NIL/NO accountability.

- Our R&D will continue to languish in their attempt to create their own empire on one hand and Military’s inability to co-ordinate the process of development.

- Shekatkar committee has deliberately undermined the status of Service Chiefs by recommending the appointment of a Four Star General to act as a coordinator amongst the three Service Chiefs, directly implying that the Service Chiefs are not capable of resolving their differences and arrive at a decision acceptable to all in the interest of national security.

I wonder if this Government found time to read the Subrahmanyam committee report before ordering the Shekatkar Committee. It still can look into the Subrahmanyam committee recommendations, with specific reference to reorganization/restructuring of the Ministry of Defence. Teeth to tail ratio will automatically improve.

It was a ‘God Sent’ opportunity for the military when the government of the day decided to appoint a committee headed by a uniformed person with exemplary professional credentials. But the opportunity has been spurned and wasted by the committee wasting their precious time on recommending internal reforms (essentially housekeeping), which could well have been done within the ambit of existing dispensation. It would be truly defending the indefensible if my observations are viewed in any other manner. After all 99 of 188 recommendations deal with purely internal reorganization/regrouping.

I would have been delighted as a soldier to read merely three recommendations dealing with defence procurement, improving standards of R&D and erasing the flab of ordnance factories. At least this is what we as soldiers should have said. On the contrary Shekatkar committee has unwittingly added plethora of new returns required to be sent to MoD as ‘progress report’ on implementation. I won’t even term/consider the supposed saving of 25,000 crore as pittance. Teeth To Tail Ratio improves when our soldiers are equipped with better personal weapon than INSAS rifle against an adversary equipped with predator class UAVs, M4 assault rifle, Glock model 19 pistols, ceramic plated body armour, satellite telephones, GPS trackers and so on.

Ministry will only be too happy to receive a report of this kind, which recommends that all/most measures are to be taken by the military itself. In any case making as many as 188 recommendations in itself is/was a self defeating agenda. In doing so military has failed to hit the ‘bulls eye’ by a mile, may be more. The committee should have made recommendations regarding organizational reforms starting with the Ministry and placing them in the “Must Implement” category. Internal reforms, which essentially can be termed as regrouping should not have been part of the main report. Indeed these could have been attached for review by respective Service HQs.

To sum it up; Shekatkar Committee report is an ‘Auditor’s Report’ submitted to the ‘Super Auditor’ of the nation, Mr Arun Jaitley and has ‘Nil’ to ‘Negative’ operational value and content.
WHO MADE NORTH KOREA A NUCLEAR POWER? DR A.Q. KHAN?
——— Sumit Walia ———

North Korea is in news again. It is threatening South Korea, the United States and the entire world with its nuclear and missile arsenal. Most in the world are not much worried. They consider it as a regular bluff by North Korean dictator. But one never knows when that cruel dictator would become adventurous and pull a stunt that could have far reaching consequences.

Ever wondered how North Korea a country that has a worst kind of communist dictatorship, that starves and tortures its own citizen, where there is no proper education system, no technological/engineer base became a nuclear power.

Readers would remember that famous confession of Dr A. Q. Khan, Pakistan’s infamous ‘nuclear’ scientist. It was on 4th Feb 2004 when Khan appeared on the television and confessed to have supplied nuclear technology and components to North Korea, Iran and Libya. Khan accepted his crimes in English and not in Urdu, which is the language understood by most Pakistanis. That telecast was actually for the international audience, specially the United States and European intelligence agencies. Khan explicitly mentioned that this proliferation network was entirely of his own and Pakistani government or authorities were never involved.

But was it true?

North Korea’s nuclear ambitions started in late 1950s/early 60s. Erstwhile USSR agreed to set up their first plutonium based nuclear reactor at Yongbyon-Kun for peaceful use of nuclear technology. Later North Korea set up more reactors, signed NPT to get access to latest technology, allowed IAEA inspectors to inspect its nuclear facilities but never gave up its desire to have ‘the bomb’. In 1993, IAEA’s inspection team had concluded that North Korea is not completely honest about its ‘peaceful’ nuclear program and had reprocessed nuclear material at least thrice – in 1989, 1990 and 1991.

But North Korea was still far from detonating a device.

Here it will be interesting to note that after Pakistan’s nuclear tests in 1998, a US sniffer aircraft flew over the test sites and took air samples. US Los Alamos nuclear laboratory tested those samples and found out that the final test(s) was conducted using plutonium as fuel. Now Pakistan had left the plutonium route long ago in 1975 when Khan bought stolen Centrifugal technology from Europe where he was working for URENCO as a technical translator. So why they detonated a plutonium device? CIA believed that Pakistan detonated a North Korean nuclear device based on plutonium fuel.

CIA and western agencies had reasons to believe.

If we check western intelligence agencies declassified information and investigative work by leading journalists, it becomes clear that their cooperation started long ago. Apart from China, Pakistan was the only major country in the world who not only maintained diplomatic relations with North Korea but received weaponry from them as well. But the cooperation in Nuclear and missile field started in late 1980s.

Investigative journalists Adrian Levy and Catherine Scott-Clark did a commendable job while investigating Pakistan’s quest to acquire nuclear weapons and their proliferation. Their book ‘Deception’ explains it all. In 2006, they interviewed Benazir Bhutto in Dubai. She revealed some interesting facts.

This evil thought of proliferation for monetary gains was the brain child of Pakistani Army Chief General Mirza Aslam Begl. Towards the end of 1989, Benazir was the Prime Minister and in a meeting (attended by Gen Jahagir Karamat, DGMI and Gen Hamid Gul, DGISI) Gen Beg briefed her about the Kashmir situation and suggested to fuel the insurgency by setting up more training camps, providing weaponry & logistic support, infiltrating 100,000 battle hardened Afghan Mujahedeen. Benazir was already under pressure due to poor economic state of the country and from the United State. She did not agree to escalate the situation, however she agreed to let Pak Army continue the low level insurgency.
Beg’s second proposal was far more dangerous. To run the low level insurgency, Pak needed money from sources independent of IMF funding, US aid etc. This was the first time when he suggested to sell off the nuclear technology and assistance to likely customers. Bhutto was stunned and could not believe her ears. But the only customer she could thought of were Iraq, Iran and may be Libya. She then told the General that IMF gave around $200 million a year to Pakistan and how many ‘customers’ he thought would give Pakistan that big amount. And for how many years? What would happen when those customers have got what all they needed? What will happen when international community get to know about this proliferation?

Bhutto rejected the idea and a disappointed General left her office. Bhutto claimed she had no clue about when happened later as military would keep her away from Khan Research Laboratory and the nuclear program.

But the general did not stop. In an interview given in 2006, then Ambassador of the United states in Pakistan, Robert Oakley informed the authors of the book that soon after the meeting with Bhutto, Gen Beg went to Iran to get their support in Pak’s proxy war in Kashmir and in return offered Iranians support in their nuclear program. Oakley had informed US administration about this development but considering the Afghan Jihad, the US administration kept quiet.

Benazir also revealed that Pak Army and AQ Khan did not lose hope. In Dec 1993, She was to visit Beijing and AQ Khan approached him again. He met Benazir and requested him to visit Pyongyang with a special request. Khan wanted Benazir to ask North Korean dictator for NoDong missiles. He argued that Pakistan was developing short range missiles which were not enough to hit deep inside India. He said that ‘we have bomb but we cant deliver it’. Benazir was again shocked but agreed for a short trip to North Korea on her way back.

She discussed Khan’s proposal to her then Counsel – Hussain Haqqani. He advised her not to fall in the trap of Security establishment but Bhutto did not want to cross Army’s way again. She tried earlier during her first term as the PM and she was accused of being a threat to the national security and her government was dismissed. Bhutto did not want that to happen again. She claimed that she believed that missile deal would be against cash. She had no clue about Army and Khan’s plan to exchange nuclear technology instead.

Bhutto flew to Pyongyang on 29th Dec 1993 and during the dinner, a nervous Benazir leaned over North Korean dictator and said “Give my country Nodong missile’s blue prints, we need those missiles”. Kim stared at her while she repeated the request. After a few moment’s silence he agreed.

Bhutto came back with a bag full of technical papers and disks.

Soon Pak Army and Khan got what they wanted- Nodong missiles. They hurriedly test fired it. Dr Shafiq, son of Brig Sajawal who was in-charge of facilities administration of KRL, revealed to Adrian Levy and Catherine that ‘there was so much excitement that no one cared to notice that paint on the missiles were still wet’. Leading newspaper The Guardian had reported the same while quoting David Wright, the co-director of the global security programme at the Union of Concerned Scientists”The first result was the Ghauri, a missile with a range of 1,500kms (930 miles). Basically, it was a repainted North Korean missile.”

An evil deal had started where Pakistan’s Uranium Enrichment technology was being exchanged for North Korean missile technology and some “cash”.

In 1995, former US ambassador to Pakistan Robert Oakley (mentioned above) held a conference in Washington where he invited three persons from Pakistan – former vice-chief Gen (R) Arif, Mr. Agha Murtaza Poya - Editor-in-Chief of the newspaper ‘The Muslim’ and famous Pakistani journalist and editor of ‘The Friday Times’, Mr. Nazam Sethi. During the conference, Oakley surprised all of them by showing photos of Pakistani Air Force’s C-130 planes unloading centrifuges and loading Nodong missile components. But Pak again denied conducting any such exchange.

Soon there were plenty of other proofs. Khan and PAF C-130s started making frequent trips to North Korea. CIA and other agencies tightened their grip over Pakistan’s network. US administration could no longer resist pressure from State Department and Intelligence agencies, who were giving irrefutable proof of Pakistan Security Establishment’s (Army leadership and Khan) one stop shop that was supplying everything to North Korea, Iran and Libya – from blue print to actual centrifuges, technical support, bomb design and trigger mechanism. Everything was on offer for dollars...
WHO MADE NORTH KOREA A NUCLEAR POWER? DR A.Q. KHAN?

– most of the amount went to Pak treasury and some of it went to personal pockets. In 2011, Washington Post\(^2\) reported that Khan had released a copy of a letter from a North Korean official, dated 1998. The letter had details of the transfer of $3 million to former Pak army chief Jehangir Karamat, and $500,000 and some jewellery to another military official, Lt-Gen Zulfiquar Khan.

In 2002, US officially announced that they had proof of Pakistani had exported the centrifugal technology to North Korea. But Pak President Musharraf did not hand over Khan for any investigation. But when pressure kept mounting, Pak Security Establishment persuaded Khan to take the sole responsibility in country’s “national interests”. Khan was assured that there would be no trial, no one will be allowed to question him and at most, he would be under house arrest.

But the Pak-North Korea cooperation never stopped. As per Sunday Guardian\(^3\) report, some sources suspect that North Korea is conducting nuclear tests for Pakistan to provide vital data to Pakistan. This crucial data is needed to perfect the tactical nuclear weapon designs and their mating with the North Korean missiles.

Interestingly China, the mentor and major supporter of both these countries, came out as the main beneficiary of this game. In early 1990s China had refused to provided M-11 missiles to Pakistan as it was normalizing its relations with the United States and was hoping to sign trade agreements to transfer manufacturing from the US to China. But China never stopped North Korea or Pakistan to fulfil each other’s needs. China had earlier provided bomb design to Pakistan and now both his main allies are threatening his arch enemies – the United States and India.

Notes

Sumit Walia is an IT Specialist. He is also a military history buff who continues to explore & research various facets of the Indian Military history in his spare time.

TERROR FUNDS IN INDIA: MONEY BEHIND MAYHEM

Dr V Balasubramaniyan & Dr SV Raghavan

2017 • ISBN: 9788170623168 • PP 400 • HB • ₹995 • eBook Available

In the bulk of literature about terrorism in India, one vital aspect has seldom been studied or researched – money behind terrorism. However, the 2008 Mumbai attacks, commonly known as ‘26/11’ changed this to a great extent. In the immediate aftermath of the 26/11 attacks, the Indian government commissioned specialised agencies and enacted legislations in order to curb the money flow to terrorist and insurgent groups like LeT, IM, Maoists, and the ULFA.

Money pays for organisational costs such as indoctrination, recruitment, training, weaponisation, shelter, infrastructure, safe houses etc., and operational costs such as planning and executing terror attacks. These groups individually generate anywhere between ₹25 crore to ₹1000 crore annually to underwrite their expenses.

Is it really possible for these groups to generate such astronomical sums giving legitimate corporate houses a run for their money? Is it really possible to quantify their annual budgets? If so, how does LeT, IM, Maoists, and ULFA raise, move and store such phenomenal sums of money?

Terror Funds in India: Money Behind Mayhem seeks to unravel this labyrinth of the financial networks of these groups individually and their money supply chain which has fuelled terrorism in India for decades. In an attempt, this book has captured the transition in the financial networks from traditional sources of funding such as state sponsorship to financial sources such as FICN, kidnapping for ransom, extortion, levy etc. And more importantly, new age financial sources using social media platforms such as Twitter, Facebook etc. have also become a major source of revenue generation mechanism for these groups.