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India's ballistic missiles could be a game-changer

India just test-launched an indigenous, nuclear-capable ballistic missile. On February 15, the India's Economic Times reported that the country's military had fired a Prithvi-II missile from a mobile launcher. According to the Economic Times, the missile was "randomly chosen from the production stock," meaning that it wasn't specifically modified for testing purposes. This isn't the first test of the Prithvi-II, which has a range of over 200 miles according to Economic Times, and over 150 miles, according to the Arms Control Association. But although the missile entered service in the Indian military in 2003 and was first test-launched in 1996, it's experienced test failures as recently as 2011, while the missile used in this week's test did not hit its intended target even though it reached its intended distance and altitude. The fact the Indian military has had even mixed success in firing an apparently randomly selected Prithvi-II from a mobile launcher suggests that the country really has developed a semi-reliable nuclear delivery system that it can indigenously produce. The Prithvi II gives India the ability to make its own mobile nuclear-capable ballistic missiles with a far-enough range to hit nearly every major city in Pakistan from inside Indian territory. An indigenous missile capability is crucial for India, which is a confirmed nuclear

weapons state but not a member of the Non-Proliferation Treaty.

Although India's nuclear program has been semi-recognized through its landmark 2008 nuclear treaty with the United States, the fact that the country has developed nuclear weapons outside of the NPT makes it highly unlikely that an outside country would provide Delhi with a strategic delivery system. India also faces a ballistic missile asymmetry. China has aided Pakistan in its ballistic missile development, providing nuclear-capable missiles with a 186-mile range along with suspected technological assistance on longer-range delivery systems. In contrast, the US discouraged India from developing the Prithvi class of missiles throughout the 1990s. Washington is understandably nervous about the appearance of encouraging strategic weapons proliferation, and one of the rationales of the 2008 nuclear treaty was to give the US additional leverage over the development of India's program. The Prithvi II encompasses the tensions of

THE KEY ISSUES

Kashmir

The heart of the hostility and the cause of two of the three wars since independence from Britain in 1947

- ▶ Separatists want Kashmir to become part of Pakistan but Kashmiris want independence from both India and Pakistan

Water

Use of water, from rivers that rise in Indian Kashmir and run into Pakistan, is governed by the 1960 Indus Water Treaty

- ▶ Pakistan says India is unfairly diverting water with upstream construction of barrages and dams. India denies the charge

Siachen Glacier

Indian and Pakistani forces have faced off in the mountains since 1984

- ▶ India is unwilling to withdraw forces until Pakistan officially authenticates the positions they hold
- ▶ Pakistan is willing to do so but on condition that it is not a final endorsement of India's claim over the glacier, one source of meltwater for Pakistan's rivers



Afghanistan

Both neighbours have long competed for influence there

- ▶ Pakistan accuses India of using Afghanistan as a base to create problems inside Pakistan
- ▶ India worries that an Afghanistan dominated by Pakistan's allies in the Taliban after a U.S. pullout would allow anti-Indian militants a base from which to launch attacks

Security

India blames the 2008 Mumbai attacks on Pakistan-based militants and wants Islamabad to show it is serious in reining in those behind the raids which killed 166 people

- ▶ Pakistan accuses India of backing separatists in its Baluchistan province, providing weapons and funding to Pakistan Taliban groups

India's nuclear weapons program. On the one hand, Delhi aspires to a position of global leadership that an overly reckless nuclear weapons program would arguably undermine. At the same time, India needs to keep up its deterrent capability against its primary strategic opponent, a nuclear-armed Pakistan. Pakistan is determined to have a nuclear edge on India, building warheads at a faster pace than its rival and testing an intercontinental missile that would be capable of covering the entirety of Indian territory. In contrast, India is more populous and less diplomatically isolated - and can produce road-mobile missiles capable of hitting just about any major city inside of Pakistan. Both countries' ballistic missile development show that India and Pakistan's rivalry is as dangerous as ever.

Business standard
19 Feb, 2016

No Rafale deal unless price is right: Parrikar

Business Standard understands that Dassault has quoted about Rs 91,548 crore, while Indian negotiators are refusing to go above Rs 68,499 crore

Defence Minister Manohar Parrikar bluntly stated on Thursday that negotiations for buying 36 Rafale fighters from French aerospace vendor, Dassault, were deadlocked on the issue of price, and that no deal would be signed until the price was right.

Well-informed defence ministry sources that are close to the negotiation say there is a wide gulf between the two sides. "The difference between what France is demanding and what India is willing to pay is too large to bridge easily - about 25 per cent."

Business Standard understands that Dassault has quoted about Rs 91,548 crore, while Indian negotiators are refusing to go above Rs 68,499 crore.

Parrikar told India Today TV: "Price is the problem which has to be resolved. Unless I get the right price, I cannot sign."

Debunking recent media articles that a deal was imminent, most recently in Hindustan Times on February 11, Parrikar said ironing out the remaining issues would take "a few months".

Pressed on the question of time-frame, Parrikar responded: "You can't commit yourself to a time, because this is not a negotiation for a few hundred crores. This is thousands of crores. I should not... put a time line on my price negotiation."

On January 25, during his visit to Delhi, French President Francois Hollande declared after signing an inter-governmental agreement for the supply of 36 Rafales, "There are some financial issues that will be sorted out in a couple of days..." It now appears he may have been speaking figuratively.

On January 27, French ambassador to New Delhi, Francois Richier, put a deadline of four months for the price to be negotiated.

On Thursday, Parrikar also confirmed that India had demanded offsets worth 50 per cent of the deal value, and that Dassault had agreed to that condition.

"We have resolved all the other issues. There were terms of guarantees, there were terms of supply, there were terms of how it will be done", said Parrikar.

The defence minister denied that the window was open for buying more Rafale fighters, beyond the 36 being currently negotiated. "As of now, the negotiation is for 36 (fighters). There are many possibilities, but this deal is for 36", he said.

When Prime Minister Narendra Modi, on a visit to Paris last April, requested for 36 Rafales, New Delhi and had Paris agreed the price would be less than what Dassault had quoted in response to the Indian tender of 2007 for 126 medium multi-role combat aircraft (MMRCA). Of those 126 fighters, the first 18

were to be supplied in "flyaway condition", i.e. fully built. Since 36 Rafales are now being bought in "flyaway condition", their per-piece price must be lower than what Dassault quoted for those 18 fighters.

The Indian Air Force had chosen the Rafale on January 31, 2012, in India's tender for 126 MMRCA aircraft. However, in protracted price negotiations that followed, the defence ministry found problems in Dassault's financial bid. Eventually, Modi chose to abandon the MMRCA tender, and instead buy 36 Rafales over-the-counter.

The Hindu
19 Feb, 2016

Hurt by U.S. plan to sell F-16s to Pakistan: Parrikar

Expressing "hurt" over the U.S.' decision to sell Pakistan eight F-16 fighter jets, the government said it had made it clear that the deal was unacceptable to India.

"I am quite hurt by [the sale of F-16s to Pakistan] and we have expressed our opinion quite clearly to the U.S.," Defence Minister Manohar Parrikar told India Today TV's 'To The Point' programme in an interview on Thursday.

The Minister's statement comes nearly a week after the Ministry of External Affairs had summoned U.S. Ambassador Richard Verma to express India's "disappointment" and displeasure over the announcement of the deal worth approximately \$699 million.

While the U.S. government had formally notified its Congress of its intention to make the Foreign Military Sale (FMS) last Friday, the deal may take some months, especially after objections from Congressmen of any plans by the U.S. of subsidising the deal.

Sources said India had made it clear that not only was its opposition to the deal over the fact that the military hardware would be used to bolster Pakistani defences against India rather than counter-terror operations, it was also upset by the timing of the deal.

Senior officials said the F-16 sale came even as India was hoping to keep the pressure on Pakistan to deliver action on the Pathankot terror attack.

Asked if the U.S. decision and rejection of India's concerns went against Prime Minister Narendra Modi's statement that India and the U.S. were "natural allies," Mr. Parrikar told journalist Karan Thapar, "There are ups and downs in all relationships. Overall the relationship has improved a lot. Of course, this [F-16 sale] is a [down]. We don't accept this deal and that is what we have told the U.S."

The Times of India
19 Feb, 2016

'UK's Make in India expertise in Def more than any other country'

The UK may have lost out in the race to supply fighter jets to IAF, but remains quite gung-ho about stepping up its international strategic partnership with India as well as the "Make in India" policy. This has gained momentum after PM Narendra Modi's visit to the UK last November, visiting British minister of state for defence procurement Philip Dunne tells TOI. Excerpts: What brings you to India?

This is my second visit to India. I attended the Aero-India at Bangalore in 2013. I am also looking forward to the DefExpo at Goa next month. After the very important visit by PM Modi to the UK, at which PMs Cameron and Modi signed a defence and strategic partnership agreement, I have been tasked by our defence secretary (Michael Fallon) to provide some impetus to the agreement, give it some teeth. So, I came to invite defence minister Manohar Parrikar to the UK, set up some strategic direction and identify areas where we can collaborate. There are some areas where India has a clear expertise that we would like to benefit from, and vice-versa.

How do you see the international security situation and the emerging threats?

We were elected on a manifesto to restore defence and security as a government priority. We are increasing defence spending. Our analysis is that there are common threats being faced by many nations, including democracies like the UK and India.

At one level there is the ever-growing threat of terrorism. At the other, it's more assertiveness by countries like Russia and China. So, we need to be in a position to respond to the entire spectrum of threats.

I will require more international collaboration. We see India playing an increasingly important role.

What do you have to say about China's aggression in the South China Sea?

The role security plays in freedom of navigation, freedom of trade is vital to all trading nations like the UK, India and even China. For many years, we have been present in the Gulf with mine hunting naval capability in order to ensure safe passage around the Strait of Hormuz. We have decided to establish a permanent naval base at Bahrain, the first permanent military base for the UK, east of Suez, since the 1970s. It will allow the Royal Navy to have a permanent presence on the edge of the Indian Ocean. We have also been active for years in the international effort to counter piracy off the coast of Somalia.

Indian Navy has been an important contributor to this effort as well.

The Modi government has really been pushing the Make in India policy.

Are there any concrete proposals for collaboration?

We recognise this is a legitimate aspiration for India to encourage collaboration to develop in-country capabilities, building skills and employment prospects. We have a similar agenda in the UK. So, we share that objective. Some of the best examples of Make in India in the defence world are with the UK, like Jaguar fighters and Hawk advanced jet trainers. Rolls-Royce is another good example. There is this proposal to upgrade the Hawk trainers into combat Hawks, with missiles, guns, rockets. We think that's a clever way to develop some additional air combat capability. We will be very interested in discussing it.

The Times of India

19 Feb, 2016

Lockheed Martin ready to make F-16 jets in India

US fighter jet maker Lockheed Martin on Thursday said it is ready to manufacture F-16 aircraft in India and supports the ongoing talks between the two countries to set up the first manufacturing facility, which could be one of the largest projects under 'Make in India'.

"We are ready to manufacture F-16 in India and support the Make in India initiative," Phil Shaw, chief executive of Lockheed Martin India Private Ltd told reporters at the Singapore Airshow 2016.

But the American corporation's executive did not commit any time-frame to have the plant operational, saying the group supports the ongoing talks. Shaw expressed strong interest in having the F-16 made in India "soon" without elaborating on the time-frame, linking it to the progress of the government-to-government talks.

Currently, Lockheed Martin manufactures one jet a month from its plant in the US and has a series of contracts and joint ventures in India with over 1,000 employees.

Industry observers said Lockheed Martin's "wish to manufacture F-16 is based on the strong demand from the Indian armed forces and would want to lower the cost of the planes for exports by using the low-cost capability in India".

"Certainly, Lockheed Martin would want to exploit the engineering skill and low cost capabilities in India and make F-16 competitive in the fighter jet markets," source said. "Both the US government and Lockheed Martin see the advantage of placing a manufacturing base in India and make F-16 affordable for emerging markets," the source said.

India's defence policy **High on aspirations**

PM Modi reiterated that India's strategic deterrence is "robust and reliable", in accordance with the country's nuclear doctrine

In a clear sign that long-neglected maritime security interests are gradually gaining prominence, the Navy hosted the President and the prime minister in less than two months. As many as 71 Indian ships and 50 navies of the world participated in the International Fleet Review held on February 6, where President Pranab Mukherjee took the salute.

Speaking on the occasion, the President said: "The Indian Navy... has re-aligned its maritime strategy, to reflect the changes in the evolving global environment, and has established a credible record of cooperative initiatives to promote stability of the oceans, and played a central role in ensuring safety of the vital sea lines of communication, across the Indian Ocean."

On December 15, Prime Minister Narendra Modi made a rare statement on India's defence policy in his address to the Chiefs of Staff and the Commanders-in-Chief of the armed forces on board the aircraft carrier INS Vikramaditya.

Modi spoke of a "new intensity and purpose" in the country's foreign policy, noted that India is now being increasingly seen as a "force of regional and global peace, security and stability" and emphasised the need to strengthen India's existing strategic partnerships while forging new ones. He mentioned India's extensive outreach to countries along the rim of the Indian Ocean and noted with approval the articulation of a new maritime strategy.

The prime minister noted, "Our responsibilities are no longer confined to our borders and coastlines. They... spread across a world of widespread and unpredictable risks." He said while the character of conflict and the objectives of war are changing with evolutions in defence technology, "Old rivalries can play out in new theatres such as space and cyber."

Speaking about nuclear deterrence, Modi reiterated that India's strategic deterrence is "robust and reliable", in accordance with the country's nuclear doctrine and "our political will is clear." As doubts have been expressed about the yield of the fission-fusion warhead during the tests in May 1998, the statement was meant to reassure the armed forces and the nation. Nuclear signalling is always carefully noted by nuclear-armed adversaries as well as the international community.

The prime minister took stock of the full spectrum of threats and challenges in India's neighbourhood and said that the shadow of West Asian instability is getting longer. Modi said he believed that "India and China can engage constructively across the complexity of their relationship" and stated his government's intention to "develop greater mutual understanding and trust in our overlapping neighbourhood."

On Pakistan, the prime minister said the renewed engagement would "try and turn the course of history," but his bold gamble at Lahore was followed by terrorist strike at the Pathankot air base and on the Indian consulate at Mazar-e-Sharif in Afghanistan.

On defence preparedness, Modi said the pace of improving border infrastructure and the process of defence procurement are being speeded up and many long-pending acquisitions of weapons and equipment have been approved. He spoke of "firm steps to address shortages and cater for replacements."

Deficiencies still persist

Large scale deficiencies, however, continue to persist in the holdings of weapons, ammunition and equipment by combat units. The Ministry of Defence is unable to procure a suitable modern rifle - the basic weapon used by infantry soldiers. Successive Comptroller and Auditor General (CAG) reports have

highlighted the alarmingly low levels of operationally critical tank and artillery ammunition held by the Army.

In the past, the CAG has pointed out that the serviceability state of the Navy's submarine fleet is rather low due to the non-availability of adequate spares. Another recent CAG report pointed out that the strength of the Indian Air Force is down to 35 squadrons (aviation analysts put the figure at 30 to 32); the serviceability rates of the Sukhoi fleet - India's frontline fighter aircraft - is as low as 55-60 per cent due to the lack of spares and inadequate repair facilities.

Hence, while the prime minister recognised the imperative necessity of improving the level of defence preparedness by making up the existing deficiencies, he did not mention whether additional budgetary support would be forthcoming. Pegged at 1.74 per cent of the GDP in the current financial year, the defence budget has been steadily declining in real terms and is now at the lowest level that it has ever been since the debacle in the 1962 war with China.

Also, while the threats and challenges to national security are increasing and India is being called upon to contribute as a "net provider of security" in its area of strategic interest, the process of military modernisation has been stagnating. It was at a standstill during the 10 years of the United Progressive Alliance (UPA) government and has not yet been substantially speeded up due to the ongoing resource crunch, though weapons acquisition projects worth Rs 1,05,000 crore have been approved in principle.

It has even been reported that the Mountain Strike Corps approved by the UPA government is being raised by depleting the war reserves rather than by acquiring new weapons and equipment. The Indian armed forces are still a mid-20th century force facing a collusive threat from Pakistan and the rapidly modernising People's Liberation Army of China, which is also undertaking structural reforms to improve its combat efficiency.

Finally, though Modi touched on the need for undertaking reforms in defence management, he made no mention of the government's position on formulating a comprehensive national security strategy that is inter-ministerial, inter-departmental and inter-agency in approach so that India's comprehensive national strength can be synergised to achieve the desired national security objectives.

Deccan Herald
19Feb, 2016

Pak may use F-16s against India

The US's proposed sale of eight F-16 fighter jets to Pakistan has understandably raised concern in India. The Barack Obama administration claims that the sale of the jets is to "enhance Pakistan's ability to conduct counter-insurgency and counterterrorism operations." This is a disingenuous explanation. F-16s are not the best aircraft to be used in counter-insurgency situations. They are more suitable for use in conventional war. The supply of F-16s to Pakistan will only embolden its military to indulge in provocative, indeed reckless behaviour vis-à-vis India. This has been the experience over the last seven decades. Washington's supply of combat aircraft to Pakistan in the Cold War years was ostensibly meant to fight Communism but Pakistan used it in its wars against India. The US is well aware of it. Yet it is keen to sell the F-16s to Pakistan, not bothering about its negative impact on India-Pakistan relations or even Pakistan's domestic politics for that matter. Supply of aid and equipment to the military has in the past tilted the military-civilian balance in Pakistan in favour of the military. At a time when Pakistan's fragile democratic institutions are struggling to break free of military pressure, it is unfortunate that the Barack Obama administration is weighing in on the side of the generals.

It is likely that the US is selling the F-16s to Pakistan to get its military's support in fighting the Taliban in Afghanistan. That is, the jets are to ensure good behaviour on the part of the Pakistani generals. But this has never worked in the past. Has the US forgotten that its \$3,6 billion military aid to Pakistan in the 1980s, which the then American president Ronald Reagan justified as necessary to dissuade Pakistan from acquiring nuclear weapons, failed in this objective?

The Obama administration's decision to supply F-16s to Pakistan will need the nod of the US Congress. It is likely to sell the \$700 million deal to Congressmen as one that will generate jobs for Americans and also help the US achieve its counter-terrorism objectives in Pakistan. India must use its influence to draw the attention of Congressmen to the sale's destructive impact. Should the deal be sealed, it will not only undermine South Asian regional security but also have dangerous implications for the rest of the world. An empowered Pakistan military will feel emboldened to incite trouble. It could deepen its support to terrorist groups. This would defeat the US's objectives in Afghanistan. Obama must call off the sale of the F-16s to Pakistan.

The Tribune
19 Feb, 2016

The Army is more than war ready

Today's military leadership is better trained with vast professional experience comprising counter-insurgency operations and high-altitude warfare. The Army has trained with world armies and UN peace-keeping missions. So to say the Army cannot conceive a conventional war is a figment of the imagination.

On February 15, in these pages, Pravin Sawhney had argued ('The Army is not war ready') that the Indian Army was distracted from its ideal readiness for war. **Lt-Gen(retd) RS Sujana** gives a contrary view. A vast array of factors combine to ensure that an army is ready for war, but the tenacity of men and women who make up the force, their wherewithal and the will of the nation to war are the three main factors. Mr Sawhney has agreed that as the Army has not fought a conventional war after 1971 and has been involved in counter-insurgency operations (CI ops) for nearly a quarter century, the senior leadership of the Army cannot conceive the concept of conventional war.

In addition, having erected a fence along the Line of Control (LC) to limit infiltration, the Army has developed an inbuilt Maginot Line, or defensive mentality which today denotes the physical, mental and psychological limit of war-fighting! He questions whether the Army wishes to be a glorified Para-Military Force (PMF). If this was not enough the article goes on to state, "that the people of India do not know what the Army is supposed to do". When the word Army is used it is a direct reflection on the officers, JCOs and other ranks of the entire force. Thus, a brief examination of how the Army (and its' men) have stood and will stand for the nation and the issues raised to assess how wrong the starting premise is follows.

The post-Independence military history bears testimony to the multi-tasking capability and true grit of the Army in handling crisis after crisis. Four months into freedom and the Army had a war at hand, the Indo-Pak War, 1947-48. The Army at that time was still reorganising itself, experience and numbers of military leaders were at a premium, but still the Army went forth to drive out the Pak intruders with tremendous credit. However, contrary to advice, the political leadership hurried into a ceasefire under the aegis of the UN, eluding a total victory. The political leadership still did not feel the necessity of strengthening the armed forces (opining that the nation could well do with just a police force). A laissez-faire attitude continued and as it cuddled up to China, no effort was made to rejuvenate the armed forces. This flawed policy saw the heart-breaking outcome of the 1962 War with China. The Army was ordered to throw out the Chinese. With what? No one could answer. Even the Air Force was kept out of action. But still, the Army fought resiliently and valiantly with archaic weapons, limited ammunition sans winter clothing to name a few; the war was lost but the enemy could not break the spirit of the Army. After this debacle, the Army started to expand in 1963. The Army's tryst with counter-insurgency operations had already begun in Nagaland. In the midst of this expansion and training of new units, the Army (and the Air Force) fought the Indo-Pak War of 1965, defeating a Pakistan Army equipped with latest weapons (like the famous Patton tanks and Sabre Jets) and drove them to dust. However, the political leadership was again found wanting and all captured areas were returned to Pak without weighing their strategic significance. Something similar seems to be brewing up now with calls of pulling back from an expensive battleground — the Siachen Glacier. Guess, some people will never understand strategic concerns. In the ensuing six years, the Army's involvement in CI in the North-East had increased manifold but come the 1971 War,

the Army amazed the world with their blitzkrieg historic victory. The political leadership again failed to garner any leverage; over 90,000 Pak prisoners were returned without resolving any issue; rather the enemy played truant and retained 54 of our prisoners who never returned home. Today, they are totally forgotten by the nation. In construing the traits of the present lot of senior officers, it hints that they lack the offensive spirit. Far from the truth as this obviously implies that the resilience, offensive spirit, camaraderie and the will to fight and win is not required in battling at the highest battlefield in the world at Siachen (since 1984) and CI ops, as this is where the Army has fought continuously post- the 1971 War. How very wrong can they be, inherent in such ops are not only these traits but much more. If this was not so, Col Gurung, Commanding Officer, 19 Madras, with the unstinted support of his seniors, would not have personally directed the super-human effort to pull out his 10 men from below tonnes of snow at the staggering height of 20,000 feet. This included one still alive, the now-legendary Hanumanthappa. Does anything more need to be said about the required traits which made this happen and the officer-man relationship in the Army? Forgotten, perhaps, is also the victory in the 1998 Kargil War, where it was all blood, guts and offensive actions. Ironically, here too, the soldiers carried the day and fought with “whatever they had” in the words of General Ved Malik, the then Army Chief. Are the LC Fence and the Maginot line the same? Definitely no, their aims are/were poles apart. Let not the LC Fence be confused to be a part of the conventional defensive concept. Moreover, wherever there is an obstacle (like a minefield or wire obstacle) offensive plans exist to strike the enemy. So has this created a defensive mindset? The answer is again, “no.” Needless to say, the cost-effectiveness of the fence is indeed debatable.

Yes, without doubt there are large deficiencies in arms and equipment and these continue to grow by the day. These telling deficiencies are likely to continue in the near future, with the defence budget at an abysmal 1.74 of the GDP, almost at the same level as it was prior to the 1962 conflict. The political leadership has to come out of the proverbial ostrich syndrome and show predilection for the armed forces and provide them not only the required wherewithal, but ensure their rightful status, dignity, pay and allowances. The Army can well do without being involved in CI ops, but to say that the Army is only training for CI ops is remissness. Regular and appropriate time is being spent on conventional roles, rather even in Jammu and Kashmir, the troops deployed along the LC on defensive positions remain acquainted with their conventional role which does have its' fair share of offensive action plans. With regard to offensive actions like hitting terrorist camps in Pakistan Occupied Kashmir, it is for the government to decide and direct the Army to implement. Will the Government's real politik allow this? It is not for the Army to decide.

Criticism is important but when someone decides to outrightly condemn the Army or any other organisation, there is a need to balance out views. At the risk of being branded intolerant, some censorship is warranted. The Army is physically, mentally and psychologically prepared to fulfil its roles and offensive soldiering is their forte! Let there be no doubt about their fighting competence.

Why India holds on to Siachen

The Siachen glacier has recently been in the news, as 10 Indian soldiers lost their lives in an avalanche.

This triggered another avalanche: Indian 'experts' commenting on why, since 1984, successive governments have allowed 900 Indian Army personnel to die?

Why occupy such inhospitable terrain, mostly above 20,000 ft, with temperatures reaching minus 60 degrees? Why should the taxpayer spend Rs 200 to transport a Rs 2 roti to the glacier?

Facts

To answer, it is necessary to look at some historical facts. In 1975, when a German expedition applied for rafting on the Indus river, Col Narinder 'Bull' Kumar, a well-known military mountaineer, discovered that the Germans had a US map showing the Siachen glacier as part of Pakistan.

Col Kumar later told journalist Nitin Gokhale, author of *Beyond NJ 9842: The Siachen Saga*: "Those maps, to my surprise, had shown the ceasefire line (today known as the LoC) being extended to the Karakoram Pass."

By that time, not only was Pakistan openly showing the glacier area on its maps, but Islamabad had also begun sponsoring mountaineering expeditions on this glacier.

After a first expedition led in 1978, other Army missions returned to the glacier in 1981; finally in 1984, it was decided to permanently occupy the glacier.

Gokhale quotes from an assessment by the Northern Command in 1984: "Pakistani occupation of the Siachen up to the Karakoram Pass would lead to their domination of the Nubra Valley and the route down to Leh. Indian positions in Siachen as well as in the vicinity of the Karakoram Pass are thus a formidable wedge between POK, the 4,500 sq km area ceded by Pakistan to China (the Shaksgam Valley) and Aksai Chin occupied by China."

It would have been a formidable strategic corridor with Pakistan and China controlling the Karakoram Pass and threatening Ladakh; it appeared to be a new Aksai Chin in the making (in the 1950s, China had built a road cutting across India's territory, without Delhi being aware of it).

This strategic concern pushed India to take the hard decision to settle on the glacier and the neighbouring peaks in the Saltoro range.

There is also a not-often mentioned legal angle.

On January 1, 1949, India and Pakistan agreed, under the UN auspices, to a Cease Fire Line (CFL), which had to be subsequently demarcated.

The military representatives of Delhi and Islamabad eventually met in Karachi between July 18 and 27, 1949; the Indian delegation was led by Maj Gen SM Shrinagesh, who later became the Army Chief.

Position

Before leaving for Karachi, the delegates received an in-depth briefing from Sir Girija Shankar Bajpai, the Ministry of External Affairs and Commonwealth's Secretary General.

Sir Girija explained to them the legal position: The UN resolution of August 1948 "had conceded the legality of Kashmir's accession to India and as such no man's land, if any, should be controlled by India during the period of ceasefire and truce."

Further, the onus of proof to convince the commission, in any disputed territory, rested with Pakistan.

“In the absence of any such convincing proof, and even if India had no troops on the date of ceasefire in that area, the disputed territory should automatically come under Indian control,” later recalled Gen SK Sinha, then ADC to General Shrinagesh.

The future governor of J&K further commented: “This convincing and legalistic argument proved a trump card in our hands at Karachi. Based on this, we obtained control of 7,00 square miles of state territory where we were not in position on the date of the ceasefire.”

Accord

An accord was finally reached and the Line of Ceasefire was demarcated.

The last point on the map was known as ‘NJ 9842’. At that time no one thought about the possibility of a war on the glaciers.

The agreement mentioned that the line continued ‘thence north to the glaciers’, without going into the details.

The demarcation had, however, been done on a clear principle: If a territory was no man’s land and not occupied by any of the two armies at that time, it was deemed to be part of India.

This position was then accepted by Pakistan and the UN.

It remains valid today. Even if not demarcated in 1949, the glacier legally belongs to India.

In early 1987, when Pakistani troops established a post on a feature overlooking India’s defence posts near the Bilafond Pass on the Salto ridge, Islamabad knew the legal implications.

The post was so important for Islamabad that it was named the ‘Quaid Post’ after MA Jinnah, the first Quaid-e-Azam.

Some Indian positions, being maintained by air, suddenly became untenable. What is disturbing is that often the Indian media swallows the Pakistani bait and portrays the glacier as ‘disputed’, which is legally wrong.

And as always in India, there are peaceniks, who argue that for the sake of ‘bonhomie’ with Islamabad, the Siachen should be a demilitarised zone, dedicated to ‘science’ or ‘peace’.

It could have dreadful consequences for India.

Deccan Herald
19 Feb, 2016

South China Sea developments worry India

NEW DELHI: Amid reports about China deploying surface-to-air missiles in one of the disputed islands in South China Sea, India on Thursday asked the neighbouring country to refrain from taking any "unilateral action" in the region.

"India has consistently maintained all states should avoid unilateral action that can lead to tension in the region," Vikas Swarup, spokesperson of the Ministry of External Affairs, said. He was responding to a journalist who asked for New Delhi's reaction to reports about China deploying the missiles in one of the disputed Paracel Islands.

A news agency on Thursday reported from Washington that a US official had confirmed that the satellite images had suggested China deploying two batteries of eight missile launchers and a radar system on the Woody Island. Fox News earlier reported about the satellite images suggesting China deploying missiles.

"India has consistently maintained that all states should avoid unilateral action that can lead to tension in the region," Swarup added.

The report from Washington also quoted the US official as stating that the missiles appeared to be HQ-9s, which have a range of about 201 km.

The South China Sea has been at the centre of an escalating conflict between China and its maritime neighbours - Brunei, Malaysia, Vietnam and Philippines.

New Delhi has been of the view that freedom of navigation in international waters must be protected. It has also been arguing that sovereignty issues must be resolved peacefully by the countries, which are parties to the dispute in accordance with accepted principles of international law, including the United Nations' Convention on the Law of the Sea (UNCLOS) 1982.

India also referred to the 2002 Declaration of Conduct of Parties in the South China Sea and called upon all to adhere to the code.

The 2002 code states that "the Parties undertake to resolve their territorial and jurisdictional disputes by peaceful means, without resorting to threat or use of force".

New Delhi has of late been raising its voice on the South China Sea dispute. Beijing is not amused and it has conveyed to New Delhi its unease, particularly reacting to reference to the row in the joint statement issued after Prime Minister Narendra Modi's meeting with his Japanese counterpart Shinzo Abe in December last.

The Asian Age
19 Feb, 2016

Pak bolsters military in PoK's Gilgit-Baltistan

Pakistan is planning to set up brigade-level military infrastructure in the Gilgit-Baltistan region of Pakistan-occupied Kashmir to provide security to its ambitious \$46-billion economic corridor with China passing through the strategic region.

A substantial piece of land is being allocated to the Pakistan Army in the Diamer district of the region so that it can set up "headquarters" and ensure security for China-Pakistan Economic Corridor (CPEC), the Express Tribune reported.

The site is situated in Thak Das, a barren piece of land near Chilas, where a brigade (5,000 personnel) will be stationed, the daily said.

"The Army will make its headquarters in Thak Das, this will help provide security to CPEC installations," Diamer district deputy commissioner Usman Ahmad was quoted as saying.

Another official told the daily that the Army will soon take over the land formally and start work immediately so it can assume responsibilities.

The strategic region in the north, which provides the only vital link with China, is on the key route of the CPEC.

The CPEC will link China's underdeveloped far-western region to Pakistan's Gwadar deep-sea port on the Arabian Sea via PoK through a massive and complex network of roads, railways, business zones, energy schemes and pipeline.

There are also reports that Pakistan is planning to upgrade the status of the Gilgit-Baltistan to bring it almost at par with the status of its provinces.

पाक पर अमेरिकी मेहरबानी के मायने

अमेरिकी रक्षा विभाग ने पाकिस्तान को आठ एफ-16 फाइटर जेट बेचने के सौदे पर मुहर लगा दी है। सत्तर करोड़ डॉलर के इस सौदे के तहत पाकिस्तान को लॉकहीड मार्टिन ग्रुप के इन जहाजों के अलावा रडार और बाकी उपकरण भी मिलेंगे। ये लड़ाकू विमान हर तरह के मौसम में हमला कर सकते हैं।

अमेरिकी रक्षा विभाग ने पाकिस्तान को आठ एफ-16 फाइटर जेट बेचने के सौदे पर मुहर लगा दी है। सत्तर करोड़ डॉलर के इस सौदे के तहत पाकिस्तान को लॉकहीड मार्टिन ग्रुप के इन जहाजों के अलावा रडार और बाकी उपकरण भी मिलेंगे। ये लड़ाकू विमान हर तरह के मौसम में हमला कर सकते हैं। अमेरिका से दूसरे देशों को हथियार बेचने का काम देखने वाली पेंटागन की डिफेंस सिव्युरिटी को-ऑपरेशन एजेंसी ने इस सौदे को मंजूरी दी है। एजेंसी ने कहा कि हम ये फाइटर जेट इसलिए दे रहे हैं, ताकि पाकिस्तान की खुद की हिफाजत करने की ताकत बढ़े। वह आतंकवाद विरोधी अभियान को भी मजबूती से अंजाम दे सके। अमेरिका का यह फैसला इसलिए ज्यादा ध्यान आकर्षित करता है क्योंकि रिपब्लिकन और डेमोक्रेटिक दोनों ही दलों के प्रभावशाली सांसदों के बढ़ते विरोध के बावजूद अमेरिकी विदेश मंत्रालय ने कांग्रेस को सूचित किया है कि वह पाकिस्तान सरकार को एफ-16 ब्लॉक 52 विमान, उपकरण, प्रशिक्षण और साजोसामान से जुड़े सहयोग वाली विदेशी सैन्य बिक्री को मंजूरी दे रहा है।

जाहिर है, ओबामा प्रशासन का यह बहुत बड़ा फैसला है। हालांकि इससे पहले अप्रैल महीने में अमेरिकी विदेश विभाग ने एक अरब डॉलर की लागत वाले सैन्य सामान और उपकरण पाकिस्तान को देने की स्वीकृति दी थी। लेकिन वहां के माहौल को देखते हुए ऐसा लग रहा था कि पाकिस्तान के साथ इस सौदे को अमेरिका शायद मंजूर न करे। सीनेट की विदेश संबंध समिति के अध्यक्ष सीनेटर बॉब कोर्कर ने ओबामा प्रशासन से पहले कहा था कि वे पाकिस्तान को जेट बेचने के लिए अमेरिकी फंड का इस्तेमाल नहीं होने देंगे। पाकिस्तान अगर विमान चाहता है तो वह खुद के बूते खरीदे। अमेरिका इस सौदे का छियालीस प्रतिशत व्यय नहीं उठाएगा। पाकिस्तान के पास आठ एफ-16 में से चार जहाज, रडार और इलेक्ट्रॉनिक वारफेयर सिस्टम खरीदने लायक भी कोष नहीं है।

सीनेटर कोर्कर ने अमेरिका के विदेशमंत्री जॉन कैरी को पत्र लिख कर कहा था कि पाकिस्तान के रिश्ते हक्कानी नेटवर्क से हैं। इस वजह से पाकिस्तान को कोई हथियार नहीं बेचा जाना चाहिए। यही नहीं, अमेरिकी सांसदों ने पिछले साल मांग की थी कि अमेरिका पाकिस्तान जैसे चुगलखोर और मुखबिरी करने वाले देश को हथियार न बेचे। सांसदों ने यह भी कहा कि पाकिस्तान लगातार आतंकियों का समर्थन कर रहा है, इसलिए उस पर भरोसा नहीं किया जा सकता।

सांसद टेड पोए ने उसामा बिन लादेन को ऐबटाबाद में मार गिराए जाने की घटना का जिक्र करते हुए कहा था कि अगर उस वक्त अमेरिका ने पाकिस्तान को यह बताया होता कि वह लादेन पर कार्रवाई करने वाला है तो पाक ने यह बात लादेन तक पहुंचा दी होती। एक सांसद डाना रोहाब्राशर ने पाकिस्तान को धोखेबाज बताते हुए उसे 'बेनेडिक्ट अर्नाल्ड' कहा था। बता दें कि सत्रहवीं सदी में बेनेडिक्ट एक अमेरिकी जनरल था, जिसने अपनी ही फौज को धोखा देते हुए ब्रिटेन की मदद की थी।

ओबामा प्रशासन ने इन सारे विरोधों को नजरअंदाज करके अलोकप्रियता का जोखिम उठाते हुए अगर फैसला किया है तो उसके कुछ कारण होंगे। ध्यान रखिए, इस सौदे से दो दिन पहले ही अमेरिका ने पाकिस्तान को मोटी राशि की भी मदद दी है। इसके पक्ष में बोलते हुए विदेशमंत्री जॉन कैरी ने कहा कि इससे पाकिस्तान को आतंकवाद से लड़ने में मदद मिलेगी तथा यह भारत के साथ संबंधों को सामान्य बनाने में भूमिका निभाएगा। उन्होंने यह भी कहा कि इससे अफगानिस्तान में आतंकवाद के खिलाफ लड़ाई में अमेरिका को पाकिस्तान सहयोग कर सकेगा। इस तर्क से हम-आप सहमत हों या न हों, अमेरिका इसी मत से, कई बार न चाहते हुए भी, पाकिस्तान को धन व हथियार मुहैया कराता है।

पाकिस्तान को अमेरिका ने पिछले चौदह सालों में यानी जब से आतंकवाद-विरोध युद्ध आरंभ हुआ, 1820 अरब रुपए की मदद दी है। आरोप है कि पाकिस्तान ने ज्यादातर मदद का इस्तेमाल भारत के खिलाफ अपनी ताकत बढ़ाने में और सरकारी खर्च निकालने में किया। उदाहरण के लिए, पिछले साल अमेरिका से मिले पचास करोड़ रुपए पाक सरकार ने बिलों का भुगतान करने और विदेशी मेहमानों को तोहफे देने में खर्च कर दिए। अमेरिका इन सूचनाओं को नजरअंदाज करता है।

पाकिस्तान को एफ-16 देने संबंधी अमेरिका का तर्क देखिए। यह प्रस्तावित बिक्री दक्षिण एशिया में एक रणनीतिक सहयोगी की सुरक्षा में सुधार में मदद करके अमेरिकी विदेश नीति और राष्ट्रीय सुरक्षा के लक्ष्यों में अपना योगदान देती है। प्रश्न है कि अमेरिकी विदेश नीति का दक्षिण एशिया में लक्ष्य क्या है? अगर पाकिस्तान उसका रणनीतिक सहयोगी है तो भारत भी रणनीतिक सहयोगी है। ओबामा प्रशासन के इस फैसले के बाद भारत ने दिल्ली में मौजूद अमेरिकी राजदूत को तलब किया। विदेश मंत्रालय ने कहा कि पाकिस्तान का रिकॉर्ड बताता है कि वह हथियार बेचे जाने लायक देश नहीं है। हम ओबामा प्रशासन के फैसले से निराश हैं।

राजदूत को तलब करना सामान्य बात नहीं है। स्पष्ट है कि भारत ने अपनी नाखुशी प्रभावी तरीके से पहुंचा दी है। लेकिन पेंटागन ने बयान में कहा कि इससे क्षेत्र में सामान्य सैन्य संतुलन प्रभावित नहीं होगा। प्रस्तावित बिक्री मौजूदा और भविष्य के सुरक्षा से जुड़े खतरों से निपटने में पाकिस्तान की क्षमता में सुधार लाती है। इसके अनुसार ये अतिरिक्त एफ-16 विमान हर मौसम में, दिन-रात अभियान चलाने में मदद करेंगे, आत्म-रक्षा क्षमता प्रदान करेंगे और उग्रवाद-रोधी व आतंकवाद-रोधी अभियान चलाने की पाकिस्तान की क्षमता को बढ़ाएंगे। पाकिस्तान के पास हथियारों की कमी है ऐसा नहीं माना जा सकता। पाकिस्तान के पास अभी सत्तर से ज्यादा एफ-16 लड़ाकू जेट हैं। उसकी वायुसेना के पास फ्रांस और चीन के बने मारक विमान भी हैं।

हालांकि कुछ विश्लेषकों का मानना है कि अभी यह नहीं मानना चाहिए कि सौदा हो ही गया है। पेंटागन से सौदे पर मुहर लगने के बाद अमेरिकी सांसदों के पास तीस दिनों का वक्त होगा। इस दौरान वे पाकिस्तान को लड़ाकू विमान बेचने के कदम पर रोक भी लगा सकते हैं। पर अब इसकी संभावना अत्यंत क्षीण है। अमेरिकी सांसदों ने ऐसा नहीं किया तो ओबामा प्रशासन की तरफ से अधिसूचना जारी होगी और सौदे पर काम शुरू हो जाएगा। अगर पाकिस्तान को एफ-16 मिल जाता है तो भारत की तुलना में वह कहां होगा। भारत को राफेल विमान मिलने वाला है। दोनों के बीच एक तुलना आवश्यक है। भारत ने स्वयं तेजस विमान विकसित भी किया है। इसी तरह चीन के पास रूस से मिला सुखोई-27 है।

इनकी तुलना करें तो अमेरिका की लॉकहीड मार्टिन द्वारा निर्मित एफ-16 की अधिकतम गति ढाई हजार किलोमीटर प्रतिघंटा है। फ्रांस की दासौ द्वारा निर्मित राफेल की गति लगभग इतनी ही है, तेईस सौ किमी से ज्यादा। भारत के हिंदुस्तान एयरोनॉटिक्स लिमिटेड द्वारा निर्मित तेजस की गति बाईस सौ किमी प्रतिघंटा है, तो चीन के पास स्थित रूस के सुखोई की ढाई हजार किमी प्रतिघंटा। अगर इस आधार पर विचार करें कि एक बार में इनका रेंज कितना है तो क्रमशः इस प्रकार होगा चौबीस सौ किलोमीटर, सैंतीस सौ किलोमीटर, बत्तीस सौ किलोमीटर व साढ़े तीन हजार किलोमीटर। इसी तरह इनकी क्षमता देखिए। मिसाइलें 6 एयर टु एयर, 2 एयर टु ग्राउंड, 6 सुपरसोनिक मिसाइलें, 6 एयर टु एयर, एयर टु सरफेस क्रूज मिसाइलें, 5 क्रूज मिसाइलें।

पाकिस्तान को आत्मरक्षा किससे चाहिए? क्या भारत से? चलिए इस प्रश्न के जवाब का इंतजार करें। इन एफ-16 लड़ाकू विमानों का इस्तेमाल भारत के खिलाफ किए जाने से जुड़ी भारत की आशंकाओं के बारे में पूछे जाने पर अमेरिकी विदेश मंत्रालय के अधिकारी ने कहा, मुझे स्पष्ट तौर पर बता लेने दीजिए, किसी भी हथियार के हस्तांतरण से पहले हम क्षेत्रीय सुरक्षा और कुछ अन्य कारकों को ध्यान में रखते हैं। हमारा मानना है कि हमारी सुरक्षा-मदद एक ज्यादा स्थायी और सुरक्षित क्षेत्र के लिए योगदान देती है। विदेश मंत्रालय के अधिकारी ने कहा, अमेरिका क्षेत्र में अपने सुरक्षा सहयोग को किसी के लाभ और किसी के नुकसान के आधार पर नहीं देखता। पाकिस्तान, भारत और अफगानिस्तान के साथ हमारे सुरक्षा संबंध अलग-अलग हैं, लेकिन हर संबंध अमेरिकी हित और क्षेत्रीय स्थिरता को आगे बढ़ाता है।

अमेरिका की ओर से कहा गया है कि ये अभियान पाकिस्तानी क्षेत्र का इस्तेमाल आतंकवाद की शरणस्थली और अफगानिस्तान में उग्रवाद को बढ़ावा देने वाले आधार के तौर पर किए जाने की आतंकियों की क्षमता को कम करते हैं। अधिकारी ने कहा कि ये अभियान पाकिस्तान और अमेरिका, दोनों के राष्ट्र-हित में हैं। इसके साथ-साथ यह पूरे क्षेत्र के हित में है। तो यह है अमेरिका का जवाब।

आखिर इस क्षेत्र में अमेरिकी हित क्या है? क्षेत्रीय स्थिरता की उसकी सोच क्या है? आतंकवाद विरोधी अभियान चलाने में वह कितना मदद करता है यह भी देखना होगा। यह उसका विश्लेषण है और हमें देखना होगा कि क्या वाकई नवाज शरीफ सरकार इतनी बदल गई है कि इसका इस्तेमाल वह पाकिस्तान में आतंकवाद के खात्मे व अफगानिस्तान में आतंकवाद-विरोधी युद्ध में करेगी? लेकिन अमेरिका कुछ भी कहे, इससे भारत की चिंता तो बढ़ेगी, जिसे उसने स्पष्ट कर दिया है। स्वयं अमेरिका ने कहा है कि पाकिस्तान द्वारा लगातार अपने नाभिकीय अस्त्रों में वृद्धि चिंता पैदा करती है। तो क्या अमेरिका ने उसके सामने कम से कम यह शर्त रखी है कि वह अपने नाभिकीय अस्त्रों में बढ़ोतरी न करे? इसकी जानकारी उसे भारत को अवश्य देनी चाहिए।

Respect '02 norms on S China Sea, Beijing told

As the US confirmed deployment of missiles by China in South China Sea, India on Thursday warned Beijing that any unilateral action which could raise tension in the region should be avoided.

The foreign ministry spokesperson said it was important to ensure full and effective implementation of the 2002 declaration on conduct of parties in the South China Sea. He said early conclusion of negotiations to establish a code of conduct by consensus will also contribute to peace and stability in the region.

Foreign minister Sushma Swaraj said the oceans and seas, including the South China Sea, were pathways to our prosperity and security. "The security of sea routes in the Asia-Pacific is essential for India's economy as a majority of our global trade flows across the straits of Malacca and beyond. Moreover, the development of a Blue Economy and optimum utilisation of marine resources can only take place within the ambit of internationally recognised rules and norms," she said, while speaking at Delhi Dialogue VII, an annual forum to brainstorm on all aspects of the ASEAN-India relationship.

"The need for resolving disputes peacefully, without threat or actual use of force, cannot, therefore, be underestimated. I would also like to stress that we support the evolution of an inclusive, balanced, transparent and open regional architecture for security and cooperation in the Asia-Pacific," she said.

The Asian Age
19 Feb, 2016

China confirms 'weapons' on island

China confirmed it has weapons on a disputed island in the South China Sea, state media said on Thursday, as criticism grew over Beijing's increased "militarisation" of the strategically vital region.

The US and Taiwan both said China had placed missiles on Woody Island, part of the Paracels chain, after Fox News reported the surface-to-air weapons had arrived there in the past week.

Beijing confirmed the presence of "weapons" on the island, reported the Global Times newspaper, which has close ties with the ruling Communist party, but stopped short of acknowledging there had been a new missile deployment, saying defence measures there were "nothing new".

Vice-Admiral Alexander Lopez, the commander of Philippine military forces assigned to guard the country's interests in the South China Sea, outlined the potential regional consequences of the reported Chinese action.

"The stability of the region is being threatened because of the deployment of those kinds of weapons," he said Thursday.

"You don't deploy those types of weapons unless you intend to use them," he added.

China claims all of the Paracels, though Hanoi and Taipei have overlapping claims.

Beijing seized several islands there from South Vietnam in a brief, bloody battle in the 1970s.

But tensions in the sea — through which a third of the world's oil passes — have mounted in recent months after China transformed contested reefs in the Spratly islands further south into artificial islands capable of supporting military facilities.

"There is every evidence, every day, that there has been an increase of militarisation of one kind or another. It's of a serious concern," US secretary of state John Kerry told reporters on Wednesday.

A US official said that China has deployed surface-to-air missiles on the island.

The official said they appeared to be HQ-9s, which have a range of about 200 kilometres.

Experts say they could be used to target enemy aircraft.

The Fox News report was based on pictures from ImageSat International, which earlier this week released images said to show reclamation work in the Paracels.

Washington says China's actions in the South China Sea threaten free passage in a strategically vital area and has sent warships to sail close to the disputed islands to assert freedom of navigation, raising fears of escalation.

"We have said repeatedly with respect to China that the standard that should be applied to all countries with respect to the South China Sea is no militarisation," Mr Kerry said.

During a state visit to Washington in 2015, Chinese President Xi Jinping vowed not to militarise the disputed Spratly island chain.

"We had these conversations with the Chinese and I'm confident that over the next days, we will have further very serious conversations on this," Mr Kerry added.

The Pioneer
19 Feb, 2016

US confirms China deployed missiles on disputed island

A US official has confirmed that China has deployed surface-to-air missiles on a disputed island in the South China Sea, as the United States expressed growing concern over China's increased "militarisation" in the region.

Fox News said earlier in the week that images showed two batteries of eight missile launchers and a radar system had arrived on Woody Island, the Paracels' main island.

"We believe the photos are accurate and that China has deployed SAMs to Woody Island," a US official told AFP, referring to surface-to-air missiles. The official said the missiles appeared to be HQ-9s, which have a range of about 125 miles (200 kilometers). Experts say they could be used to target enemy aircraft.

The Statesman
19 Feb, 2016

Asian countries eye stronger sea RECCE because of china

Market for ISR caches soars in Asia

The market for spy planes and surveillance platforms is buoyant in Southeast Asia, where countries are facing off against China – and each other - in the resource-rich South China Sea, industry insiders at the Singapore Airshow said.

Indonesia, Malaysia, the Philippines, Singapore and Vietnam have all been seeking information from suppliers, trade sources said, as maritime patrol aircraft and intelligence gathering platforms become more of a priority.

Some of the kit is needed for traditional activities such as counter-piracy, fisheries protection or disaster response, but China's growing assertiveness in the region's seas is looming increasingly large in the thinking of defense planners.

"They did not know that China was building artificial islands," said one industry source who regularly talks to the region's navies. "They did not know that it had built a runway or put in missile launchers. They want to fix this."

China has been building runways and other infrastructure on islands it controls in the South China Sea, where it has a series of overlapping territorial claims with its neighbors.

The rising tensions in the region are fuelling demand for advanced radars, sensors and other equipment known in defense jargon as "ISR" - intelligence, surveillance and reconnaissance.

"People don't trust their neighbors, resource and territory claims require a keen knowledge of what the other guy is going, and military operations other than war demand strong situational awareness," said Richard Aboulafia, vice-president of analysis at Teal Group, a U.S.-based aerospace consultancy.

"And of course, societies, militaries, and non-state armed groups are electronically more noisy than ever, meaning countries need ISR to keep tabs on them."

LEAN BUDGETS

Manufacturers displaying their wares in Singapore included traditional players such as Airbus and Boeing, alongside newcomers from Indonesia and Japan.

Sweden's Saab unveiled its "Swordfish" maritime patrol and anti-submarine system, which can be based on a Bombardier business jet or a turboprop aircraft, at the show.

Lean defense budgets, however mean that many countries are after a lower-cost option.

Boeing offers a stripped-down version of its P-8 Poseidon - the most advanced marine spy plane on the market - called the Maritime Surveillance Aircraft, which is based on a Bombardier business jet.

PT Dirgantara Indonesia, the country's state-owned aerospace firm, offers a maritime patrol version of the Casa CN235 military aircraft that is produced under license from Airbus.

Several are in service with the Indonesian navy, which is expected to acquire more, and talks have been held with Malaysia and other countries in the region.

The company is working with French firm Thales to provide maritime surveillance and anti-submarine capabilities, but it is open to countries customizing their requirements.

"We are not selling any of the equipment," said Ade Yuyu Wahuna, vice-president of business development and marketing at the company. "We are the integrators and if anyone wants to choose their own kit, we can integrate that onto the aircraft."

The Hindu
19 Feb, 2016

Don't wait for 10 years like China, say activists

'Put in place regional, national level action plans quickly'

Experts who worked on China's successful pollution control measures have said India should learn from China's mistakes and put in place regional and national level action plans — quickly.

Environmentalists had campaigned against coal-based power plants, which used to account for 60 per cent of the PM2.5 in and around Beijing, and demanded that comprehensive regional action plans be put in place.

Among those working on the issue was Lauri Myllyvirta, energy campaigner with Greenpeace International. Currently in Delhi, Mr. Myllyvirta and members of Greenpeace India will meet Delhi and NCR officials to recommend certain measures.

Delhi's poor air quality has been at the top of the government and the public's agenda, with road rationing, car-free days and other measures being tried out.

However, according to Mr. Myllyvirta, measures restricted to Delhi cannot have any substantial impact on the air quality — just like the Chinese authorities learned. The Chinese government woke up to the problem of air pollution only in the early 2000s, particularly in the run up to the 2008 Olympics. They tried out pollution control measures in Beijing, which hosted the games, but found that the problem lay elsewhere.

“It took the government some time to get around the fact that the ‘episodes’ were starting hundreds of kilometres away from Beijing, in manufacturing hubs. Air mass was travelling for days across the landscape,” said Mr. Myllyvirta.

January 2012 saw a particularly bad episode, which was labelled the ‘airpocalypse’. Public outrage finally forced the government to come up with regional action plans for three key areas as well as a national plan in September 2013.

“Delhi and North India are seeing something similar now. There is a great amount of public awareness. We would urge the governments not to wait for 10 years like China,” he said.

Apart from the crackdown on polluting industries, China expanded its air quality monitoring system, which is something India needs to do as well, said Mr. Myllyvirta. Some of the most polluted parts of the country do not have an air quality monitoring station.

An online platform for each province of China was created, where air quality data, including emissions from individual industrial units in the area, is available to the public via an app. A five-year plan with specific targets for pollution reduction was also drawn up in 2013.

Pollution control became a political agenda as well, with local government representatives being judged on whether they achieve air quality targets.

All these are measures that India can take too. Mr. Myllyvirta said that time-bound goals, perhaps in the Five-Year Plans, are needed immediately.

The Hindu
19 Feb, 2016

Govt. reviewing denial of OROP for premature retirees

The government is “reconsidering” the denial of One Rank One Pension (OROP) to personnel opting Pre-Mature Retirement (PMR) in light of the concerns expressed by serving and retired military personnel.

“This aspect is under consideration. We understand that there is a problem... I am talking of the PMR which is required for the forces,” Defence Minister Manohar Parrikar said on Thursday in an interview to India Today TV on the programme, “To the point”.

The PMR in the armed forces is a way of maintaining a younger officer profile at the middle level and open up vacancies for lower ranks. Currently the PMR tenure for Jawans and Junior Commissioned Officers (JCO) is 15 years and for officers it is 20 years after which they are eligible for pension.

However, he said that there has to be a distinction between those leaving service for greener pastures and those leaving for the sake of the country.

Defending the equalisation of pension every five years as it was mentioned by the Koshyari committee, Mr. Parrikar said it would be looked into by the one-man judicial committee. “We have no objection in referring anything and everything to the committee...” he added in response to questions from journalist Karan Thapar.

The government issued the notification implementing the OROP in November last year which stated that personnel opting for the PMR will be out of the ambit of the OROP effectively distinguishing those who had already retired and those opting for the PMR in future.

“Personnel who opt to get discharged henceforth on their own request.... will not be entitled to the benefits of the OROP. It will be effective prospectively,” the notification said.

This statement goes against the recommendations of the A.V. Singh committee of 2004 which recommended ways of lowering the age of Commanding officers and brigade commanders for combat and support arms.

Tech majors spurn move to link Aadhaar with biometrics

Step can potentially replace multi-factor authentication for secure transactions.

Global technology companies such as Apple, Google and Microsoft have so far fobbed an attempt by the Government of India to let their proprietary software allow matching of a user's fingerprint or iris scan as captured in the mobile instrument with his or her biometrics as stored in the Aadhaar database.

If allowed, this will let a smartphone user to electronically undertake myriad financial transactions. The biometrics on the phone can potentially replace multi-factor authentication for credit cards and other such secure transactions by offering two-factor authentication at the click of a button. According to senior government officials, companies such as Apple, Google and Microsoft are acting as "gatekeepers" and are averse to allowing open API (application programme interface) that facilitates programmatic access to a proprietary software application.

For instance, Microsoft's Lumia has an iris scanner, Apple has a biometric touch ID and newer devices running Google's latest Android Marshmallow operating system have a fingerprint scanner. A detailed questionnaire sent to all three companies last Thursday, February 11, seeking their response on the issue has not elicited a response so far.

Officials explained that the biggest problem in the online world today is of authentication. "As you move more and more business and government processes online, security is a key concern. For financial transactions, what we do today is a two-factor authentication. In other words, there are two separate ways of confirming identity. This improves security and reduces fraud. For instance, today, you have a credit card and a PIN (Personal Identification Number), both sent separately to you. The card is known as 'what you have' factor of authentication. PIN is the second 'what you know' factor of authentication," the official said.

Another official said, not everyone has a credit card today, but everyone has a mobile phone. "The mobile number that you have for the phone is 'what you have'. Phone is one factor of authentication. There are ways to confirm that this mobile number is yours, for instance through mechanisms such as One Time Password. The second factor of authentication is the biometric, which can be an Iris scan or a fingerprint. India's Aadhaar is unique in the world, and can make the mobile instrument provide a two-factor authentication for online transactions," the official said.

Working to patch Skype with Aadhar: Microsoft president

Microsoft is working with the Indian government to link Skype with the Aadhar database

Microsoft is working with the Indian government to link Skype with the Aadhar database to see if the video calling service can be used to make authenticated calls with government institutions and others.

Answering a question from IndianExpress.com during a meeting with select media persons here, Brad Smith, President and Chief Legal Officer, Microsoft Corporation said they have been very enthusiastic and have "embraced the universal ID system".

"We have been pursuing work, initially on a pilot basis, to use this specific technology and integrate it with Skype. We see Skype evolving in a way that will enable someone at home to authenticate themselves with using that ID system with a fingerprint or iris scan and then communicate with someone on the other end, maybe even a government agency, which will know that person is the same as he or she is claiming to be," Smith said, adding that this will enable people to testify in a government proceeding or get a licence.

The kind of convenience this can bring to people's lives will be significant, he said, adding how you will not need to travel long distances for many requirements and will be able to do things in front of a computer.

Responding to a query on how Microsoft viewed the entire Indian digital framework being on Open Source, Smith said the Microsoft thinks Open Source and proprietary software will coexist. "We think this was a debate in 2006 and now there is a healthy future for software in every form. As the world moves to the cloud, more open source software will coexist. In fact, 25 percent of the workload on Microsoft Azure are run on Linux," he said, adding this was now a mainstream technology trend. "Five years from now there will be open-source applications of all kind running in the three Microsoft data centres out of India too," he added.

Along with the launch of the data centres, that will keep customer data within the country, Smith said Microsoft was also working closely with the government on setting up the Cyber Security Engagement Centre (CSEC) under the digital crimes unit of the company. "The centre will work with law enforcement agencies as well as customers and help stakeholders fight cyber crimes," he added. Microsoft India chairman Bhaskar Pramanik said the company was also offering security consulting to organisations with critical infrastructure like power plants and defence.

The Indian Express
19 Feb, 2016

Govt's Move To 'Open Source'

Firm support system a necessity for adoption

Despite financial advantages, questions over security and operational efficiency need a closer look.

Switching over to open source software across all Central departments, as per a policy decision taken by the NDA government last year, could entail substantial savings on the Centre's software expenses as most open source alternatives are free. Experts, though, caution that the obvious financial advantages of adopting open source notwithstanding, concerns pertaining to security and operational efficiency may have to be addressed concomitantly.

The government's cumulative IT spending is estimated at \$66.98 billion (around Rs 4.17 lakh crore) in 2015, according to the Ministry of Communications and IT, which has based this estimate on various global IT research and advisory forecasts. As per NASSCOM's Data Security Council of India, average spend on cyber security is about 2 to 3 per cent of the total IT spending — at about \$1.5 to 2 billion.

"A big share, about 15-20 per cent, of the government's IT spending comprises of closed software. Shifting to open software would help the government save a lot of money," said Rahul De, Hewlett-Packard chair professor in ICT for sustainable economic development at IIM Bangalore. "However, adoption of open-source software will take time. Unlike closed or commercial software, open source requires a certain ecosystem to work smoothly. However, Centre's change of policy towards open source is a positive step," added De.

As the source code of open software is publicly accessible, which can be modified by anyone, many experts question the efficiency and security of such software. "The question about the efficiency of open source software is largely a perception issue. While most people think that closed software work better because large companies are behind them, there are good alternatives to most commercial software and they come at a far cheaper cost," said Kannan M Moudgalya, professor of chemical engineering at IIT Bombay.

Experts also believe that educational institutes should be the first places that use open source extensively. "The problem of working with closed software, especially in educational institutes, is that the talent that comes out of these places are too dependent on commercial software. It's very important that we create an environment where open-source talent can come out of these institutes. Open source can allow things to be done in a much faster manner and it's also cheaper. Using such software in government departments is good but using these in educational institutes is even better," says Akhilesh Tuteja, partner and head of IT advisory, KPMG.

Tuteja, however, believes that open source can work in India only when a strong support system is developed. “There are some open source softwares which are backed by strong user communities but there are others with less competent communities behind them. If a software is not backed by a strong community then there might be some vulnerabilities which might not be fixed.” With no regulation governing these kinds of software, using open source in government departments might be a concern, he adds.

As the source codes of most open source software are publicly available, many also think that this eases the chances of malicious users to hack into such software. “It’s the opposite actually. As the source code is openly available more people are likely to work on such software and fix the vulnerabilities. It’s more difficult to hack into open source software than proprietary software. One of the first organisations to adopt open source were the US military forces. They did so because they believed that this was a more secure alternative,” De said. “In open source users have access to the algorithm that makes it work, but no one has access to the encryption key or the set of numbers that act as a password. Without that password it’s impossible to hack into these,” De added.

Even though many institutes of higher education have adopted open source in a big way, a lot more can be done. “Big institutes like IITs and IIMs have started using open source but a lot more can still be done. Many institutes, especially schools across many states in the country, have not been able to adopt these software because there is no serious policy backing them. As a result they are left with no option but to go with commercial vendors for closed software,” De said.

A big part of government’s push for open source is based on the need to include vernacular languages in governance. The government is banking on BOSS (Bharat Operating System Solutions), a Linux-based operating system to meet this particular requirement along with imparting an enhanced understanding of open source in the country. But experts think that government should focus more on applications and then later move on to operating systems. “There are already strong open-source alternatives available in the open source community. Applications should be a bigger focus for the government because that is more important when it comes to governance,” Tuteja said.

Moudgalya, who has developed workshops for people to use open source software in 15 Indian languages, said that such workshops can be also be conducted for officials so that they can start using open source alternatives in vernacular languages across government departments. “Such training programmes can be developed for all government institutes and a strong support staff can be trained to use applications in open source mediums,” Moudgalya said.

The IT ministry has already approved a policy on “Collaborative Application Development by Opening the Source Code of Government Applications”. The policy intends to increase the pace of application development and rapid roll out by adopting the principles of open source model and the government intends to promote reuse of existing developed applications. It is also intended to encourage innovation — inside and outside the government by encouraging collaborative development to develop better products in less time, a source said.

The Economic Times
19 Feb, 2016

IIT-Kharagpur Students Ride Innovation, Develop i-Bike, a Driver-Less Bicycle

Inspired by the differently-abled batchmates, the bike can also be used with an Android app

Even as Google is testing its self-driving cars on roads, some engineering students from IIT Kharagpur have come up with a ‘Make in India’ innovation – a driver-less bicycle.

Inspired by the differently-abled batchmates in the campus, these students thought of developing an autonomous bicycle, ‘i-bike’. In the recently held KPIT Sparkle 2016, an annual national design and development innovation contest for engineering and science students across India, these students exhibited the i-bike and took home the first prize.

The theme of the competition was 'Smart Solutions for Energy and Transportation', where the i-bike idea won from among 1,700 other innovative ideas.

The autonomous steering, braking, drive and balancing mechanisms differentiate this bicycle from other bicycles that need a rider.

"This can make the life of a physically challenged person way better in terms of hisher commute from one place to other," said Ayush Pandey, a fourth-year undergraduate student in the department of electrical engineering at IIT Kharagpur.

If a person is an arm amputee, the autonomous steering would help himher with the wheel chair or a tricycle or i-bike itself. If a person has lost hisher leg(s), then the autonomous drive would provide the required energy to move ahead while the person only steers the bicycle.

"All these things are provided by the same i-bike due to its dual mode of locomotion in steering and driving. The user can choose as per hisher requirements," said Pandey.

This is how the bicycle works: The steering hub is modified using innovative gear mechanism that allows for both autonomous and manual mode with switching between the two provided by a latch mechanism. The balancing mechanism uses trainer wheel based torsional spring mechanism which is inventively developed in a way that it is retractable (allowing for easy switching between manual and autonomous modes).

The translation is provided by a hub motor in the rear wheel where autonomous gear based braking mechanism has also been installed.

The IIT students are in the process of applying for patent. "The application procedure would hopefully be complete in a few months," he said.

The bicycle can also be used with a dedicated Android application developed by IIT Kharagpur students.

The Times of India
19 Feb, 2016

Five 'hot' Jupiter-like planets discovered

Scientists have discovered five new Jupiter-like planets that are similar in characteristics to our solar system's biggest planet and orbit very close to heir host stars.

Researchers from Keele University in UK used the Wide Angle Search for Planets-South (WASP-South) instrument -an array of eight cameras observing selected regions of the southern sky , to study five stars showing planet-like transits in their light curve. The newly discovered planets were designated WASP-119 b, WASP-124 b, WASP-126 b, WASP-129 b and WASP-133 b. The orbital periods of the planets vary from 2.17 to 5.75 days, and their masses range from 0.3 to 1.2 the mass of Jupiter, with radii between one to 1.5 Jupiter radius, researchers said.

WASP-119 b, which has a mass of 1.2 of the mass of Jupiter, and an orbital period of 2.5 days, is a typical hot Jupiter. Its host star has a similar mass to the Sun's but appears to be much older based on its effective temperature and density .

WASP-124 b, less massive than Jupiter, has orbital period of 3.4 days and a much younger parent star.

WASP-126 b is the lowest-mass world found by researchers. Its low surface gravity and a bright host star make the planet a good target for transmission spectroscopy . "WASP-126b orbits the brightest star of the five. This means it can be a target for atmospheric characterisation, deducing the composition and nature of the atmosphere from detailed study ," said Coel Hellier from Keele University .

WASP-129 b, similar in size to Jupiter, has the longest orbital period. WASP-133 b has the shortest orbital period of the exoplanets detected by researchers. PTI

New thruster for future Mars mission

Scientists have developed a prototype of a tabletop-sized thruster for a spacecraft propulsion system that may help take humans to Mars, reports PTI from Washington.

NASA selected the thruster, developed by Alec Gallimore, from University of Michigan in US as part of its Next Space Technologies for Exploration Partnerships, or NextSTEP programme.

NextSTEP encompasses a set of projects aimed at improving small satellites, propulsion and human living quarters in space.

These are milestones towards sending humans into orbit between the Earth and the Moon in the 2020s and to Mars the following decade.

The thruster 'X3' is central to the the propulsion system, dubbed the XR-100.

The XR-100 is up against two competing designs. All three of them rely on ejecting plasma - an energetic state of matter in which electrons and charged atoms called ions coexist - out the back of the thruster.

The X3 is relatively small and light for thrusters of its design power, 200 kilowatts. Its core technology - the Hall thruster - is already in use for manoeuvring satellites in orbit around the earth.

The Indian Express
19 Feb, 2016

Smartphone APPs: Don't click 'yes' for all permissions

With apps seeking more access to improve their focus on advertising content, users must be careful of the privacy intrusion they are allowing in the process.

While India has more than 300 million mobile internet users, awareness of app-based security and privacy issues are still quite low in the country. People download multiple apps each week providing numerous permissions unwittingly to various companies. According to experts, while such behaviour is understandable, such ignorance poses numerous threats to smartphone users.

“Privacy concerns and awareness of threats from mobile applications is extremely poor in India. Over time, applications have become more and more intrusive,” says Akhilesh Tuteja, partner and head of IT advisory, KPMG.

Initially, the resources that the apps required were half of the amount they need at present. Over the last year, apps have become a lot more immersive and companies want more access so as to provide relevant content, which also translates to focussed advertising.

This is not a surprise as the smartphone market is growing at a rapid pace — urban areas registered a y-o-y growth of 71 per cent in December 2015 while the user-base in rural zones has gone up by 93 per cent from December 2014, according to an Internet and Mobile Association of India (IAMAI) report.

How do we know how much access apps have? “Specifics are difficult to determine. In theory, an app can acquire tremendous amount of details. In practice, numerous permissions can go unused. Because of the way in which Android works, all potential permissions must be approved at the time of installation rather than when a feature requiring the permission is first used (as it is with iOS),” says Sean Sullivan, security advisor, F-Secure Labs.

The latest version of Android includes options to remove/disable permissions from apps. So for example, after installing but before running an app, users could disable permissions they aren't comfortable with providing. While you would no longer be able to do a “music search” (like Shazam) via the app, but then you'll also know that the app cannot use the permission for other functions.

The problems that may arise for users due to lack of awareness are multi-fold:

Privacy: A shopping app might need access to your camera and the logical answer for such a permission would be based on the fact that lots of these apps allow you to search for items through pictures or via scanning barcodes. However, many ask for permissions which have no relevance to its function.

Simple apps that can be downloaded to allow you to use your camera flash as a torchlight or your phone as a mirror are supposed to have basic functions — like lighting up the LED of phone’s flash or turning on your front camera. There’s no reason for such apps to have access to your messages or contacts.

Data/Battery consumption: Multiple applications run in the background eating your internet data continuously. Shopping apps keep pushing their offers which include an image, a status bar and messages. These ‘push notifications’ utilise a lot of data and battery for updates and downloads.

Vulnerabilities: Many applications suffer from vulnerabilities which users may not be aware of. Rogue apps can exploit this vulnerability.

If you have an app that uses your contacts, the app in itself may not be malicious. However, if the app itself suffers from vulnerabilities, rogue apps can exploit this to access your data from your phone or even steal content from authentic apps. Some can also use your phone to place international calls through a third party which you could get billed for.

So how much of our personal information can a company access from specific permissions?

“As much as the user offers to give,” says Devendra Parulekar, partner and national leader, infosecurity, advisory services, EY. “Most users never bother to read the privacy policy of the app owner or service provider, and inevitably sign away most of their rights.”

Some analysts say that is where the state needs to step in, so that the rights obtained can never exceed the protection offered by law.

At present, The IT Act has a specific provision under Section 43(a) that defines sensitive personal information and provides some degree of protection to us. It places some responsibilities on service providers/ app owners to disclose, obtain consent, use and process appropriately and dispose securely all such sensitive personal information.

So what can users do to enhance their security? “Be mindful,” says Sullivan.

“One shouldn’t overreact, but it is important to really review the permissions and compare them to the potential features of the app. If they don’t appear to be in the favour of the users’ privacy — they should consider using the mobile web version of the service.”

“I don’t often use Facebook — but when I do — it’s via the web, not the Facebook app. In fact, I’ve blocked access to Facebook related services on my iOS devices. I’d do the same on Android,” he adds.

This is because when using the web version of a service, you can route through a VPN (virtual private network) to limit location information. When using an app, the phone’s location services can provide details, even though a VPN is being used.

The main point is to be aware at all times, consult if in doubt, and avoid unknown or suspect apps.

Things you should do

- * Always take a look at the policy.
- * Do not install unknown or suspect apps
- * Do not allow minors to install apps without adult supervision
- * There are many settings that can be activated to protect privacy of a person — browsing in incognito mode, or not providing your location, or explicitly disallowing access to contact list, etc. However, at times the usage of the app is dependent on providing such access – taxi apps become meaningless without access to location.

* Critically examine permissions that an app asks for. If you come across permissions that sound strange – it is asking for a permission that has no relevance to its function – avoid it, especially its asking for your contacts, phone, camera, location.

* Before you download an app, it's a good idea to look at its rating. If it's below 2 -2.5 on the scale of 5, then either it's not very good functionally or has other issues. Also go through the reviews.

The Indian Express
19 Feb, 2016

Encryption battle : Pichai Backs Apple

Google CEO Sundar Pichai has backed Apple in its battle with FBI over opposing a US court's ruling to unlock the iPhone of a Pakistani-American terrorist who shot dead 14 people in California, saying forcing companies to enable hacking could "compromise" user's privacy.

In a series of tweets, Pichai said that although Google gives "law enforcement access to data based on valid legal orders", but it is "wholly different than requiring companies to enable hacking of customer devices and data," which could set a "troubling precedent".

"Forcing companies to enable hacking could compromise user's privacy," the Indian-American CEO said as he supported Apple CEO Tim Cook's stand. "We know that law enforcement and intelligence agencies face significant challenges in protecting the public against crime and terrorism," Pichai said.

"We build secure products to keep your information safe and we give law enforcement access to data based on valid legal orders," he said. "But that's wholly different than requiring companies to enable hacking of customer devices and data. Could be a troubling precedent," he said as debates are on on the merits of the case between Apple and federal law enforcement agencies.

Apple, which is eyeing big on the Indian market, yesterday opposed a US court's ruling to unlock the iPhone of of San Bernardino gunman Syed Farook who shot dead 14 people and injured 22 others last December.

The Hindu
19 Feb, 2016

LED bulb could connect you to Internet

Path-breaking technology of Li-Fi uses light to carry data

Imagine an LED bulb doubling as an access point for connecting to the Internet and ordinary light being used as a medium to carry data.

A whole new world wherein a bulb would not only give us light but also help us access the Web might not be too far away, if a new technology called Li-Fi (or Light-Fidelity) goes mainstream.

Prof. Harald Haas of the University of Edinburgh, who coined the term Li-Fi in 2011, demonstrated the new technology to a packed auditorium at the Wipro's Electronics City campus on Wednesday.

He streamed a video from the Internet on a laptop using light from an LED bulb to access the Web.

Prof. Haas said Li-Fi was a disruptive technology that could transform business models, create new opportunities, and was poised to be a \$113 billion industry by 2022.

He said that the RF (radio frequency) spectrum would not be enough considering the rate of growth of wireless data communication.

The visible light spectrum was much larger.

The use of the light spectrum for Li-Fi overcomes the issues in traditional wireless communication, like the shortage of spectrum and network disruption because of interference.

In Li-Fi, anyone who has access to light can access the Internet. The system also allows users to move from one light source to another without losing their network connection.

What about connecting to the Internet in the night? The stream of photons can be reduced to a minimal level that won't produce visible light but enough to carry data.

Prof. Haas said though Li-Fi was poised to compete with Wi-Fi, it was not meant to replace it.

"We are not looking at an either-or situation."

Though the inability of light rays to pass through walls and similar structures is seen as a major drawback of this technology, Prof. Haas has a totally different view.

He said it's an advantage since restriction by walls provides more security to the network and eliminates the risk of the signal leakage to eavesdropping.

The Li-Flame, described as the world's first true Li-Fi system, was displayed at the Mobile World Congress in Barcelona in March last year. The third generation of the product has now been developed and will be on display at the MWC later this month.

What is Li-Fi?

Light-Fidelity is a new technology that uses light waves, instead of radio frequency waves, as a medium to carry data. An improvised LED bulb functions as a router

How does Li-Fi work?

An ordinary off-the-shelf LED bulb connected to a device, which in turn is connected to the Internet.

The Internet data flows in via the device into the bulb, and is carried by light waves.

At the other end, light waves carrying the Internet data falls on a receiver or a dongle which is connected to the computer.

Benefits of Li-Fi

- Visible light spectrum is available in plenty, unlicensed and free to use
- Double benefit of a bulb giving us light as well as internet access
- Low interference leads to very high data speed
- Li-Fi works under water as well
- Not harmful, unlike RF that can interfere with electronic circuitry
- Light won't pass through walls, making eavesdropping nearly impossible
- LED illumination is already efficient and data transmission needs very little additional power.
- It can achieve about 1,000 times data density of Wi-Fi, since light can be contained in an area

A landmark for Indian scientists

The Union Cabinet has finally granted in-principle approval for a gravitational wave detector in India. The clearance, awaited for five years, comes close on the heels of the detection of the elusive gravitational waves for the first time; the Laser Interferometer Gravitational-Wave Observatory (LIGO) based in Washington and Louisiana in the U.S. found evidence of gravitational waves coming from two black holes colliding and fusing together 1.3 billion light years away. By virtue of having the same sensitivity as the LIGO detectors in the U.S. and being geographically separated by thousands of kilometres, the Rs.1,200-crore LIGO-India project, scheduled to become operational in about eight years, will at once vastly improve the level of accuracy and ability to detect new gravitational wave events. Since all detectors may not be operational all the time — for instance, the VIRGO detector, based near Pisa in Italy, had remained shut on September 14, 2015 — the addition of an Indian detector will increase the chances of detecting events that generate gravitational waves. When the advanced LIGO and LIGO-India detectors reach their full sensitivity, many more events will become detectable and the ability to detect faraway signals would also increase dramatically. For instance, 50 to 100 gravitational wave-generating events a year may become detectable. And in the case of neutron stars, signals from as far away as 600 million light years could be detected as compared with 200 million light years now.

Though Indian scientists were part of the LIGO project, their involvement was limited to theoretical aspects and data analysis. The LIGO-India project will change this altogether as the construction, commissioning and running of the observatory will be India's responsibility. It will offer unprecedented opportunities for Indian industry and scientists from diverse fields to be actively involved in a scientific project of a scale never before seen in the country. For instance, though many of the critical components such as mirrors and lasers will be shipped from the U.S., an ultra-high capacity vacuum system that can handle one million litres of vacuum (as in the case of CERN), and secondary optics, have to be manufactured in India. An active programme to develop optics for the laser system that could be used in future upgrades to the detectors is already under way at the Indore-based Raja Ramanna Centre for Advanced Technology. Currently only a few students from Indian institutions are able to participate in the LIGO project, but this will change completely when the observatory becomes operational in India, providing easier access for a larger number of students. Besides playing a pivotal role in gravitational wave astronomy, the Indian observatory could thus be a catalyst in changing the landscape of Indian scientific efforts. Together with other mega projects such as the India-based Neutrino Observatory project, experimental science will at last get a much-needed boost in the country.