

# समाचार पत्रों से चयित अंश Newspapers Clippings

दैनिक सामयिक अभिज्ञता सेवा

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## **2 Years of Modi Sarkar: Foundation laid, it's time to deliver**

In the past two years, the Ministry of Defence has showed its intent of bridging gaps in battle readiness. But over the next three years the Narendra Modi-led government needs to implement the same by procuring fighter jets, artillery guns, bulletproof jackets, torpedoes and helicopters among other items.

Though policy changes have been made, a case of increasing the limit for Foreign Direct Investment is pending. Expectedly, the 'Make in India' agenda has taken some time to show on ground.

Defence Minister Manohar Parrikar has been at the helm since November 2015 and his biggest challenge is to reduce the import bill and dependence on imports from the US, Russia, Ukraine and France. India yet again emerged as the world's largest buyer of weapons and military equipment, accounting for some 14 per cent of all such international imports, a report of the Sweden-based think-tank Stockholm International Peace Research Institute (SIPRI) said in March this year.

Parrikar has announced an amendment to the Defence Procurement Procedure (DPP) that gives more importance to local products.

The Modi government has taken key decisions to have an indigenous artillery gun programme, make the light transport aircraft in private sector in India and produce the Russian Kamov light utility helicopters here, but everything will take time to fructify. The three services collectively need around 1,000 copters. Conversely, the purchase of 36 Rafale jets from France in a fly-away condition and the decision to procure 145 ultra light howitzers (ULH) from the US is still not done.

The indigenous nuclear submarine, INS Arihant, is on sea trials and so is the conventional sub Kalvari.

A deepening military alliance with Japan has formalised a US-India-Japan grouping, a fact not palatable to Beijing while New Delhi has deepened ties with countries involved in the South China Sea.

Focus of the MoD will have to be on building roads along the 3,488-km Line of Actual Control (LAC) with China. Four strategic railway lines have been approved and will need attention.

### **Achievements**

- Key decisions taken to have an indigenous artillery gun programme, make the light transport aircraft in private sector and produce the Russian Kamov light utility helicopters in India
- Amendment to the Defence Procurement Procedure that gives more importance to local products, hence increased focus on 'Make in India'
- Indigenous nuclear submarine INS Arihant and conventional sub Kalvari are on sea trials

### **Downside**

- India remains the biggest importer of weapons and military equipment, accounting for some 14 per cent of all such international imports
- Procedures are taking long, which is holding back changes. The purchase of 36 Rafale jets from France in a fly-away condition and procurement of 145 ultra light howitzers from the US is yet to be sealed
- Demand to increase FDI limit from existing 26 per cent

## **Parrikar Visits Muscat, Signs Four Key Agreements**

India and Oman have reaffirmed their resolve to deepen bilateral Defence ties as the two countries signed four key agreements in the critical sector with focus on enhancing military cooperation.

The pacts were signed during Defence Minister Manohar Parrikar's maiden visit to Muscat on Saturday.

The agreements included defence co-operation, marine crime prevention, maritime issues and flight safety information exchange. Parrikar, who was on an official two-day visit at the invitation of Bader Bin Saud Bin Harib Al Busaidi, Minister Responsible for Defense Affairs of Oman, later left for UAE.

Giving details of his visit, a Defence Ministry statement said during Parrikar's talks with the leadership there, all aspects of bilateral defence co-operation including enhanced military to military exchanges were discussed. Both sides also exchanged views on regional developments of mutual interest.

Both sides noted that defence cooperation is a key facet of their bilateral strategic partnership. It was agreed that the two sides would further expand and consolidate their ongoing bilateral defence cooperation, the statement said.

Parrikar reiterated the high importance that India attaches to its strategic partnership with Oman and also conveyed his appreciation at the continued support rendered by Oman for the Operational Turnaround (OTR) of Indian Navy ships for anti-piracy patrols as well as technical support for landing and overflight of IAF planes.

He visited the Military Technology College and the Sultan's Armed Forces Museum in Muscat. He also attended a reception at Sultan Qaboos Port to mark the goodwill visit to Oman of naval ships INS Delhi, INS Deepak and INS Tarkash.

The minister was accompanied by a high-level official delegation comprising Secretary (Defence Production) Ashok Gupta, DRDO chief Dr S Christopher, Army Vice Chief Lt Gen MMS Rai, designated new Navy chief Vice Admiral Sunil Lanba, IAF Vice Chief Air Marshal B S Dhanoa besides other senior defence ministry officials.

Meanwhile, in an effort to forge closer maritime relations with countries in the Gulf region, three Indian Navy ships are visiting Muscat, Oman from May 21 to 24. The visit coincided with the visit of the Indian defence minister.

Led by Flag Officer Commanding Western Fleet, Rear Admiral Ravneet Singh, the three ships entered Muscat on Sunday. During their stay, the crew of these ships will undertake professional interactions with the Royal Navy of Oman (RNO) pertaining to nuances of maritime operations, including means of combating maritime terrorism and piracy.

Giving details of the ongoing visit, Navy officials said here on Sunday the Indian ships are also likely to conduct exercises with the Royal Navy of Oman. In addition, calls on senior Government and military authorities, sporting and cultural interactions and sharing of best practices, aimed at enhancing cooperation, strengthening ties and mutual understanding between the two navies, are also planned.

Bilateral relations between India and Oman have been historically strong based on deep cultural affinity and vibrant economic linkages. In modern times, these were formally established with the 1953 Indo-Oman Treaty of Friendship, Navigation and Commerce, a first between India and any Arab country.

The signing of a MoU on Defence Cooperation in December 2005 and the subsequent establishment of the Joint Military Cooperation Committee in March 2006 has set the foundation for increased defence cooperation, they said.

Since then, naval co-operation between the countries has progressed steadily with increased port visits by naval ships and training of RNO personnel by the Indian Navy in hydrography, diving, training, logistics and dockyard management.

India and Oman are also members of Indian Ocean Naval Symposium (IONS), a voluntary and co-operative initiative between 30 countries of the Indian Ocean Region, which has served as an ideal forum for sharing of information and cooperation on maritime issues. Oman also supports Indian Navy's anti-piracy patrols in the Gulf of Aden by providing related facilities.

The successful conduct of bilateral biennial naval exercise 'Naseem Al-Bahr' off the Indian Coast in February 2016 has reinforced the strong ties between the two navies. The Royal Navy of Oman's participation in the recently concluded International Fleet Review at Visakhapatnam, India with two ships is another indicator of the close ties between the two Navies.

The current visit would be another milestone in the strong maritime relationship between the countries. It will strengthen mutual understanding, facilitate sharing of best practices and enhance interoperability. It will enable a common understanding of the security challenges in the region and contribute to security and stability of this vital part of the Indian Ocean Region.

Captain Sandeep Singh Sandhu is commanding INS Delhi, INS Tarkash commanded by Captain Pradeep Singh and Captain Sujit Kumar Chhetri leading INS Deepak.

*The Times of India*  
*21 May, 2016*

## **Govt eyes re-balancing defence spend**

*By Rajat Pandit*

### *Sets Up Experts Panel to Suggest Ways to Cut Non-Operational Flab in Forces*

The NDA government has appointed a committee of experts to recommend measures to enhance the combat capabilities of the over 13lakh strong armed forces and "re-balance" the overall defence expenditure in view of the escalating salary and pension bills.

The 11-member committee led by Lt Gen D B Shekatkar led by Lt Gen D B Shekatkar (retd), which includes several other top military officers as well as civilian experts, has been given three months to chalk out an action plan.

# GARGANTUAN DEFENCE MINISTRY

Defence Budget (2016-17)

**Overall ₹3.4 lakh crore**

- Revenue (day-to-day costs/salaries) | **₹143,869 crore**
- Capital (modernization) | **₹78,587 crore**  
(Only ₹12,000 crore for new projects, rest committed liabilities)
- Defence pensions | **₹82,333 crore**
- Defence ministry (miscellaneous) | **₹36,113 crore**

## ARMED FORCES



### ARMY

41,000 officers & 11.32 lakh soldiers

### IAF

12,000 officers & 1.3 lakh airmen

### NAVY

9,000 officers & 52,000 sailors

**COAST GUARD:** 1,400 officers & 10,000 enrolled personnel

## DEFENCE MINISTRY ALSO INCLUDES SEVERAL OTHER ORGANISATIONS LIKE

➤ **DRDO** & its 50 labs (over 25,000 manpower)

➤ **Ordnance Factory Board** with its 41 factories & other units

➤ Other organisations like **DGQA, DGAQA, DOS, MES, Defence Estates** etc

**5 defence PSUs** | Hindustan Aeronautics Ltd, Bharat Electronics Ltd, Bharat Earth Movers Ltd, Bharat Dynamics Ltd & Mishra Dhatu Nigam Ltd

**4 Shipyards** | Mazagon Dock, Hindustan Shipyard, Goa Shipyard & Garden Reach Shipbuilders & Engineers

“The overall aim is to ensure India's combat capabilities and potential are enhanced, with a better teeth-to-tail combat ratio, within budgetary constraints. The committee will hold its first meeting with defence minister Manohar Parrikar once he returns from his May 20-23 trip to Oman and UAE,” said a source.

This comes a year after Parrikar first underlined the need to slash the non-operational “flab” of the Army, Navy and IAF after a detailed review to ensure leaner, meaner and cost-effective fighting forces, as was then reported by TOI.

Parrikar feels there is no option but to “downsize in areas which are not of operational importance”, both in terms of manpower and infrastructure, due to budgetary limitations. PM Narendra Modi, too, has told top military commanders that instead of constantly trying to expand the size of their forces, they should focus on forces that are “agile, mobile and driven by technology”. While Parrikar stresses there will be no cuts in combat forces, he has repeatedly attacked the previous UPA regime for the “arbitrary way” in which it approved the raising of the Army's new 17 Mountain Strike Corps without any budgetary planning.

As reported by TOI earlier, the Army is being forced to dip into its critical war wastage reserves to raise the 17 Corps with 90,274 additional soldiers, which is meant for acquiring some land combat deterrence against China. As it is, the revenue component (day-to-day costs salaries) in the defence budget by far outstrips the capital outlay every year, leaving very little for new modernisation projects for the armed forces.

Interestingly, the 1.18-million strong Army has also ordered a study, headed by a senior Lt-General, to determine ways to optimise manpower. “The Army has followed a policy of ‘save and raise’ since the 1999 Kargil conflict to improve combat capabilities without manpower increases. With modernisation and induction of cutting-edge technologies, some more scope for manpower optimisation can be created,” said an officer.

## **Panel to trim armed forces**

The Ministry of Defence has set up an 11-member committee headed by a retired Lieutenant General to suggest major structural changes in the Army, IAF and the Navy, like cutting down on “flab” and reducing day-to-day expenses.

This will entail doing away with posts that may have become redundant due to technology and ensuring that modernisation or addition of new equipment does not mean a corresponding rise in numbers for the force.

Defence Minister Manohar Parrikar has ordered the committee to report in three months. It is headed by Lt Gen BD Sheketkar (retired), its nine other members are retired officers and its member-secretary is a Joint Secretary-level officer. The Tribune had first reported on May 2 that the MoD would set up a panel to reduce flab. The three forces have been consulted and asked to project what all can be done away with.

### **New fighter jet may be Rafale, Boeing or Eurofighter**

- The government is yet to decide on which fighter jet will be ‘made in India’. Defence Minister Manohar Parrikar said it could be the French origin Rafale, the F-18 from Boeing, the Eurofighter from Airbus or the Gripen from Sweden
- In an interview to the state broadcaster, Parrikar said the decision on the type of multi-role fighter jets would be taken during this financial year

## **Now, women guard China border**

In a first, the Indo-Tibetan Border Police Force (ITBP) has started deploying women constables to guard the rugged Sino-Indian border in Ladakh.

“Over 150 women constables have been posted to Leh this month. They will be based at the battalion headquarters in Leh and will be deployed at border outposts (BOPs) in groups of 15-20 on a rotation basis,” an ITBP officer said.

The ITBP mans the border with China in J&K, Himachal, Uttarakhand, Sikkim and Arunachal Pradesh, with posts being located at altitudes up to 18,000 feet in remote and snow-bound areas. Three BOPs have been indentified where these women constables will be deployed. Modalities such as having women officers and women doctors to cater to the needs of women personnel in forward areas along with requisite administrative and logistic facilities have also been factored in their deployment.

“Since women constables have been recruited into the ITBP, it is prudent that they undertake the fundamental duties that the force is meant for, rather than being posted on merely administrative or clerical duties in headquarters or rear echelons,” the officer said.

## **‘Make in India’, Choppergate clip forces’ wings**

*Navy requires aircraft and helicopters: House panel.*

A combination of the ‘Make in India’ initiative and AgustaWestland chopper scam have effectively stalled the services efforts to procure new helicopters to replace the ageing Cheetah and Chetaks in service.

While the Indian Air Force (IAF) inducted several medium lift choppers and signed deals for attack and heavy lift variants, along with the Army it is awaiting new utility helicopters to support its troops in far flung areas.

The Navy is the worst hit with procurements struck in all categories and practically one helicopter being shared by several frontline warships.

“Once the government announced the ‘Make in India’ initiative the programmes that were in the loop were retracted to process them through the new route in partnership with Indian industry. But policy clarity is still awaited and allegations of corruption have further slowed down things,” a senior officer said.

The Defence Procurement Procedure (DPP) 2016 which came into force in April promises a level playing field and boost domestic manufacturing but is still without crucial chapters on strategic partnerships and blacklisting norms in case of wrongdoing. There are also added dimension of capacity building and disaster relief support in the neighbourhood.

There are 139 ships in the Navy of which barring about 30-40 ships the rest can carry 1-2 helicopters. The two aircraft carriers INS Viraat and INS Vikramaditya are capable of carrying 12 helicopters each in various roles.

### **Obsolete Chetaks, Kamovs**

In contrast the Navy has about 40 obsolete Chetaks, 24 Kamov 28/31s which are now being upgraded, 10 Dhruvs and some Sea Kings.

Except the 10 Dhruv Advanced Light Helicopter all others vintage and are in urgent of replacement.

“Helicopters are crucial in supporting ships or responding to distress calls on the high seas. But currently the numbers are so less that several ships are sharing a helicopter,” one Navy officer said.

The Parliamentary Standing Committee on Defence in one of the reports tabled in the last session noted that the Navy requires aircraft and helicopters as these are critical for surveillance and Stand-off targeting at sea.

“Further, the Committee has been informed by the representatives of Indian Navy that the force is short of 61 integral helicopters on existing ships,” the report stated.

Several procurement processes under various categories of helicopters, Naval utility, Multi-Role, Naval Multi-Role (NMRH), are all stuck due to re tendering or for clarity in DPP on blacklisting norms.

## **‘Centre bargaining hard to lower Rafale price’**

*Defence Manohar Parrikar compared the indigenous Tejas to the French fighter jet.*

As negotiations between India and France stretch to the last mile on the deal for 36 Rafale fighter jets, Defence Minister Manohar Parrikar underscored the cost of a Rafale jet by observing that a Su-30 fighter and an indigenous Light Combat Aircraft (LCA) Tejas can be purchased at the cost of one Rafale jet.

“One Rafale fighter is worth approximately Rs.700 crore to Rs.750 crore while a Su-30 costs about Rs.475 crore. Compared to these planes, India’s Tejas is in the range of Rs.200-250 crore only. We can get two Tejas at the price of one Rafale,” Mr. Parrikar said in an interview to All India Radio (AIR) on Friday.

However it was not clear what composition of the aircraft Mr. Parrikar was referring to at this unit cost. Typically the cost of the aircraft goes up with the addition of components, electronics, armaments and other customisation.

Though Mr. Parrikar had stated earlier that Rafale jets were expensive and bringing down the price was important, this is the first time he gave a comparative figure while underscoring that the indigenous Light Combat Aircraft (LCA) Tejas is as good as the French Rafale fighter jet in terms of capabilities.

On the current price negotiations for 36 jets under a government-to-government deal, he said it will take a “few more weeks” to finalise it. “You will have to bring down the cost. If you throw away the price they demand, our coffers will soon be empty,” he observed.

### **Tejas vs. Rafale**

Drawing a comparison between Tejas and Rafale jets, Mr. Parrikar stated that Tejas had similar capabilities although it was in a different class.

“Our Tejas is having the same qualities as Rafale does. Although Tejas is in light weight category, its range also half compared to Rafale, in terms of avionics, electronics and fire power it is no less than the Rafale,” he said.

Talking of measures to improve the squadron strength of the Air Force, he pointed that four to five squadrons of the Tejas will be added in the next three to four years in addition to a few more squadrons of Sukhoi as well as two squadrons of Rafales. “The first squadron of Tejas will be ready by September-October and it will be flying before Diwali,” the Minister said.

On the selection of another fighter aircraft to be built under the ‘Make-in-India’ initiative, Mr. Parrikar said it could be any aircraft and a “decision in this regard will be taken in this financial year.”

*पंजाब केसरी*  
21 मई, 2016

**राफेल की कीमत में एक सुखोई और तेजस आ सकता है: पर्रिकर**

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इस तरह एक राफेल की कीमत में इस प्रकार के दो विमान खरीदे जा सकते हैं। तेजस की तुलना करते हुए उन्होंने कहा कि इसकी एविएनिक्स, इलेक्ट्रॉनिक्स भी उतनी ही अच्छी है और उसके पास मारक क्षमता भी वही है। लेकिन ये थोड़ा लाइटवेट है, यह एक साथ दस टन, नौ टन, मिसाइल और बम नहीं उठा सकेगा,ए साढ़े तीन-चार टन वाला है।

इसकी दूर जाने की क्षमता भी थोड़ी कम है। सरकार की महत्वाकांक्षी योजना मेक इन इंडिया के तहत देश में ही बनाए जाने वाले लड़ाकू विमान के लिए प्रतिस्पर्धा का ऐलान करते हुए उन्होंने कहा कि अलग-अलग काम के लिए अलग-अलग लड़ाकू विमान चुनने पड़ते हैं, अभी तक निर्णय नहीं लिया गया है कि राफेल बनाना है, या यूरोफाइटर बनाना है या ग्रीपेन बनाना है,अभी निर्णय नहीं हुआ और यह इस वित्त वर्ष हो जाएगा।

परिंकर ने राफेल के अत्यधिक महंगा होने का मुद्दा ऐसे समय पर उठाया है, जब फ्रांस से 36 राफेल विमानों की कीमत के अनुबंध को अंतिम रूप दिया जा रहा है और इसकी कीमत को लेकर दोनों पक्षों के बीच कड़ी सौदेबाजी चल रही है।

उन्होंने कहा कि यह सौदा एकदम अंतिम चरण में है, लेकिन वे इसकी तारीख नहीं बता सकते, कुछ बारीक और छोटे मोटे मुद्दे हैं जिनके लिए कुछ हफ्ते चाहिए। राफेल की कीमत को लेकर की जा रही सौदेबाजी पर उन्होंने कहा कि कीमत तो कम करनी ही पड़ेगी।

हम उसे कम से कम कीमत में खरीदना चाह रहे हैं और इसके लिए दबाव बनाया जा रहा है। उन्होंने कहा कि यदि बेचने वाला जो दाम मांग रहा है वो देने लगे तो आपका खजाना ही खाली हो जाएगा।

*The Tribune*  
21 May, 2016

## **Govt mulls laser wall on Pak border**

Even as a high-level committee under the chairmanship of former Union Home Secretary Madhukar Gupta is working on suggesting measures to the government for better management of borders, Home Minister Rajnath Singh today said the Centre was contemplating putting up a “laser wall” along the sensitive western border with Pakistan.

Delivering the Centenary Rustamji Memorial Lecture organised by the Border Security Force (BSF) here, the Home Minister said, “We are making efforts to put up the laser wall at sensitive places along the western border.”

A laser wall is used for fencing, which is a mechanism to detect objects passing the line of sight between the laser source and the detector. Stronger lasers can potentially be used to injure someone or something passing through the beam, said an expert in security mechanism.

The minister said though technology had a role to play, only this would not be enough. “I know without the forces we will not be able to secure our borders,” he said.

Appreciating Rustamji, first BSF Director General, for his role in building a great organisation, he emphasised that for any “development activity, security is the key”. He said, “Unless our borders are secure and we have a sense of security, India cannot achieve its goal of having a double-digit GDP.”

Assuring all assistance from the government to the border-guarding force, he asked the officers and personnel to work hard for further improving situation on the eastern border with Bangladesh, which is notorious for “human trafficking” and “cow smuggling”.

He said, “I appreciate your effort in reducing cow smuggling by 50 per cent, but we need to see that we get the situation at zero level.”

## **‘Pak was initially positive on hosting NIA’**

- On a possible NIA’s visit to Pakistan in connection with the Pathankot terror attack, Home Minister Rajnath Singh said, “Pakistan was initially positive about hosting Indian investigators to further probe into the Pathankot attack. Now, the Foreign Secretaries of the two countries are discussing it.”

*The Tribune*  
21 May, 2016

## **India rebuts China on NSG issue**

India today gave a firm rebuttal to China on linking signing of the Non-Proliferation Treaty (NPT) to membership of the elite Nuclear Suppliers Group (NSG) and took exception to its increased investment in Pakistan-occupied Kashmir.

Countering the Chinese argument, India cited the example of France, which was admitted to the NSG without first having signed the NPT. “I think there is some confusion here. Even the NPT allows civil nuclear cooperation with non-NPT countries. If there is a connection, it is between the NSG and IAEA safeguards and with export controls,” Ministry of External Affairs spokesperson Vikas Swarup said today in a media interaction.

“NSG members have to respect safeguards and export controls, nuclear supplies have to be in accordance with the NSG guidelines. The NSG is an ad-hoc export control regime and France, which was not an NPT member for some time, was a member of the NSG since it respected NSG’s objectives,” Swarup added.

China has objected to India’s NSG membership on the grounds that isn’t the NPT signatory. Chinese foreign ministry spokesman Lu Kang had said all the multilateral non-proliferation export control regime, including the NSG have regarded NPT as an important standard for the expansion of the NSG.

Chinese stand has irked India and it is one of the topics that will also be raised by President Pranab Mukherjee who is travelling to China next week.

India also slammed China for its increased investments in the Pakistan-occupied Kashmir. “Chinese activities in PoK have been taken up with the Chinese side, including at the highest level. Pakistan-occupied Jammu and Kashmir is an integral part of India... we have asked them to cease all activities (there),” Swarup said.

*The Economic Times*  
21 May, 2016

## **China Objects to Presence of Indian Ships in S China Sea**

*By DipanjanRoy Chaudhury*

China has upped the ante on its claims in the South China Sea region ahead of President Pranab Mukherjee's four-day trip to the country from May 24, objecting to the presence of Indian Navy ships in the region where it has significantly expanded its presence since 2009 through artificial islands and military presence.

Indian Navy ships taking part in maritime exercise in the South China Sea is “a matter of concern“, a senior Chinese official said in Delhi on Thursday night, a day after four naval vessels set sail for participating in Malabar exercise with the United States and Japan.

The Chinese official, who did not want to be identified, alleged that Western powers are using the colonial tactics of “divide and rule“.“When there is some trouble in the South China Sea, India is

worried. When Indian ships participate in maritime exercises in the South China Sea, of course China will show concern," the official told a select group of media persons.

The remarks come ahead of the President's visit to China, where he is expected to raise issues of political, regional and strategic significance including China's efforts to block India's bid at the United Nations to get Jaish-e-Mohammad chief Masood Azhar banned as well as India's entry into the Nuclear Suppliers Group, both ostensibly at the behest of Pakistan.

On May 24 Mukherjee is scheduled to land in Guangzhou, one of China's most prosperous regions, to seek to attract business and investments. He will be in Beijing on May 25-27 for political dialogue and meetings with Peking University. The Chinese leadership has gone an extra mile for the President, with plans for several official banquets and meetings. Guided missile stealth frigates INS Satpura and INS Sahyadri; INS Shakti, a sophisticated fleet support ship; and INS Kirch, a guided missile corvette, had set sail on Wednesday on a two-and-a-half month long operational deployment to the South China Sea and North West Pacific.

*Business Standard*  
23 May, 2016

## **US defence cooperation Bill steered past anti-India lobbies in Washington**

*By Ajai Shukla*

*The US House of Representatives passed the 'US India Defense Technology and Partnership Act', which authorises the US military to spend Budget allocations*

That act bound every US President to ensure Israel always has the "ability to counter and defeat any credible conventional military threat from any individual state or possible coalition of states or from non-state actors, while sustaining minimal damages and casualties."

Now, in similar fashion, the US Congress is binding future American Presidents, whatever their alliances or foreign policies, to nurturing US-India defence ties.

On Thursday, the US House of Representatives passed the "US India Defense Technology and Partnership Act", as an amendment to the National Defense Authorization Act (NDAA) - which authorises the US military to spend Budget allocations. Initiated by Representative George Holding, and supported by most of the House, this highlights Congress' dramatic swing towards India and away from Pakistan.

The US Congress often passes important, but potentially divisive Bills, by tagging them as amendments to larger, compulsory Bills like the NDAA. A stand-alone Bill would be extensively debated, allowing potential opponents to oppose them. It is easier to pass them as an amendment to another less contentious Bill.

The passage of the Bill has not been without tension. Pro-India lobbies have worked discreetly to tamp down opposition from Congressmen disappointed with the tardy pace of India's defence and economic reforms. There is also ire in Washington about New Delhi's continued stonewalling of bilateral "foundational agreements", even though American and Indian officials have agreed on the drafts of two - the Logistics Exchange Memorandum of Agreement (LEMOA), and the Communications and Information Security Memorandum of Agreement (CISMOA). Anti-India critics complain that India has never fought alongside the US, the way allies like the UK and Australia have.

Even so, the growing pro-India mood in the House ensured the Bill comfortably passed. Congressional practice now requires the upper house, the Senate, to pass a similar "companion" Bill. On May 9, Senators Mark Warner and John Cornyn, introduced such a Bill, entitled

"Advancing US-India Defense Cooperation Act". Senator Warner, a Democrat; and Senator Cornyn, a Republican, co-chair the Senate's bipartisan, 35-member India Caucus which promotes Washington's relations with New Delhi.

After the Senate passes the Warner-Cornyn Bill, as appears likely, the House and Senate versions of the Bill must be reconciled. This is done either by a formal committee, or through a series of Amendments in each chamber until the Bill looks the same in both. This would not be difficult, since the Senate and House versions are already close to identical. The agreed joint version would then be signed into US law.

American legislators are increasingly conscious of the Cold War divergence between India and the US; and Washington's continuing support for Pakistan, which makes New Delhi regard the US as a potentially fickle partner. The new Bill aims at reassuring New Delhi of American strategic commitment.

Towards this, the House Bill (just passed) and the Senate Bill (under process) require the US President to "formalise India's status as a major partner of the United States." It remains unclear what this status would be. New Delhi's historical non-alignment rules out a formal treaty, like the North Atlantic Treaty Alliance (Nato) that binds the US and several European countries into a mutual defence arrangement. New Delhi might also be hesitant to be designated a "major non-Nato ally" (MNNA) - which does not automatically include a mutual defence pact, but which permits Washington to extend a range of defence and financial benefits. The US currently has 15 designated MNNAs, including Australia, Japan and Pakistan. In 2014, Israel was elevated from an MNNA into a higher category and designated a "major strategic partner".

For now, US-India defence ties are covered only by a 2015 executive agreement entitled "Framework for the US-India Defence Relationship", which is valid for a decade. This follows previous, less comprehensive agreements signed in 1995 and 2005.

The new Bill also requires the President to strengthen the Defence Technology and Trade Initiative, and the India Rapid Reaction Cell - a Pentagon department that irons out wrinkles in defence ties.

*The Hindu*  
22 May, 2016

## **U.S. House votes for enhanced defence cooperation with India**

The U.S House of Representatives has passed amendments to the National Defence Authorisation Act (NDAA)-2017, seeking to enhance the country's defence cooperation with India. A similar bill is under the consideration of the Senate also.

The bipartisan move of the U.S Congress seeks to bring India at par with NATO allies for technology and equipment sale. Once signed into law by the president, these provisions will liberalise the sale of a wide range of technologies to India, bypassing bureaucratic and legislative approvals. It also seeks to open a special office in the Pentagon dedicated exclusively to the U.S.-India Defence Technology and Trade Initiative (DTTI). The Senate is likely to pass the bill before Prime Minister Narendra Modi's address to the joint session of Congress on June 8.

The amendment - Enhancing Defence and Security Co-operation with India --in the House was sponsored by members George Holding and Ami Bera who are chairs of the House India Caucus, House Foreign Affairs Committee Chair Ed Royce and Ranking Member Elliot Engel. The U.S.-India Defence Technology and Partnership Act in the Senate was introduced by Senators Mark Warner and John Cornyn, 'co-chairs of the Senate India Caucus. Senator Marco Rubio has also joined as a sponsor.

"It seeks to promote greater defence trade and encourage additional military cooperation between the United States and India," Mr. Holding said on the floor of the House. "I believe that by requiring

our government to take actions such as strengthening Defence Technology and Trade Initiative and encouraging combined military planning with India, we can make certain that the U.S.-India defence relationship endures.”

"Given the dynamic nature of the Indo- Pacific region and its importance to our own national security and future economic growth, now is the time to build on recent successes and propel the U.S.-India strategic partnership forward," he said.

In another set of amendments to the NDAA, the House has tightened the flow of aid to Pakistan. As per the new conditions, the Secretary of Defence must certify to Congress that Pakistan is not using its military or any funds or equipment provided by the U.S. to persecute minority groups seeking political or religious freedom. The amendments also put new conditions before Pakistan can access \$450 million next year in Coalition Support Fund, which is for reimbursing costs incurred in Afghanistan.

*The Pioneer*  
*22 May, 2016*

## **Us Set To Give India NATO Ally Status**

As a rare red carpet welcome awaits Prime Minister Narendra Modi at the Capitol on June 8 when he will address a joint meeting of the United States' Congress, the US is set to elevate India's status to that of a Nato ally in order to boost defence ties and ease technology transfer. The US House of Representatives on Thursday passed an amendment to the National Defence Authorisation Act 2017 that seeks to enhance and promote "greater defence trade and military cooperation" between the two countries.

The amendment was sponsored by Holding, Ami Bera from the House India Caucus Chairs, and Ed Royce (chair) and Elliot Engel (ranking member) of the Foreign Affairs Committee. Interestingly, the same Bill also sought to block military aid of \$450 million to Pakistan unless it cracked down on the Haqqani network. Reuters reported that US lawmakers were seeking to pass a defence policy Bill that would put restrictions on military aid to Pakistan.

The move comes as some expressed frustration with Islamabad's failure to crack down on Afghanistan's extremist Haqqani network and looks to block \$450m (\$309m) in aid to the country unless they take urgent action to fight the militants.

Speaking about the amendment to the National Defence Authorisation Act, Holding said, "It seeks to promote greater defence trade and encourage additional military cooperation between the United States and India... Given the dynamic nature of the India-Pacific region and its importance to our own national security and future economic growth, now is the time to build on recent successes and propel the US-India strategic partnership forward."

According to PTI, the amendment will encourage the designation of a US official that will focus solely on US-India defence cooperation and facilitate the transfer of defence technology. The official is also expected to have an office in the Pentagon that will be dedicated to the US-India Defence Technology and Trade Initiative (DTTI).

## U.S. rejects Russian proposal for joint air strikes

Moscow on Friday proposed that Russia and United States, which have been flying separate bombing campaigns in Syria, launch joint air strikes against jihadists from next week, a proposal the Pentagon swiftly rejected. “We are proposing to the U.S., as the head of the International Syria Support Group, to take part as of May 25 in joint operations between the Russian air force and the air force of the coalition,” Russian Defence Minister Sergei Shoigu said in televised comments.

Hours later Pentagon spokesman Navy Captain Jeff Davis rejected Moscow’s proposal, saying the U.S. military does “not collaborate or coordinate with the Russians on any operations in Syria”.

“Russian operations are supporting and enabling the Assad regime and our focus is solely on degrading and defeating [the Islamic State]” Captain Davis said.

जनसता

22 मई, 2016

## मुद्दा : परमाणु हथियारों की होड़

लेखक: विजन कुमार पांडेय

**जैसे-जैसे अपने परमाणु कार्यक्रमों के विकास में लगे देशों की संख्या बढ़ रही है, वैसे-वैसे दुनिया भर में नाभिकीय सामग्री का परिवहन भी बढ़ रहा है। इस वजह से यह जोखिम भी बढ़ता जा रहा है कि नाभिकीय सामग्री संभावित आतंकवादियों के हाथ न लग जाए।**

दुनिया आज परमाणु हथियारों के ढेर पर बैठी है। स्टॉकहोम इंटरनेशनल पीस रिसर्च इंस्टीट्यूट (सिप्री) के मुताबिक परमाणु हथियारों की संख्या के मामले में रूस सबसे आगे है। 1949 में पहली बार परमाणु परीक्षण करने वाले रूस के पास 8,000 परमाणु हथियार हैं। 1945 में पहली बार परमाणु परीक्षण के कुछ ही समय बाद अमेरिका ने जापान के हिरोशिमा और नागासाकी शहरों पर परमाणु हमला किया था। सिप्री के मुताबिक अमेरिका के पास आज भी 7,300 परमाणु बम हैं। यूरोप में सबसे ज्यादा परमाणु हथियार फ्रांस के पास हैं। परमाणु बम बनाने की तकनीक तक फ्रांस 1960 में पहुंचा। एशिया और दुनिया की सबसे बड़ी थल सेना वाले चीन की असली सैन्य ताकत के बारे में बहुत पुख्ता जानकारी नहीं है। लेकिन अनुमान है कि चीन के पास 250 परमाणु बम हैं।

चीन ने 1964 में पहला परमाणु परीक्षण किया था। ब्रिटेन ने पहला परमाणु परीक्षण 1952 में किया। इस समय उसके पास 225 परमाणु हथियार हैं। अपने पड़ोसी पाकिस्तान के पास 100-120 परमाणु हथियार हैं। 1998 में परमाणु बम विकसित करने के बाद से भारत और पाकिस्तान के बीच कोई युद्ध नहीं हुआ है। लेकिन डर है कि अगर अब इन दोनों पड़ोसियों के बीच लड़ाई हुई तो वह परमाणु युद्ध में बदल सकती है। 1974 में पहली बार और 1998 में दूसरी बार परमाणु परीक्षण करने वाले भारत के पास 90-110 परमाणु बम हैं। भारत का वादा है कि वह पहले परमाणु हमला नहीं करेगा। साथ ही भारत का कहना है कि वह परमाणु हथियारविहीन देशों के खिलाफ भी इनका प्रयोग नहीं करेगा। 1948 से 1973 तक तीन बार अरब देशों से युद्ध लड़ चुके इजरायल के पास करीब 80 नाभिकीय हथियार हैं। जब ऐसे हालात हों तो इसकी सुरक्षा भी बहुत जरूरी है जिससे ये गलत हाथ न लग जाए।

परमाणु सुरक्षा की ओर ले जाने वाला अंतरराष्ट्रीय कानून प्रणाली बड़े धीमी गति से आगे बढ़ रहा है। जबकि आतंकी नाभिकीय खतरा पूरे विश्व पर मंडरा रहा है। मूल नाभिकीय सामग्री भौतिक संरक्षण संधि को 1979 में 152 देशों ने स्वीकार किया था और यह संधि 1987 में लागू हो गई थी। इसमें तय किया गया था कि नाभिकीय सामग्री और परमाणु केंद्रों के संरक्षण की पूरी जिम्मेदारी उठाने वाले देश नाभिकीय सामग्री के अंतरराष्ट्रीय परिवहन के दौरान भी उसके संरक्षण की पूरी जिम्मेदारी

उठाएंगे। जैसे-जैसे अपने परमाणु कार्यक्रमों के विकास में लगे देशों की संख्या बढ़ रही है, वैसे-वैसे दुनिया भर में नाभिकीय सामग्री का परिवहन भी बढ़ रहा है। इस वजह से यह जोखिम भी बढ़ता जा रहा है कि नाभिकीय सामग्री संभावित आतंकवादियों के हाथ न लग जाए।

2005 की संधि में परमाणु सामग्री के घरेलू उपयोग, उसके भंडारण और उसके परिवहन से जुड़े नियमों का विस्तार किया गया था। विभिन्न देशों के बीच इस संधि को लागू करने और इसके नियमों के पालन पर नियंत्रण रखने की जिम्मेदारी अंतरराष्ट्रीय परमाणु ऊर्जा एजेंसी को सौंप दी गई थी। लेकिन कुछ देशों ने इसे अपने संप्रभु अधिकारों पर आघात माना। इस वजह से ही इस संधि में नए संशोधन करने के लिए दो तिहाई सदस्य देशों का समर्थन प्राप्त होने में ज्यादा वर्ष का लंबा समय लग गया। लेकिन पिछले मार्च के अंत में वाशिंगटन में आयोजित नाभिकीय सुरक्षा शिखर सम्मेलन से पहले ही इन नए संशोधनों के लिए आवश्यक 102 सदस्य देशों का समर्थन मिल गया। उल्लेखनीय है कि रूस ने इस शिखर सम्मेलन में भाग नहीं लिया था।

अब दुनिया को सुरक्षित बनाने की दिशा में कुछ कदम और आगे बढ़े हैं। अंतरराष्ट्रीय परमाणु ऊर्जा एजेंसी के मुताबिक पिछली आठ मई को नाभिकीय सामग्री भौतिक संरक्षण संधि में नए संशोधन लागू हो गए हैं। इसके अनुसार विभिन्न देश परमाणु केंद्रों और नाभिकीय सामग्री को पूरी तरह से संरक्षित करने के लिए कानूनी रूप से बाध्य होंगे। नाभिकीय सामग्री की चोरी या तस्करी जैसे किसी भी विध्वंसकारी काम को अपराध माना जाएगा और अब से इससे जुड़ी जानकारियों का अंतरराष्ट्रीय परमाणु ऊर्जा एजेंसी के माध्यम से ही आदान-प्रदान किया जाएगा। अंतरराष्ट्रीय परमाणु ऊर्जा एजेंसी के महानिदेशक यूकिया अमानो ने छह मई को वियना में इस नई अंतरराष्ट्रीय व्यवस्था की शुरुआत करते हुए कहा कि यहां तक पहुंचने में उन्हें लगभग ग्यारह साल लगे हैं।

आतंकवादी अगर परमाणु पदार्थों का उपयोग करके कोई हमला करेंगे तो उसके काफी विनाशकारी परिणाम निकल सकते हैं, लेकिन अब इस संधि के लागू होने से ऐसे हमलों का खतरा कम होगा और दुनिया पहले से कहीं अधिक सुरक्षित हो जाएगी। इन संशोधनों के लागू होने के बाद नाभिकीय संधि और मजबूत हुई है और अब वह परमाणु आतंकवाद और परमाणु सामग्रियों की तस्करी को रोकने में और अधिक कारगर सिद्ध होगी। अमेरिका द्वारा करवाए गए कई नाभिकीय सुरक्षा शिखर सम्मेलनों और अंतरराष्ट्रीय परमाणु ऊर्जा एजेंसी की सक्रिय भागीदारी की वजह से इन संशोधनों को लागू किया गया। इससे आतंकवाद से प्रभावित देशों को राहत मिलेगी। साथ ही परमाणु आतंक के खतरे से दुनिया और भी सतर्क हो जाएगी।

हमें यहां इस बात को भी नहीं भूलना चाहिए कि कुछ ही वर्ष पहले तक इस मुद्दे पर सदस्य देशों के बीच भारी मतभेद थे। भारत के हुक्मरानों के नाभिकीय ऊर्जा प्रेम के पीछे एक लंबा इतिहास रहा है। आजादी के बाद से ही देश में बहस चल रही है कि ऊर्जा सुरक्षा के लिए नाभिकीय ऊर्जा पर जोर देना उचित है या फिर शोध और अनुसंधान ऊर्जा के वैकल्पिक स्रोतों पर केंद्रित होना चाहिए। प्रसिद्ध मार्क्सवादी इतिहासकार और वैज्ञानिक डीडी कोसाम्बी शुरू से ही इस मत के थे कि भारत जैसे देश में जहां यूरेनियम की उपलब्धता निहायत ही कम है, वहां नाभिकीय ऊर्जा पर जोर निश्चय ही विकसित देशों पर निर्भरता को बढ़ाएगा।

उनका मानना था कि भारत में वर्ष के अधिकांश समय में सूर्य की किरणें पर्याप्त मात्र में आती हैं और यहां एक विस्तृत समुद्री तट है इसलिए शोध और अनुसंधान की दिशा नवीकरणीय ऊर्जा के स्रोतों जैसे- सौर ऊर्जा, समुद्र लहर ऊर्जा, ज्वार-भाटों से उत्पन्न ऊर्जा, पवन-ऊर्जा इत्यादि पर होना चाहिए। लेकिन हमारे शासकों को कोसांबी की बजाय भाभा के विचार रास आए, जिनका मत था कि शोध नाभिकीय ऊर्जा की दिशा में होनी चाहिए। इसके फलस्वरूप अब यह आलम है कि नवीकरणीय ऊर्जा विभाग रस्मअदायगी का अड्डा बनकर रह गया है। शोध और अनुसंधान के लिए आबंटित फंड का अधिकांश हिस्सा नाभिकीय शोध पर खर्च होता है। ऐसा नहीं कि हमारी सोच नाभिकीय ऊर्जा का विरोधी है। दरअसल नाभिकीय ऊर्जा का उपयोग शांतिपूर्ण कार्यों के लिए हो, यही उद्देश्य होना चाहिए।

ऊर्जा का उपयोग किसी भी रूप में हो सकता है, लेकिन उसके केंद्र में मुनाफा नहीं होना चाहिए। इसके पीछे मानव हित होना चाहिए। यही इसकी सुरक्षा और उपयोगिता की गारंटी है। यह आतंकवादी संगठन के हाथ न लग जाए, इसपर कड़ी नजर होनी चाहिए। इसीलिए नाभिकीय ऊर्जा अधिक सुरक्षा और सावधानी की मांग करती है। इसके सुरक्षा और सावधानी के और उन्नत तरीके और उपाय विकसित करने के लिए अभी बहुत अधिक शोध की आवश्यकता है। इसमें कोई शक नहीं कि देश के सर्वांगीण विकास के लिए नाभिकीय ऊर्जा बहुत आवश्यक है। जिसका मकसद देश की व्यापक आबादी के जीवन स्तर में सुधार लाना है। लेकिन यह तभी होगा जब इसका उपयोग केवल शांतिपूर्ण कार्यों के लिए किया जाए। धमकाने के लिए नहीं।

*The Tribune*  
21 May, 2016

## **Israel defence chief quits**

*Warns of 'extremist' rise under PM Netanyahu*

Israel's defence minister resigned on Friday, saying the nation was being taken over by 'extremist and dangerous elements' after Prime Minister Benjamin Netanyahu moved to replace him with a far-right politician in an effort to strengthen his coalition.

Political sources say Netanyahu has offered long-time rival Avigdor Lieberman the defence portfolio. The Defence Ministry also runs civil affairs in the occupied West Bank, where Palestinians struggling for statehood live in friction with Jewish settlers.

"To my great regret, I have recently found myself in difficult disputes over matters of principle and professionalism with the prime minister, a number of cabinet members and some lawmakers," outgoing Defence Minister Moshe Yaalon said, reading, grim-faced, from a statement at his Tel Aviv office.

"The State of Israel is patient and tolerant toward the weak among it and minorities ... But to my great regret extremist and dangerous elements have overrun Israel as well as the Likud party, shaking up our home and threatening harm to those in it," he said, hinting he might quit the ruling party.

Netanyahu rebuffed Yaalon's criticism. "The reshuffle in portfolios did not result from a crisis in faith between us. It resulted from the need to expand the government so as to bring stability to the State of Israel given the great challenges it faces," he said in a video statement.

Netanyahu, who doubles as foreign minister, added that he had offered the top diplomatic post to Yaalon but was refused.

Yaalon's departure could put a new dent in domestic and Western confidence in the Netanyahu government. Lieberman, whose appointment has not yet been confirmed, is inexperienced militarily and famed for his past hawkish talk against Palestinians, Israel's Arab minority and Egypt.

*The Economic Times*  
21 May, 2016

## **China Beats India in Social Media Fakery**

*Apparently, the Chinese Communist Party presses into service a Fifty Cent Party*

In China, as we are reminded over and over again, they do things differently. While, in the free world that includes our neck of the woods, social media is abuzz with incredibly truthful and useful information that puts the D into democracy, it turns out that the Chinese 'fake' some 488 million social media comments a year. This fact was uncovered by Harvard University political scientist Gary King as part of his study on China's online propaganda workers. Prof King, we believe, is genuine.



Known as the Fifty Cent Party -not because they are fans of rapper 50 Cent, but because they are reportedly paid 50 renminbi cents for every social media post -these folks post cheerful messages about the Chinese State and its various activities. A bit like our bhakts on social media who do it for free. The use of the word 'fake', though, to describe these 488 million comments maybe a bit stretched. To extol the virtues of a flyover in Xinjiang, or to find a State cultural programme to be more riveting than the Oscars does not comprise a 'lie'. The purpose of these comments is reportedly to 'distract' citizens from 'bad news' and 'sensitive issues'. Which, last heard, is not a Chinese Communist Party monopoly but a practice perfected by the likes of American reality television and 'news' on which celebrity is cheating on which other celebrity, vital info that's been cloned and is lapped up across democracies, including our own.

*The Pioneer*  
23 May, 2016

## **India to Test Reusable Launch Vehicle Technology on Monday**

India will test on Monday a reusable launch vehicle technology (RLV) space agency ISRO developed to reduce cost of firing rockets to deploy satellites in orbit, a senior official said. "A mini-rocket with the winged reusable launch vehicle demonstrator (RLV-TD) on its top will lift-off during the launch window between 7 a.m. and 11 a.m. on Monday, depending on wind and weather conditions," Indian Space Research Organisation director Devi Prasad Karnik told IANS here.

A successful demonstration of the indigenously-developed technology will qualify India to enter the elite club of space-faring nations like the US, Russia and Japan, which have developed and used RLVs for their space missions over the years.

The 9-metre rocket with a mass weight of 17 tonnes, including nine tonnes of solid propellants, will take off vertically from ISRO's spaceport at Sriharikota in Andhra Pradesh, about 80 km northeast of Chennai.

The ISRO has designed and built the 1.7-tonne winged RLV-TD as a flying test bed to evaluate technologies developed to reduce the cost of launching rockets for carrying satellites into polar and geo-stationary orbits.

"The mini-rocket will soar up to 70km where its booster will release the 1.7-tonne aircraft-shaped RLV-TD into the lower orbit and re-enter the atmosphere for returning to the earth, with its heat-shield protecting it from searing temperatures," Vikram Sarabhai Space Centre (VSSC) director K. Sivan told IANS.

Rockets for launching satellites and space explorations are made at VSSC at Thiruvananthapuram.

"The exercise will enable us to collect data on hypersonic speed, autonomous landing, powered cruise flight using air-breathing propulsion," Sivan said.

The long-term objective of this mission is to reduce the launch cost by 80 percent of the present cost by using a reusable vehicle.

Space agencies worldwide spend on average \$20,000 to build and use medium-to-heavy weight rockets to launch satellites into the earth's orbits.

The first technology demonstrator will conduct the hypersonic flight experiment, followed by landing test, return flight experiment and scramjet propulsion test, using the 15-tonne (mass) rocket, with 9-tonne propellants (solid fuel as booster).

"The 10-minute flight will demonstrate the hypersonic and aero-thermo dynamics of the winged re-entry vehicle, with autonomous mission management to land after passing through very high temperatures during the re-entry," Sivan said.

The space agency's telemetry, tracking and command network (Istrac) in Bengaluru will collect the data from the vehicle spanning vertical take-off, its release in the space by the rocket booster for manoeuvres and its plunge into the Bay of Bengal.

The vehicle, being a "dummy", will not be recovered from the sea this time.

"In subsequent test flights, we will attempt to land the reusable vehicle at a specific location on land like an aircraft does on a runway so that we can again use it for launching more satellites," Sivan said.

The space agency is developing the RLV and its support systems from the budget earmarked annually for technology development and research and development.

The cost of developing the RLV technology is estimated to be about Rs.100 crore.

"Developing the complex technology and using a reusable vehicle will take a decade (10 years) as we have to build them with our own resources," Sivan added.

Besides the US (NASA) and Russia (Roscomos), Japan (Jaxa) and the European Space Agency (ESA) have developed the RLV technology.

*The Indian Express*  
23 May, 2016

## **RLV: India's first reusable space shuttle**

*The RLV Technology Demonstration (RLV-TD), that aims to ultimately put satellites into orbit around earth and then re-enter atmosphere, will be carried up on a solid rocket motor.*

India is all set for the maiden launch on Monday of an experimental indigenous winged Reusable Launch Vehicle (RLV) from Sriharikota spaceport in Andhra Pradesh.

The RLV Technology Demonstration (RLV-TD), that aims to ultimately put satellites into orbit around earth and then re-enter atmosphere, will be carried up on a solid rocket motor. The nine-metre long rocket weighs 11 tonnes.

"The launch window for the RLV-TD is between 7 am and 11 am," a senior ISRO official said.

Very similar in its looks to the US space shuttle, the double delta-winged RLV-TD is a scale model almost six times smaller than the final version. The 6.5-m-long 'aeroplane'-like structure weighs 1.75 tonnes and will be hoisted into the atmosphere on a special rocket booster.

The RLV-TD is described as "a very preliminary step" in the development of a reusable rocket, whose final version is expected to take 10-15 years.

Explaining the importance of the experimental RLV, Indian Space Research Organisation (ISRO) Chairman Kiran Kumar said it is essentially an attempt by India to bring down the cost of making infrastructure for space.

"We are designing for the first time a winged body which will come back from space... We will be launching from Sriharikota, and the plane-like winged body will land in the ocean, in the Bay of Bengal. Ultimately, the objective will be this winged body will come and land on the Sriharikota island," Kumar told PTI.

The development of an RLV — sometimes referred to as a space truck or a space shuttle — has not been the top priority at ISRO, evident from the fact that there has been no technology demonstration despite an RLV development programme being in the pipeline for six to seven years now.

One of the first trials of an RLV was announced by ISRO as far back as 2010 but was put off due to technical reasons. Another was hinted at in 2015 but was again grounded over technical issues.

Much of the attention in recent years at ISRO was focused on the development of the heavy lift Geosynchronous Satellite Launch Vehicle (GSLV) and its high-end version, the GSLV-Mk III, to enable the space organisation to break into the lucrative market of launching large communication satellites weighing over 2000 kg.

A decision in 2011 by the US government to shut down NASA's space shuttle programme on the grounds of viability also caused a drop in interest in the development of an RLV at ISRO.

A renewed interest worldwide through the pioneering efforts of private companies like the Elon Musk-founded SpaceX in the US in creating cost-effective launch vehicles, that can fly hundreds of times into space in their lifespan, appears to have also rekindled fresh efforts at ISRO.

On Monday, a technology RLV demonstrator will be flown to an altitude of 70 km in the sky before being brought back to land in the sea. The mission, known as the hypersonic flight experiment, is expected to last about 10 minutes from liftoff to splashdown.

The hypersonic flight experiment (HEX) will be followed by the landing experiment (LEX), return flight experiment (REX) and scramjet propulsion experiment (SPEX).

While companies like SpaceX have moved away from using winged spaceplanes for their RLV plan, ISRO feels a winged spacecraft provides more accuracy for landings.

Though manned space flights are an ultimate goal of RLVs, the major advantage is reducing the cost of space launches and making space travel more affordable. "The cost of access to space is the major deterrent in space exploration and space utilisation. A reusable launch vehicle is the unanimous solution to achieve low-cost, reliable and on-demand space access," according to ISRO.

"Nearly 80 to 87 per cent of the cost in a space launch vehicle goes into structure of the vehicle. The cost of propellants is minimal in comparison. By using RLVs, the cost of a launch can be reduced by nearly 80 per cent," says Dr K Sivan, Director of Vikram Sarabhai Space Centre.

*The Asian Age*  
23 May, 2016

## **India to get indigenous supercomp next year**

India will get an indigenously-built supercomputer next year as part of the government's Rs 4,500-crore programme aimed at taking India into an elite league of nations who has made advancements in the field. The Centre for Development of Advanced Computing that built India's first supercomputer, Param, is handling the project, said Ashutosh Sharma, secretary in the ministry of science and technology.

The government had in March last year approved the plan of the National Supercomputing Mission, under which 80 supercomputers will be built in the next seven years. "Some of them will be imported and the rest will be built indigenously. The first one will come up by August 2017," he said.

"We are working on how to control heat. The cost of power to run these supercomputers alone will be around Rs 1,000 crore," Mr Sharma said.

The new supercomputers will be kept in different institutes across the country. "A supercomputer can be used for various purposes like climate modelling, weather forecast, discoveries of drugs among others," Mr Sharma said. Currently, countries like the US, Japan, China and the European Union account for a major share of the top supercomputing machines in the world.

*Deccan Herald*  
23 May, 2016

# Large solar telescope to be set up at Ladakh

*By Kalyan Ray*

New Delhi: After almost five years, the Defence Ministry has finally approved setting up of the National Large Solar Telescope (NLST) at a site close to the India-China border in Ladakh.

Besides studying the intricacies of solar dynamics and magnetism, the NLST may also be used in the night to search for extra-solar planets.

A tiny village named Merak near Pangong Tso Lake in Ladakh was the preferred site for the NLST, which was thought of as one of the mega-science facilities to be built in India. But the project hit a stonewall when the Ministry of Defence objected to it citing proximity to the Sino-Indian border.

"Almost eight weeks ago, the permission finally came from the Defence Ministry for the Merak site. We will now revise the proposal because of cost enhancement," sources in the department of Science and Technology told DH.

The 2-metre class telescope was to cost about Rs 300 crore and was to be ready by 2017. Because of the five-year delay in getting the permission, both cost and completion schedule would have to be reworked.

Earlier this month, a panel of law-makers asked the department of Science and Technology to move fast on the NLST and advised the Finance Ministry to arrange for necessary funding. The University of Hamburg was thought of as one of the partners, specifically for instrumentation.

The NLST's main task would be studying the sun to know more about its magnetic field, sun spots and solar activity. When completed, it will be one the world's largest solar telescopes.

Two other large solar telescopes are being created by the USA and Spain. China too has proposed to build a giant one for researching on solar activities. The location of the telescope needs to provide a large number of clear hours for making observations with very good seeing and transparency.

*Deccan Herald*  
*23 May, 2016*

## Solar Impulse 2 plane in Dayton

A solar-powered plane landed in Dayton, Ohio on Saturday on the latest leg of a record-breaking trip to circle the globe without consuming a drop of fuel, AFP reports from Washington.

Solar Impulse 2, piloted by Swiss businessman Andre Borschberg, arrived at 9:56 pm (0156 GMT Sunday) at Dayton International Airport after a flight from Tulsa, Oklahoma that lasted a 16 hours and 34 minutes, a live video feed showed.

"Amazing to have landed in #Dayton after being in the sky for 17 hours!" Borschberg tweeted. The slow-moving, single-seat plane with the wingspan of a Boeing 747 cuts a flimsy figure, but it has traversed much of the globe in stages since taking off March 9, 2015 from Abu Dhabi.

The project aims to promote renewable energy. The aircraft - clad in thousands of solar cells, the sole source of energy for the flight - reached its destination more than an hour ahead of schedule. Still, traveling at average speeds of only 30 miles (48 km) per hour, it took Solar Impulse 2 longer to reach Dayton than a car - the typical road trip from Tulsa is around 12 hours. The flight to Dayton was the 12th leg of Solar Impulse's projected 16-leg east-west circumnavigation, with Borschberg and Bertrand Piccard alternating as pilots.

Piccard, a Swiss psychiatrist and balloonist, initiated the project. "The flight is part of the attempt to achieve the first ever Round-The-World Solar Flight, the goal of which is to demonstrate how modern clean technologies can achieve the impossible," Piccard and Borschberg said in a statement.

## **This ‘Solar Tree’ Needs Just ‘4 Sq Ft’ To Light Five Houses**

A Council of Scientific and Industrial Research (CSIR) laboratory in West Bengal has designed a ‘solar power tree’ that takes up only four square feet of space and produces about three kilowatts (kW) of power— enough to power about five households.

“The challenge was to come up with a design so as to generate more solar power in less land space,” Sibnath Maity, chief scientist at the Central Mechanical Engineering Research Institute (CMERI) in Durgapur, which developed the “tree”, told IANS.

“For one MW of power, one needs five acres of land. To generate 10,000 MW we would need 50,000 acres. Now this poses a dilemma in States like West Bengal and Bihar,” Maity said.

The “solar tree” was inaugurated on Tuesday by Union Science and Technology Minister Harsh Vardhan during his maiden visit to the CMERI, which is a constituent of the CSIR.

Maity said one conventional solar photovoltaic system of five kW requires 400 square feet of area.

The three kW solar power tree resembles a tree with branches at different tiers and could be squeezed on rooftops and highways with a space requirement of around four square feet.

“The branches hold up the 30 photovoltaic panels and the system costs around Rs3 lakh with battery back-up,” Maity said.

Two solar power trees would be installed at the office at Harsh Vardhan’s bungalow on the Minister’s request, said Maity.

Harsh Vardhan also inaugurated the ‘Control Container’ developed by the CMERI for lake and sea trial of ‘Remotely Operated Vehicle (ROV)’.

“I happily took part in live demonstration of the tractors developed by CSIR-CMERI by being literally in the driver’s seat and actually driving one vehicle,” the Minister posted on his official Facebook page.

“I lauded the contribution of the institute in Green Revolution with its immensely successful technological achievements — the ‘Swaraj Tractor’ followed by the ‘Sonalika’ and the ‘Krishi Shakti’. I also drove the ‘e-Rickshaw’ developed by the institute with great enthusiasm,” Harsh Vardhan added.

# THE BUZZ ABOUT DRONES



Inspired by nature, scientists have built flying microrobots called 'RoboBees', which can perch during flight like birds or butterflies to save energy and stay in the air for longer

## THE PROBLEM, CURRENTLY

According to researchers from Harvard University, many applications for small drones require them to stay in the air for extended periods

Unfortunately, smaller drones run out of energy quickly

## WHAT THE ROBObEE CAN DO

The RoboBee, pioneered at the Harvard Microbotics Lab, uses an electrode patch and a foam mount that absorbs shock

## FEATURES

**13.4 mg** is the total weight of the mechanism, similar to the weight of a real bee

## HOW IT WORKS

The robot takes off and flies normally

When the electrode patch is supplied with a charge, it can stick to almost any surface, from glass to wood to a leaf

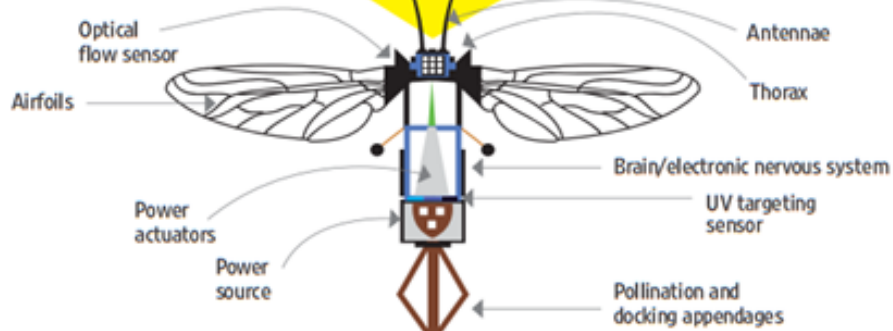
To detach, the power supply is simply switched off

## KEEPING UP ENERGY LEVELS

The team used electrostatic adhesion that functions on the same basic science principles which cause a static-charged sock to cling to a pants leg or a balloon to stick to a wall

"In the case of the balloon, however, the charges dissipate over time, and the balloon will eventually fall down," said Graule

"In our system, a small amount of energy is constantly supplied to maintain the attraction," he said.



## TO BEE OR NOT TO BEE

The researchers found inspiration in nature for the flying microrobots

"A lot of different animals use perching to conserve energy," said Kevin Ma, Harvard student, who co-authored the study.

## **Largest gene database of Indians soon**

### *Medgenome teams up with consortium that has committed to sequence 1 lakh Asian genomes*

In a step to create one of the largest repositories of Indian genomes, Bangalore-based Medgenome has teamed up with a southeast Asian consortium that has committed to sequence 100,000 Asian genomes. Were it to work to plan this could mean a consolidated storehouse of at least 30,000 Indian genomes and could help understand the wide genetic variety in India's various ethnic groups and midwife customized medications for cancer and heart disease as well as identify possible new genetic aberrations that cause untreatable diseases.

Ever since the human genome was first sequenced in 2003, meaning, that the entire DNA pattern in the cell that lends people their unique identity was deciphered, several countries have announced initiatives to map genomes of their resident populations. The so-called 1000 Genomes project is a collection of gene samples from across the world to capture the variety of genes that are typical to different population groups. The United Kingdom announced a plan in 2014 to create a bank of 100,000 genomes in the nation and 100,000 Asia genomes project—called GenomeAsia 100K--echoes similar ambitions. "Indian populations are greatly neglected in such databases," said Mahesh Pratapneni, Executive Director, Medgenome and a top official with the GenomeAsia 100K. "and glaring considering we're one-sixth of humanity."

The project will develop in phases with an initial 1000 genomes, consisting of India and East Asian populations, sequenced within this year and the entire database to be ready by 2020. Medgenome already has a bank of 200 Indian genomes.

### **\$120 million project**

The project will cost \$120 million (approx. Rs 800 crore) though only about half of that has been firmed up. Other key collaborators in the project are Singapore's Nanyang Technological Institute, Singapore and Macrogen, a genetics diagnostic company in Seoul. Nearly 60 petabytes of data—equivalent to 30 trillion pages of text—are expected to be churned out in this study. Though all this data would be publicly available to researchers, access to it would be staggered. "We will release it all over 3-4 years but the main contributors to the project would access this earlier," Pratapneni told *The Hindu*.

Though human genome sequencing is a frontier area of biotechnology, it was prohibitively expensive. Technology advancement has made prices dramatically drop, enabling several companies to offer genome sequencing services. Experts however say that while the cost of sequencing has fallen it's the analysis of genes that adds value and that would mean being able to access and compare huge datasets.

While many diseases are linked to genes going awry, afflictions such as diabetes, cardiovascular diseases, cancer etc are usually the result of several genes malfunctioning, and often in a domino-like effect. Identifying such culprits are impossible without comparing genes, across individuals and population groups, in large numbers. Thus BRCA 1 and BRCA 2—genes associated with breast cancer—are found in as many as one-third of women. Several of them go on to live without ever contracting the cancer. These genes come in several varieties that can vary on the level of families as well as ethnicities. Genome sequence studies are effective in studying such variations.

### **'Good initiative'**

"It's a good initiative and could throw up valuable data provided there is a good study design in place," said Samir Brahmachari, former head of the Council of Scientific and Industrial Research and who led the country's first initiative to sequence an Indian genome.

## **Modified microalgae converts sunlight into valuable medicine**

London: Scientists, including one of Indian-origin, have modified microalgae genetically to allow them to transform sunlight into everything ranging from chemotherapy or bioplastics to valuable flavour and fragrance compounds.

"We hijack a portion of the energy produced by the microalgae from their photosynthetic systems. By redirecting that energy to a genetically modified part of the cell capable of producing various complex chemical materials, we induce the light driven biosynthesis of these compounds," said Agnieszka Janina Zygodlo Nielsen, from the University of Copenhagen in Denmark.

The researchers successfully modified microalgae to form complex molecules to an unprecedented extent, an advance that may lead to an inexpensive and environmental friendly method of producing chemicals such as pharmaceutical compounds. The problem with many of these substances today is that they are extremely expensive and difficult to make, and therefore produced only in small quantities in the medicinal plants, researchers said.

"A cancer drug like Taxol for instance is made from old yew trees, which naturally produce the substance in their bark. It is a cumbersome process which results in expensive treatments. If we let the microalgae run the production this problem could be obsolete," Nielsen said.

The method can be run sustainably and continuously, and this is what makes it even more spectacular compared to present methods, said Thiyagarajan Gnanasekaran, from University of Copenhagen. "Our study shows that it is possible to optimise the enzymatic processes in the cells using only sunlight, water and CO<sub>2</sub> by growing them in transparent plastic bags in a greenhouse," said Gnanasekaran.

"Theoretically, the water could be replaced with sewage water, which could make the process run on entirely renewable energy and nutrient sources," he said.

## **Simple platform for antibiotics' discovery developed**

Boston: Scientists have created a new, simplified platform for antibiotic discovery that can lead to the development of new medicines and also help fight bacteria which are resistant to existing drugs.

Researchers developed a platform where they assemble eight (chemical) building blocks by a simple process to make macrolide antibiotics - which inhibit the growth of bacteria - without using erythromycin, the drug upon which all others in the class have been based since the early 1950s.

Erythromycin, which was discovered in a soil sample from the Philippines in 1949, was on the market as a drug by 1953. "For 60 years chemists have been very, very creative, finding clever ways to "decorate" this molecule, making changes around its periphery to produce antibiotics that are safer, more effective, and overcome the resistance bacteria have developed," said Andrew G Myers, professor at the Harvard University.

"That process is semisynthesis, modifying the naturally occurring substance," Myers said.

In contrast, the process described in the new study involves using "eight industrial chemicals, or substances derived from them," Myers said, and manipulating them in various combinations and then testing the products against panels of disease causing bacteria.

This allows us to make new new compounds in fewer steps than was previously possible, the researchers said.



"One of the things that's quite encouraging about the data in our paper is that some of the structures we've made are active against clinical bacterial strains that are resistant to every known macrolide," Myers said. The study was published in the journal Nature.

*Deccan Herald*  
23 May, 2016

## **Breakthrough into study on immune cells**

Washington, PTI: Scientists have discovered how immune cells trigger an inflammatory response - a finding that may pave the way for new treatments for many diseases. Immune cells play essential roles in the maintenance and repair of our bodies. When we injure ourselves, immune cells mount a rapid inflammatory response to protect us against infection and help heal the damaged tissue.

"While this immune response is beneficial for human health, many human diseases (including atherosclerosis, cancer and arthritis) are caused or aggravated by an overzealous immune response," said Helen Weavers, from the University of Bristol in the UK.

"A greater understanding of what activates the immune response is therefore crucial for the design of novel therapies to treat these inflammatory disorders," Weavers said.

"Our study found that immune cells must first become 'activated' by eating a dying neighbouring cell before they are able to respond to wounds or infection," she said.

"In this way, immune cells build a molecular memory of this meal, which shapes their inflammatory behaviour," she said. The researchers used the fruit fly (*Drosophila melanogaster*) to study how a particular immune cell (the macrophage) becomes activated in order to respond to injury or infection.

Using the fly researchers were able to make time-lapse movies of the dynamic behaviour of the immune cells as they migrate within a living organism. It also allowed them to easily manipulate different genes and signalling pathways within the fly, to test which genes are important for immune cell behaviour. Using genetics, the researchers dissected the mechanism by which the molecular memory is generated within the immune cell. Ingestion of the dying cell activates signalling via a calcium flash, which leads to an increase in the amount of an important damage receptor Draper in the immune cell.

High levels of this receptor enable the 'primed' immune cell to sense the damage signals that entice them towards a wound during inflammation. Without this priming, the cells are blind to wounds and infections.

"Our work has important implications for human health, given that the pathology of many human diseases is often caused by an inappropriate inflammatory response," said Paul Martin from University of Bristol.

"Understanding how one signal (in this case a dying cell) can influence the ability of an immune cell to respond to a subsequent signal is a major step towards finding novel ways to clinically manipulate immune cells away from sites of the body where they are causing the most damage," Martin said. *The study was published in the journal Cell.*

*The Hindu*  
23 May, 2016

## **Breakthrough as new form of light discovered**

*The discovery may impact our understanding of the fundamental nature of light*

In a breakthrough, scientists have discovered a new form of light, which will impact our understanding of the fundamental nature of light.

One of the measurable characteristics of a beam of light is known as angular momentum. Until now, however, it was thought that in all forms of light the angular momentum would be a multiple of Planck's constant — the physical constant that sets the scale of quantum effects.

Now, researchers from Trinity College Dublin's School of Physics and CRANN Institute have demonstrated a new form of light where the angular momentum of each photon (a particle of visible light) takes only half of this value. This difference though small is profound, researchers said.

**Changes of light property** - "We're interested in finding out how we can change the way light behaves, and how that could be useful. What I think is so exciting about this result is that even this fundamental property of light, that physicists have always thought was fixed, can be changed," said Assistant Professor Paul Eastham.

"Our discovery will have real impacts for the study of light waves in areas such as secure optical communications," Professor John Donegan said.

"This discovery is a breakthrough for the world of physics and science alike," said Professor Stefano Sanvito, Director of CRANN.

In the 1830s, mathematician William Rowan Hamilton and physicist Humphrey Lloyd found that, upon passing through certain crystals, a ray of light became a hollow cylinder.

The team used this phenomenon to generate beams of light with a screw-like structure.

Analysing these beams within the theory of quantum mechanics they predicted that the angular momentum of the photon would be half-integer, and devised an experiment to test their prediction.

Using a specially constructed device they were able to measure the flow of angular momentum in a beam of light. They were also able, for the first time, to measure the variations in this flow caused by quantum effects.

The experiments showed a tiny shift, one-half of Planck's constant, in the angular momentum of each photon.

Theoretical physicists since the 1980s have speculated how quantum mechanics works for particles that are free to move in only two of the three dimensions of space.

**New possibilities** - They discovered that this would enable strange new possibilities, including particles whose quantum numbers were fractions of those expected. This work shows, for the first time, that these speculations can be realised with light. The research was published in the journal *Science Advances*.

*The Hindu*  
23 May, 2016

## **Age of the digital dawns on Indian IT industry**

*By Pradeesh Chandran*

*Cloud, mobile, analytics and social media are becoming mainstream, fuelling hope for future growth*

The Indian Information Technology (IT) services industry, which has been through a roller coaster ride since the 2008 financial crisis hit it hard, is transitioning to the digital age for growth given the strategic position in which technology companies are placed in the IT spectrum.

Infosys, for example, which had been through a few troughs in the recent past, is on a turnaround under the leadership of Vishal Sikka, its Chief Executive Officer (CEO) and Managing Director (MD). With his strategy of 'Renew and new,' the bellwether is now focusing on digital technologies. Optimism seems to be high given the opportunities in digital technologies that IT

companies are best placed to exploit. The ability to visualise uses for new digital technologies combined with execution capability is driving opportunities for the industry.

“In the current digital business front, the sourcing model is changing. Clients are looking at IT services firms as partners with whom they can work and can do more co-discovery, co-sourcing and co-innovation,” said Partha Iyengar, Vice President, and Gartner.

**Consulting** - Gordon Coburn, President, Cognizant, recently told *The Hindu* that the company’s combination of investment in consultants and the retraining of its employees in digital technologies is bearing fruit now. Consultants help clients understand what technology can do for them and as to how a technology vendor can help implement the same. Retrained employees from the technical teams help execute the project, typically. Clients find this attractive since their technology investments in the past and returns from them have reached a plateau. The only way for some of these large spenders to move forward is to devise dramatically new ways to engage their own end-users. In today’s economic environment, cutting costs is as critical as enabling new revenue. “Clients want savings from the way they run their business and then use those savings to invest in new ways to change their business” said Mr. Coburn.

**Digital spend** - According to Gartner, of the total IT spend of about \$ 3.54 trillion in 2016, IT services is expected to be about \$929 billion, fuelled by digital technologies. Digital technologies are certainly more mainstream today than five years ago. But they still do not account for a major portion of IT services revenue, yet. For TCS, in the last fiscal, digital revenues grew 52.2 per cent due to faster adoption of digital solutions. Infosys is concentrating on digital solutions through its platform business. The company has announced an ambitious plan of achieving \$20 billion revenue by 2020 of which \$2 billion would be from ‘next generation’ services. Under the new leadership of Abidali Neemuchwala, billionaire Azim Premji-promoted Wipro has also embarked on a new journey equipped with six themes, including digital. “Our vision of the digital business across advisory, design and technology is securing mindshare amongst existing and new customers. We believe consulting capabilities in business and IT strategy, functional and process excellence are critical to the advisory offering in digital,” said Abidali Neemuchwala, CEO, Wipro.

**Changes** - HfS Research, an analyst firm, said in February it came across about 56 large outsourcing deals of which over 50 per cent are in the digital arena, including social, mobility, analytics, cloud, automation, security and IoT. The percentage of digital deals stood between 30 per cent and 40 per cent during the period between September and November 2015. But in the last three months, it has risen over the 40 per cent mark, the report said.

Hansa Iyengar, Senior Analyst - Large Enterprise Services, Ovum, a research organisation, said, “There is surely a lot of work being put out on the market. We have witnessed an increase in contract activity. Major markets like North America and Europe (U.K., Nordics, Germany) are showing an increase in the number of contracts coming up for renewal as well as new contracts coming to market.”

**Niche capability** - With new technologies, niche players get an opportunity to gain experience. Large outsourcing companies lacking in expertise may need to either partner or acquire specialised players. Now, ‘acquire’, or buyout of a company for skills of its staff is also gaining ground. Infosys’ acquisition of Panaya and Skava, Wipro’s buyout of Designit, Mindtree buying Magnet 360 and Cognizant buying US-based KBACE Technologies are examples. Funding start-ups, both external and internal, is gaining acceptance as giants value a nimble-footed culture. “We will see more collaboration between larger companies and start-ups that address niche needs,” said P.N. Sudarshan, Senior Director, Financial Advisory, Deloitte.

**In-sourcing** - With new technologies coming in faster than before, clients today realise that vendors are only a step ahead. This has given rise to the in-sourcing phenomenon. David Smoley, Chief

Information Officer, AstraZeneca, said last month on a visit to India that the company's move to get technology operations in-house had resulted in annual IT costs dropping from \$ 1.3 billion in 2013 to \$ 900 million now.

Deal sizes are also dropping, moving to the \$75 million range from \$100 million-and-more. While this may worry major firms, smaller players see an opportunity. "There was a notion that dealing with large companies involves less risk than with smaller one. With the focus on digital and specialisation, smaller players are also getting a chance to compete with major players," said Rostow Ramanan, CEO and MD, Mindtree.

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However, large deals have not disappeared. The challenge for large vendors will be to find ways to retain margins in smaller deals. Moreover, the smaller deals are 2-3 years in duration rather than the older pattern of more than five years range, which poses a challenge of dealing with reduced recurring revenue streams and annuity revenues.

**Reskilling** - Companies are spending more on training its workforce to become digitally able to execute projects. TCS, which is the largest employer in Indian IT, has trained 1.20 lakh people in over 400 new digital technologies, Wipro, which trained 10,000 people in digital, will train 20,000 more while Infosys is also training 30,000 people on design thinking.

"There is a growing interest in non-linear models and a lot of the vendors show greater appetite to tie in their revenues to business outcomes. There are pockets of business where there is a greater tendency to move towards non-linear models but the evolution is rather slow at this juncture," said Hansa Iyengar. According to IT industry body Nasscom, the industry will see 20 per cent fewer recruitments this year as players like TCS, Wipro and Infosys are focusing more on automation. Earlier, it had predicted that the \$150 billion industry will hire 2.75 lakh people in 2016-17 against 2.3 lakh people in the year earlier period.

*The Hindu*  
23 May, 2016

## **Earth home to a trillion species**

The Earth could contain nearly one trillion species, of which 99.999 percent are yet to be discovered, says a study based on the largest analysis of microbial data. The findings, published in the journal *Proceedings of the National Academy of Science s*, suggest that only one-thousandth of one percent of all the species have been identified till now.

"Estimating the number of species on Earth is among the great challenges in biology," said one of the study authors Jay Lennon from Indiana University in Bloomington, Indiana. The scientists combined microbial, plant and animal datasets from government, academic and citizen science sources, resulting in the largest compilation of its kind.

Altogether, these data represent more than 5.6 million microscopic and non-microscopic species from 35,000 locations across all the world's oceans and continents, except Antarctica. "Our study combines the largest available datasets with ecological models and new ecological rules for how biodiversity relates to abundance. This gave us a new and rigorous estimate for the number of

microbial species on Earth,” Lennon explained. The estimate is based on universal scaling laws applied to large datasets.

The authors are Jay Lennon and Kenneth Locey of Indiana University. “Until recently, we’ve lacked the tools to truly estimate the number of microbial species in the natural environment. The advent of new genetic sequencing technology provides a large pool of new information,” Lennon added.

*Deccan Herald*  
*21 May, 2016*

## **40 m Indians face rising sea level risk**

United Nations: Nearly 40 million Indians will be at risk from rising sea levels by 2050, with people in Mumbai and Kolkata having the maximum exposure to coastal flooding in future due to rapid urbanisation and economic growth, according to a UN environment report.

The Global Environmental Outlook (GEO-6): Regional Assessments said that the worst impacts of climate change are projected to occur in the Pacific and South and Southeast Asia.

It said focusing on the population at risk from sea level rise by 2050, seven of the 10 most vulnerable countries worldwide are in the Asia Pacific region.

India tops the chart with nearly 40 million people in the country projected to be at risk from rising sea levels, followed by more than 25 million in Bangladesh, over 20 million in China and nearly 15 million in the Philippines.

It said that changes in settlement patterns, urbanisation and socio-economic status in Asia have influenced observed trends in vulnerability and exposure to climate extremes.

The report said that in many coastal areas, growing urban settlements have also affected the ability of natural coastal systems to respond effectively to extreme climate events, rendering them more vulnerable.

"Some countries, such as China, India and Thailand, are projected to face increased future exposure to extremes, especially in highly urbanised areas, as a result of rapid urbanisation and economic growth," it said.

It listed Mumbai and Kolkata in India, Guangzhou and Shanghai in China, Dhaka in Bangladesh, Yangon in Myanmar, Bangkok in Thailand, and Ho Chi Minh City and Hai Phong in Vietnam as projected to have the largest population exposure to coastal flooding in 2070.

"Many of these cities are already exposed to coastal flooding, but have limited capacity to adapt due to their fixed location," it said.

The report, published ahead of the UN Environment Assembly taking place in Nairobi next week, said the worst impacts of climate change are projected to occur in the Pacific and South and Southeast Asia. In 2011, six of the ten countries most vulnerable to climate change worldwide were in Asia and the Pacific.

The report said livelihoods can be impacted negatively by natural disasters, economic crises and climate change. In coastal areas highly exposed to cyclones and typhoons the poor tend to be more exposed to natural disasters because they live on hazardous land. Evidence suggests that climate change and climate variability and sea-level rise will exacerbate multi-dimensional poverty in most developing countries. By 2050, areas of storm surge zones are expected for Bangladesh, China, India, Indonesia, and the Philippines, with a combined total of over 58 million people at risk.