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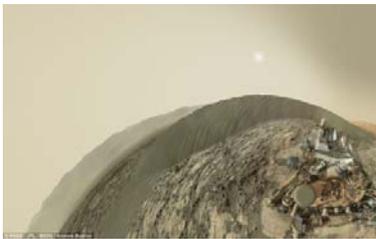
Social media advisory for defence personnel

After an ISI spy racket involving defence personnel was unearthed, security agencies are keeping a close eye on the social networking profiles of over 2,000 serving and retired officers of the defence forces. According to officials, the move is to ensure that no information is being leaked via social networking sites, which can be used against the nation. Recently, agencies have found involvement of serving and retired officers with Pakistan spy agency ISI. They allegedly used to pass information to them via Internet. On Monday, the Crime Branch of Delhi Police arrested an Indian Air Force official identified as Ranjith KK. He was caught leaking information on Bathinda air force camp to his Facebook friend. "There are many officers serving and retired officials who are revealing crucial details of their camps unknowingly on social media websites, which are being misused. Some officers are leaking details to spy agencies against a payment and a close watch is being kept on them," said a senior officer of the central security agency, claiming that more than 2,000 such profiles are under scanner.

Even the defence forces have found that a number of cases have surfaced wherein their personnel have fallen prey to agents of adversaries on social networking sites. "Many officers were tracked and information was extracted from them on social media websites. Such incidents take place once the identity along with interests and personal views of an individual get highlighted on social networking sites," a senior officer said. In the wake of incidents like cyber attacks and espionage, senior defence officials have asked their establishment to ensure that no person discloses his service identity on any social networking site. A source claims that despite the policy already being in place, an increasing number of cases of non-adherence are resulting in serious compromises. Their investigation has also revealed that the hackers, suspected to be from Pakistan or China, would 'make friends' with the officer or other members on his friend list to extract details of their location. "Family members, friends and social acquaintance be briefed that they don't address defence personnel by rank on social media network sites. No discussion related to course, posting be entertained," an advisory to the officials said. It also asked them to stay extra cautious while posting photographs.

Curiosity clicks the ultimate Martian selfie

Humans aren't the only ones snapping selfies to celebrate this holiday season. Nasa's Curiosity rover celebrated its arrival at the lee face of Namib Dune by taking its first ever coloured self-portrait. The rover has used the Mastcam colour camera to take thousands of high resolution panoramic images of the red planet, but this is the



first image taken of the rover's deck by the sensor. **Andrew Bodrov**, a member of the International Virtual Reality Photography Association, stitched together the series of images to create a mosaic that stretches about 30,000 pixels in width and includes 138 images, including the deck of the rover and the seldom seen robotic arm that holds the MAHLI camera. Curiosity is part of Nasa's Mars Exploration Program, and is a long-term effort to determine if the red planet once supported life and if it has potential to in the future. Curiosity has been using the MAHLI, a camera attached at the end of its robotic arm, to take self-

portraits and pictures of the Martian land. But with its arrival at the lee side of the active sand dune, scientists believe the deck camera is necessary to look for grains of sand that have blown onto the rover from the dune. Although the self-portrait does not include the rover mast, it does contain the robotic arm that has been missing from previous photos.

'I've collaged thumbnails of all of the individual images that include rover hardware, so you can see just how many frames it took to cover the whole thing,' stated Bodrov. 'Near the horizon, it takes 30 individual Mastcam frames to cover the full 360 degrees around the rover; they can use fewer as they go downward in elevation, but it still takes a lot of frames to cover the hemisphere.' Curiosity landed outside of Namib Dune earlier this month, which is an enormous region of rippled dark sand dunes known as Bagnold Dunes. This area is located at the base of Mount Sharp and is about two stories tall. The expedition is the first up-close investigate of active sand dunes that aren't on Earth. The expedition is the first up-close investigate of active sand dunes that aren't on Earth. 'Namib is an Aeolian paradise,' wrote Edgar. 'The view at Namib Dune is pretty spectacular. We've received a lot of beautiful Mastcam and Navcam images.'

MAKE IN INDIA TAKES OFF IN DEFENCE SECTOR

In the first 'Make-in-India' project in the Defence sector, India and Russia have signed an agreement to manufacture 200 Kamov-226T light utility helicopters to replace the ageing fleet of Cheetah and Chetak helicopters. Public sector Hindustan Aeronautics Limited (HAL) will build these helicopters here in collaboration with Rostec State Corporation and the deal is worth \$1 billion (₹6,500 crore). The deal figured during talks between Prime Minister Narendra Modi and Russian President Vladimir Putin during the summit meeting in Moscow last week. An agreement was signed in the presence of the two leaders between the two countries on co-operation in the field of helicopter manufacturing. The pact said Rostec State Corporation will build not less than 200 Kamov helicopters in India and the agreement also provides for maintenance, operation and repair of helicopters. Putin had offered to manufacture the Kamov helicopters as part of 'Make-in-India' initiative of the NDA Government during his visit to New Delhi last year. The Defence Acquisition Council (DAC), chaired by Defence Minister Manohar Parrikar, gave the go-ahead in May this year. Stating that it is an inter-Governmental pact, sources said here on Tuesday that Russia selected HAL as its partner in this project. While India will buy 20 helicopters off-the-shelf from the Russian manufacturer, the remaining 180 Kamovs will be built in HAL facilities in Bengaluru and Tumkur, they said. The deal comes as a shot in the arm for the Army which is flying Cheetah and Chetak helicopters that are more than 40 years old. In fact, the Comptroller and Auditor General (CAG) in its report tabled in Parliament last week had pulled up the Government for delaying the acquisition of latest helicopters. At present, the Army has 181 of these helicopters, which are the lifeline of troops posted in Siachen glacier and inaccessible mountain terrain in Arunachal Pradesh and Ladakh besides the North-East. The UPA Government had twice cancelled a deal for procurement of 197 helicopters to replace the existing fleet on grounds of irregularities in technical trials and price negotiations. The NDA Government finally cancelled the entire deal for 197 helicopters in August last year and decided to go in for the 'Make in India' option. The officials said though the initial order is only for 200 helicopters, it is likely to be increased later on. It stems from the fact that the IAF, Navy and Coast Guard are also using Cheetahs and Chetaks and most of these machines are in the last phase of their operational life. The total number of the present fleet is more than 430 helicopters, including 181 flown by the Army. "The agreement with India is the result of the long work with our Indian partners," CEO of Rostec, Sergei Chemezov said in a statement. "The organization for the manufacture of helicopters is provided by the creation of a Russian-Indian joint venture in India, which includes holdings of Rostec-JSC Rosoboronexport and Russian Helicopters, and on the India side, the corporation HAL," he said. The light multipurpose twin-engine helicopter KA-226T is built on the scheme coaxial rotors and features excellent handling and installed power. KA-226T is equipped with modern navigation equipment. It can easily manoeuvre in both, dense urban (between high-rise buildings) as well as non-urban environments (such as mountains). The absence of a tail rotor and compact dimensions allows the use of small airfields. Moreover, the helicopter has a low noise level and meets the latest environmental requirements. It has a replaceable transport module, which allows a short time to change the functionality of the helicopter.

ISRO to build re-usable launch vehicles

The Indian Space Research Organisation (ISRO) is all set to build re-usable satellite launch vehicles, another milestone in its space endeavour. ISRO chairman AS Kiran Kumar has said in Mysuru that ISRO was working on designing reusable satellite launch vehicles in an effort to cut down cost. He said "ISRO will complete the design in 2016. The aim is to bring back the vehicle from the orbit and test if this process is economically viable. The objective is to access space with best minimum cost possible." He was in Mysuru to deliver a lecture on 'Space Technology and Societal Applications'. ISRO now uses separate vehicles to launch satellites and the vehicles cannot be reused. It had planned to test re-usable satellite launch vehicles in September but things did not go as planned, Kumar added. Kumar said ISRO is also working on 'Geo tagging of post offices' across the State. The facilities available in as many as 1.5 lakh post offices across Karnataka will be mapped under the project for the benefit of people. ISRO chairman said ISRO is developing a 'Space-based information support' to educate Gram Panchayat members on various schemes available for the development of villages. As part of the project, the Panchayat Raj department will impart training to members in 7,000 blocks spread across the country. Stressing on the 'Tele-education Programme' initiated by ISRO, he said that the country needs more such education institutions and expert teaching faculty. To address the need of education, ISRO developed 'EDUSAT' - exclusively for educational services, which cater to a wide range of interactive educational delivery modes such as one-way TV broadcast, video conferencing, etc. The chairman also highlighted various

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The Pioneer

Dated-30 Dec, 2015

ISRO to build re-usable launch vehicles

communication satellites developed to address issues during natural calamities, medical services, and farmer's issues among other issues. ISRO has launched 21 satellites in 2015 and out of this 17 satellites were foreign satellites boosting the commercial capabilities of ISRO. According to reports, ISRO is launching its next satellite in the IRNSS constellation will be launched in January 2016. The satellite for SAARC Countries, which was announced by Prime Minister Narendra Modi earlier, is getting ready and is waiting for clearance from various member countries.

Hindustan times

Dated-30 Dec, 2015

Make in India: Russian firm, HAL tie up to build 200 Kamov choppers

In a major boost to the 'Make in India' programme, Russia's Rostec State Corporation on Tuesday announced a tie-up with Bengaluru-based Hindustan Aeronautics Limited (HAL) to manufacture at least 200 Kamov-226T helicopters at an estimated cost of Rs 6,000 crore. The development came barely a week after India and Russia inked a pact for cooperation in helicopter manufacturing during Prime Minister Narendra Modi's two-day visit



to Moscow. HAL chairman T Suvarna Raju was a member of the Indian delegation even as Anil Ambani-led Reliance Group was also eyeing the deal. India had originally planned to import 197 light helicopters but the NDA government scrapped the \$1 billion proposal in August last year for manufacturing the choppers in the country in a joint venture with a foreign firm. The joint venture with HAL covers maintenance, operation and repair of helicopters. "The agreement is the result of a long work

with our Indian partners. This is the first Russian and Indian high-tech project, being implemented by the Modi government within the framework of the 'Make in India' programme," said a release quoting CEO of Rostec State Corporation Sergei Chemezov as saying in Moscow. It added that Rostec "will arrange the production of as many as 200 units of Russian Ka-226T and its modifications in India." Chemezov said the Indian and Russian partners could also consider the possibility of "joint access" to other markets in the future. "Rostec's competitive advantage lies in the fact that we are ready to deal with not only the localization of helicopters in India, we also offer our partners the localization of production technology," added the CEO. The chopper has a distinct design as it has coaxial rotors – a pair of rotors mounted one above the other. It is a versatile platform capable of operating in environments ranging from dense urban conditions to mountains.

The Hindu

Dated-30 Dec, 2015

Crony connectivity, and Internet for us

If the objective is to connect the whole world to the Internet, then Free Basics by Facebook (previously known as internet.org) is a controversial method to achieve it. The company wants to provide a subset of the Internet free of charge to consumers, with mobile telecom operators bearing the costs of the traffic. Facebook acts as the unpaid gatekeeper of the platform. This kind of arrangement has come to be called "zero rating" and attracted criticism from Internet civil society groups like the Electronic Frontier Foundation. It argues that the Free Basics scheme has "one unavoidable, inherent flaw: Facebook's central role, which puts it in a privileged position to monitor its users' traffic, and allows it to act as gatekeeper (or, **Contd next page....**

Crony connectivity, and Internet for us

depending on the situation, censor)... there is no technical restriction that prevents the company from monitoring and recording the traffic of Free Basics users. Unfortunately, this means there is no guarantee that the good faith promise Facebook has made today to protect Free Basics users' privacy will be permanent.” **Monopolists vs free market.** In India, Internet civil society activists are opposing Facebook's scheme for additional reasons. While the attempt to introduce new users to the Internet is a good thing, they argue, the scheme risks breaking the network into many smaller ones and skewing the playing field in favour of apps and services that enjoy privileged pricing. Zero rating in general and Free Basics by Facebook in particular has many defenders among advocates of free markets and capitalism. They argue that if the mobile operator wishes to lose money or cross-subsidise some users at the cost of others, then it should be allowed to do so. Government intervention in pricing usually has bad unintended consequences, and it should be no different in the case of Internet traffic. The Telecom Regulatory Authority of India (TRAI) has re-engaged in a public consultation seeking submissions on which path it should take: the conservative path of insisting on net neutrality, a laissez-faire approach of non-intervention in the decisions of private firms, or other options in between these two. What seems to be taken for granted but should really surprise us is that companies and policymakers accept that getting the developing world online requires methods that are different from how the developed countries got there. So, how did the hundreds of millions of people around the world become Internet subscribers? Not because of government schemes, but because they could afford it. They could afford it because market forces — competition — drove prices down to levels that made an Internet connection affordable. Unless government policies get in the way, there is no reason why the same forces will not reduce prices further to make the service affordable to ever more people, with lower disposable incomes. There is empirical evidence for this: the 980 million mobile phone subscribers in India are able to make phone calls because they can afford the charges. Even after some price capping by TRAI, most mobile telecom operators are doing well. Despite persistent call drops and atrocious customer service, consumers enjoy reasonably good service and the industry as a whole is fairly healthy. All this happened without a mobile phone operator providing free calls to a limited set of numbers in order to demonstrate the value of mobile phones and to encourage more people to take up subscriptions. Operators did, however, innovate in retailing, launching prepaid packages and recharging these connections. On the flip side, they also cut costs by skimping on customer service, overloading spectrum and sharing tower infrastructure.

Competition is the key

TRAI should reflect on its own success in transforming India from a low teledensity country to a moderately high teledensity one. This happened not due to “no-frills services for poor and developing country users” but by ensuring that market competition is allowed to take its course. There is no reason why mobile Internet services will not become as popular as mobile phone services as long as there is adequate competition. Therefore, the debate on whether or not to permit zero rating is beside the point. What TRAI ought to be asking is whether there is sufficient competition in its current policy framework. Should it be licensing more telecom operators? Has the government made enough spectrum available so that mobile operators can lower prices and ensure adequate service quality? Are there bottlenecks in the hands of monopolists that raise the costs of service? The path to achieving the dream of Digital India

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Crony connectivity, and Internet for us

lies not in foreign companies deciding on what basic services India's poor ought to access free of charge, but by encouraging ever greater competition and a level playing field. This calls for the regulator to have a hawkish approach towards anti-competitive behaviour by existing market players. Now, let's say that the government really wishes to make the Internet affordable to citizens whose incomes are too low to pay for it. There is a good case for this based on positive externalities: that some benefits of an individual's connection to the Internet accrue to society as a whole. Much like primary education, an Internet connection allows a citizen to participate in the modern economy. Just as society as a whole benefits if all citizens are educated, it benefits if all citizens are connected. To be clear, this is not an argument for the government to run telecom businesses. Rather, it is to say that it is in the public interest for nearly everyone to be connected to the Internet.

Growth as a force multiplier

While it is tempting to provide free or subsidised services — like we do in India for many such things — the best method to achieve this outcome is to raise people's incomes. If the Indian economy grows at 8 per cent over several years, the income effect will make Internet connections more affordable even if prices do not fall. In other words, the best scheme to bring the Internet to all involves boosting competition to bring down prices and pursuing economic growth to raise people's incomes. This is the formula that has worked elsewhere in the world, has worked in India and will continue to work. Schemes like Free Basics by Facebook and Airtel Zero are unnecessary from the perspective of connecting the unconnected. Now, Facebook is not a charity. So, it probably must have a good explanation to its shareholders why it is spending so much of its time and resources in promoting a good cause. That explanation is likely to go: "more Internet users in the world means more users for Facebook, which we monetise in our usual ways". It might also hint that being the gatekeeper, however open, of Internet content for hundreds of millions of people will give it a lot more market power. This is important, for as Chamath Palihapitiya, venture capitalist and an early Facebook executive says, the company worries that it will lose out if it does not capture most of the world's Internet content on its own platform. TRAI must take a call on whether such business strategies are anti-competitive. But in dealing with the question, the regulator must not allow itself to be persuaded that such schemes are necessary for bringing the Internet to the masses.

Navy to test Barak-8 missile

The Navy will carry out the maiden test of the long-range Barak-8 surface-to-air missile from INS Kolkata early on Wednesday, Navy spokesperson Captain D.K. Sharma said. The Barak-8 missile is being developed jointly by India and Israel. While two tests have been successfully conducted from Israeli ships, this is the first time that the test would be held onboard an Indian one. The missile has been designed to defend against a variety of airborne threats.

Govt. to amend patent rules**The centre is in the process of bringing out a new national policy for IPR**

The Centre plans to amend patent rules to speed up patent filing and approvals to give a boost to the government's ambitious slogans of 'Make in India' and 'Startup India,' a top official said. Apart from amending the patent rules, the Union Government is also planning to outsource the job of patent agents to about 1,000 professors in various Indian Institutes of Technology (IITs) in the country. "India has become the centre for research and development in the last five years," said Amitabh Kant, Secretary Department of Industrial Policy and Promotion (DIPP). "India needs to be made into a nation of innovation, design for which patents are important. "The government is in the process of amending the patent rules so that Make in India and startup's patents are put on a fast track," he said. The Centre is also in the process of bringing out a new national policy for Intellectual Property Rights (IPR), which will be one of the finest in the world. The new IPR policy will be placed before the cabinet for approval in a month's time. The government had created a think tank to provide recommendations and draft the IPR Policy. Intellectual property and patents give companies an edge to compete in the competitive global markets.

Post FDI policy change, Tatra set to partner with Reliance Defence for making military trucks

NEW DELHI: In the first major defence joint venture after the big-bang changes in the FDI policy, Czech major Tatra is set to partner with Reliance Defence to manufacture military trucks for Indian as well as global requirements. The 51:49 partnership JV, which will have Reliance with the majority stake, is also expected to get several Tatra trucks already in service with the army and the nuclear forces back on the road after spares and servicing were hit due to a scandal in 2012. ET has learnt that the defence ministry received a letter on the impending JV two weeks ago, informing that the two companies are planning to partner for maintenance and overhaul facilities, upgrades as well as manufacturing units for the trucks in India and have signed a Memorandum of Understanding (MoU). Sources told ET that the JV is targetting an annual market of Rs 3500 cr given the new and the service needs of the armed forces. A new production unit for the trucks is also planned at the Dhirubhai Ambani Defence Park as part of the 'Make in India' initiative. When contacted, a Reliance Defence spokesperson confirmed that the company is in advanced stage of discussions with Tatra for collaboration to serve the Indian market as well as exports to other nations. While the process of registering the company and obtaining manufacturing licences is pending, this would be the first major joint venture since FDI norms were relaxed in November, making it much easier for foreign investors to venture into the defence manufacturing with a 49% limit under a new automatic process. Industry analysts say the new norms have resulted in a flurry of activities and interest in JVs between foreign defence manufacturers and Indian entities. A further boost would come if the defence ministry places tenders and orders for military systems from the private sector. "In addition to the relaxation of Defence FDI norms, the OEMs and their Indian partners are looking to the MoD to help them create viable business cases. The MoD should and can play a significant role in this aspect as well," says Ankur Gupta of EY. At present, Tatra trucks are in service with the Army and strategic forces for several critical military systems including the Brahmos missile complex.

China launches 'most sophisticated' observation satellite

Beijing: China on Tuesday successfully launched its "most sophisticated" observation satellite, Gaofen-4, as part of the country's high-definition earth observation project. Gaofen-4 was launched from the Xichang Satellite Launch Centre in the southwestern province of Sichuan aboard a LongMarch-3B carrier rocket. It was the 222th flight of the Long March rocket series, the State Administration of Science, Technology and Industry for National Defense (SASTIND) said. Gaofen-4 is China's first geo synchronous orbit HD optical imaging satellite, and the world's most sophisticated HD geo synchronous orbit remote sensing satellite, Xu Dazhe, head of SASTIND and China National Space Administration said. Different from Gaofen-1 and Gaofen-2 in low orbits (600-700 km) around the earth, Gaofen-4 is located at the orbit 36,000 kilometers away from the earth and moves synchronously with the earth. It can "see" an oil tanker on the sea with a huge CMOS camera, reaching the best imaging level among global high-orbit remote sensing satellites, Li Guo, chief designer of Gaofen-4 said. The successful launch of Gaofen-4 was the 19th space mission in this year. It will be used for disaster prevention and relief, surveillance of geological disasters and forest disasters, and meteorologic forecast, state-run Xinhua news agency quoted Tong Xudong, the chief designer of the Gaofen project with SASTIND as saying. The Gaofen project aims to launch seven high-definition observation satellites before 2020. Gaofen-1, the first satellite of the project, was launched in April 2013.

Benefits of visiting Moscow

Prime Minister Modi visited Russia last week for the sixteenth Indo-Russian summit, an annual feature that showcases the close relationship between the two countries. The erstwhile Soviet Union and India historically maintained good diplomatic relations. It was at Tashkent that the peace treaty between India and Pakistan was



brokered after the 1965 war. Indira Gandhi signed the Indo-Soviet treaty of peace, friendship and cooperation in August 1971 prior to the war, thus ensuring non-interference from any Western power or China during the conflict, while at the same time stalling any unilateral decision by the UN Security Council. Till the recent past, until relations with the US moved to a new high, the former Soviet Union was India's main military supplier. For decades India employed mainly Soviet-made weapons and technology. These were purchased at special prices, and with easy repayment plans. It was after the breakup of the

Soviet Union that India began experiencing shortfalls in spares and ammunition, as a number of manufacturing plants were now located in satellite nations, thus requiring separate military agreements. The last few years also witnessed a slow decline in military cooperation between the two. Shortfalls in critical spares, escalation in costs and time overruns on the aircraft carrier, problems with servicing of Russian-origin transport and fighter aircraft are some reasons for the decline. The defence minister visited Russia recently, with the aim of resolving these issues, including the leasing of a Russian nuclear submarine. While some issues were resolved, the leasing of a nuclear submarine still remains. The Indian military is well versed with Russian technology, having employed Russian equipment for decades. Historically, Russia has always stood by India, when other nations were unwilling to do so. Presently, Russia is a willing partner in development of helicopters and aircraft, while the jointly developed BrahMos Missile has been a success and is inducted into the Indian arsenal. Russia is keen to participate in the 'Make in India' programme and has set up plants for manufacture of helicopters and reactors. With a growing economy and the need to maintain a powerful military, due to ever-growing nature of threats, India started moving closer to the West, notably the US and Israel for military supplies. This move by India was viewed by Russia as a shift in India's foreign and defence policy. Therefore this visit, which included a slew of defence and economic agreements, was aimed at offsetting the freeze and bringing the relationship back on track. These were the issues that formed part of the defence and manufacturing deals signed between the two leaders. The joint statement also highlighted the closeness and depth of understanding between the countries, in spite of India moving closer to the US. Strategically India and Russia need one another's support. Russia is presently facing sanctions from the West due to its annexation of Crimea and its support to the pro-Russian rebels in Ukraine. These have begun taking their toll on the Russian economy. Its actions in Syria and its support to the Assad regime have again brought it into confrontation with the West. India has remained

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Benefits of visiting Moscow

neutral during these events, and has refrained from taking sides. There would have been other security issues also discussed, albeit behind closed doors. These would be issues that concern both nations. Foremost is the growing menace of terrorism, taking centre stage in Afghanistan. The increased footprint of the ISIS and the enhanced power of the Taliban there threaten both. Unless they are contained in a tactical timeframe, they have the possibility of spreading their wings in every direction. While India considers Pakistan to be a part of the problem, Russia like the West considers Pakistan to be a part of the solution, as it is the only nation with the ability to bring the Taliban to the table. Thus the importance of compelling Pakistan to act would surely have been discussed and a strategic solution arrived at. The next issue would be the current situation developing in West Asia, which threatens the stability of an entire region. This, if permitted to escalate, could affect India's energy imports and employment opportunities for its populace in West Asia, thereby affecting remittances. For Russia, this threatens the survival of its close ally, Assad in Syria. India would also have raised the supply of military hardware to Pakistan. Though the numbers are fairly low, however they could lead to the commencement of greater supplies, and become a threat to India's conventional superiority. At the same time, Russia would have raised India's growing relations and bonhomie with the West, notably the US. With Russia-US relationships now at a near all-time low, India's proximity could be considered a threat. India would have justified the same, and clearly stated that it is neither anti- Russia nor against joint interests. India also needs Russian support for the UNSC as well as to fulfil its energy hungry economy. In the long term, the two nations need to remain diplomatically close. The growing menace of terrorism in South and West Asia has begun affecting both, albeit in different manners. While Russia has committed its military in Syria, and would not hesitate to do so in other regions where its interests are affected, India has tended to maintain a studied silence. There is however a need for both to cooperate and work together for ensuring that terrorism remains contained and is not permitted to export its ideology.

Mr Abe comes calling

Prime Minister Narendra Modi's visit to Japan in September last year had given a fresh impetus to India-Japan ties; his counterpart Shinzo Abe's three-day visit to India from December 11 to 13 has reaffirmed the desire to transform the Japan-India Strategic and Global Partnership to a deep, broad-based and action-oriented partnership. It was in this context that both Prime Ministers discussed a wide range of issues of common interest



relating to economics, politics, security, climate change, infrastructure, manufacture, UN reform and other matters. The two leaders also agreed to develop a comprehensive and concrete medium and long-term action plan to realise their shared objectives as part of India and Japan Vision 2025. The joint statement issued at the end of the visit of Prime Minister Abe mentions some major agreements which in turn would help buttress bilateral ties. Of course, economic and trade relations form one of the most important segments of bilateral ties. Modi views Japan as an important player in realising India's desire to achieve double-digit growth rate. The Government feels that its initiative of Make in India cannot succeed unless there is a degree of synergy between India's "Act East policy" and Japan's "Partnership for Quality Infrastructure". Without world-class infrastructure, the Indian market cannot be suitably attractive to foreign investors. Secondly, China has over the past few years made huge investments in other South Asian countries. For instance, President Xi laid out bold plans to develop the \$46 billion China-Pakistan economic corridor running across the Karakoram Mountains to the Arabian Sea. Thus, Japan's increasing engagement in development projects in India would help Delhi to balance its position vis-a-vis Beijing in this region. On the other hand, Japan sees good prospects in promoting economic ties with India in view of the latter's huge domestic market and natural resources. This has been further boosted by the Modi Government's efforts towards removing obstacles in doing business in India. Abe has commended Prime Minister Modi's strong initiatives such as "Make in India," "Digital India," etc. It was in this context that the signing of the Memorandum of Cooperation on the introduction of Japan's High Speed Railway technology to the Mumbai-Ahmedabad route has been described as "very encouraging" for bilateral ties in the sense that this particular project would be financed by a Japanese loan at just 0.5 per cent rate of interest. At the same time, Japan will also provide technical assistance to build the domestic capacity to manufacture coaches and tracks before making them operational. Above all, it underlines the commitment of the Abe Government to help India

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Mr Abe comes calling

in building infrastructure by providing world-class technologies and skills. The agreement on building a high-speed railway system between Ahmedabad and Mumbai would help Japan revive its infrastructure exports. In fact, ever since Japan lost to China a high-speed railway project in Indonesia earlier this year, this particular project in India was viewed as very crucial by Japan to challenge China's growing rise as a leader in infrastructure-building in Asia and other parts of the world. Japan has also agreed to provide ODA loans for different development projects in India, notably for the improvement of road connectivity in the north-eastern states. Both countries have created a "Core Group" chaired by the Cabinet Secretary to coordinate and closely monitor the process to promote Japanese public and private investments to India. Another area which has emerged as a cornerstone of the relationship is defence ties. In this context, Modi and Abe reiterated their commitment to deepen cooperation in the field of defence, which would help them to promote peace and security in the Indo-Pacific region. In so doing, while India and Japan have already formed a trilateral concert along with the US, Japan has started participating in the India-US Malabar Joint Naval exercise. During the visit of Prime Minister Abe, India and Japan also signed agreements for Transfer of Defence Equipment and Technology and concerning Security Measures for the Protection of Classified Military Information, which further strengthens the foundation to explore potential projects on defence equipment and technology cooperation such as US-2 amphibian aircraft. A more significant aspect of Prime Minister Abe's visit was the reference to the South China Sea in an India-Japan joint statement. It states that in view of the "critical importance of the sea lanes of communications in the South China Sea for regional energy security and trade and commerce which underpins continued peace and prosperity of the Indo-Pacific, the two Prime Ministers called upon all States to avoid unilateral actions that could lead to tensions in the region". The affirmation by India and Japan that the two have shared interests in the disputed South China Sea region is aimed at countering China's claim that South China Sea exclusively belongs to it. In January 2015, Prime Minister Modi and President Obama had also expressed a similar view about the South China Sea. In turn, India, Japan and the US appear to forge closer ties among them in order to effectively deal with any adverse situations emerging from the assertive posturing of China. The two Prime Ministers expressed concern over growing terrorist activities across the world and pledged "zero tolerance." Abe urged Modi to bring the perpetrators of terrorist attacks, including those of November 2008 in Mumbai, to justice. In turn, the statement clearly indicated that Japan shares the concerns of India with regard to Pakistan's role in abetting cross-border terrorism from its soil against India. Although sections of experts and scholars in both countries had ruled out any prospect of a new agreement, it is noteworthy that India and Japan have reached an agreement on Cooperation in the Peaceful Uses of Nuclear Energy, which was stalled since 2013. The nuclear agreement is a very significant development in bilateral ties in view of the fact that Japan has in the past been very critical of India's nuclear programme and had imposed economic sanctions following the 1998 Pokhran tests. Thus, the agreement indicates that Japan has now come to recognise India as a responsible nuclear power and acknowledges this country's compulsions for developing the nuclear arsenal. This can further be gauged from the fact that India has become the first country, with which Japan would have nuclear cooperation without the former being the signatory of the NPT. Apart from boosting strategic ties between New Delhi and Tokyo, the agreement would be viewed as the facilitator for the sale of US nuclear reactors to India in the sense that two Japanese-owned/controlled companies, GE-Hitachi and Westinghouse, which are major nuclear manufacturers in the US, can speed up the process of investment in the civil-nuclear field in India as Japan will now not oppose the removal of the tracking clause from the India-US nuclear agreement. In addition, India can be in a position to get access to advanced nuclear technology at cheap rates prices because the agreement will reduce the dependability on France and Russia. Abe also agreed to work for India to become a full member in the four international export control regimes, Nuclear Suppliers Group, Missile Technology Control Regime, Wassenaar Arrangement and Australia Group, with the aim of strengthening the international non-proliferation efforts. It is true that Japan has only in principle agreed to cooperate with India in the civil-nuclear field. It will require dedicated efforts from India and Japan before they can realise actual cooperation in this area. However, the striking feature of Prime Minister Abe's visit is the fact that India and Japan have found convergence of interests in a number of areas including security, defence, and economic issues. Thus, while containment of China in the Indo-Pacific region is one shared interest, promotion of multi-polarity is another. Economic interests would also prove to be a crucial factor in shaping the future course of India-Japan ties. Above all, since Modi and Abe view Japan and India as critical for achieving their domestic and external interests, it can be hoped that in the coming years, India and Japan would be able to expand and deepen bilateral ties further still.

Slipping friends through the barrier

A most convenient way of taking medicine is by swallowing a pill, but the body has created barriers to prevent pathogens, like bacteria that could come in along with food, from entering the bloodstream. These same barriers could also prevent useful drugs that are taken orally from reaching the place where they are needed. Oral medication thus needs to have special arrangements to ensure absorption. Debora Walker, Benjamin T Käs Dorf, Hyeon-Ho Jeong, Oliver Lieleg and Peer Fischer at the Max Planck Institute for Intelligent Systems at Stuttgart, the University of Stuttgart and the Institute for Medical Engineering at the Technical University at Munich, report a step in this direction in the journal *Science Advances*. They have piggybacked, they report, on a stratagem used by an adapted bacterium to design a drug carrier that can drill its way through the mucus armour of the stomach wall. One of the main defences of the body is the layer of mucus, a viscous fluid that covers some tissue, either internal or which is exposed to the exterior, like the nostrils, eyelids, the airways in the lungs, the stomach and intestines, the genitals or the anus. The function is both to moisten and prevent the loss of moisture through exposed tissue as well as to prevent access by dirt, toxins or micro-organisms. The primary component of mucus is the protein, mucin, whose molecules form an interconnected network that serves to prevent larger particles from passing through, but does not come in the way of nutrients in the food being absorbed by the intestines. But this barrier, compounded by the acidic environment in the stomach, is also an impediment in the oral administration of therapeutic agents, which are often large molecules or encapsulated to be effective and have large particle size. One way to get around this difficulty is with the use of chemical agents that break up the mucin network and clear the way. But this method cannot be followed to any great extent as it would compromise the protective role of mucus. Many pathogens have devised ways to get around the barrier, the Stuttgart/ Munich paper says, including interaction with the mucus surface, affecting the production of mucin and then of liquefying the mucus. The only way available to drug carriers, so far, the paper says, has been to coat the carriers with agents that affect the mucus-surface interaction, if not to use enzymes whose effect of degrading the mucus layer is not reversible. A particular bacterium, *Helicobacter pylori*, which has flagelles, or whip-like organs for propulsion, however, uses a variation in the form of an enzyme called urease that directly affects only the level of acidity of the medium but manages to get through the mucus barrier anyway. In the highly acid environment of the stomach, *H. pylori* secretes a large quantity of urease that has a first effect of neutralising the acidity. How it works is that urease acts on urea, which is a waste product that is present in circulation. Urea arises in the liver out of digestion of protein and reduction of levels of ammonia and gets taken out for excreting by the action of the kidneys. But at the spot where *H. pylori* has secreted urease, the enzyme works as a catalyst to convert urea back to ammonia. The rising ammonia level is alkaline and this reduces the local level of acidity, which is good for the bacterium. But the fall in acidity is not so good for the mucin membrane, which undergoes changes that make it less viscous. The *H. pylori* then has free passage and its flagelles propel the bacterium through the mucus to the intestine wall, where it does its work of promoting peptic ulcers and gastritis. The paper says that the bacterium is able to move through mucus so long as there is urea and the medium is not acidic. But even moving flagelles cannot help if there is acidity and there is no urea and the movement resumes when urea is added. Once the bacterium has gone through and there is no more urease, acidity is restored and the mucin network thickens again to close the door to other large particles. This “altruism”, of letting the fence get mended once its purpose is served, may be the secret of *H. pylori*'s success, as the body may have evolved differently if the damage had been long lived.

Imitating *H. pylori*

The Stuttgart/Munich group has created an artificial drug delivery microstructure with a magnetic propulsion arrangement and a urease dispenser to make use of the *H. pylori* method of breaching the mucus layer. Magnetic propulsion, where a screw-like piece of magnetic material is subjected to a rotating magnetic field, has been found to work in low viscosity fluids in a number of studies, the paper says. The micro-helices, or screw-shaped propellers were fashioned by a process of “vapour deposition” and made of glass, with nickel as the magnetic material deposited towards the end of the fabrication. The surface was then coated with alumina, aluminum oxide, to protect the nickel from acid. The nickel material was magnetised in a sense transverse to the axis of the screw so that a rotating magnetic field set the screw turning, which would move it forward. Just before the micro-propellers were magnetised, a charge of urease was deposited on their surface using agents that would bind to the surface and then hold on to the urease. Testing with glass beads of the same dimensions and treated in the same way showed that they effectively acted on urea to reduce acidity below the level needed for mucin to remain gelled and viscous. In practice, however, it was found that even urease-treated rotating micro-propellers were not able to actually get moving when placed in mucus. This appeared to be because mucin adheres to the propeller surface, which gets entangled with the web of mucin molecules. After trying different agents to reduce this adhesion, it was found that bile salts, which are present in any case in the intestines, were effective. Trials then showed that micro-propellers could effectively go through a layer of mucus that was largely like the conditions found in the stomach and intestines, except for the need to adjust some parameters. The study would prove useful both for artificial devices like remotely steerable “robot-type” devices and even to help non-propelled drug or particle delivery across the mucus barrier in the gastro-intestinal tract, the paper says.

Life's building blocks

How photosynthetic organisms replenish chemical energy and organic carbon drained from the biosphere by chemotrophs is explained by their use of solar energy to drive the reduction of CO₂ (the most oxidised form of carbon) to produce carbohydrates, fats, and proteins — the reduced forms of carbon upon which all chemotrophs depend. The use of solar energy to produce these reduced building blocks of life is aptly named photosynthesis — the conversion of light energy to chemical energy — and its subsequent use in synthesising organic molecules. Nearly all life on earth is sustained by the cascade of energy that arrives as sunlight. Phototrophs are organisms that convert solar energy to chemical energy in the form of ATP. Some phototrophs, such as the halobacteria, are known as photoheterotrophs, organisms that acquire energy from sunlight but depend on organic sources of reduced carbon. Most other phototrophs — including plants, algae and most photosynthetic bacteria — are known as photoautotrophs, organisms that use solar energy to drive the biosynthesis of energy-rich organic molecules from simple inorganic starting materials: carbon dioxide and water. Many photoautotrophs, appropriately called oxygenic phototrophs, release molecular oxygen as a byproduct of photosynthesis. Thus, phototrophs not only replenish reduced carbon in the biosphere but also provide molecular oxygen in the atmosphere, completing the cyclic flow of energy. Two general aspects of photosynthesis involve how photoautotrophs capture solar energy and convert it to chemical energy, and how this energy is used to transform energy-poor carbon dioxide and water into energy-rich organic molecules, such as carbohydrates, fats, and proteins. Photosynthesis involves two major biochemical processes: energy transduction and carbon assimilation. During energy transduction reactions, light energy is captured by chlorophyll molecules and converted to chemical energy in the form of ATP and the reduced coenzyme NADPH. ATP and NADPH generated by the energy transduction reactions subsequently provide energy and reducing power for the carbon assimilation reactions, commonly known as the Calvin cycle, during which fully oxidised carbon atoms from carbon dioxide are fixed (reduced and covalently attached) to organic acceptor molecules and then rearranged to form carbohydrates and other organic compounds required for building a living cell. Light energy is captured by members of a family of green pigment molecules called chlorophylls, which play a key role in every photoautotroph's energy transduction pathway. These are present in green leaves as well as the cells of algae and photosynthetic bacteria. Light absorption by a chlorophyll molecule excites one of its electrons, which is then ejected from the molecule and flows energetically downhill through an Electron Transport System. As in mitochondria, this flow of electrons is coupled to unidirectional proton pumping, which stores energy in an electrochemical proton gradient that drives an ATP synthase. In photosynthetic organisms, ATP synthesis driven by energy derived from the sun is called photophosphorylation. To incorporate fully oxidised carbon atoms from carbon dioxide into organic molecules, photoautotrophs need not only ATP but also NADPH, the reduced form of NADP⁺. In oxygenic phototrophs — plants, algae, and cyanobacteria — light energy absorbed by chlorophyll and other pigment molecules drives the movement of electrons from water, which has a very positive reduction potential, to ferredoxin, which has a very negative reduction potential. From ferredoxin, electrons then travel exergonically to NADP⁺, thereby generating NADPH. In anoxygenic phototrophs — green and purple bacteria compounds with less positive reduction potentials than that of water, such as sulfide (SH₂), thiosulfate (S₂O₃²⁻), or succinate — serve as electron donors. In both oxygenic and anoxygenic phototrophs, the light-dependent generation of NADPH is called photoreduction. The most important pathways for our consideration are the biosynthesis of sucrose and starch. Sucrose conveys energy and reduced carbon from photosynthetic cells to non-photosynthetic cells and is, therefore, the major transport carbohydrate in most plant species. Starch, or glycogen in photosynthetic bacteria, on the other hand accumulates when photosynthetic carbon assimilation exceeds the energy and carbon demands of a photoautotroph and is, therefore, the major storage carbohydrate.

रूस और भारत के बीच लगातार बढ़ता सैन्य-तकनीकी सहयोग

रूस-भारत वार्षिक शिखर भेंट के बाद कहा गया कि रूस और भारत के बीच सामरिक साझेदारी मुख्य रूप से उनके सैन्य-तकनीकी सहयोग में ही व्यक्त हो रही है।

त्रिगोरी उवायक
आरआईवीआर

रूस-भारत शिखर भेंट के बाद रूस ने केए-226 टी हैलिकॉप्टरों का भारत में निर्माण करने से जुड़े समझौते की पुष्टि कर दी है। रूस के राष्ट्रपति व्लादीमिर पुतिन ने कहा कि रूस और भारत मिलकर बहुक्रियात्मक लड़ाकू विमान और बहुउद्देशीय परिवहन विमान का विकास कर रहे हैं और यह आपसी सहयोग की बड़ी संभावनाशील दिशा है। उन्होंने आपसी सहयोग को पारंपरिक रूप से किया जा रहा 'सघन' सहयोग बताया।

संयुक्त पत्रकार सम्मेलन में बोलते

हुए व्लादीमिर पुतिन ने कहा - हम सिर्फ तैयार उत्पादों की ही भारत को सप्लाई नहीं करेंगे, बल्कि आपस में गहरा तकनीकी सहयोग भी करेंगे। हमारे इस तरह के सहयोग का एक उदाहरण 'ब्रह्मोस' मिसाइलों का उत्पादन है। भारतीय नौसेना के लिए बड़े पैमाने पर पोतनाशक मिसाइलों का उत्पादन भी शुरू कर दिया गया है।

मास्को शिखर-सम्मेलन की पूर्ववला में बताया गया था कि इस मुलाकात के दौरान 7 अरब डॉलर से ज्यादा मूल्य की सैन्य-तकनीकी सहयोग से जुड़ी परियोजनाओं पर विचार किया जाएगा, जिनमें भारत द्वारा नवीनतम रूसी वायु रक्षा प्रणाली एस-400 'त्रीऊम्फ', परियोजना 636 की दो डीजल-इलेक्ट्रिक पनडुब्बियों, परियोजना 11356 के तीन युद्धपोतों, 48 सैन्य परिवहन हैलिकॉप्टरों एमआई-17 बी-5 तथा बीएमपी-2 के नामक 149 लड़ाकू बख्तरबंद गाड़ियों

का भारत में उत्पादन करने के लिए लायसेंस की खरीद से जुड़ी योजनाएं शामिल हैं।

इसके अलावा भारत चाहता है कि रूस उसके आइएल-76 सैन्य-परिवहन विमानों और हवा में ही लड़ाकू विमानों को ईंधन की सप्लाई करने वाले आइएल-78 विमानों का आधुनिकीकरण करे। यह भी बताया गया था कि भारत रूस से परियोजना 971 की दूसरी एटमी पनडुब्बी भी किराए पर लेना चाहता है। इसके अलावा दो देश भारत में बहुक्रियात्मक केए-226 टी नामक 200 हलके रूसी हैलिकॉप्टरों का मिलकर उत्पादन करने के बारे में एक समझौते पर भी विचार करना चाहते थे।

विगत फरवरी माह में 'इकूत' निगम ने यह घोषणा की थी कि भारत में बहुक्रियात्मक लड़ाकू विमानों एसयू-30 एमकेआई की एसबलिंग के लिए बस छह विमानों की किट और भारत

भेजनी है। 'इकूत' निगम का कहना था कि इस साल यह अनुबंध पूरा हो जाएगा। भारत ने रूस से इस तरह के कुल 222 विमान खरीदे थे।

विगत अगस्त में 'वित्याल्योती रस्सी' नामक कंपनी ने बताया था कि 151 बहुक्रियात्मक सैन्य-परिवहन हैलिकॉप्टर एमआई-178-5 की सप्लाई के बारे में हुए अनुबंध में से 148 हैलिकॉप्टरों की सप्लाई हो चुकी है। इसके अलावा, संयुक्त विमान निर्माण निगम के प्रमुख यूरी स्ल्यूसर ने बताया कि इस साल के अंत तक भारत और रूस पांचवी पीढ़ी के लड़ाकू विमान और बहुउद्देशीय परिवहन विमान के मिलकर किए जा रहे डिजाइन-निर्माण के अंतिम दौर में पहुंच जाएंगे।

सैन्य-तकनीकी सहयोग के क्षेत्र में आज रूस और भारत मिलकर जो काम कर रहे हैं, वह उस काम से पूरी तरह अलग है, जो काम वे पिछली सदी के

Contd...

part-2



आठवें और नौवें दशक में किया करते थे। बात अब सिर्फ विक्रेता और क्रेता के रूप में तकनीक की खरीद की ही नहीं की जाती, बल्कि भारत की राजकीय और निजी कंपनियों की सहभागिता से उन जटिल परियोजनाओं की भी होती है, जिनका भारत लायसेंस के आधार पर खुद भारत में उत्पादन करना चाहता है या जिनका विकास भारत और रूस दोनों मिलकर कर रहे हैं।

मास्को में हुई शिखर मुलाकात के

बाद संयुक्त रूप से जारी की गई विज्ञापित में कहा गया है - दोनों पक्षों ने फिर से आपसी सहयोग का विकास करने तथा 'मेक इन इंडिया' कार्यक्रम पर अमल करते हुए इस कार्यक्रम की बढ़तीलत सामने आई संभावनाओं का रक्षा उद्योग के क्षेत्र में इस्तेमाल करते हुए विभिन्न विभागों और मंत्रालयों को यह जिम्मेदारी सौंपी है कि वे जल्दी से जल्दी ऐसी परियोजनाएं तैयार करें जिनपर दो देश मिलकर अमल कर सकते हैं।

'मेक इन इंडिया' कार्यक्रम के तहत केए-226 टी हैलिकॉप्टरों के संयुक्त उत्पादन पर भी बनी सहमति

Navbharat Times

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रूस-भारतीय संयुक्त सैन्य-अभ्यास 'इंद्र-नेवी-2015' संपन्न

संयुक्त सैन्य-अभ्यास 'इंद्र-नेवी-2015' का रूस और भारत में ऊंचा मूल्यांकन किया जा रहा है। वाइस-एडमिरल अन्द्रेय रियाबूखिन ने कहा कि अभ्यासों के दौरान जटिल और बड़ा काम पूरा करना था, लेकिन काम मुश्किल होने के बावजूद पारस्परिक समझ और दो देशों की नौसेनाओं के बीच तुरत किए गए तालमेल की बढ़तीलत बड़ी सफलता से सारी जिम्मेदारियों को पूरा कर लिया गया।

भारतीय नौसेना के वाइस-एडमिरल सुनील भोकरे ने कहा कि सैन्य-अभ्यास रूस और भारत के बीच बन रहे रणनीतिक रिश्तों में आगे की ओर बढ़ाया गया एक और सकारात्मक कदम सिद्ध हुए हैं। उन्होंने कहा कि अभ्यासों के दौरान कोई भी जटिलता पैदा नहीं हुई और सभी सवाल बड़े पेशेवर ढंग से हल कर लिए गए। सैन्य-अभ्यास के दौरान तैरते हुए समुद्री लक्ष्यों पर मिलकर गोलाबारी की गई और उसके बाद चलते-चलते एक-दूसरे को मालों का हस्तांतरण किया गया।



Govt to sign nuclear damages pact

**Convention for Supplementary Compensation Will Be Ratified By Mid-Jan
Indrani. Bagchi**

New Delhi: The government is getting ready to ratify the international Convention for Supplementary Compensation (CSC), capping a year of surprising successes in nuclear energy in India, which ended with Parliament passing the joint venture bill for nuclear projects. India is confident it will keep its promise to US President Barack Obama and ratify the CSC by mid-January. Once ratified, it will add to the pool of compensation for nuclear damage. Last week, the government informed Parliament that the Indian Nuclear Insurance Pool (INIP) with a capacity of Rs 1,500 crore was launched on June 12, 2015 to provide insurance to cover liability as laid down in the controversial Liability Act (2010). "In addition to providing coverage for operator's liability, INIP will also address liability-related concerns of suppliers under the CNLD Act," the MEA said. Sources also said the operator, NPCIL, will take out the first insurance policy in the coming weeks, opening the road for suppliers to take out insurance policies, in another reply in Parliament, the MEA once again clarified that while the liability of the supplier will be according to Section 17 of the CLND Act along with Rule 24, "the operator's right to recourse against the supplier will be as per the contract entered". The government has said the supplier holds "no liability to pay compensation for nuclear damage in the first instance to the victims of a nuclear accident". That liability rests solely with the operator-in this case, NPCIL. In December, Canada sent the first uranium consignment of 250 tonnes to India for its nuclear reactors, a major achievement. This year, when the world focused on cleaner energy, India also completed nuclear agreements with Australia and Japan. Although Japan still has to clear the deal through its Parliament, it has major implications not only for India's nuclear power, but for a strategic relationship with Japan. For starters, it will make it easier for Toshiba-Westinghouse to advance negotiations with the Indian government for 6 nuclear reactors. The early works agreement, said sources, has already been implemented and the two sides are working on a commercial contract scheduled for the first half of 2016. These would be the AP-1000 reactors that Westinghouse has sold to China. Meanwhile, following an agreement between L&T and Areva, the Indian company is reportedly in the process of a major upgrade of its Hazira facility for nuclear equipment manufacture. While international focus has been on solar energy sources say, India could be on a fast track to add significant amount of nuclear power to its energy mix.