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Centre to clear Russian military purchases ahead of Modi-Putin meet

Days before Prime Minister Narendra Modi meets Russian President Vladimir Putin in Moscow on December 24, the Defence Acquisition Council (DAC) chaired by defence minister Manohar Parrikar is all set to clear on Thursday procurement of five S-400 supersonic air defence systems from Russia. Besides, the DAC will also clear a 'Make in India' plan to raise six regiments of Pinaka multibarrel rocket launcher systems (MRLS). The five S-400 systems will cost around Rs 40,000 crore, while the Pinaka systems will cost another Rs 14,000 crore. South Block sources said the acquisition of the S-400 system, which has a range from 40 to 400 km, depending on the missile fired, could be through the Request for Proposals (RFP) or government-to-government route. The acquisition will be discussed between Modi and Putin and may figure in the joint statement. Although the military had earlier projected a requirement of a dozen S-400 systems, the defence ministry is clear that only five systems are sufficient to take care of the future airborne threat from across India's borders. The S-400 is a proven anti-aircraft system, and is widely considered the most advanced of its kind in the world, with the capability of engaging missiles as well as aircraft. It comes with a mobile launcher and a threat detection radar-cum-command centre. The deal includes purchase of some 6,000 missiles from Russia. The DAC is also expected to clear Pinaka MRLS that is expected to replace traditional artillery guns on the border. The Pinaka system can fire within seconds a barrage of unguided rockets with a range of up to 38 km to achieve a saturation bombing effect, or what is called area destruction. This kind of weapon system is lethal for troop and armour concentrations, and is also battle-proven.



The five S-400 systems will cost around Rs 40,000 crore.

The Statesman

17 December 2015

PM may visit Brussels for India-EU summit in 2016

Prime Minister Narendra Modi is likely to visit Brussels in the first half of 2016 for the India-EU summit, a meeting that did not take off over earlier this year ostensibly over the the Italian marines issue. Speaking to mediapersons on Wednesday, the new European Union (EU) Ambassador to India, Tomasz Kozlowski, said during Modi's meeting with the European Commission president Jean-Claude Juncker and the European Council head Donald Tusk at Antalya, Turkey, in November, "both sides had agreed to hold the India-EU summit in the first half of 2016". Kozlowski said that dates for the Brussels summit are being firmed up. A visit by Modi to Brussels in April 2015 had to be postponed after the 28-member bloc apparently cold shouldered a proposal by India for the prime minister's visit. The reason, it was understood, was the long-running trial of the two Italian marines who are charged with the murder of two Indian fishermen off the coast of Kerala in 2012. Kozlowski said that the November 15 meeting between Modi and Tusk and Juncker was "short but a very useful and fruitful". "We got a clear statement that the government of India is willing to put India-EU relations back on track," he said. The ambassador said that the EU is willing to "re-engage" with India on the Free Trade Agreement, which has been hanging fire for several years. "Both the sides will sit down and see what the options are, what the expectations are, and how to work it forward," he said. "We are interested to re-engage, and ready to come to India and discuss the issue," he said, adding that the idea was that the trade deal should be profitable to both sides. He also said that the EU was keen to participate in the flagship projects of the Modi government, like the smart cities, Make in India, urban planning, Digital India, Clean Ganga, ICT and Renewable Energy. The EU is also keen to engage with India on global issues, like cooperation in combating climate change. On political issues too, both sides could engage in areas of counter-terrorism, cyber crime and in maritime security in the Indian Ocean Region, he added. Kozlowski said he was keen to elevate the profile of the EU in India. On the Italian marines issue, Kozlowski said that the case was for international arbitration according to the UN Convention on the Law of the Sea (UNCLOS). He said the EU felt it was a matter concerning India and Italy and "is naturally a matter of concern to us".

China mends ties, hosts top Indian Army Commander

Ananth Krishnan

India's Northern Army Commander Lieutenant General D.S. Hooda has held rare talks with top People's Liberation Army Generals in Beijing, aimed at boosting confidence along the border and expanding cooperation on terrorism. In a significant visit that officials said has helped draw a line over recent differences between the two countries, China had in 2010 declined to host the then head of the Northern Command at a time when Beijing was issuing "stapled visas" to Jammu and Kashmir residents. Lt. Gen. Hooda met the PLA's top brass in Beijing on Tuesday, including Deputy Chief of General Staff General Qi Jianguo. He was accompanied by Major General YK Joshi, a Brigadier and two Colonels from the Northern Command. China had in the past refused to host delegations from the Northern Command, pointing to "sensitivities" over J-K, which Indian officials saw as referring to China's territorial claims as well as concerns of its ally Pakistan. This prompted India to suspend all defence exchanges in 2010, which began to be resumed only after two years when China agreed to once again host officers from the Northern Command and stopped issuing stapled visas for J-K. Beijing does, however, continue to issue stapled visas for Arunachal residents. The Northern Command delegation, which will visit PLA facilities in Xi'an and Shanghai, will also hold talks with the Commander of China's Lanzhou Military Region, General Liu Yuejun, providing a rare occasion for the heads of the commanders from across the disputed western section of the Line of Actual Control (LAC) to have direct talks. Most of the recent incursion and stand-off incidents have taken place in the western sector. In a statement issued in Beijing on this week's visit, the Indian Embassy said the talks had "stressed on the need to ensure peace and tranquility along the borders and hoped that both sides will further strengthen the bilateral defence exchanges by enhancing the frequency of interactions between the two armies". Officials said both sides had also discussed common concerns on terrorism, which found prominent mention unlike in the past, where it was seen by the Chinese as another sensitive matter on account of its "all-weather ally" Pakistan. This week's talks follow the November visit to India of top PLA General Fan Changlong, the Vice Chairman of the Central Military Commission, which is headed by President Xi Jinping, and the top-ranking General - the highest visit to India by the PLA to India in a decade.

The Statesman

17 December 2015

CDS may appointed soon, says Parrikar

Defence Minister Manohar Parrikar on Wednesday indicated that the post of Chief of Defence Staff (CDS) could be a reality soon, a day after Prime Minister Narendra Modi marked defence reforms as a priority and stressed that "jointness at the top" was a need long overdue. The post of CDS was recommended by a Group of Ministers in 2001. Parrikar said that the Defence Ministry will also submit a report on various issues that Modi had raised during the annual Combined Commanders Conference held in Kochi on Tuesday. "Should be," Parrikar told reporters in New Delhi when asked if the post of a CDS could be a reality soon. "Prime Minister has mentioned many things. We will be submitting a report on that soon. He has raised many issues and they are important issues," he said. If the recommendation for CDS is implemented, it would be the first major military reform by the Modi government besides changes being made in the procurement process. Defence sources have said that the appointment of CDS is aimed at promoting "jointness at the top" when it comes to planning, operations and modernisation of the military. Though India has a tri-service command, it is headed by a three-star officer and he is junior to the military chiefs who are four-star. The post of the CDS is likely to be a four-star and he would be in-charge of the tri-services command at Andaman and Nicobar islands, the strategic command in-charge of nuclear weapons along with the upcoming cyber and space command. Prime Minister had on Tuesday called for "jointness at the top" of the military establishment. Stating that the country has been slow to reform the structures within the armed forces, he had added, "We should shorten the tooth-to-tail ratio. And, we should promote jointness across every level of our Armed Forces. "We wear different colours, but we serve the same cause and bear the same flag. Jointness at the top is a need that is long overdue." Pitching for reforms, including in senior defence management, he further said, "It is sad that many defence reform measures proposed in the past have not been implemented. This is an area of priority for me." Meanwhile, asked about the concern in the military about the recommendations of the 7th Pay Commission, Parrikar said that he will see to it that their concerns are addressed. Talking about India's concerns on Pakistan-sponsored terrorism that he raised in his meeting with US Defence Secretary Ashton Carter in Washington last week, Parrikar said the reaction was "very good". "They have taken note of the concerns we have expressed," he said.

IAF finds 3 women trainees suitable to fly combat planes

Rahul Singh

Three women training at the Air Force Academy near Hyderabad have been found suitable to fly warplanes, bringing them a step closer to becoming India's first female fighter pilots, a top officer told HT. None of them would have dreamed of flying combat planes when they joined the academy in January as doors to the fighter stream were thrown open to women only two months ago. A high-powered board of officers carried out detailed assessment of the flying capabilities of the 125 cadets training at the Dundigal-based premier academy and selected 45 of them for the fighter stream, including the three women. The cadets will graduate from the academy on December 19 before those selected for the fighter stream head for Hakimpet near Hyderabad in early January for stage-II training on Kiran Mk-II planes for six months. As first reported by HT on November 22, six female cadets were taking a shot at becoming fighter pilots after the government approved an IAF plan in October making them eligible to fly warplanes from June 2017, ending a rigid combat exclusion policy. The remaining three women are among the cadets who have been assigned to the transport and helicopter streams. "The 16-member board of officers worked hard to shortlist the cadets for the fighter stream. The three female trainees performed splendidly in flying and ground subjects too," said a top fighter pilot, familiar with the combat experiment for women. One of the three women is the daughter of an air warrior. The other two are from civilian backgrounds, though one of them has a brother serving in the army. The decision to allow women to fly warplanes - a watershed in the air force's 83-year history - has been taken on an "experimental basis" and the government will review it after five years. Stage-II training in the fighter stream at Hakimpet will be critical as the performance of the cadets there will decide whether they are fit for the final stage of preparation. Those who make the cut will then go to Bidar in Karnataka in June 2016 for stage-III training for a year on British Hawk advanced jet trainers, before they can fly supersonic warplanes. Some wastage can take place at the last stage, too. The course that passes out on Saturday began with 140-plus cadets but at least 15 of them, including a female trainee, failed to make the cut for flying duties. Wastage rate during training usually hovers around 10-15%. Flight cadets at the academy train on the Swiss Pilatus PC-7 trainer aircraft for six months, with the stage-I syllabus requiring approximately 55 hours of flying training. The trifurcation into fighter, transport and helicopter streams takes place after the performance of cadets during stage-I training is measured against clearly laid down parameters. The headcount of women in the armed forces is upwards of 3,300, including 1,300 in the air force, but combat roles were off-limits to them until the IAF took the lead in crushing internal resistance to grant them equal opportunities. Warships, tanks and combat positions in infantry are still no-go zones for women, who were allowed to join the military outside the medical stream for the first time in 1992.

The Hindu

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Physicists find hint of mysterious new particle

Dennis Overbye

Does the Higgs boson have a cousin? Two teams of physicists working independently at the Large Hadron Collider at CERN, the European Organisation for Nuclear Research, reported on Tuesday that they had seen traces of what could be a new fundamental particle of nature. One possibility, out of a gaggle of wild and not-so-wild ideas springing to life as the day went on, is that the particle - assuming it is real - is a heavier version of the Higgs boson, a particle that explains why other particles have mass. Another is that it is a graviton, the supposed quantum carrier of gravity, whose discovery could imply the existence of extra dimensions of space-time. At the end of a long chain of "ifs" could be a revolution, the first clues to a theory of nature that goes beyond the so-called Standard Model, which has ruled physics for the last quarter-century. It is, however, far too soon to shout "whale ahoy," physicists both inside and outside CERN said, noting that the history of particle physics is rife with statistical flukes and anomalies that disappeared when more data was compiled. A coincidence is the most probable explanation for the surprising bumps in data from the collider, physicists from the experiments cautioned. They added that a lot more data was needed and would in fact soon be available.

The strange love for nuclear energy

The prospect of a nuclear deal with Japan is worrying because it ignores voices on the ground and takes India a step closer to the construction of untested and expensive reactors

M.V. Ramana & Suvrat Raju

During Japanese Prime Minister Shinzô Abe's visit to India last week, Japan and India reportedly made progress on a nuclear deal that they have been discussing for more than seven years. The governments did not actually conclude the deal: the Joint Statement released by the Prime Ministers only includes a droll phrase welcoming the "agreement reached... on the Agreement... for Cooperation in the Peaceful Uses of Nuclear Energy" and expresses the hope that "this Agreement will be signed after the technical details are finalised". These "details" include deep concerns about India's growing weapons arsenal within Japan's polity that even Mr. Abe's militaristic government has found difficult to ignore. Nevertheless, even the prospect of an India-Japan nuclear deal is worrying because it takes the country a step closer to the construction of untested and expensive reactors. Moreover, despite the Narendra Modi government's "Make in India" rhetoric, the agreement will primarily benefit multinational corporations based in Japan.

A silent nuclear player - Although the debate on reactor imports in the past few years has largely focussed on France, Russia and the United States, Japan is an important background player in this market. Except for the Russian VVER reactors at Kudankulam, in Tamil Nadu [which is the Vodo-Vodyanoi Energetichesky Reaktor or Water-Water Power Reactor and a pressurised water reactor], Japanese corporations have a key role in the three other reactor designs that the government is planning to import: the Westinghouse AP1000 reactors for Mithi Virdi (Gujarat), the General Electric (GE) Economic Simplified Boiling Water Reactors (ESBWR) for Kovvada (Andhra Pradesh), and Areva's European Pressurised Reactors (EPRs) for Jaitapur (Maharashtra). The Japanese company, Toshiba, holds a controlling stake in Westinghouse. The ESBWR was developed by GE in collaboration with Japan's Hitachi. Finally, the EPR is so large that Japan Steel Works is one of the few companies in the world that can forge some of its critical components. The India-Japan nuclear deal is meant to clear the way for these Japanese corporations to sell their wares in India. Nuclear suppliers have a clear interest in this deal. A global downturn in the nuclear industry after the Fukushima disaster in 2011 has left them with serious commercial difficulties. GE, which built the Fukushima reactors, was considered a "laggard" in the industry even before its reputation was damaged by the accident. It has since struggled to find buyers for its ESBWR design, which was certified by the U.S. Nuclear Regulatory Commission only last year. Last month, Toshiba announced that from the time it acquired the company in 2006, Westinghouse had accumulated a net operating loss of \$290 million. Areva is now virtually bankrupt - its rating downgraded to "junk" by Standard & Poor's - after billions of euros in recent losses. Its reactor division may be taken over by the French state-run Électricité de France, and possibly Mitsubishi.

Need for new markets - Nor is there any scope for reactor sales within Japan. The Fukushima disaster, which has not been contained even after four years, continues to remind many Japanese of the dangers of nuclear power. A commission established by the Japanese Parliament emphasised the role of poor safety practices in the Japanese nuclear industry and went so far as to state that "this was a disaster 'Made in Japan'". Despite a strong push by the Abe government, nuclear power finds little support in the country. A poll conducted by a Japanese national newspaper Asahi Shimbun in 2014 found that 77 per cent of respondents supported a phase-out of nuclear power. It is not surprising, therefore, that Japanese nuclear corporations have turned to India as a market for their technology. But there are good reasons for India to resist this sales pitch. Even with domestic Indian reactors, nuclear power has been an expensive source of

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The strange love for nuclear energy

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electricity, but with imported reactors the costs become prohibitive. This is, in large part, due to the astronomical capital costs of reactors. Since none of the reactor designs being considered - the AP1000, the ESBWR, and the EPR - are operational anywhere in the world, cost figures must rely on projections, and these have been rising with each passing year. For example, just this month, it was reported that the total costs of the two AP1000s being built in the U.S. state of Georgia might rise to \$21 billion, significantly more than the initial projection of \$14 billion. Likewise, the latest estimate, from September 2015, of the cost of the EPR being built at Flamanville (France) is •10.5 billion (\$11.6 billion), up from •3.2 billion.

Costly proposition - It is straightforward to translate this into a final tariff, using techniques that we described in a paper for the Economic and Political Weekly in 2013. Even accounting for a reduction in construction costs in India, a reactor that costs \$11.6 billion in Europe is likely to lead to a first-year tariff of about Rs.19 per unit of electricity. For perspective, recent winning bids at auctions from coal and solar power have been in the range of Rs.4.50 to Rs.5.50 per unit of electricity. The Indian government claims that it would reduce costs by manufacturing reactor components in India, and concomitantly promote India's domestic manufacturing industry. However, the deal with Japan shows that this is mostly empty rhetoric. In a press briefing last year, the Joint Secretary (East Asia) explained that India's motivation in pursuing a nuclear agreement with Japan had to do with its belief that "in the area of nuclear technology there are certain advantages which rest with Japanese industry, in large-scale forgings for example". Of course, if key reactor components are forged in Japan, they cannot simultaneously be "made in India".

Disaster in the making? - Another problem with the proposed reactors has to do with safety. The reactors under consideration are untested, and provide no empirical track record of safe operation. Although the industry produces some calculations, using a technique called probabilistic risk assessment to claim that these reactors are safe, these techniques are unreliable both on theoretical and empirical grounds. Indeed, given the complexity of the new designs, it is only natural to expect construction difficulties that will also impact safety. Just a few months ago, Areva announced that it had found serious flaws in the fabrication of the pressure vessel of the EPR under construction in Flamanville. The industry is itself well aware of the possibility of a devastating accident, as is clear from its constant efforts to alter India's liability law and pre-emptively insulate itself from the consequences of a disaster. GE's CEO, Jeffrey Immelt, explicitly stated earlier this year that he would not invest in India without legal indemnity: "I am not going to put my company at risk... there is no project that is worth it." One lesson that India should definitely learn from Japan has to do with the danger of giving in to such threats. More than 50 years ago, Japan succumbed to pressure from nuclear suppliers and instituted a law to indemnify them. Consequently, when the GE reactors at Fukushima suffered an accident, in part due to a design defect that had been pointed out decades earlier, GE was protected from any claims by victims. The cost of the clean-up, estimated at about \$200 billion, has been borne almost entirely by Japanese taxpayers. Of course, multinational suppliers would like to institute the same outrageous arrangement in India, but there is no reason that the government should oblige them. Citizens in both India and Japan have expressed their serious concerns about this deal and India's nuclear imports. Recently, 13 villages near Jaitapur passed a joint resolution against that nuclear plant. Large protests have also taken place at Kovvada and Mithi Viridi. Before Mr. Abe's visit, the mayors of Hiroshima and Nagasaki took the unusual step of jointly writing to their Prime Minister asking him to reconsider the deal with India. It is revealing that the leaders of "Asia's largest democracies" have entirely ignored these voices on the ground, and instead moved to bail out the multinational nuclear industry.

Russia and China are building highly autonomous killer robots

Danielle Muoio

Russia and China are creating highly autonomous weapons, more commonly referred to as "killer robots," and it's putting pressure on the Pentagon to keep up, according to US Deputy Secretary of Defense Robert Work. During a national security forum Monday, Work said that China and Russia are heavily investing in a roboticized army, according to a report from Defense One. "We know that China is already investing heavily in robotics and autonomy and the Russian Chief of General Staff [Valery Vasilevich] Gerasimov recently said that the Russian military is preparing to fight on a roboticized battlefield," Work said at the forum, which was hosted by the Center for a New American Security in Washington D.C. "[Gerasimov] said, and I quote, 'In the near future, it is possible that a complete roboticized unit will be created capable of independently conducting military operations,'" Work continued. Work then said it's important for the US to "dominate" machine learning and artificial intelligence to offset the imposing threats posed by China and Russia. Concerns over the creation of killer robots have mounted as advancements have been made in the field of artificial intelligence. More than a thousand artificial intelligence researchers co-signed an open letter calling for a ban on autonomous weapons this summer, including big names like Tesla CEO Elon Musk and scientist Stephen Hawking. Musk announced the creation of a new nonprofit research company, OpenAI, of which he is co-chair of last week. OpenAI's goal is to "advance digital intelligence in the way that is most likely to benefit humanity as a whole" - staying in-line with his previous stance on ensuring AI advancements are heading in a safe direction. Questions regarding the future of AI will only become more important as Russia and China make advancements with the creation of a robot army. According to Defense One, Russian Strategic Missile Forces announced it would deploy armed sentry robots capable of selecting and destroying targets with no human in or on the loop at five missile installations in March 2014. Additionally, Vyacheslav Khalitov - deputy director general of Russian defense contractor Uralvagonzavod - said it plans to show prototypes of its new combat robots within the next two years, according to RT. "We will be able to show prototypes in 1.5 to 2 years. We are gradually moving away from crewed machines," he said in October.

The Times of India

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Found: Traces of a new fundamental particle

Two teams of physicists working at the Large Hadron Collider at CERN, the European Organization for Nuclear Research, said they had seen traces of what could be a new fundamental particle of nature. One possibility, is that the particle -assuming it is real -is a heavier version of the Higgs boson, a particle that explains why other particles have mass. Another is that it is a graviton, the supposed quantum carrier of gravity, whose discovery could imply the existence of extra dimensions of space-time. At the end of a long chain of "ifs" could be a revolution, the first clues to a theory of nature that goes beyond the so-called Standard Model, which has ruled physics for the last quarter-century. A coincidence is the most probable explanation for the surprising bumps in data from the collider, physicists from the experiments cautioned, saying that a lot more data was needed and would in fact soon be available. Kyle Cranmer, a physicist who works on one of the CERN teams, known as Atlas, said many theorists had put other work aside to study the new result. When all the statistical effects are taken into consideration, Cranmer said, the bump in the Atlas data had about a 1-in-93 chance of being a fluke - far stronger than the 1-in-3.5-million odds of mere chance, known as five-sigma, considered the gold standard for a discovery. That might not be enough to bot her presenting in a talk except for the fact that the competing CERN team, named CMS, found a bump in the same place. "What is nice is that it is not a particularly crazy signal, in a quite clean channel," said Nima ArkaniHamed, a particle theorist at the Institute for Advanced Study in Princeton. Physicists could not help wondering if history was about to repeat itself. It was four years ago this week that the same two teams' detection of matching bumps in Large Hadron Collider data set the clock ticking for the discovery of the Higgs boson six months later. The Higgs boson was the last missing piece of the Standard Model, which explains subatomic particles and forces. The main news since then, reported on Tuesday, is an excess of pairs of gamma rays corresponding to an energy of about 750 billion electron volts. The gamma rays could be produced by the radioactive decay of a new particle, in this case perhaps a cousin of the Higgs boson, which itself was first noticed because it decayed into an abundance of gamma rays. Or it could be a more massive particle that has decayed in steps down to a pair of photons.

ISRO launches six Singapore satellites

Fourth stage of PSLV rocket tested; this is expected to help future missions

Dennis S. Jesudasan

The Indian Space Research Organisation (ISRO) never misses an opportunity. This time, even as it successfully launched six Singapore satellites on Wednesday, the national space agency also tested the fourth stage of its PSLV rocket. The test to restart the fourth stage of the PSLV rocket would help the country in its future launches while attempting to launch multiple satellites in different orbits. According to ISRO chairman A.S. Kiran Kumar, "The four-second firing test is a success. This test will help us when we launch multiple satellites with a single rocket but want to place them in different orbits." At 6 p.m., ISRO's PSLV C-29 rocket lifted off from the first launch pad of the Satish Dhawan Space Centre here and in about 21 minutes, it placed all six Singapore satellites in the intended orbit before it commenced its 'coasting' to prepare for the test. And some 50 minutes later, ISRO scientists at the Mission Control Centre here fired the fourth stage of the rocket for a few seconds as a test.

50 years of Singapore's Independence - Call it coincidence or otherwise, the launch of six Singapore satellites came in the year when Singapore is celebrating its 50 years of Independence and 50 years of Indo-Singapore diplomatic ties. "The very fact that Singapore has chosen PSLV for its maiden commercial launch shows the amount of trust they have in ISRO," said Mission Director B. Jayakumar. Though the sky was partially cloudy at dusk, most of the stage separation of the rocket was clearly visible to the naked eyes from the Media Centre here, even as the spacecraft was cruising towards the intended orbit, several kilometres away from the Earth's surface. "We have completed our major set of activities for this year and we look forward to 2016 for sending more communication, navigation and Earth observation satellites with greater vigour. We have lot more to achieve," Mr. Kumar said, soon after the rocket placed all six satellites in orbit. Besides the primary payload 400-kg weighing TeLEOS-1 - Earth observation satellite, ISRO placed in orbit VELOX-CI (123 kg) micro-satellite, VELOX-II (13 kg) 6U-Cubesat technology demonstrator, Athenoxat-1 nano-satellite; Kent Ridge-1 (78 kg) micro-satellite and Galassia (3.4 kg) 2U-Cubesat. All the six Singapore satellites were put into orbit some 21 minutes after the lift-off at an altitude of 550 km. In December last year, ISRO while testing the experimental flight of the Geosynchronous Satellite Launch Vehicle (GSLV) Mark III, also tested the re-entry of its unmanned crew module on a suborbital trajectory. Minister of State in Prime Minister's Office Jitendra Singh, informed the Lok Sabha that Wednesday's launch earned India 26 million euros. ISRO has launched 17 foreign and four Indian satellites this year, including its GSAT-15 which was launched from French Guiana in November. With the latest, India has launched a total of 57 foreign satellites for 20 countries.



The PSLV -C29 TeLEOS-1 lifts off successfully from the Satish Dhawan Space Centre in Sriharikota in Andhra Pradesh on Wednesday.

Drones to map high-altitude glaciers

About five-km high in the Peruvian Andes, drones are helping scientists map glaciers and wetlands with 10-cm precision and gauge how climate change will affect the people who rely on those glaciers for water supply. The strategy provides a ground for research teams that are investigating water security in other areas of the world with much larger populations, including India and China. In the Cordillera Blanca mountain area, glacier melt provides up to 50 percent of the water during the dry season and people use it for farms, hydroelectricity and to drink. One early finding is that the Cordillera Blanca has a healthy groundwater system. "We know the glaciers are disappearing, so there will be less water available for the dry season in the future. But what my colleagues and I have found is that the groundwater system is storing some of the glacier melt as well as precipitation," said Oliver Wigmore, doctoral student in geography at the Ohio State University. "There will still be a significant drop in water supply eventually, but there may be some potential for the groundwater to buffer it," he added. With the help from data gathered by unmanned aerial vehicles (UAVs), Mr. Wigmore also recorded measurements that suggest a key glacier in the region's Llaca Valley is changing rapidly. "UAVs offer some of the best technology available today for gathering data on a scale to inform local water management decisions," Mr. Wigmore said. The drone technology overcomes clouds, rough terrain and thin air that prevent easy access to ice on the Cordillera Blanca. In the Cordillera Blanca, clouds block satellite views for all but a few weeks a year, and the terrain is too irregular to take reliable ice surface measurements by hand.



Remote-controlled drones are finding more and more applications.

10-cm resolution - The Ohio State UAVs have a 10-cm resolution, work despite frequently cloudy conditions in the mountains of Peru and cost a few thousand dollars each. In contrast, satellites provide a half-meter resolution at best, work only during the two months a year when the region is relatively cloud-free and cost millions of dollars. Mr. Wigmore equipped the large, lightweight drones with high-speed motors and extra long propellers to carry them through the thin air.

The Hindu

17 December 2015

Google to invest more in India

Yuthika Bhargava

Company to ramp up engineering presence in Hyderabad; hire more people for Bangalore, Hyderabad campuses Google is ramping up investments in India for development of more local products, building engineering capabilities and setting up a new campus in the country as it aims to bring all Indians online. India as one of the most important markets, Google CEO Sundar Pichai said, "Our focus is on bringing Internet access to everyone, making sure our products are working for them in a meaningful way and then ensure our platform allows them to add their voice to the Internet." Google plans to ramp up engineering operations in the country by hiring more people at its Bengaluru and Hyderabad centres, said Mr. Pichai, who is on his first official visit to India since taking the top job in August.. A new campus will also come up in Hyderabad, he said. .Google has four offices in India with over 1,500 people working on building products, of the 14,000 people globally. The company will install 100 railway stations across the country with WiFi, by December 2016 with Mumbai Central station being the first to go live in January, Pichai said. It is a part of the plan to provide free WiFi access at railway stations in the country as announced during Prime Minister's visit to the headquarters of the search engine giant in September. India will have the largest user base for Android devices by next year, overtaking the United States, though just a quarter of the Indian telecom user base has smart-phones, Pichai said..India ranks second, after the U.S. in terms of search volumes from mobile phones. It already sees higher volumes of search traffic from India on mobile devices than those from desktops. To foster developers and content developers, Mr Pichai said Google is announcing a programme to train 2 million developers in the country for which it will partner with 30 universities across India and National Skill Development Corporation. The Indian-born CEO also shared plans to expand Google's rural internet programme for women from pilot to full-scale programme to cover three lakh villages in three years.

