E-NEWS

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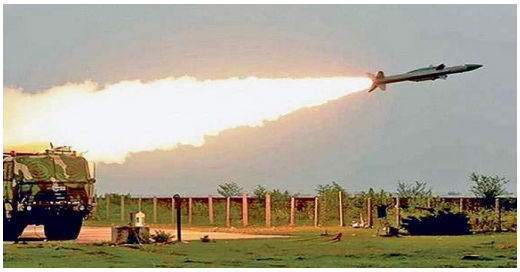
TECHNOLOGY

India's Light Combat Aircraft to Be Armed With Beyond Visual Range Missile

Maruti 800 engine to power airboats

QRSAM successfully test-fired



The Defence Research and Development Organisation (DRDO) successfully test-fired an indigenously developed Quick Reaction Surface-to-Air-Missile (QRSAM). The missile was flight tested from the Integrated Test Range (ITR) in Chandipur, off Odisha Coast at 11.30 a.m. "All the technologies and subsystems incorporated in the missile have performed well, meeting all the mission requirements. All the radars, electro optical systems, telemetry systems and other stations have tracked the missile and monitored all the parameters," DRDO said in a statement. This is the second test of the QRSAM. It was tested for the first time on June 4. The new missile will complement the existing Akash short range SAM (surface-to-air missile) with a range of 25 kilometres which has already been inducted into the services.

Source: http://www.thehindu.com/

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CURRENT AFFAIRS

At 499 USD, a drone for beginners

If you thought those drones buzzing around on the beach were annoying, just wait and see what happens when they become cheaper than iPhones. Whether you like it or not, drones — miniature remotely controlled aircraft — may be on the cusp of going mainstream as they plummet in price. DJI, the world's largest consumer drone-maker, which is based in Shenzhen, China, will soon release Spark, its first $499 drone. That's roughly half the price of the most popular drones on the market, or three-quarters the cost of an iPhone, which starts at about $650. I tested Spark over several days and found it surprisingly capable for a low-cost drone. Unlike most expensive drones, which operate with a physical remote control, this machine was designed to work primarily with a smartphone app; you can also make hand gestures to move Spark or make it take your selfie. It shoots superb high-definition video, weighs about a quarter of a pound and is so compact you could stuff it in a tote bag. I was able to confidently fly Spark, the first drone I have ever used, after several sessions, a testament to its overall ease of use. Unsurprisingly, Spark isn't perfect. Its app can be tough to grasp without reading an instruction manual. The battery lasts only about 15 minutes, and there are some bugs in the software that could send your drone flying off erratically. Yet I wouldn't hesitate to recommend Spark for people who are curious about trying drones for taking aerial photography or for experiencing the sheer joy of flying an object. Considering how small and lightweight this drone is, Spark will also make a great stocking stuffer this holiday season. Here's what you need to know about what you're getting from a budget drone.

Easy setup, rough start

There are a few basic components to Spark: propellers, motors, a camera and a battery. To set up the drone, slide the battery into the bottom of the device. Then install the smartphone app, scan a bar code on the carrying case to register the drone, turn on the gadget and connect to it via Wi-Fi. From there, you use the app to change settings on the drone and make it take off. Inside DJI's app for controlling Spark, there are virtual joysticks for making the drone rotate or move up, down, forward or backward. Initially, the app will be confusing to use. It took me three sessions, or 90 minutes of flight time using two batteries, to get the hang of it. The app buttons do not intuitively state what they do or how to use them. In the end, I had to flip through a 50-page instruction manual to learn how to better operate Spark. There is an option to skip using the app altogether by enabling PalmControl, a mode that lets the drone respond to your hand gestures. To enable this, hold your palm flat toward the camera, and the drone will lock in on your hand and follow it around as you move. You can hold out your thumbs and index fingers to form a frame around yourself to make the drone automatically take a selfie of you. Wave your hand at the drone and it will ascend and fly backward. Spark was ultimately inconsistent with reacting to hand gestures. Sometimes it responded quickly, but often the drone failed to recognise the gestures and continued to hover.

Pros and cons

The Spark has several features that make it well suited for those who are new to drones. The killer feature is a menu of shortcuts called QuickShot: These are automated motion sequences for shooting some neat drone videos. You select a subject (like a human or a dog) to record, choose a QuickShot mode and tap a button to commence the sequence. One QuickShot mode called Circle makes the drone automatically circle a subject while recording video of it. My favourite QuickShot mode was Rocket, which caused the drone to lift dozens of meters into the air while continuing to shoot video of me and a friend from overhead. The recording was a delight to watch and share on Instagram. Typically, you would need a lot of skill flying drones to shoot these types of videos adequately. By including these automated video-recording sequences in its app, DJI has made Spark very accessible as an aerial photography tool. There are downsides, of course. One of the QuickShot modes, called Helix, did not work properly in my tests. Helix is supposed to cause the drone to fly upward and spiral around the subject. But in three different test locations, activating Helix caused the drone to fly upward and so far away that it lost its Wi-Fi connection with the smartphone. (This may have been related to interference caused by nearby Wi-Fi routers.) The drone is programmed to return home, or land where it took off, whenever it loses connection with a smartphone — but nobody would blame you if you chased after it out of anxiety. By far Spark's most annoying feature is its carrying case. The case snugly fits the drone, two batteries and some extra propeller blades, but it lacks room for the propeller guards, which are essentially bumpers that help prevent the spinning propellers from cutting people or objects. DJI said that because the propeller guards are optional accessories that are sold separately, the compact case has no room for them. But to me, this was an oversight: Any beginner should equip the propeller guards, and they should be part of the overall package and fit inside the case. That brings up another issue with Spark: The $499 price tag is misleading when you add the extra

accessories you are likely to need. After buying the propeller guards ($19), you probably also need at least one extra battery ($49) and the battery charging station ($69). In the end, you'll probably spend roughly $640 just to make flight sessions last half an hour, given the device's 15-minute battery life. Even so, $640 is still cheaper than an iPhone or a high-end Android device like the Google Pixel (also priced at about $650), which makes it a compelling potential gift for tech and photography enthusiasts. Spark is a solid product for a relatively low cost, and it seems inevitable that drones will become more commonplace at parks, beaches and tourist attractions.

Source: http://www.deccanherald.com

Israel's Rafael eyes larger role in India's defence programme

Keen to make India a global manufacturing hub for its high-tech defence systems, Israeli firm Rafael Advanced Defence Systems is "speaking" to several Indian companies. Though the defence major has been working with different branches of the Indian military, it is seeking to enlarge its partnerships in India. "India and Israel are strategic partners and Israel has always supported India's urgent operational necessities during times of crisis," said a senior official of the company. For Rafael too, he added, India is a strategic and significant partner. Rafael designs, develops, manufactures and supplies a wide range of defence systems for air, land, sea and space applications. "Rafael has always stood by India to supply systems at short notice during various operational contingencies. We work with the different branches of the Indian military and Indian security," the official told BusinessLine. The company has been looking to establish global manufacturing hubs for the supply of systems abroad, and is keenly watching "the Indian defence industry as it matures", said the official, adding: "Rafael is open to exploitation of our R&D intensive and combat proven technology for developing the Indian defence industry." Though the company has already partnered with Bharat Forge, Reliance Defence, Bharat Dynamics and Astra Microwave Systems, among others, and has "excellent relations with the DRDO and the forces", it is keen to expand its activities in India. Several of the company's armaments are already in use with Indian forces. A spokesperson for Rafael told BusinessLine that the company has integrated its "electro-optical Litening pod, air-to-air missiles Python-5 and i-Derby, as well as air defence systems in India". Last June, Rafael agreed to supply 164 Litening targeting pods to the Indian Air Force (IAF), for use on four types of combat aircraft including the Sukhoi Su-30 fighters. Rafael Litening-5 targeting pod is integrated on Airbus Defence and Space-owned Eurofighter combat aircraft. The IAF has been using Litening-3 Pods on the Mig-29, Sukhoi-30KI, Mirage-2000, and the indigenous developed LCA Tejas.

Source: http://www.thehindubusinessline.com/

CSIR scientists to turn schoolteachers

Scientists of Council of Scientific and Industrial Research (CSIR) laboratories will double up as teachers and science demonstrators to at least 50,000 school students over the next year. The aim is to spark scientific curiosity among them and, hopefully, attract them to careers in scientific research. About 1,000 Kendriya Vidyalayas will connect with 38 CSIR laboratories as part of Jigyasa, a student-scientist connect programme that was launched. Though outreach programmes involving CSIR scientists and students aren't new, this is the first time that the programme will follow a structured approach. During vacations, CSIR laboratories will host students over one-two weeks and assign them projects and organise demonstrations of various kind of research under way at these laboratories. "CSIR scientists will also get incentives… and the time spent with students will count in their annual performance review," CSIR Director-General Mr Girish Sahni said. The range of activities planned include student residential programmes, laboratory-specific activities and on-site experiments, science and maths clubs, popular-science lectures and apprenticeship programmes. As part of institutionalising the programme, a memorandum was signed in the presence of Mr Harsh Vardhan, Minister for Science and Technology, Earth Sciences, Environment, Forests and Climate Change, and Mr Prakash Javadekar, Minister for Human Resource Development.

Source: http://www.thehindu.com/

Imports of aircraft, spares get relief from GST levy

In what is seen as a breather for the local airline industry, the Finance Ministry has exempted aircraft imported on lease from the 5 per cent Goods and Service Tax (GST) levy. Under the recently introduced GST regime, aircraft imported on lease basis attracted integrated GST (iGST) of 5 per cent. However, based on representation from the Civil Aviation Ministry, the Revenue Department has now pegged the iGST levy as 'nil', official sources said. Taking aircrafts on lease is a common practice in the airline business in India. Leasing not only helps increase fleet size quickly, but also reduces the cost of airline operations. Low-cost carriers such as SpiceJet and IndiGo have been resorting to leasing of aircraft in a big way to expand their operations.

Experts' take

Mr Abhishek Jain, Tax Partner, EY, said the Government has finally provided exemption from levy of GST as part of customs duty on import of aircrafts, engines and parts on lease basis. This will bring huge relief to the airline industry by resolving the issue of dual levy, especially when the GST paid at the time of import of aircraft was not creditable against the GST levied on economy class travel, according to Jain. Mr R Muralidharan, Senior Director (indirect taxes), Deloitte in India, said the impact of the exemption notification is that there is no iGST on goods on import of aircraft, aircraft engines and other aircraft parts. "But for this exemption, there would have been a cascading impact of taxes as the airlines are allowed to set off only GST on input services and not goods against sale of economy class tickets. The exemption, therefore, provides the much needed relief," Mr Muralidharan told . The Revenue Department's move has restored the status quo (prior to GST regime) in the sense there will be no levy of tax at all at the time of aircraft import via leasing route, he said. However, lease rentals paid by the airline will be subject to GST, Mr Muralidharan said. "Thus, this notification achieves two things: First, double levy is avoided. Secondly, no cascading effect as taxes on lease rentals (service) is available as credit against economy class tickets," he said.

Source: http://www.thehindubusinessline.com/

Reliance Aerospace Park gets approval

The decks have been cleared for the setting up of Reliance Aerospace Park at Mihan in Nagpur. The board of approval for the Special Economic Zone (SEZ) under the Union Ministry of Commerce, last week, okayed the Reliance Aerostructure Ltd's proposed Mr Dhirubhai Ambani Aerospace Park with related infrastructure facilities and services. The board was headed by Union Commerce Secretary Rita Teotia. The aerospace park will be home to the joint venture company set up by Reliance and French major Dassault Aviation to execute the Rs 30,000- crore offset programme linked to the sale of 36 Rafale fighter jets to the Indian Air Force. The first of the Rafale jets is expected to be inducted by 2019. In the first phase, the Mihan park will be built on a 104-acre land, while the second phase will cover an additional area of 185 acres, a company official said. The park with a proposed investment of Rs 6,500 crore is expected to generate more than 10,000 highly skilled jobs. It will also be home to the facilities of Thales, Daher and Strata among others. The proposed projects in the first phase include production of aircraft, electronic warfare systems, radars, unmanned aerial vehicles, and maintenance repair and overhaul for commercial aircraft. There would also be a large number of small and medium companies to support the big projects. The construction is expected to start by the end of July with production starting in the first quarter of 2018. Reliance will co-develop the park with the Maharashtra Airport Development Company, which is the nodal agency for developing the Mihan SEZ project.

Source: http://www.deccanherald.com

Air Odisha, Air Deccan could begin operations on regional routes by Sept-end

Air Odisha and Air Deccan should be able to fly on regional routes that they had bid for earlier this year by the end of September, a senior official of the Ministry of Civil Aviation said. The start of flights by these two airlines will give a boost to the Government's regional air connectivity scheme (RCS) as Air Odisha had won the right to operate on 50 routes, while Air Deccan has been awarded 34 routes. These two airlines bagged the maximum number of routes among the five airlines which were given the mandate to start flying under the RCS scheme of the Government. "Both the airlines have completed two of the five processes that need to be completed with the Directorate-General of Civil Aviation for the issue of a licence to start a regional airline. They have also approached the authorities for importing six Beachcraft aircraft between them," the official said. The Government had stipulated that the five airlines which won rights to operate regional flights in March this year must start them by the end of September. Failure to start operations would result in the airline not being granted a licence to start air services. Alliance Air, the regional arm of Air India, SpiceJet and TruJet were the other airlines which won the right to operate flights under the RCS scheme. While Alliance has started flights to Shimla, Bhatinda, Pant Nagar and Gwalior from Delhi, SpiceJet has started operating on the Mumbai-Porbandar-Mumbai and Mumbai-Kandla-Mumbai routes under the scheme. Similarly, TruJet has started operations on the Hyderabad-Nanded and Hyderabad-Kadapa routes under the scheme. The RCS scheme, which is also popularly called The UDAN or Ude Desh Ka Aam Naagrik scheme, seeks to give people from tier-II and tier-III cities a chance to fly at a ticket price of ₹ 2,500. Airlines operating under the UDAN scheme have to ensure that the prices of at least 50 per cent of the seats on their flights are available at a price of ₹ 2,500 each for an hour of flying. The Centre and state will provide viability gap funding for the airlines operating on the UDAN routes to ensure profitability of these flights.

Source: http://www.thehindubusinessline.com/

ENSURE NO MICROLIGHT HAS ANY ALTERATION, DGCA TOLD

The committee investigating the crash on May 2 in Kodagu district involving prominent brand strategist and city-based businessman Mr Ramesh Rao has directed the Directorate General of Civil Aviation (DGCA) to inspect all microlights (very small one- or two-seater aircrafts) operating in the country. The Ministry of Civil Aviation, which had constituted a committee to investigate the causes of the crash which led to Rao's death, in its safety recommendations has asked the DGCA to carry out a one-time inspection of all the organisations that operate Zenair and other microlights for any unauthorised modifications to the aircraft. The committee has Mr K Ramachandran, air safety officer, Aircraft Accident Investigation Bureau (AAIB) as chairman and Captain Mr Pavan Varma as operational member. In its report, the committee noted that the Zenair STOL CH 701 microlight aircrafts are usually installed with fixed, full-span leading edge slats on both wings. However, Mr Rao was flying a microlight without slats. The slats on the microlight Mr Rao was flying were replaced with vortex generators fixed all along the wingspan at various positions. According to the committee, this modification was one of the main reasons behind the crash. The committee also has asked the DGCA to formulate regulation covering all aspects of microlight flying. "Possibility of association with local administration may be explored to ensure that flying is undertaken only with a valid C of R (Certificate of Registration) and permit to fly. Also, accidents like these must be reported to AAIB and DGCA at the earliest," the committee recommended. The two sorties which Mr Rao undertook from Bengaluru to Begurkoli in Kodagu and the subsequent local sortie over Kodagu were not carried out under the authority and supervision of a flight instructor or an examiner approved by the DGCA as per the privileges under the student pilot license (microlight). According to an aviator, there are only a handful of microlight aircrafts in the country and a couple of them operate in Bengaluru. "Unlike other countries, only a few own microlight aircrafts as it is very difficult to obtain security clearance for them which is given by the Ministry of Home Affairs. Even those who have applied for permit to fly a microlight aircraft are not issued permits so easily," he said. The National Cadet Corps (NCC) Air Wing uses the Zenair microlight aircrafts for flying activities. However, these too are being replaced with Pipistrel Virus - a modern state-of-the-art microlight aircraft.

Source: http://bangaloremirror.indiatimes.com/

Finding feathers: India's regional flight puzzle

The government wants India to fly high. Consider the developments that have taken place in the realm of civil aviation, from the rollout of the 0/20 Rule to the latest divestment plans for Air India. And then there's UDAN (Ude Desh ka Aam Naagrik), a one-of-a-kind scheme, seeking to provide connectivity to unserved and underserved airports of India through the revival of existing air strips and airports. As the acronym suggests, UDAN is a regional connectivity scheme (RCS) which aims to give wings to as many Indians as possible, 'uplifting' small towns in the literal sense of the term. It aims to increase ticketing volumes to 300 million from 80 million, a 3.75 times growth by 2022, and specifically develop the regional airline segment, as India makes its way to become the third largest aviation market by 2020. "India's domestic aviation market grew at over 20.3% during 2015. Drop in ATF prices, increase in arrival of tourists, and visa reforms, have placed India in a unique position, bringing the country closer to achieving its vision of becoming the largest aviation market by 2030," reflects Aerosource India Managing Director Mr Vinod Singel. The passenger throughput for 2015-16 was 184 million, which is expected to reach 370 million by 2020, with domestic traffic constituting around 80%. It is estimated that around 28% of air traffic today is from the least busy airports, which could be accounted as regional aviation. Today, over 400 regional airports exist, and UDAN has brought in around 31 underserved airports already. "Regional airports comprise a small fraction of this currently, but are likely to grow. Many Tier-II and Tier-III airports are showing growth of over 30-50%, highlighting the potential there," KPMG Partner and India Head (Aerospace and Defence) Mr Amber Dubey says. Market turbulence Through UDAN, it is clear that regional air connectivity is viewed as an important infrastructure and development asset by the Centre, but is it a favourable growth industry? The airline industry is uncertain, volatile, cutthroat-competitive, and extremely price-sensitive, troubled by inflexible break-even opportunities. Over the decades, global airline giants such as Pan Am, Swissair and Sabena went bankrupt, while in India, once popular carriers like Damania Airways and Kingfisher Airlines ceased to exist. Sustainability is vital from the beginning, and one cannot say when the winds might change for the worst, forcing airlines into a nosedive. The problem becomes more compounded in terms of regional carriers, which are small, yet risk it to find some ground in a nascent market. In the last few years, many regional players came and went — Paramount Airways, Air Costa, Air Carnival and Air Pegasus, to name a few. Among the various issues that bothered them were markets with few passengers leading to low load factors, high capex and opex, few aircraft, inability to manage or balance costs, and so on. "In Tier-III cities, people are not used to travelling by air because they don't value time as much as urbanites. It will take a while for people to understand the advantage of flying, safely. Also, infrastructure and security services at regional airports are poor, but this opens up employment opportunities," Singel says. Among the said carriers who are

out of service, Air Pegasus however, is hopeful of returning to the sky in late-July, having secured fresh funding. Explaining the perils that regional airlines face in order to grow, Air Pegasus Managing Director Mr Shyson Thomas says, “For regional airlines, capacity is everything. Any regional airline needs at least two aircraft to begin with, and as average load factor grows, and the airline lands in new markets, more aircraft must be periodically added.” When Air Pegasus stopped operations last year, it had a fleet of three ATR-72 aircraft, which Thomas says is enough to break even for a regional airline. “However, with more than five aircraft only will an airline begin tasting profits,” he says, adding, “The moment you are stagnant, you are falling fast.” Also, capital inadequacy is a major challenge, which is why established carriers are in a better position to raise capital and tap the regional space. Having tasted and tested medium-haul and long-haul routes, established carriers — both full-service and budget — seem to be clearly bullish on UDAN, which if not anything else, will secure them presence in more sectors. Backed by a strong financial support system, operational infrastructure, staff and institutional knowledge, these risk-taking airlines are making the most of the RCS, a pushover against tiny regional players. While Air India Regional and Jet Airways are traditional contenders in the regional markets, SpiceJet and IndiGo have made their presence felt more in recent times. Recently, SpiceJet launched two daily direct flights on UDAN routes of Mumbai-Porbandar-Mumbai and Mumbai-Kandla-Mumbai. The no-frills carrier was awarded six proposals and eleven routes under the first phase of the RCS. Out of the six proposals, four will cater to unserved markets of Adampur, Kandla, Puducherry and Jaisalmer, whereas two will be for underserved markets of Porbandar and Kanpur. At the recent International Paris Air Show, the airline also signed a letter of intent with Canada’s Bombardier Commercial Aircraft, for up to 50 Q400 turboprops, an order potentially valued at up to $1.7 billion, translating into the single biggest order for the Q400. “SpiceJet operates India’s largest regional fleet and is the only organised operator in this space. This order will help us further increase connectivity to smaller towns and cities, and help realise Prime Minister Narendra Modi’s vision of ensuring that every Indian can fly,” SpiceJet CMD Mr Ajay Singh says. Acknowledging SpiceJet’s UDAN push, Civil Aviation Secretary Mr R N Choubey states, “This latest aircraft order by SpiceJet is testament to the huge demand for air travel in India’s smaller towns and cities.” India’s largest airline by market share, IndiGo, has also placed an order for 50 ATR-72 planes worth $1.3 billion. “In support of Prime Minister Narendra Modi’s UDAN vision, we are embarking on a journey to build a nation-wide regional network and connect cities that have not benefited from the growth in Indian aviation,” says IndiGo President and Whole-time Director Aditya Ghosh. Cleared for takeoff with established carriers having already grabbed a large piece of the pie, what remains for young regional-only ones? An unperturbed Thomas feels that while there is competition, each has its own market, and suitable offerings to customers must be made in the form of apt flight timings and right pricing. With UDAN, regional players are assured of some support from the government too, such as certain concessions in terms of lower tax on fuel, zero airport charges, and so on, through which costs will substantially reduce and infrastructure at regional airports will develop. On flights operated under the RCS, 50% of the seats will have a fare cap of Rs 2,500 per seat per hour. The operators of such flights will be extended viability gap funding (VGF), for which money is partly raised through a levy imposed on flights operating on major routes. “Only spare capacity can be used for UDAN, and not prime capacity. For an aircraft that can cover 10 sectors a day, eight sectors will be concentrated on the prominently successful routes, while the last two will be left for UDAN,” mentions Mr Thomas, adding that it is important to fill the aircraft to the maximum capacity to break even. Also, in order to derive effective load factor, the industry is considering the use of smaller 19- and 21-seater planes, from the likes of Cessna, Beechcraft, and Dornier. New airlines have already begun to reap the benefits of UDAN. Air Odisha and Air Deccan, which were among the five operators awarded 128 routes under the RCS, are likely to start operations by September-end, after they informed the government about having acquired Beechcraft 1900D aircraft. The other airlines that were awarded routes are Alliance Air, SpiceJet and TurboMegha, which have already begun flights. Regional aviation is expected to become a game-changer in the way average Indians travel, but the market must be a level-playing-field. “There’s space for everyone. Every top airline in India and abroad started small. The best survive and the rest fall through,” concludes Mr Dubey.

Source: http://www.deccanherald.com/

DGCA braces for ICAO safety audit

The Directorate General of Civil Aviation (DGCA) is bracing for a safety oversight audit by the U.N. body, International Civil Aviation Organisation (ICAO), in November this year. The aviation regulator is taking a series of steps to save it from the embarrassment of the 2012 audit in which the ICAO had raised safety concerns about India’s aviation system.

Fresh hiring

The measures include hiring flight operation inspectors, aligning its rules with ICAO norms, certifying flight examiners, among others. The DGCA will be furnishing its response to the detailed protocol questionnaire posed

by ICAO for its Universal Safety Oversight Audit Programme (USOAP) by August first week, officials said. This will be followed by a visit by ICAO officials to India from November 1-16 this year. “We have hired 67 flight operation inspectors and we plan to fill the remaining eight posts soon,” a senior DGCA official said, requesting anonymity. To make the posts of flight operation inspectors attractive for experienced pilots, the DGCA offered them market-linked salary. “We managed to get the approval of the Finance Ministry within three days,” the official added. The DGCA has also aligned most of its rules, known as civil aviation requirements (CAR), with the ICAO norms, another DGCA official said. The aviation regulator has been holding review meetings with airlines and airports every month for safety compliance. Further, DGCA has issued rules for allowing airlines to recommend appointing designated flight examiners for conducting flight tests and technical examinations. “The designated examiner will conduct instrument rating checks, pilot licensing skill and proficiency checks on our behalf instead of our staff doing these checks. The airline will send us a proposal and we will certify the examiner,” the DGCA official said. The ICAO conducts audit in areas related to legislation, organisation, licensing, operation, airworthiness, accident investigation, air navigation and aerodromes.

Source: http://www.thehindu.com/

TECHNOLOGY

Indigenous NavIC to navigate all future Indian rocket launches, replacing GPS

Indian rocketry is set for another makeover. Indian Space Research Organisation (ISRO) has taken a decision to replace US-owned GPS with NavIC (Navigation with Indian Constellation) in all future missions for Navigation, Guidance and Control (NGC). The NGC is the brain of the launch vehicle responsible for directing the propulsive forces and stabilising the vehicle along the desired path to achieve the orbit with the specified accuracy. It also defines the optimum trajectory in real time to reach the specified target and steer the vehicle along the predefined path and inject the spacecraft into the mission targeted orbit. Speaking to the Express, Mr Tapan Misra, Director of Ahmedabad-based ISRO’s Space Applications Centre (SAC) said it would be a major step towards having 100 per cent indigenous technology in building and launching the rockets. “From now on, NavIC receiver would perform the key role and GPS receiver would be kept on standby. The NavIC receiver developed by SAC can receive signals from both IRNSS and GPS satellites,” he said. In December 2016, NavIC receiver was flight tested in ‘piggyback’ mode onboard PSLV C-36 mission and later for the first time given active role navigating PSLV C-38 that launched Cartosat-2 series satellite along with 30 other co-passenger satellites in June this year. The desi navigation technology has performed well giving ISRO scientists confidence to completely replace GPS with NavIC. Besides, Mr Tapan Misra said, SAC has newly developed miniaturised processor, which is smaller and powerful than Vikran processor.

Source: http://www.newindianexpress.com/

KARNATAKA DEPTS WILL GET DRONES TO GET THEIR JOBS DONE

The framework for the use of unmanned aerial systems (UAS) in state governance has almost been finalised and is set to roll out soon. Once implemented, Karnataka would be the first state to use UAS applications extensively in government departments. The final draft of the framework, a comprehensive one prepared by experts, has been cleared by the technical committee and will be placed before the state cabinet for approval. The framework looks to develop Karnataka as a major hub for development and manufacturing of the UAS technology. A couple of months ago, the government had decided to come up with a framework for the use of UAS or drones following recommendations by the Karnataka Knowledge Commission.The Commission had recommended that Karnataka must immediately take up a pilot-project demonstration of UAS for governance and that various sectors like agriculture, urban, water resources, mining may be considered. “The final report will be submitted to [the chief minister, among others] and once the cabinet approves it, we will have an official UAS for Karnataka,” Mr Gaurav Gupta, principal secretary, IT, BT and Science & Technology Department, told Mirror. “The idea is to perceive increased use of UAS applications in various departments, be it in agriculture to monitor or survey crops, in urban development for mapping and town planning, quick surveillance of traffic, monitoring crowds in large congregations like the Mahamastakabhisheka, which is to be held next year,” said Gupta. The framework would also contain guidelines on the dos and don’ts for operating the drones in public and private spaces. It includes tracking technologies to rein in rogue drones. “At present, there are some restrictions on the use of drones and where they can be operated. The framework will give a clear picture if it can be used in a wedding hall or an apartment space. We have to ensure that it does not infringe on the airspace or

restricted areas," Mr Gupta added. For drones to be operated legally, a Unique Identification Number (UIN) issued by the Directorate General of Civil Aviation (DGCA) is mandatory. The DGCA guidelines further state that the operator shall intimate local administration, ATS unit (for operations at or above 200 feet above ground in uncontrolled airspace), Bureau of Civil Aviation Safety and the aerodrome operator (if applicable), before commencement and after termination of operation.

HIGHLIGHTS OF THE FRAMEWORK

* Encourage UAS applications in various government departments
* Encourage and support better design, development and manufacture of UAS technology.
* Develop Karnataka as a major hub for development and manufacturing of UAS technology.

Source: http://bangaloremirror.indiatimes.com/

Decks cleared for Dhirubhai Ambani Aerospace Park at Mihan

The Board of Approval (BoA) for special economic zone (SEZ) under the Ministry of Commerce has approved the Reliance Aerostructure proposal for the development of the Dhirubhai Ambani Aerospace Park with related infrastructure facilities and services at Mihan SEZ (Nagpur), an official statement said here. "With the BoA nod, the Dhirubhai Ambani Aerospace Park (DAAP) at Mihan, spread over 289 acres, will become the largest greenfield aerospace park in the country. In the first phase, development will be spread over 104 acres and the second phase will cover an additional area of 185 acres," the statement said. Business at the aerospace park is expected to exceed Rs 200,000 crore over the next 30 years, the company said. Business at the aerospace park is expected to exceed Rs 200,000 crore over the next 30 years, the company said. "The aerospace park will also be home to the Dassault Reliance Aerospace Limited joint venture, which is presently creating the state-of-the-art integrated eco structure to execute the Rs 30,000 crore offset program linked to the sale of 36 Rafale Fighter Jets." The construction at the aerospace park is expected to start by end of the month with production starting in the first quarter of 2018, the statement said. The aerospace park with a proposed investment by Reliance of Rs 6,500 crore is expected to generate more than 10,000 skilled jobs, promoting 'Make in India' and 'Skill India' initiatives of the government. Dassault Reliance JV has already shortlisted more than 200 vendors, mostly small and medium size enterprise to be part of the supply chain at DAAP. Apart from the Dassault Reliance offset facility, the park will also be home to proposed facilities with Thales, DAHER and Strata amongst others. The proposed projects in the first phase include production of aircraft, electronic warfare systems, radars, unmanned aerial vehicles (UAVs), maintenance repair and overhaul for commercial aircraft and complete eco-system of tiered suppliers to support these large projects. Reliance will co-develop DAAP with the Maharashtra Airport Development Company (MADC) which is the nodal agency for developing the Mihan SEZ.

Source: http://economictimes.indiatimes.com/

ISRO develops ship-based tracking antenna terminal

In order to cater to specific tracking requirements of launch vehicles and post-launch activity, ISRO Telemetry, Tracking and Command Network (Istrac), Bengaluru, has designed and developed a 4.6-metre Ship Borne Transportable (SBT) Antenna Terminal that meets the launch vehicle telemetry, tracking and command (TTC) requirements. Istrac is entrusted with the responsibility of providing tracking support for all satellite and launch vehicle missions of ISRO, besides being mandated to provide space operations support for Deep Space Missions. "For supporting Deep Space Missions, a large number of ground stations are required to provide Telemetry Tracking and Command (TTC) support during the launch and initial phase. Based on the launch vehicle trajectory and visibility requirement, many a time TTC stations are to be located mid-sea, where conventional Ground Station Antenna are not suitable," ISRO said in a statement. It was in this backdrop that Istrac developed a 4.6 metre SBT antenna terminal that meets the launch vehicle TTC requirements. "The SBT Antenna system consists of 3-axis antenna mount, a motion simulator, reflector and feed, servo control systems and radio frequency electronics. Mechanical Systems Area (MSA) of Istrac made a detailed study of the technical requirements, availability of similar systems internationally and derived state-of-the-art specifications," ISRO added. The final system performance and validation was carried out by a sea trial. The antenna system was integrated on Sagar Manjusha Ship hired by the National Institute of Ocean Technology (NIOT). The ship was stationed at a specified observation point in Bay of Bengal and has successfully tracked the PSLV-C38 launch vehicle.

Source: http://timesofindia.indiatimes.com/

India's Light Combat Aircraft to Be Armed With Beyond Visual Range Missile

Israeli defense contractor Rafael Advanced Defense Systems successfully completed integration of the I-Derby beyond-visual-range (BVR) air-to-air missile on the Indian Air Force's Tejas Light Combat Aircraft (LCA) with test firing of the missile scheduled for the end of 2017, ***Flight Global*** reports. According to a Rafael representative, the new missile is slated to become the LCAs main air-to-air weapon following the completion of testing by the end of the year. The last test firing of an I-Derby BVR missile occurred at the Chandipur Integrated Test Range (ITR) in the Indian state of Odisha in May. "The objective of the test was to assess the Derby integration with aircraft systems on board Tejas, including the aircraft avionics, fire-control radar, launchers and missile weapon delivery system and to verify its performance," the Indian Ministry of Defense (MoD) said in a statement at the time. "A safe separation was followed by missile guidance towards RADAR acquired target. The flawless launch was demonstrated with all on-board systems performing satisfactorily and the missile scored a direct hit on the target with complete destruction of it. The test firing achieved all its planned objectives," the MoD statement added. "The Derby firing is a major step towards clearing BVR capabilities on LCA aircraft for FOC [full operational capability]." The missile, fitted with a fire-and-forget guidance system, has an estimated range of over 50 kilometers and an estimated speed of Mach 4. According to Rafael, the LCA could be equipped with an extended-range variant of the I-Derby with a range of up to 100 kilometers. The weapon can be fired from missile rail launchers fitted underneath the aircraft's wings. The Tejas LCA is a supersonic, single-seat, single-engine multirole light fighter aircraft, which has been under development since 1983 by the Aeronautical Development Agency in cooperation with Indian state-owned military aircraft maker Hindustan Aeronautics Limited (HAL). As I noted elsewhere: ***T***he Indian Air Force intends to induct a total of 123 Tejas Mark-IA aircraft. In November 2016, the Indian MoD cleared the purchase of a first batch of 83 Mark-IA LCAs. The IAF is also currently slated to receive 40 Tejas Mark-I aircraft by early 2018. However, HAL has so far not yet been able to meet the target of eight aircraft per year. In July 2016, the IAF inducted the first two serially-produced LCAs, followed by three more aircraft during the year. A sixth LCA is expected to join the IAFs Number 45 Squadron. HAL is expected to produce 16 LCAs during the full-production phase.

Source: http://thediplomat.com/

The future of aerospace manufacturing is digital

To keep pace with an increasingly competitive international market, it's crucial that the UK's aerospace industry continues to find ways to improve passenger experience whilst scaling back costs and becoming more energy efficient. To support this, the UK Government invested £100 million last year, aiming to attract new skills, technology and innovation to the industry. Finding new means of reducing weight, cutting down on emissions, and increasing cargo and cabin capacity, airline manufacturers have embraced the spirit of innovation by turning to the latest in digital manufacturing technology as the key way forward. Organisations across a range of industries are currently enjoying new and exciting opportunities to transform their business and improve their speed to market through employing digital manufacturing technology. The advances in automation and the new types of manufacturing processes it offers, running in parallel with significant developments in existing technology, represent part of an ongoing transformation within the aerospace industry. Advancements in 3D printing techniques in particular are already delivering tangible benefits to manufacturers as a means of reducing material and labour costs, enabling them to test small parts and components such as those critical to the construction of landing gear and engines. In the recent United Launch Alliance between Boeing and Lockheed Martin, for example, a move to 3D printing technology for the manufacture of components saved the companies a reported $1m in a year.

Source: http://insights.swie.io/

India's HAL targets growth through indigenous programmes

India's state-owned aerospace manufacturer, Hindustan Aeronautics Limited (HAL), has been set a target to achieve INR179 billion (USD2.8 billion) in revenue for fiscal year 2017–18, it announced on 12 July. The target, set by the Indian ministry of defence (MoD), represents a 3% increase over the record revenue achieved in 2016–17, which in turn was a 4% increase over the previous year. HAL's pre-tax profit in 2016–17 was INR32.94 billion, which is comparable with 2015–16, although the company did not disclose profit targets for 2017–18. The targets are framed through a memorandum of understanding (MoU) signed by HAL and the MoD on 11 July (the MoU is signed by the two parties on an annual basis).

Source: http://www.janes.com/

E-NEWS

China begins mass production of CH-5 drone

China has started commercial production of its CH-5 Rainbow drone, touted to be a rival to the US unmanned aerial vehicle MQ-9 Reaper, which could attack targets on the ground. Mr Wang Song, an associate professor with the school of aeronautic science and engineering at China's Beihang University, said the first flight of a mass-produced CH-5 Rainbow, a heavy military drone last week meant signals China's readiness to export it. He said the drone equals that of the US General Atomics MQ-9 Reaper, but at around half the cost. However, Mr Wang said the Chinese drone had a weakness compared to its American counterparts. The Reaper can climb to a height of between 12,000 and 15,000 metres. This allows the US drone to stay above the reach of most ground fire. "The CH-5, on the other hand, cannot operate at more than 9,000 metres, which makes it vulnerable to some anti-aircraft weaponry," Mr Wang was quoted as saying by the Hong Kong-based South China Morning Post today. The limited ceiling of the Rainbow is a by-product of its relatively weak engine, according to Mr Wang, who noted that China still lagged behind the West in aircraft engine technology. "This is in fact the weakness of all China-made aeroplanes," he said. United States Reaper, or Predator B, was the world's first unmanned aerial vehicle that could attack targets on the ground. At $16.9 million, it is the world's most expensive drone. "The CH-5 may come in at less than half of the price," Wang said. State-run CGTN TV also showed a video of the CH-5 destroying targets.

Source: http://www.thehindubusinessline.com/

PSLV best choice in global market for launching small satellites: ISRO chairman

Indian Space Research Organisation (ISRO) chairman Mr A S Kiran Kumar says the space body is working on new technologies and space programmes, especially for interplanetary missions. In an exclusive interview to TOI's Surendra Singh , Padma Shri awardee Mr Kiran Kumar explains reasons as to why India, despite having so many remote-sensing satellites in orbit, is still taking help from NASA to keep an eye on the Doklam plateau, the site of the ongoing stand-off with China. Excerpts: ISRO this year has achieved several milestones — starting from the launch of 104 satellites in one go to the launch of heaviest rocket GSLV Mark III on June 5. How do you see these achievements? We need a lot of payload capacity (satellites) for various activities. We have to make sure we achieve the required capacity as early as possible. Towards that we have been working on.

What are new technologies ISRO is working on?

We have done the first development flight test of capacity launcher (GSLV MkIII launch on June 5). We will repeat its launches to make it operational. We are also working on semi-cyrogenic engine for the launch vehicle — making use of liquid oxygen and kerosene as fuel. We are also trying to streamline activities of satellite launchers. We'll see eight PSLV launches and two GSLV Mk II and Mk III launches in coming months. We are also working on the next phase of the reusable launch vehicle whose experimental test is likely within one to five years. ISRO is also building high throughput satellites like Gsat-11, Gsat-29 and Gsat-20 with high beam (a special kind of transponder that operates on a high frequency) that will increase our communication capabilities. We are also trying to improve weight capability of our satellites with the help of electric propulsion technology (which helps a satellite reduce its conventional fuel intake and instead draw energy from solar energy in space). Gsat-9 (South Asia satellite) has this technology. **With a space agency launching its first rocket brought on a bicycle in 1963 to one launching the country's heaviest rocket, how do you see this advancement in space technology of ISRO?** Our focus on indigenous development of space technologies, which were not easily available, helped us come this far. We have been consistently pursuing to achieve these technologies. Persistence definitely pays.

What have been the hardships faced by ISRO?

Initially, ISRO had faced the problem of developing cryogenic engine and also witnessed a couple of GSLV failures. This hurdle actually delayed the GSLV Mk II and Mk III programmes.

ISRO had successfully launched Mars Orbiter Mission and Chandrayaan in first attempt and at a budget less than that of NASA for similar missions. Is our technology cost-effective?

We are trying to achieve more within the resources available to us. Our methodology is different from other countries. But we have also benefitted from what others had done.

With ISRO launching 209 satellites of 28 countries since 1999, do you think it has made an impact in the commercial market?

Money that we are earning from satellite launches is small. But what is significant is ISRO has made a mark in the small satellite launch market — those ranging from less than 100 kg to 500 kg. PSLV-class of launch vehicle is not available everywhere. And as we are engaging in frequent launches and have the capacity to carry small foreign satellites along with our primary satellite, PSLV is the best choice available in the market. By carrying small foreign satellites, we are also able to cut the cost of launches. Globally, small satellites are becoming the order of the day.

What about India's space collaboration with the US and Israel?

Individual space agencies, including NASA, are not getting enough funds from their respective governments for their space programmes. Collaboration between space agencies is, therefore, the order of the day. India and NASA are currently working on NISAR (NASA-ISRO Synthetic Aperture Radar) project.

With PM Narendra Modi's special focus on technology, do you think the space budget allocated by the Centre is sufficient enough for ISRO?

Progressively, the budget for space programmes is being increased. In the last three years, the outlay has been increased. With the resources available to us, we will prioritise missions.

ISRO had placed a lot of remote sensing satellites in orbit, then why does India have to depend on high-resolution images from NASA to keep an eye on the India-China military stand-off at Doklam?

It is not possible for ISRO to look at all locations of the country 24x7. For example, if one satellite covers an area of 10 km once a day, how will you scan the total area of the country in a day. Therefore, by pooling resources (with images from NASA), we can get what we want.

What are the new milestones you, as ISRO chairman, are striving to achieve this year and next?

We are working to increase the frequency of launches so that we can have more (communication) capabilities. Inter-planetary programmes like Chandrayaan-2 and Aditya (solar) missions are on track. Chandrayaan-2 launch expected in the first quarter of next year and Aditya mission by 2018-end or beginning of 2019.

After the first development flight of India's heaviest rocket GSLV Mk III with carrying capacity of a 4-ton class satellite, will ISRO still depend on European spaceport for launching heavier satellite?

During the first development flight of GSLV Mk III, we didn't want to use the full heavy-lift capacity of the rocket and therefore kept an extra margin. The rocket therefore launched only a 3.1- ton Gsat-19. With a couple of launches, GSLV Mk III will be able to carry the full capacity 4-ton satellite. ISRO will go ahead with the launch of its 5.8-ton Gsat-11 from French Guiana scheduled later this year. But thereafter, I don't see any reason for ISRO to depend on foreign spaceport for launching its heavier satellites.

Source: http://timesofindia.indiatimes.com/

MARUTI 800 ENGINE TO POWER AIRBOATS

NAL plans to test the boat to clear weeds from Ulsoor Lake Owning a Maruti 800 was a dream for the middle class in the 80s and 90s. Its fuel-efficient and powerful engine made it the most-sought-after car for most Indians then. When the economy opened up, an avalanche of cars flooded our market, and gradually, Maruti 800s started fading away. Now, its powerful engines are being used for an altogether different purpose — to operate airboats. The National Aerospace Laboratories (NAL), involved in making airboats for inland waterways applications and clearing the weeds from water bodies, is developing one which will be powered with a modified engine of Maruti 800. "Initially, the idea was to develop airboats which will have an air propulsion system that can push the boat forward in the water to clear weeds. But now we have decided to use car engines instead to power the boat," said NAL sources. "We found that the Maruti 800 engine to be more cost-effective compared with small aircraft engines. Besides they are much more versatile.

Using this engine, the boat can also be reversed something which could not be done using the other engine," sources said. The boat, with the modified engine, is currently being integrated to the boat and about 80 per cent of the work has been completed. NAL plans to test the boat in Ulsoor Lake in a couple of weeks. Airboats' task is to easily push forward the floating weeds and plants to a corner of the lake from where it be bundled and lifted out of the lake. "To begin with, NAL will use the Maruti 800 engines and then shift over to more powerful engines," sources said. "The modified Maruti 800 engines can generate about 40 hp on water bodies. In the next phase, we would look to opt for more powerful ones like the multi-point fuel injection (MPFI) engines which can zoom into different locations and complete its task," sources added. The city-based laboratory, which has developed airboats, has been approached by corporates as well. It's learnt Biocon has shown interest in airboats to be used for its CRS initiatives.

Source: http://bangaloremirror.indiatimes.com/

BUSINESS

Israel Aerospace's accelerator seeks to support Indian start-ups

Israel Aerospace Industries (IAI), which is to supply systems for Barak 8 surface-to-air missiles to Bharat Electronics Ltd for installation on Indian warships, is look to engage with start-ups that work in the field of aviation and defence. The decision has sparked interest among Indian conglomerates such as the Kalyani Group and Piramal Enterprises. As Israel continues to produce an impressive number of highly successful tech start-ups — earning it the moniker 'Start-up Nation' — IAI is keen to build what is being referred to as the country's first aviation accelerator. The Bedek Aviation Group, IAI's biggest division that conducts heavy aircraft maintenance and upgrades, and converts aircraft to various specified configurations such as aerial refuelling and cargo, will host the accelerator. The aim is to identify start-ups that have passed the seed stage, so that their products can be used by IAI, said officials. The start-ups will utilise IAI's infrastructural facilities as well as professional guidance from leading aviation specialists. Israel's aviation accelerator has sparked interest among Indian firms, with the $3-billion Kalyani Group looking to up the ante, given its association with IAI. In February, the group's defence arm Kalyani Strategic Systems had inked a MoU with IAI to incorporate a joint venture company in India. Baba Kalyani, Chairman of Bharat Forge, the flagship company of the Kalyani Group, told Business Line that collaborating with hi-tech aviation and defence experts as well as start-ups would help Indian firms "get access to critical technology which is the need of the hour in defence and aviation." The group, which is also into aerospace, has built strong ties with foreign partners over the years for specialised raw materials. It is keen to become a strategic player in the global aerospace supply chain, with its forged and machined products and assemblies, and aims to achieve $100 million in revenues from that sector. "Our JV with IAI will manufacture specific air defence systems. Since we have been supplying components for aircraft and make metal components in super alloys and titanium, new technologies used by start-ups in the aerospace sector could be critical for India's aviation space," said Mrs Kalyani. Piramal Enterprises holds a minority equity stake in Israeli firm BlueBird Aero Systems, which manufactures tactical unmanned aerial systems and peripheral equipment.

Source: http://www.thehindubusinessline.com/

Mahindra Aerostructures ties up with Elbit arm

Cyclone, a subsidiary of Israel-based Elbit Systems, and Mahindra Aerostructures have teamed up to collaborate on the production of aerostructure parts and assemblies. The two companies had inked an agreement earlier, and now propose to team up on new work opportunities, even as Cyclone intends to source content for existing work packages from Mahindra. Mahindra Aerostructures is part of the business delegation visiting Israel along with Prime Minister Narendra Modi. Elbit Systems-Cyclone is a wholly-owned subsidiary of Elbit Systems, an Israel-based defence electronics company. It has awarded the first work package to its Indian partner, and Mahindra is to commence trials of the first few parts for Cyclone at its aerostructures manufacturing facility near Bengaluru. The Mahindra's Bengaluru facility produces parts for its global customers and also exports primary structural assemblies for the Mahindra Airvan 8 aircraft. Mr SP Shukla, Chairman, Mahindra Aerospace, observed that India and Israel have long shared a rich history of tradition and culture. "Mahindra is proud to be part of the government's drive to seek larger cooperation with Israeli companies," he said in a statement. Mr Yoram Shmuely, Executive Vice-President of the Aerospace Division of Elbit Systems, added that Elbit and Mahindra are well placed to participate in strategic ties between Israel and India.

Source: http://www.thehindubusinessline.com/

Reliance Infrastructure gets go-ahead for $1-billion Aerospace Park

Reliance Infrastructure of Anil Ambani-led Reliance Group has received government approvals for its planned $1-billion Greenfield aerospace park near Nagpur. "We can now start working on the first unit by August and hope to complete it by first quarter of 2018," said Mr Rajesh Dhingra, chief executive officer at Reliance Defence, an arm of Reliance Infra. "All our aerospace-related units will be based in this one location. We will invest around $1 billion (about Rs 6,500 crore) on developing the entire part," he told ET. The board of approval for special economic zones (SEZs) in the ministry of commerce has given its approval to the proposed aerospace park spread across 289 acres at Mihan near Nagpur. The park aims to carry out business worth over Rs 200,000 crore over the next 30 years, the company said. In the first phase, the project will build manufacturing unit for production of aircraft, electronic warfare systems, radars, unmanned aerial vehicles, maintenance repair and overhaul for commercial aircraft, and complete eco system, including ancillary units and suppliers, to support these large projects. This development will be spread over 104 acres and the second phase will cover an additional area of 185 acres. Mr Dhingra, who is a former Indian Air Force officer, has been at the helm for the company's aerospace business even before it acquired Pipavav Defence & Offshore Engineering in 2015 to make a foray into the sector. Since the acquisition, Reliance Defence has signed collaboration deals with international defence manufacturers and joined the race to grab a slice of the country's defence spend along with other private players like Larsen & Toubro, Tata Group, and Mahindra Group. Reliance Group last year entered into separate joint ventures with French defence majors Dassault Aviation and Thales. In both the ventures, the Indian partner will hold majority 51% stake. The company has already incorporated the Dassault JV and it will be the first project it undertakes in the aerospace park, officials said. Both the JVs will be based out of Mihan SEZ and will work towards the execution of offset obligation worth up to Rs 30,000 crore for the 36 Rafale fighter jets being bought by India for Rs 60,000 crore, the company said.

Source: http://economictimes.indiatimes.com/

ISRO earned 6.1 million euros for 29 foreign nano satellites launched on June 23

Antrix Corporation Limited (ACL), the commercial and marketing arm of ISRO, earned 6.1 million euros (about R. 45.2 crore) from the launch of 29 foreign nano satellites, that were put in orbit along with the Cartosat 2, on June 23. The information was shared by the Prime Minister's Office in Lok Sabha. The 29 nanosatellites came from 14 foreign countries. Over the years India's space agency has become a favourite for foreign companies and governments seeking cost-effective launches. Till date, ISRO has launched over 200 foreign satellites, including 101 nanosatellites in its historic launch in February, where 104 satellites were launched into orbit in a single mission. The agency did not reveal how much it earned from that record-breaking launch, but ISRO did hope to recoup half of the mission's cost from payments for these foreign launches. Of the 101 nano satellites, the largest number (96) were from the US and 88 from only one company called Planet. The US has become ISRO's biggest client in recent years, though its first payload from the country was carried by an ISRO launch vehicle only in 2015. The largest number of nanosatellites in the June 23 launch were also from the US. In 2016 alone, ISRO launched 22 satellites for other countries, more than double the number of Indian satellites launched that year (10). However, it must be noted that foreign satellites are mostly co-passenger satellites and not the main payload. The launch services are offered because the same launch vehicle can carry more payload, and is a more cost effective option. Antrix earned R. 230 crore from its commercial launch services in 2015-16, capturing 0.6 % of the global launch services market, which is estimated to be worth R. 37,000 crore.The agency is aggressively pushing its commercial launch operations even as it ramps up its launch program aiming for 12 launches every year, from the present 7.

Source: http://www.hindustantimes.com/

Israel to partner DRDO for developing missile defence system for India

In a major upgrade to its defences, the Indian Army has signed a MoU with the Defence Research and Development Organisation (DRDO) to raise one regiment of the advanced Medium Range Surface to Air Missiles (MRSAM). The army plans to have a total of five regiments of this air defence system, which will be deployed opposite to China and Pakistan. The MRSAM marks a paradigm shift in the capabilities of the Indian Army. The system can shoot down enemy ballistic missiles, aircraft, helicopters, drones, surveillance aircraft and Airborne Warning and Control System (AWACS) aircraft. Meant for the Army Air Defence, the MRSAM is an advanced, all weather, mobile, land-based air defence system. It is capable of engaging multiple aerial targets at ranges of more than 50 km. Each MRSAM system comprises a command-and-control system, a tracking radar, missiles, and mobile launchers. Each regiment consists of four launchers with three missiles each. So five regiments will have 60 missiles. A MOU has been signed between

the army and the Defence Research and Development Organisation (DRDO) for one regiment. "The MOU marks the beginning of the development of the MRSAM in the configuration required by the army," said a defence ministry official, adding that the entire project is worth Rs 17,000 cr. Earlier this year, the Cabinet Committee on Security headed by PM Narendra Modi approved a proposal for procuring the MRSAM system for the army. According to the proposal, the army will induct five regiments of the system. The system will be jointly developed by Israel Aerospace Industries (IAI) and DRDO with the involvement of private sectors and DPSUs. "The system will have majority indigenous content, giving boost to the Make-in-India initiative. The participation of Indian companies in producing MRSAM will empower them in the field of hightech weapon technology. Last July, the IAI and DRDO conducted three flight tests of the MRSAM at the integrated test range off the Odisha Coast. The missile successfully intercepted moving aerial targets in all three tests. The MRSAM is a land-based variant of the long-range surface-to-air missile (LRSAM) or Barak-8 naval air defence system, which is designed to operate from naval vessels.

Source: http://economictimes.indiatimes.com/

India, Russia to soon ink deal on fifth generation fighter aircraft

Russia was the only country for India that transferred all technologies without restrictions, declared Mr Sergei Chemezov, the CEO of Rostec, to the Indian media. Rostec is a Russian state corporation, comprising hundreds of entities, that develops and promotes hi-tech defence and civilian products worldwide. Mr Chemezov was speaking on the sidelines of MAKS 2017 as it got under way, the aeroshow where this year 800 companies from Russia are participating along with 180 companies from 37 other countries. The centrepiece was the flight demonstration of MiG 35, the most advanced of Russian fighter aircraft, but not quite fifth generation, that will go into production in a couple of years. Asked what the prospects of co-operation were with India, given India's growing defence co-operation with other countries, the CEO of Rostec was sanguine, maintaining that "Cooperation with India will certainly continue. Regardless of whether India cooperates only with Russia or also with Israel and other countries. And France also, and USA." He declared Russia had its own "niche". "These countries have their own directions for cooperation. Therefore, this does not mean that if India will work with some other countries, cooperation with Russia will cease. No. There are things that no one else will give except Russia. Therefore, Russia has always been and will be a strategic partner of India." Giving an overview of Russia's defence relationship with India the CEO of Rostec said that every year, Russia supplied products to India worth more than two billion dollars. The volumes in the past year was more or less the same as the previous year. There had been fluctuations, in the range of ten to fifteen per cent but Mr Chemezov characterised them as being "insignificant". He said where India was concerned the co-operation was aimed not only in selling products but also transferring technology. It began with the late 90's with the sale of licenses for SU-30MKIs which today are manufactured in India. He cited the example of the T-90 tank the production of which India had "mastered" and that the Russian role in this was only to provide assistance, supply components, but for the most it was already localized. He said the co-operation was very wide, pointing out that, "Most recently we signed a contract for the joint production of Ka-226 helicopters. We have to supply a certain amount, most will be localized, in total, in the amount of 200 helicopters. But in the future this amount can be increased. We are working on the 5th generation aircraft, the work continues." On the Brahmos missile, he said the production had been completely localised as well. On the delivery of Ka 226 helicopters, Mr Chemezov said there was a joint venture in India. "And we expect an official request from the Ministry of Defense of India, the customer. Accordingly, after the contract is signed, in two years, the first deliveries of helicopters will be made. The agreement for that is signed and is being exercised." Mr Chemezov refused to be drawn into commenting on the S-400 triumf systems to India, saying "until the contract is signed I would not be able to answer precisely on this topic. When we finalise the deal and sign it, and if our India partners agree, we could announce details of this contract." S 400 triumf is an anti-aircraft missile defence system which has been deployed in Russia for about a decade. He did not wish to comment on the creation of a fifth generation fighter aircraft with India either, saying merely that it was complicated therefore not going fast. " Stage 1 is over. Now we are discussing the 2nd stage. And I think that in the near future all decisions will be made. And the contract documents will be signed. But the work is going, it is very complicated, so it is not going fast. "

Source: http://www.thehindu.com/

E-NEWS

OBITUARY

Professor UR Rao, India's satellite man, no more

A determined lifetime of a man focussed on solving societal issues using space science and technology for more than five decades came to an end as Professor Udupi Ramachandra Rao, 'India's Satellite Man', breathed his last unable to recover from illness. It also marked an end of an era, leaving the Indian Space Research Organisation (ISRO) bereft of the experience of a man who has been part of all its launches, from Aryabhatta, India's first satellite to the experimental flight of GSLV MK-III. UR Rao, as the 85-year-old was popular, is a globally-renowned space scientist, who occupied key positions in multiple international fora besides having occupied important positions in India—the most important one being chairman, ISRO (1984-1994). Having trained under Vikram Sarabhai—the father of Indian space programme—Rao was an inspiration to both his contemporaries and juniors alike. Relentless dedication to science and a vision on a par with his predecessors and mentors Sarabhai and Satish Dhawan, Rao's service to science in India had continued until his last breath. "He just did not stop working. He just could not, with all the things he wanted to do for our country," eminent scientist Prof Roddam Narasimha, 85, who worked with Rao in the early years and was associated with him throughout told TOI. Whether it was the launch of Aryabhata, or the success of the Ariane Passenger PayLoad Experiment (Apple), which was transported on a bullock cart, in 1981, or the initial failures of the SLV series of launchers and the PSLV's first flight, Rao was unfazed. "He had a vision so clear that such hurdles could not stop him. His command on science and ability to work through challenges is what paved way to such a grand satellite programme in the country," former ISRO chairman Dr K Kasturirangan said. Recollecting one such experience, Roddam, said: "It was early 1980s, and Prof Rao and I were waiting outside the chamber of then Prime Minister Indira Gandhi. There had been a couple of failures of the SLVs and we had been summoned to give explanations." Rao had been given 20 minutes with the prime minister, but as he began speaking, first about the failures and then about the country's space programme, all three lost track of time. "When we walked out, it had been more than two hours. The failures were behind us, and in (Mrs) Gandhi, we had a prime minister committed to space programme," Roddam said. A career largely punctuated by successes, Rao, who was the chairman of ISRO's advisory committee that selected projects and payloads, had even convened a meeting last week. "It was unfortunate that I had to chair the meeting as he took ill," Roddam said, while Kasturirangan added: "We just did not foresee that his demise would come so soon after that day." He had had elaborate discussions with a host of scientists before scheduling the meeting. He was also serving as Chairman of the governing council of the physical research laboratory and the chancellor of the Indian Institute of Science and Technology at Thiruvananthapuram. Rao has held several top positions, including several in foreign universities. He has about 10 international awards and many more national awards. In January his year, he was awarded the Padma Vibhushan, and Rao had told this correspondent: "...I thought I will get this posthumously..." Among other positions that Rao has held, he is remembered for his tenure at the Massachusetts Institute of Technology (MIT). In May 2016, Rao became the first Indian to be given the 'Hall of Fame' award by the International Astronautical Federation (IAF). He has published more than 350 scientific and technical papers covering cosmic rays, interplanetary physics, high energy astronomy, space applications and satellite and rocket technology and authored many books. He is also the recipient of D.Sc. (Hon. Causa) Degree from over 25 Universities including University of Bologna, the oldest University in Europe.

Source: http://timesofindia.indiatimes.com

Professor Dr. H.V.Lakshminarayana (Born on 08 July 1942), no more

An academician and seasoned educationalist passed away on 18 July 2017. Dr. H.V. Lakshminarayana was serving as Professor with the Department of Mechanical Engineering, Dayananda Sagar College of Engineering, Bengaluru during his last tenure of the professional association. He has rendered his service at University Visvesvaraya College of Engineering (1968-1973), MS Ramaiah Institute of Technology (1992-1998), MS Ramaiah School of Advanced Studies (1998-2006). He was a scientist at NAL (1973-1990), and a researcher at Wright Patterson Airforce Base, Dayton, Ohio, USA (1980-1982), University of Montreal, Canada (1990-1992). He has authored number of technical papers, chapters in books and two text books. He has received best teacher award from the Bangalore University and outstanding research performance award from the National Aerospace Laboratories. He was also looked up as an outstanding mentor by his fellow colleagues and other aspiring graduates for the guidance provided and enormous shared with. He has taken stupendous initiatives for setting up a skill developmental training institute aimed at enhancing the competency of the students in the Dayananda Sagar college.

He was one of the noted senior members of NAFEMS Working Group in India. At NAFEMS, senior though, he demonstrated to be a very active member of the core working group through his contributions in helping to promote the best practices including his specialization in the FEM field. He had also shared many of his valuable insights on revising the pedagogy related to computational applications in design engineering.

He was a prompt and active reviewer of the technical papers of Journal of Aerospace Sciences and Technologies. He has given many useful suggestions to the authors of the papers which improved their quality. We at the journal office miss him as a person his courteous and prompt reviews.

Dr S. Kishore Kumar

SHRI VED PRAKASH SANDLAS, no more

Prof. Ved Prakash Sandlas Passed away on July, 06 – 2017. He retired from regular Govt. service in Feb 2005 after working in ISRO (1967-1986) and DRDO (1986-2005) in the areas of Electronics & Communications, Satellite Launch Vehicles and R&D Management. Subsequently (during 2008-13) he functioned as the founder Director General, Amity Institute of Space Science and Technology, and Amity Institute of Aerospace Engineering, Noida.

He was designated Distinguished Scientist and appointed as Chief Controller R & D, DRDO during 1996-2005. As Director, Defence Electronics Applications Laboratory (DEAL), Dehradun (1986-96) he was responsible for the introduction of satellite communication era in the defence services. Earlier, he worked at the Vikram Sarabhai Space Centre (VSSC), Trivandrum and grew up to become Group Director, Electronics (1984-86) and, Mission Director/Project Director SLV-3 (1980-84), and was responsible for the two successful launchings of SLV-3 and Rohini Satellites on May 31, 1981 and April 17, 1983.

He has been awarded DRDO's 'Scientist of the Year' award (1988), FIE Foundation National Award (1998) for Science & Technology, and IIT Kharagpur Distinguished Alumnus Award (2012). He has extensively lectured and published on Project Management, Satellite Launch Vehicle Systems, R&D Management, Electronics, Communication Systems, Amateur Radio, EMI/EMC, Electromagnetic Radiation Hazards, Defence Space Systems and Cyber Security.

Prof. Sandlas is Fellow, Indian National Academy of Engineering (INAE), Institution of Electronics and Telecommunication Engineers (IETE), Astronautical Society of India, and NGN Forum; Vice President, Amateur Radio Society of India (ARSI) and Radio Amateur Satellite Corporation (AMSAT-India); President, dB Society of USA (India Chapter) and Microwave Applications Society of India (MASI); and Patron, Society of EMC Engineers (India).

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