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HAL launches Hawk-i aircraft upgraded with Indian-made equipment



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ISRO launches 104 satellites in one go, creates history

India, a one-rocket fledgling in space transportation compared to its European and U.S. counterparts, created launch history by placing a record 104 spacecraft in their desired orbits. The feat was performed on the old reliable launch vehicle, the PSLV, numbered C-37, which took off from the first launch pad at the Satish Dhawan Space Centre, Sriharikota, at 9.28 a.m. Precise launch C-37 was a largely commercial flight as all but three passenger satellites, small nanosats, belonged to six other countries. The 29-minute launch went off precisely as planned; it took just 11 minutes from the release of the primary Cartosat-2 series spacecraft to the last launch of a client satellite, ISRO said after the mega-payload launch. The PSLV, in the category of launch



vehicles that can lift relatively light loads to space, now marks 38 successful missions in a row out of a total of 39 flights. This time, it took to space a total of 1,378 kg, of which the primary satellite was 714 kg. The latest Cartosat is the fifth in the series of six Cartosat-2 spacecraft, starting from Cartosat 2 in 2007 and followed by what were earlier marked A, B, C, D and E. The last one is due. "After a flight of 16 minutes and 48 seconds, the satellites achieved a polar Sun synchronous orbit of 506 km inclined at an angle of 97.46 degrees to the equator — very close to the intended orbit. In the next 12 minutes, all 104 satellites successfully separated from the PSLV fourth stage in a predetermined sequence, beginning with the Cartosat-2 series, INS-1 and INS-2," an official communique said. ISRO's workhorse lives up to its billing. The PSLV, which created launch history by placing a record 104 spacecraft in their desired orbits, has totally launched 46 Indian spacecraft, most of them Indian Remote Sensing (IRS) satellites. As many as 180 small satellites of foreign customers contracted by ISRO's commercial company Antrix Corporation have also reached space on this vehicle. This time, it took to space a total of 1,378 kg, of which the primary satellite was 714 kg. The latest Cartosat is the fifth in the series of six Cartosat-2 spacecraft, starting from Cartosat 2 in 2007 and followed by what were earlier marked A, B, C, D and E. The last one is due. "After a flight of 16 minutes and 48 seconds, the satellites achieved a polar Sun synchronous orbit of 506 km inclined at an angle of 97.46 degrees to the equator — very close to the intended orbit. In the next 12 minutes, all 104 satellites successfully separated from the PSLV fourth stage in a predetermined sequence, beginning with the Cartosat-2 series, INS-1 and INS-2," an official communique said. The PSLV, 39 flights old since 1993, also launched the Indian Moon mission Chandrayaan-1 in 2008; and is set to launch a private lunar mission for Bengaluru start-up Team Indus in late December this year. "It is confirmed that all 104 satellites have been successfully deployed in the orbit," PTI quoted PSLV Project Director Mr. B. Jayakumar at the Vikram Sarabhai Space Centre (VSSC) as saying. "After separation, the two solar arrays of Cartosat-2 series satellite were deployed automatically and ISRO Telemetry, Tracking and Command Network (ISTRAC) at Bengaluru took over the control of the satellite," the space agency said. In the coming days, the satellite will be brought to its final operational configuration.

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

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CURRENT AFFAIRS

Karnataka govt ropes in NAL, Ramaiah University for Aerospace Centre

The Karnataka government is partnering with the National Aerospace Laboratories (NAL) and MS Ramaiah University of Applied Sciences to set up the Karnataka Aerospace Technology Innovation Centre, a flagship initiative touted to boost research in the sector. A brainchild of the industries and commerce department, this is the first-of-its-kind attempt to bring industry and academia together in the aerospace sector in Karnataka, which faces stiff competition from neighbours. "The idea is to identify technologies that can be hived off for commercial production to benefit small and medium enterprises in and around Bengaluru," Commissioner for Industrial Development Mr. Gaurav Gupta told ET. The idea is also to allow larger defence PSUs such as the DRDO, HAL and BEL to look at the facility for product development. "We're most likely to go ahead with it because we want some form of academic hand-holding. So then we'll have a research and development unit anchored by NAL, academics, industry participation and the government -all working to boost a lot of new things that can happen in the sector," Mr. Gupta said. The MS Ramaiah University has offered to provide space for the Karnataka Aerospace Technology Innovation Centre on its Peenya campus. "We will give 1,300 sqft of office space for the centre on our campus," vice-chancellor Mr. SR Shankapal said. The university wants to create an incubation centre to give its students exposure to the aerospace industry, he added. The university currently offers B Tech in aerospace engineering and M Tech in aircraft design engineering. Eventually, the centre will move to the Bengaluru Aerospace Park, a 950 acre parcel of land at Singahalli behind the Kempegowda International Airport. Wipro Aerospace, Thyssenkrupp Aerospace and Starragheckert have started functioning there. The government has been trying to position Bengaluru as India's aerospace capital, citing the presence of Boeing, Airbus among other key players in the city. Mr. G Raj Narayan, MD at Radel Advanced Technology, was cynical. Mr. Narayan, who was part of a 4-member team that built India's first indigenous cockpit simulator, pointed out that the project would add little value without the involvement of the HAL and the Indian Institute of Science. "As of now, the entire domain expertise lies within HAL and the IISc has been catering to the aerospace industry for many decades," he said.

Source: <http://tech.economictimes.indiatimes.com>

Aerospace Industry to come up in Donakonda in Andhra Pradesh

In what could be realising the long-cherished dreams, the sleepy town of Donakonda in the Prakasam district is going to turn into a major industrial hub in the coming years as the state government has succeeded in roping in big-ticket investments to the region. At least three major industrial houses are going to launch their operations in the industrial corridor of Donakonda shortly as the firms signed Memorandum of Understanding (MoU) with the state government at just concluded CII-partnership summit at Visakhapatnam. The works on Rs 6,000 crore aviation industry to be owned by the Titan Aviation a subsidiary of Titan Metals and Minerals Ltd are expected to kick-start anytime now as the company is making arrangements for laying the foundation stone for the big project. The project will come up in an extent of about 5,000 acres in Donakonda industrial park. "At least three firms, which have promised to invest in Donakonda are readying to conduct foundation laying ceremony in next few weeks," disclosed district minister Mr. Sidda Raghava Rao. The Titan Aviation will make foot in Donakonda in collaboration with several Ukrainian companies which have strong presence in aviation and aerospace businesses across the globe. Titan Aviation is reportedly contemplating to make spares for fixed wing and Boguslaev helicopters and maintenance repair and overhauling (MRO services). It also have plans to produce engine for various aircrafts, helicopters, missiles, space shuttles programs to implement Product Lifecycle Management (PLM) in association with Antonov Aircrafts. Besides Titan aviation, a food park is also coming up in about 500 acres of land at Tripuranthakam. An automobile industry too is planning to set up a major industry with an investment of Rs.1500 crore. The project will come up in about 500 acres. "Works on all the three major projects will be commenced in few weeks between February and March," said Mr. Raghava Rao. The three industries are expected to provide direct employment to about 5,000 people and indirect employment to another 20,000.

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

Airport expansion plan gets big push

Union aviation minister Mr. V Gajapathi Raju has cleared the proposal of changing the location of the isolation bay of Kolhapur airport, which would no longer require acquisition of forest land. The district collector's proposal was raised

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before the aviation ministry by Mr. Rajyasabha MP Sambhajiraje Chhatrapati. Mr. Sambhajiraje told TOI, "I was informed today that the proposal is accepted by the aviation ministry, which is a major relief for the people concerned with airport development. A meeting on the issue is scheduled in Mumbai to take up the issue further." The Airport Authority of India has already received 223 hectares of land from the state government after the latter acquired it for expansion of the airport. Despite that, a proposal for acquisition of another 10 hectares of land was under consideration for construction of isolation bay. The change in location of the isolation bay would make further land acquisition unnecessary. The airport has been used for special flights and the state government was keen on starting a scheduled flight from Kolhapur to Mumbai. The officials have also proposed to subsidize the air tickets for the first few weeks so that people would get used to air travel. The Kolhapur airport is also proposed to be used as a parking place for several major airlines due to shortage of space at Mumbai airport. The idea is to use Kolhapur as base airport so that airlines can have early morning flights to Mumbai and further to other locations. The last scheduled flight took off from Kolhapur airport in 2010.

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

HAL's light combat aircraft, Swedish fighter at Aero India

With the five-day 'Aero India 2017', defence manufacturers from both public and private sectors have started making announcements regarding the aircraft to be put on display. Swedish aerospace and defence company's premier single engine fighter aircraft, Gripen-E, will be on display. Hindustan Aeronautics Limited (HAL) revealed that the company's indigenous products, such as HTT-40, a basic trainer aircraft, Light Combat Aircraft and others were displayed. Chairman and Managing Director Mr. T Suvarna Raju said the HAL was gearing up to display recent advancements in fixed and rotary wing segments. Among the aircraft displayed will include its key indigenous products HTT-40 (Basic Trainer Aircraft), first indigenously upgraded Hawk Mk132, named as Hawk-i, Light Utility Helicopter (LUH) and Light Combat Helicopter (LCH). "Visitors will get an opportunity to know about Advanced Hawk that will be on display in front of the HAL stall. Also, in the static display section, HTT-40, upgraded Jaguar & Mirage 2000, LCH and LUH are expected to be crowd pullers," he said. Customer demonstration flights were held for ALH Mk III Dhruv and Mk IV (Rudra).

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

Aero India 2017: Daredevilry in the air, deals on the ground

The biennial Aero India, an exhibition which witnesses defence players across the world showcasing their products, started from February 14. The four-day event, will have participants from 270 Indian companies and 279 foreign companies. 72 aircrafts displayed at the event. It will be held at the Yelahanka Airforce station in Bengaluru from February 14-18. Defence Minister Manohar Parrikar will be the guest of honour for the event. Army Chief Gen Bipin Rawat and Air Force Chief B S Dhanao, Defence Secretary, Mr. G Mohan Kumar, Secretary (Defence Production) Mr. A K Gupta are attend the event. Models of the Su-30MKI fighter jet and components for its modernisation, Su-35 fighter jet, MiG-35 frontline fighter, Il-76MD-90A transport aircraft, Be-200 amphibious aircraft, Ka-226T light helicopter will be showcased at the show. Over 550 defence and aerospace firms, including 279 foreign companies, took part in the 11th edition of the biennial event held at the Yelahanka air force base. Modi's promise to shell out \$250 billion in the coming years on fighter jets, submarines, howitzers and helmets to modernize his armed forces came with one call — Make in India.

Source: <http://www.newsnation.in>

Satellite launch: ISRO to earn half the cost from foreign parties

ISRO will recover half of the total cost incurred for next week's launch of 104 satellites from the foreign capsules mounted on its workhorse rocket PSLV-C37. Of the 104 satellites to be launched on February 15, only three are Indian. "We want to make optimum use of our capacity. We are launching our three satellites. One is of 730 kgs while other two are 19 kgs each. We had additional space of 600 kgs. So we decided to accommodate 101 satellites," ISRO chairman Mr. A S Kiran Kumar said. "Roughly half of our cost will be covered by the foreign satellites we are launching," he said, without revealing the exact amount ISRO will earn from foreign customers. The space agency has earned more than \$100 millions by launching foreign satellites. It also has achieved mastery on launching smaller satellites. ISRO launched a record 104 satellites through its workhorse rocket PSLV-C37 on February 15 from the Satish Dhawan Space Centre in Sriharikota in Andhra Pradesh. These 101 satellites are nano-satellites and belong to foreign nations,

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including the US and Germany. The Indian satellites are from the Cartosat series. Last year, ISRO launched record 20 satellites at one go. The highest number of satellites launched in a single mission is 37, a record that Russia set in 2014. The US space agency NASA launched 29. Mr. Kumar said ISRO is at present doing tests on its lander for Chandrayaan 2 at its facility in Mahendragiri in Tamil Nadu and Challakere in Karnataka.

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

Not flying solo: Tie-ups the trend at Aero India 2017

From the Adani group making its debut with a drone project with Israel to Reliance Defence tying up with a UAE company for composites and state-owned HAL revealing a combat version of the Hawk trainer with BAE, joint development of military systems has been the theme of India's top air show that kicked off here. While in the past, stand alone projects were the top draw, with Indian companies and PSUs focused on the 'self dependency' theme, a more realistic approach was visible at the show this year. The focus now was on jointly developing new systems and value adding onto existing platforms for both the Indian and export market. The top showcase on day one of the show was the HAL-BAE project for a combat version of the Hawk trainer. The Advanced Hawk, which has been in the works for two years, is expected to fly shortly and is aimed at the export market. "Advanced Hawk is a great example of Make in India, for India and Export from India," Alan Garwood, group business development director, BAE Systems said. The Adani Group, that entered the defence business in 2015, also choose a joint project for its debut at the air show. Its newly-formed entity, the Adani-Elbit Advanced Systems India Limited, had the Hermes 900 multi-role unmanned aerial system on display. The project being aimed for is a naval requirement for UAVs that is expected to roll out shortly. Planning big, the entity aims at building defence manufacturing facilities at the Mundra Aeropark and SEZ. The company says that its vision is to 'help build a secure nation aligned with Adani's vision of nation building'. Reliance Defence, which has recently announced a major tie up with the US Navy to service the 7th fleet at its Pipavav shipyard, will be tying up with a UAE firm to make composite structures in India. Vital to all aerospace structures, there is a high demand for composites in India and a tie-up with a UAE company has strategic implications as well. Its promoter Mr. Anil Ambani is also scheduled for a sortie in the Rafale fighter jet. Reliance defence is a major offset partner for the Indian Rafale deal as well. Government-owned Bharat Dynamics Limited (BDL) also announced a tie-up with European firm Thales, with a plan to transfer technology for an anti-air missile system that is being showcased as undefeatable by any known jamming system in the world. Earlier, a day before the air show, L&T announced a strategic tie up with French weapons manufacturer MBDA - with its main focus on jointly producing a new generation of anti-tank missiles for an upcoming project for armoured infantry vehicles. While the realistic approach on joint development is refreshing, most of these projects still hinge on the Indian armed forces ordering some quantities of the products on offer. However, with several domestic buy projects stalled at various levels, there is little clarity on when the announced plans would take off.

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

PSLV launched the Indian Moon mission

The PSLV, which created launch history by placing a record 104 spacecraft in their desired orbits, has totally launched 46 Indian spacecraft, most of them Indian Remote Sensing (IRS) satellites. As many as 180 small satellites of foreign customers contracted by ISRO's commercial company Antrix Corporation have also reached space on this vehicle. The PSLV, 39 flights old since 1993, also launched the Indian Moon mission Chandrayaan-1 in 2008; and is set to launch a private lunar mission for Bengaluru start-up Team Indus in late December this year. "It is confirmed that all 104 satellites have been successfully deployed in the orbit," PTI quoted PSLV Project Director Mr. B. Jayakumar at the Vikram Sarabhai Space Centre (VSSC) as saying. "After separation, the two solar arrays of Cartosat-2 series satellite were deployed automatically and ISRO Telemetry, Tracking and Command Network (ISTRAC) at Bengaluru took over the control of the satellite," the space agency said. In the coming days, the satellite will be brought to its final operational configuration. Thereafter, its panchromatic (black and white) and multi-spectral (colour) cameras will start giving remote sensing services. Two Indian co-passengers are technology demonstrators: ISRO Nano Satellite-1 (INS-1) weighing 8.4 kg and INS-2 weighing 9.7 kg. Of the 101 foreign co-passengers, 96 came from two U.S. customers; and one each from the Netherlands, Switzerland, Israel, Kazakhstan and the UAE. Planet Labs, a U.S. Earth observation company, alone sent up 88 of its roughly 5-kg cubesats on this vehicle. ISRO Mr. Chairman A.S. Kiran Kumar told PTI: "Now we are targeting [the bigger launchers] GSLV MarkII and then Mk III. A series of launch activities are planned this year also." The MkIII is designed to lift around 4,000 kg payloads to a higher geosynchronous orbit. "It is one of the

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toughest missions we have handled,” said Mr. K. Sivan, Director of the launch centre, the Vikram Sarabhai Space Centre (VSSC). Satish Dhawan Space Centre Director Mr. P. Kunhikrishnan said the extraordinary launch reiterated ISRO’s capability to professionally handle complex missions. Mr. Jayakumar described the feat as “a great moment for each of us,” launching 104 satellites on a single rocket was a complex, yet enjoyable mission achieved through excellent team work. Soon after the satellites were confirmed as deployed in space, Prime Minister Narendra Modi congratulated the ISRO Chairman and Team ISRO on the record-making launch. “Congratulations to @ISRO for the successful launch of PSLV-C37 and Cartosat satellite together with 103 nano satellites!” Mr. Modi tweeted. “This remarkable feat by @ISRO is yet another proud moment for our space scientific community and the nation. India salutes our scientists.”

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

Lighter, stronger Saras set to fly again within next three months

India’s ambitious multi-role transport aircraft project seems to be on a revival mode. National Aerospace Laboratories (NAL) has reduced the aircraft weight and got engines with more power to put Saras project back on track. It is likely to take to the skies again in the next three months. Indian Air Force (IAF) is backing the 14-seater aircraft project that had almost hit a dead end due to weight issues and a major mishap in 2009. “The IAF recently sent a letter stating they are still interested in the aircraft,” a senior NAL official said. The aircraft was overweight by 500 kg. “Weight optimisation has been done. Metal wings have been replaced with those made from composite materials and even the fuselage has been structurally optimised to reduce its weight by 500 kg,” the officer, who is associated with the project, said. Saras also got the more powerful Pratt & Whitney 1200 SHP engines over the earlier 850 SHP ones. NAL is now preparing for ground tests and hopes to start flight tests in two-three months. Union Minister of Science & Technology Dr Harsh Vardhan told media persons that the project has been revived with modifications after considering the recommendations of a committee that looked into the 2009 accident. Mr. Jithendra Jadhav, Director of NAL, said Saras will be in action within the next one-and-half months. NAL has made many changes in the aircraft and integrated latest systems, he said. On funding, the NAL director said they do not need any additional funding as they received funds from CSIR. “In the next phase, we need around Rs 400-500 crore for production of two Limited Series Production aircraft and IAF will fund it,” he added. Mr. Jadhav also said they are looking at options of a stretch version of Saras in the 19-seater configuration. In an attempt to boost domestic air operations, NAL has tied up with Mahindra Aerospace Pvt Ltd to have a plant in India to start production of the C-NM5 aircraft in India. Speaking at a press conference, Union Minister of Science & Technology and Earth Sciences, Dr Harsh Vardhan said, “The five-seater C-NM5 was designed by NAL and fabricated by Mahindra in association with a laboratory of Australia. Now they have agreed to bring it back to India. In the next few months, we will get certifications from authorities concerned. Production of the C-NM5, which can be used as an air taxi, is expected to start in another 18 months from now.” NAL said, “Studies have been carried out regarding developing a Regional Transport Aircraft (RTA). The feasibility study forecast about 250-300 aircraft for India (20-year demand), over 7,000 RTA class of aircraft in the international market and about 150 aircraft for military transport in India (replacement for A 32 and HS 748).

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

India to give new wings to 3 aircraft programmes

The renewed thrust for regional connectivity and the Indian Air Force’s need to replace some of its transport aircraft will see India revive three aircraft programmes, all being designed in Bengaluru. These include the re-engined and modified version of the 14-seater Saras aircraft. National Aerospace Laboratories (NAL), which first conceived Saras as a civil aircraft, has been pushing for military certification in the past two years, hoping to sell the aircraft to the IAF. Saras, a light transport aircraft, was handed over to the Aircraft and Systems Testing Establishment of IAF, and NAL is hopeful of its first flight in 45 days. “The modified Saras will have a new configuration. While the design is for a 14-seater plane, it can be configured to accommodate 19,” NAL director Mr. Jitendra Jadhav said. Union minister for science and technology Mr. Harsh Vardhan, who met with Mr. Jadhav, said the Centre will provide all support. “NAL has improved a lot in the past one-and-a-half years and no project will suffer for want of funds,” he said. Mr. Jadhav said manufacturing of two limited series prototypes will need Rs 400 crore to Rs 500 crore. “The final product will be taken care of by IAF, but we will need this much money for prototypes,” he said. If the project is revived, Saras will boast of multi-role capabilities like feeder line aircraft, air ambulance, executive aircraft, troop transport, reconnaissance, aerial survey and light cargo transport. The Saras programme had come crashing after a 2009 accident. The original design included a maximum takeoff weight of 6,100kg and maximum payload of 1,232kg. The first prototype which completed its

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maiden flight on May 29, 2004, was overweight at 5,118kg compared to the 4,125kg design specifications. 70-SEATER TO BE REVIVED Mr. Harsh Vardhan and Mr. Jadhav said the 70-seater aircraft programme — which has consistently failed to take off from the drawing board — will also be revived. As of now, only a paper design is complete as the project was shelved three years ago. “The aircraft will now be reconfigured, given that the regional transport police will require capacity building,” Mr. Harsh Vardhan said. When the project was shelved, NAL projected an estimated cost of Rs 9,000 crore. A source told TOI that the aircraft, which will be capable of short takeoff, will be able to operate from smaller airfields and airports that the Regional Connectivity Policy is aiming to revive. Mr. Jadhav said part of the reconfiguration will be looking at a next-generation turbo prop engine.

NAL-MAHINDRA JOINT PROJECT

NM5-100, the 5-seater aircraft jointly developed by NAL and Mahindra Aerospace, being tested in Australia since 2011-12 after it was felt that the Director General of Civil Aviation (DGCA) lacked the expertise to certify aircraft, will be brought back to India for certification. “There have been 12 flights in Australia. Now the DGCA has improved and they have about 20 engineers in Bengaluru. We will bring the aircraft back to India,” Mr. Jadhav said.

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

B'luru to get Centre of Excellence in Aerospace & Defence in 3 months

A Centre of Excellence in Aerospace and Defence, to provide specialised training to students and engineers in industrial design among others, will begin functioning from Bengaluru in three months. The Karnataka government has entered into an agreement with French multinational software company Dassault Systemes to impart both short and long-term courses in aerospace and defence sectors using 3D design and 3D digital mock-up software programmes. Speaking at a press conference here to announce the launch of the Centre, Minister of State for Information Technology and Biotechnology Mr. Priyank Kharge said courses will be offered for engineering students and also for practicing engineers to take up industry specific job certification courses as an add-on to their careers. Initially, the courses will be offered in a few Visvesvaraya Technological University (VTU)-affiliated engineering colleges (venues not finalised) in Bengaluru and later shifted to Vivesvaraya Institute of Advanced Technology campus coming up at Muddenahalli on the outskirts of Chikkaballapur town. IT and BT Additional Chief Secretary Mr. V Manjula said the Centre will offer multiple levels of training programmes ranging between three-months and two-years and around 1,600 people will be trained each year. Online courses will also be offered. The course content and fees are being worked out by the VTU in association with Dassault Systemes, Mr. Kharge said. The total cost of the project is Rs 288.68 crore with Dassault Systemes contributing Rs 250.93 crore in the form of software package, software updation, licence charges, faculty and training. Pointing out that at present there is acute shortage of skilled engineers in defence and aerospace, Mr. Kharge said the Centre will help make skilled professionals available in these two sectors. The IT and BT department also signed a Memorandum of Understanding with Institut Aeronautique et Spatial (IAS), a non-profit organisation based out of Toulousane, France. As part of the understanding, IAS will design high-end training and skill development programmes for professionals in aeronautics and space sector, which will be imparted at the Centre.

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

Wind power installations may cross 5,000 MW this year

Mr. Sarvesh Kumar k, Chairman of Indian Wind Turbine Manufacturers' Association, is confident that wind power installations in India will cross the 5,000-MW-mark. The previous high was 3,472 MW of fresh capacity set up in 2015-16. The Association's General Secretary, Mr. D V Giri, is a shade less optimistic. While 5,000 MW is not impossible, he says, upwards of 4,500 MW is certain. Year-end installations 5,000 MW is a heady number — just two years back the sector struggled to achieve half of it. In the first ten months of the financial year, till January, the sector added 2,094 MW, which means close to 3 GW would need to be put up in just two months. However, a rush of activity towards the end of the year is not uncommon, as power producers hurry to finish the projects by March, so that they could avail themselves of the depreciation benefits and also be ready for the peak winds of summer. In 2015-16 installations of 3,472 MW, as much as 1,700 MW came in March alone. Further, the 'generation-based incentive' scheme, under which the government gives 50 paise a kWhr of electricity generated by wind turbines, expires this March. Year-end installations will therefore peak, as developers rush to meet the March deadline. This year, the highest installations are likely to come from Andhra Pradesh, around 2,500 MW, Mr. Sarvesh Kumar said. Gujarat (around 1,000 MW) and Karnataka (700 MW) were the bigger markets this year. Industry insiders feel that 2017-18 will be good too. One

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reason is that an additional demand for 1,000 MW will come from the 'competitive bidding' process that is under way, through which some developers will win mandates to sell wind power to the government-owned Solar Energy Corporation of India. At the end of January, India had 28,871 MW of wind capacity. It ranks fourth in the world after China (145,362 MW), US (74,470 MW) and Germany (44,947 MW). The government aims to see 60,000 MW by 2022.

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

India, France to set up Aerospace and Defence Centre of Excellence in Bengaluru

The centre will help train 1,600 engineers and professionals in industry-specific skills in a bid to meet the rising demand for Make in India products in defence and aerospace. Keeping in mind the Make in India theme and a fast developing ecosystem of aerospace and defence industry, a Centre of Excellence is being set up in Bengaluru in collaboration with a French non-profit for imparting industry-specific, high-end skill training to make the available manpower readily employable. As part of the centre, two campuses will be started by the government of Karnataka along with French aerospace and defence major Dassault Systems. Karnataka's IT and BT minister Mr. Priyank Kharge told YourStory that the government had been in talks with Dassault since Bengaluru ITE.biz, the country's premier tech event held last November. Kharge explained, Of the two campuses in Bengaluru, one will come up at Muddenahalli, which will help attract rural talent in this specialised sector. A MoU has been signed with Institut Aeronautique et Spatial (IAS), a Toulouse-based non-profit organisation. The CoE will provide hi-end training and skill development to about 1,600 engineers every year to make them readily employable in the sector. The course certificate will be given by Visvesvaraya Technological University (VTU), which governs and oversees engineering colleges and courses in the state. India is currently the eighth largest spender on defence in the world, and this spending is expected to grow 7-8 percent per annum. Defence Minister Mr. Manohar Parrikar, who was in the city last week for the Make in India – Karnataka conference, as well as Aero India 2017, said for the first time, the Ministry of Defence had sourced almost 95 percent of defence requirements locally. With an estimated \$250 billion worth of procurement seen over the next decade, the defence sector is expected to give a major push to the Make in India initiative. Bengaluru has for long been the hub for aerospace and defence sector, in terms of manufacturing, testing and R&D, being home to established players such as state-run Hindustan Aeronautics Limited, Bharat Electronics Limited and DRDO labs and private players like Airbus, Safran, Mahindra, Tata and others. There are also a large number of small and medium enterprises that serve as ancillary units as well as startups that produce hi-end technology for major players. HAL and the Indian Space Research Organisation alone have together nurtured more than 6,000 manufacturing units, and a large pool of trained manpower is already available. The CoE will improve the skills of employable engineers and other professionals through industry-focused skill development programmes, he added.

3D experience platform

The CoE will use a 3D experience platform developed by Dassault, which has worked with the world's leading companies for over 35 years. Dassault will also bear the bulk of the project cost, by contributing Rs 251 crore in the form of developing software packages, updation, licence charges, faculty and training. The Karnataka government has provided land and will also contribute around Rs 34 crore over the next three years for the project. Samson Khaou, Managing Director-India, Dassault Systems, said his company is delighted to partner with the state government in its endeavour. "Dassault will draw upon its expertise and experience and ensure that the training imparted at the CoE is of high standards, matching that of the industry around the globe." Mr. Pierre Valenti, Managing Director, Institut Aeronautique et Spatial, said his institute will help turn the CoE into a world-class institution for the aerospace and defence sector. Academic partner VTU will provide space at both the centres and is also expected to spend Rs 4.5 crore for putting together infrastructure, provide manpower to run the centres, as well as meet costs towards power, Internet and other expenditure, the minister added. The CoE will ensure that the competitive advantage of Karnataka as an aerospace and defence hub in the country is retained and strengthened. "There is an acute shortage of skilled engineers and professionals in the area and CoE will act as a catalyst for growth. The youth here can get exposure in industrial design as a career option," Mr. Kharge added.

Source: <https://yourstory.com/>

PM: nation needs more scientists

Prime Minister Narendra Modi said the country needs many more scientists to create innovative solutions to benefit the common man and society. In his monthly radio address 'Mann ki Baat', the prime minister asked students to

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develop an interest in the field of science, observing that it was inadequate among youngsters. To motivate girls and women to pursue a career in science and technology, the prime minister referred to the participation of women scientists in Indian Space Research Organisation's Mangalyaan probe, which was successfully sent into the orbit of Mars. He also hailed the scientific community for the record launch of 104 satellites and the successful test-firing of a ballistic interceptor missile, saying the "tremendous" participation of "youth and women" in India's space research programmes is a "major glorious dimension" in ISRO's success. Speaking further, Modi said, "The country needs more and more scientists. Today's scientist becomes a potent catalyst for an enduring change in the lives of our future generations." Only 27,532 (14.33%) of a total of 1.92 lakh researchers in India are women, according to government data. Government reports indicate that the gender gap is slowly getting narrowed in the higher education sector with the percentage of girl student enrolment rising from 39% in 2007 to 46% in 2014. However, the percentage of women in science stream continues to remain very low. The girl student enrolment to the Indian Institutes of Technology (IITs) was pegged abysmally low at 8% in 2015-16, even as the total intake capacity of the premier technical institutes is 10,500 students to undergraduate, 8,000 students to postgraduate and 3,000 to PhD programmes. The prime minister also took note of the "record production" of food grain and credited the farmers. "Our farmer brothers and sisters have toiled hard to fill our granaries. More than 2,700 lakh tonnes of food grain have been produced in the country this year. This is 8% more than the last record set by them (farmers). I am happy that they heeded the needs of our poor people and cultivated various types of pulses on about 290 lakh hectares of land."

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

350 crore design centre to boost Tamil Nadu aerospace

The nascent aerospace sector in the state will get an impetus through the Advanced Computing and Design Engineering Centre to be set up at the aerospace park in Sriperumbudur near Chennai. The 350 crore facility is a precursor to the first-of-its-kind aerospace policy to be unveiled by the TN government shortly. The Tamil Nadu Industrial Development Corporation Limited (TIDCO) is establishing the aerospace park at Sriperumbudur to create an integrated ecosystem for aerospace industry development covering design, engineering, manufacturing, servicing and maintenance of aircraft for the civil and defence sector. "The centre will come up in an area of one million square feet at the aerospace park. It will focus on product design and prototype development giving a support system for the companies in the park," a TIDCO official said. While the state government has allocated land for 14 companies to set up their manufacturing units, seven more companies have sought land in the industrial park. "These companies have been allocated around 70 acres of land. We are expecting 30-40 companies to establish their facilities investing 1000 crore in the first phase over a period of three years," a senior government official said. Industries department sources said that the state government would be launching an aerospace policy to promote the sector. "It would be the first-of-its-kind policy on aerospace (manufacturing) for Tamil Nadu," a senior official said.

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

TECHNOLOGY

HAL launches Hawk-i aircraft upgraded with Indian-made equipment

Hindustan Aeronautics Limited (HAL) has launched the first indigenously upgraded Hawk Mk132 trainer aircraft for the Indian Air Force (IAF). The upgrade work included the replacement of imported mission computer and data transfer units with systems that were locally designed and developed. Designated as Hawk-i, the aircraft is equipped with mission computer in the dual redundant configuration which has additional capabilities such as digital map generation (DMG) to provide improved situational awareness. The aircraft has also been fitted with an embedded virtual training system (EVTS) that offers improved training capability over the existing system, HAL said in a statement. It is said to provide secure voice communication and data link capability by integration of Softnet Radio and pilots can configure and select cockpit human machine interface (HMI) for different aircraft platforms. HAL chairman and managing director Mr. T. Suvarna Raju said: "This is the 100th Hawk aircraft produced at HAL and we are proud that it has a Made in India mark. "HAL had conceived a programme for indigenous upgradation of the Hawk Mk132 for achieving self-reliance and has successfully accomplished it." The aircraft upgrade was carried out at HAL so as to be independent in matters "such as integration of new sub-systems or modifications, obsolescence management of avionics systems and to enhance the aircraft operational and training capabilities", according to a statement posted on the company's website. The aircraft will be showcased at Aero-

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India, an international show on aerospace, defence, civil aviation, airport infrastructure and defence engineering, which will be held at Bengaluru between 14 and 18 February this year.

Source: <http://www.airforce-technology.com/>

In ISRO's launch of 104 satellites, 88 will be from U.S.

The Indian Space Research Organisation (ISRO) is on the cusp of making history when it sends 104 satellites into orbit on its PSLV-C37 rocket on February 15. Only three of them are Indian satellites. Notably, in ISRO's first mission of 2017, a single U.S. Earth imaging company, Planet, has made an eye-popping bulk booking for 88 of its small 'cubesats'. No space agency has launched such a large number of satellites in a single flight so far. (While ISRO's PSLV launched 20 satellites last year, Russia's Dnepr launcher holds the record for lifting 37 satellites to orbit in June 2014.) The PSLV will carry a main remote-sensing satellite in the Cartosat-2 series and two small spacecraft, all for ISRO, and 101 small foreign commercial satellites. The 88 cubesats are part of Planet's earth observation constellation of 100 satellites. They weigh around 5 kg each and are called 'Doves' or Flock 3p. For California-based Planet, too, it will be the record largest number of cubesats to be flown in a single launch, according to one of its executives. Planet, an earth observation company formed in 2010 by former NASA scientists, has chosen ISRO's PSLV launch for the second time. It got its earlier set of 12 'Doves' launched in June last year.

Cartosat-2 & INS-1

The main passenger on PSLV-C37 will be the fourth in the Cartosat-2 series, a very high resolution Earth observation satellite of about 650 kg, and occupies roughly half the space in the launch vehicle. It will carry two more Indian nano satellites, INS-1A and INS-1B, each weighing about 10 kg. They have a short lifespan of six to 12 months. All the payloads will totally weigh around 1,500 kg, according to an ISRO official who did not want to be named. The 88 Doves would be released in sets of four cubesats. The other co-riders are cubesats or small specialised satellites of customers from Israel, the UAE, Kazakhstan, the Netherlands, Belgium and Germany. They will be released separately into their orbits at around 500 km from Earth. While ISRO has been cagey about giving details of its customers, Planet's executive Mr. Mike Safyan announced, "In February, we are launching 88 satellites — the largest fleet of satellites launched in history. The Dove satellites, collectively known as "Flock 3p," will ride aboard a PSLV rocket from the Satish Dhawan Space Centre in Sriharikota, India."

Biggest launch

"This is the 15th time Planet is launching Dove satellites; and it will be our biggest launch to date. Combined with the 12 satellites of Flock 2p operating in a similar orbit, this launch will enable Planet's 100-satellite 'line scanner' constellation of Doves," Mr. Safyan said. Since September 2015, the PSLV has launched 18 small U.S. earth imaging satellites in a total of 79 foreign spacecraft — which earns it some revenue and an increasing global market share. The Planet series comes even as COMSTAC, (Commercial Space Transportation Advisory Committee under the U.S. FAA) is considering if U.S. satellites can be sent to space on Indian launchers. Sources said PSLV's U.S. clients were being approved on individual basis.

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

Japan's mission to clean up 'space junk' misses the mark

Tether that was created to slow down orbiting rubbish fails to get released An experimental Japanese mission to clear 'space junk' or rubbish from the Earth's orbit has ended in failure, officials said, in an embarrassment for Tokyo. Over 100 million pieces of garbage are thought to be whizzing around the planet, including cast-off equipment from old satellites and bits of rocket, which experts say could pose risks for future space exploration. Scientists at the Japan Aerospace Exploration Agency (JAXA) were trying to test an electrodynamic 'tether'— created with the help of a fishing net company — to slow down the orbiting rubbish and bring it into a lower orbit. The hope was that the clutter, built up after more than five decades of human space exploration, would eventually enter the Earth's atmosphere and burn up harmlessly before it had a chance to crash into the planet. The 700-metre-long tether was made from thin wires of stainless steel and aluminium. It was due to be extended out from a cargo ship launched in December carrying supplies for astronauts at the International Space Station. Short window Problems arose quickly, however, and technicians tried for days to remedy the situation but only had a one-week window to carry out the mission before the vessel re-entered the Earth's atmosphere. "We believe the tether did not get released," leading researcher Koichi Inoue said. "It

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is certainly disappointing that we ended the mission without completing one of the main objectives," he said. The latest disappointment comes just weeks after the agency had to abort a mission that sought to use a mini-rocket to send a satellite into orbit. The agency also abandoned a pricey ultra-high-tech satellite launched in February last year to search for X-rays emanating from black holes and galaxy clusters after losing contact with the spacecraft. — AFP

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

Team Indus launches moonshot wheels

In a bid to create awareness about space missions among school children, Bengaluru-based Team Indus Foundation, has launched 'Moonshot Wheels', a bus which will travel across India reaching out to children in government schools. The journey was flagged off by business tycoon Ratan Tata here. The Team Indus Foundation is a subsidiary of Team Indus, which is one of the five teams across the world shortlisted for Google Lunar XPRIZE. The Google contest requires privately funded teams to land a spacecraft on the moon by December 2017. The bus will travel to nine states in a span of 12 months, reaching out to thousands of students. The bus will carry 16 science experiments, spacecraft scaled model, satellite tracking, moon rover and an experience zone. Children will get a feel of the lunar surface, they will be able to visualise the satellites passing above them, said Mr. Priyanka Narayan, chief functionary, Team Indus Foundation, speaking to reporters here. The experiments will be explained in the local language by the trainers for the benefit of students, she added. At the end of each trip to a particular school, there will be a quiz and a snap shot will be taken of the child who performed the best, with the child's aspiration and the principal's signature written on the back. These snapshots will be taken along with Indus' Moon mission. As part of this programme, children will not only get to learn about these technologies but will also get to interact with scientists. The states covered include Karnataka, Maharashtra, Gujarat, Rajasthan, Haryana, Uttar Pradesh, Bihar, Madhya Pradesh, Andhra Pradesh, Telangana, Tamil Nadu. Team Indus Foundation has conceptualised Moonshot Wheels under 'Har Indian Ka Moon Shot' campaign, which looks at bringing every Indian on board the private Moon Mission.

Lab2Moon

In 2016, the team had launched Lab2Moon, a competition for youngsters in the age group of 14 and 25 to build a project that would catalyse the evolution of mankind as a sustainable multi-planetary species. While this was focused on students who were tech-savvy, the current programme looks at reaching out to children at the grass root level, enthusing them to learn about space technology. As many as 3,000 teams participated in the competition out of which 25 teams have been selected for the final round. Five of these projects will finally get to be on-board the space mission. Some of the projects selected for the final round include electrocoagulation water recycling, brewing beer on moon using yeast, plant growth experiment and production of oxygen using photo bioreactor.

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

ISRO-Mars orbiter mission life extended up to 2020

A crucial orbital manoeuvring of India's Mars probe has not only saved the spacecraft from imminent death, but also increased its life span by another three years till 2020. The fate of the probe was in jeopardy as it was to face an eclipse during which dark shadows of the Red Planet was to fall on the satellite, denying its solar panels any light. The on-board battery which was to take over had a life of just about 1.4 hours, while the eclipse was to last for 8 hours. The spacecraft's future was bleak. The scientists thought of a solution. On the night of January 17, a team of eight engineers at Indian Space Research Organisation's Telemetry, Tracking and Command Network, Bengaluru, sent a time-delayed command to the Mars probe. The command set in motion firing of eight on-board thruster rockets. Each of them were fired for 431 seconds, pushing the Mars Orbiter Mission (MOM) space probe to a new orbit that completely avoids an eclipse up to September 2017. The shadowing in September is of a smaller duration, which the satellite's batteries can handle. "Because of the crucial orbital change, the MOM now gets three additional years' life. We are expecting it to transmit data till 2020," ISRO chairman Mr. A S Kiran Kumar told DH. As against its designed life of six months, the MOM completed two-and-a-half years beaming pictures of the Red Planet back to the Earth and is likely to continue for another three years. Last month's orbital manoeuvre exhausted almost 20 kg of fuel from the MOM's stock of 30 kg. The remaining 13 kg of fuel, Mr. Kiran Kumar said, was sufficient for the rest of its life. The 1,337 kg probe, designed and developed on a shoestring budget of Rs 450 crore, was inserted into the Martian orbit in September 2014. Most of the fuel was spent during its voyage to the Martian orbit. Some of the scientific tasks it performed include creation of a vertical dust profile of the Martian atmosphere, checking out the presence of carbon-containing methane in Mars and studying the noble gas Argon.

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

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ISRO will use native processor for Earth to space signals

Indian Space Research Organisation has said that the indigenous development of Telemetry & Telecommand Processor (TTCP) has been realised and its production will be initiated with the help of Indian industry. The processor, whose development was taken up by ISRO as part of 'Make in India' campaign, replaces expensive imported equipment. The inter-planetary spacecraft use an international standard known as Consultative Committee for Space Data Systems (CCSDS), and presently equipment are being imported for telemetry reception and telecommand transmission requirements, it said. TTCP will be used in Integrated Spacecraft Testing of Low Earth Orbit, Geostationary Orbit and Interplanetary Spacecraft, ISRO said. This system is configurable to meet uplink and downlink (telemetry and telecommand) requirements of both CCSDS and ISRO standards, and multiple clients can remotely access this system for data and monitoring, it said. Pointing out that during the testing, ground systems will communicate to spacecraft via the same uplink and downlink signals as in space, the space agency said. The new Processor was successfully deployed for the first time in checkout of GSAT-19, which is scheduled to be launched shortly.

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

ISRO plans Venus mission, wants to revisit Red planet

India plans to go to Venus for the first time and revisit the red planet, Mars, very soon. A formal acknowledgement of these two bold inter-planetary sojourns by the government is in the electronic budget documents. The news comes ahead of the Indian Space Research Organisation (ISRO) attempting its mega launch this week when it will place 104 satellites in space in a single launch by its workhorse Polar Satellite Launch Vehicle (PSLV). No other country has ever tried to hit a century in a single mission. Russia holds the current record of 37 satellites. The mission, set for February 15, has another significance. It will bring arch-rivals Israel and the Arab world together in single launch for the first time. An ISRO official told TOI that the 104 satellites include one from Israel and another from Dubai. "The last satellite included was from a private firm in Dubai and is a nano satellite. It is significant that we have brought together Israel and the Arab world," he said. In the 2017 budget, funds for the department of space have been increased by 23%. Under the space sciences section, the Budget mentions provisions "for Mars Orbiter Mission II and mission to Venus".

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

India's 'interceptor' may make ballistic missile shield real

India's efforts to develop an impregnable Ballistic Missile Shield has received a major boost. Defence scientists have demonstrated the capability to destroy an incoming ballistic missile by hitting it directly above the Earth's atmosphere with an interception missile. The indigenously developed interceptor that mimicked the enemy destroyer, with a range of 2,000 km, was launched from Indian Naval Ship from the Bay of Bengal. The entire operation without human involvement was executed with perfection, a press release from the Defence Research & Development Organisation (DRDO) said. The successful morning test from the APJ Abdul Kalam island off the coast of Odisha, propels India into the exclusive club of four nations, which include the US, Russia and Israel, to possess the technology. The robust missile shield will aid in securing its skies, key installations and assets from incoming enemy missiles. While other countries took several trials before realising this capability, India has achieved it after two tests, the DRDO sources claimed. Over the past decade the DRDO labs have been developing the two layered (Endo & Exo or inside and above the Earth's atmosphere respectively) BMD system. It contains a host of technologies and the indigenously ballistic missile. More than a dozen industries are involved in fabricating the hardware components. After the latest test it is clear that the technologies required to put in place the BMD are developed and demonstrated indigenously. It would take a few more advanced tests and fine tuning before it can be operationalised, sources said. The entire exercise was tracked by radars located far off by the weapon systems radars. The mission computer predicting the trajectory of the target missile was used to launch the interceptor missile from the Kalam Island (formerly Wheeler Island). The interceptor missile guided by the radars and on-board avionics hurtled towards the target. Thereafter, the on-board navigation and seekers took control, tracked and homed in towards the target as per its dynamic trajectory. Finally, the interceptor hammered into the ballistic missile breaking it into pieces, DRDO sources said. The radar, electro optical tracking, telemetry and monitoring systems including the on board video systems followed the vehicle throughout its course till the final assault.

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

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An Indian challenge to China in space?

China is clinically analysing the successful and cost-effective launch of 104 satellites in one go by the Indian Space Research Organisation (ISRO), as well as the outcome of the Aero-India show, with some media reports acknowledging that New Delhi may out-compete Beijing in the commercial space-launch business. An op-ed in the Global Times highlighted that India's successful record-breaking satellite launch could serve as a "wake-up call" for China's commercial space industry. The article diagnosed China's inability to access components and parts from the U.S. as part of the problem. Consequently, China had to step up independent research and indigenous manufacturing in order to by-pass the U.S. restrictions. China also has to cut down costs, as it is likely to target price-sensitive customers in the developing countries. Low price advantage On the contrary, of the 104 satellites that were launched by ISRO, 96 belonged to the U.S. "The South Asian nation's achievements are largely driven by its low price advantage, a weak point for China's commercial space sector," the article observed. It added: "Competition with India for commercial space launches may be inevitable, and the most urgent action needed for China to expand its market share is to reduce the cost of putting satellites into orbit." Separately, the website, Chinamil.com.cn, affiliated with the People's Liberation Army (PLA), noted that simultaneously, the Indian aviation industry was also undergoing a rapid transition, focusing on military exports, and technologically upgrading itself through joint ventures. Commenting on the Aero-India show that concluded in Bangalore last week, the website said: "We observed that this year's Aero India kept a very low profile in arms purchase and Indian Defence Ministry didn't sign any official agreement with foreign arms dealers."

India's progress here too

On the contrary, Indian arms dealers leveraged the exhibition to tap the overseas defence market. "The Astra air-to-air missile, Pinaka multi-barrel rocket launcher and Rustom UAV independently developed by India were popular among foreign clients," it observed. The write-up noted that India has also made progress on aircraft and vessel technology transfer. It quoted Christopher, head of the Defence Research and Development Organisation (DRDO), as saying, that India will export advanced light torpedo worth \$21 million, which also involves transfer of technology. The article pointed out that India's Reliance Defence has signed an agreement with the U.S. Navy on vessel repair and retrofitting services. The pursuit of joint ventures has improved the quality of Indian military equipment. During the show, India's Kalyani Strategic Systems Ltd. (KSSL) has signed an agreement with Israel Aerospace Industries (IAI). The two sides will work together on the Barak-8 air-defence missile. Raytheon of the U.S. has also signed a MoU with a subsidiary of the Tata's to jointly produce parts of the Stinger ground-to-air missile in India.

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

Agriculture from the air: Basant to Air Tractor

Can Indian farmers ever afford to engage an aircraft to spray seeds and fertilisers? State-owned aviation major, Hindustan Aeronautics Ltd (HAL) thought so when it produced 39 Basant aircraft but stopped building them after 1980. Now, the Aussies want rich Indian farmers to check out the Air Tractor, a hit with farmers Down Under. At the just concluded Aero India 2017 airshow at the Yelahanka Air Force Station, the Air Tractor lurked in a remote corner. The expectations of its promoters were modest. They were well aware that only state governments and farmers' collectives could afford the aircraft. Even that would take at least another five years. A few interested agriculturists stopped by as the promoters talked about the two-seater Air Tractor (AT-504). This aircraft could spray pesticides and seeds on vast fields, multi-task in fire-fighting and even transport fuel to remote locations. "We have been talking to the governments here. The response has been good," said an Air Tractor spokesman. But he knew despite the huge potential for growth, the concept was yet to take off in India. "There are 200 Air Tractors in Australia, engaged in farms, fire-fighting and other utilities. However, India is one of the few big countries without agricultural aircraft," he informed. India did have an Agriculture Aviation division in the 1960s, when HAL was tasked with designing the Basant. Designated as H-31 Mk II, the Basant had its maiden flight on March 30, 1972. It was a conventional braced low-wing monoplane with a fixed tailwheel landing gear. Powered by a 400 HP piston engine, Basant had a raised cockpit. This helped the pilot get a good all-round view of the area during spraying operations. So how does the Air Tractor work on Australian farms? "Rich farmers/farmers collectives take the aircraft on lease or contract. But in many cases, the aircraft is hired. When a farmer calls and provides the map with areas to be covered, we load up the aircraft and cover up to 250 acres an hour. The AT-504 can carry up to 2,000 litres of pesticide and two tons of seeds." For Avinder Singh, a farmer from Punjab, the Air Tractor had to wait for a market to emerge in India. His rationale was this: "Only rich farmers with more than 100 acres of land can even think of it. Governments can liaise with big agricultural corporations to try it out on state-owned farms. But the question remains: If you can get the work done by paying Rs 500 to labourers, why spend Rs 50,000

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for a day on an aircraft? **Agro aviation** Agricultural aircraft undertakes aerial application of pesticides (crop dusting) or fertiliser (aerial topdressing) besides hydroseeding. Most common agricultural aircraft are fixed-wing, such as the Air Tractor, Cessna Ag-wagon and Gippsland GA200. But helicopters are also used. Crop dusting with insecticides began in the 1920s in the United States. The first widely used agricultural aircraft were converted war-surplus biplanes.

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

GAGAN navigation system-compliant aircraft may soon be mandatory for airlines

The government is likely to come out with a notification shortly making it mandatory for Indian carriers to only induct aircraft which are compliant with the newly-developed GAGAN navigation system in their fleets from January 1, 2019. GPS-Aided GEO Augmented Navigation (GAGAN) is an implementation of a regional satellite-based augmentation system (SBAS), developed by India. Aviation regulator Directorate General of Civil Aviation (DGCA) had late last year convened a consultation meeting with all stakeholders on the issue. Sources say a mandate is now being prepared, which would make it compulsory for all domestic airlines to induct only those aircraft in the fleet which are equipped with GAGAN air navigation system. The combined fleet strength of Indian carriers including regional ones currently stands at over 450 planes. According to Boeing's 2016 India Current Market Outlook (CMO), released last year, Indian airlines would require 1,850 new airplanes, valued at USD 265 billion over the next 20 years. Significantly, three domestic carriers — IndiGo, SpiceJet and GoAir— have placed orders with both Boeing of the US and European aviation major Airbus for large number of aircraft which are to be inducted over the next few years. At present, majority of the aircraft in the country are not equipped with a particular type of GPS receiver compliant for satellite-based augmentation systems like GAGAN. These receivers help in precision guidance for landing at airports using satellite signals. According to a senior AAI official, so far only four SpiceJet and two GoAir planes have the GAGAN system while a few non scheduled-charter planes are also GAGAN-compliant. The National Civil Aviation Policy, announced by the government in 2015, made it mandatory for all aircraft being registered in India from January 1, 2019 to be GAGAN-enabled. Jointly developed by Indian Space Research Organisation (ISRO) and Airports Authority of India (AAI), at an investment of Rs 774 crore, the new system offers seamless navigation to the aviation industry. GAGAN system, which is said to make airline operations more efficient and cut costs as it reduces separation between aircraft with increase in air safety and fuel efficiency, was officially launched by Civil Aviation Minister Ashok Gajapathi Raju in July, 2015. However, for availing the system, airlines are required to make their fleet system compliant which entails huge investments. Sources say that while smaller aircraft like ATRs and Bombardiers which are currently in Indian carriers' fleets are already equipped with such a system, bigger planes like Airbus A320, A330, Boeing 737, B777 and B787s, among others, are not.

Source: <http://www.financialexpress.com/>

BUSINESS

World's Most Modern Aircraft, Airbus A350-900, Flies Into India

Airbus A350-900, the cornerstone member of Airbus' all-new A350 XWB family, was brought to India via Lufthansa Airlines. The aircraft, which can hold at least 325 passengers and has a range of 15,000 km, reached Delhi. The aircraft weighs 28 tonnes and has business, premium and economy classes with bigger windows. Lufthansa has personalised the Airbus to accommodate large TV screens, innovative mood lighting, and marks an important milestone in our growing partnership with India. This game-changing aircraft reflects the values of the new global Indian, and reaffirms our commitment to this important market by personalised playlists, reported The Indian Express. The aircraft produces 25 percent fewer emissions and also reportedly makes less noise while takeoff. The aircraft was greeted with water cannons when it landed in Delhi and the passengers were given gifts. "The launch of the Lufthansa's A350 services in Delhi introducing the very best and latest in air travel," Wolfgang Will, Senior Director (South Asia), Lufthansa Passenger Airlines, said. Singapore Airlines has also acquired the A350 series and Airbus has become the most successful aircraft producer with more than 800 orders. The fuselage and wings re made of carbon-fibre-reinforced polymer. Depending on the variant, the aircraft can seat up to 366 passengers. It is positioned to succeed the A340 to take on the Boeing 787 and 777.

Source: <https://www.thequint.com/>

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India to revive three passenger plane projects, looks to tap feeder routes

India plans to revive its three-passenger plane programmes, the 14-seater Saras, the five-seater NM-5 being developed with Mahindra Aerospace and a 70-seater regional transport aircraft (RTA-70) as it looks to meet the growing demand for planes to connect small airports in the country. The country expects to connect small towns with main metros through its regional connectivity scheme (RCS) by offering incentives to airlines to fly small planes. The government is looking to offer incentives, including relief in aviation turbine fuel, reduced landing and parking charges and set up a regional connectivity fund to subsidise air travel to the hinterland. To meet the anticipated demand, the government says it would need locally built aircraft so that the benefits are reaped by Indian entrepreneurs. The first of the planes is to bring NM5, a five-seat passenger aircraft co-developed by National Aerospace Laboratories (NAL) with Mahindra, to India and certify it by the Directorate General of Civil Aviation (DGCA), Union Science and Technology Minister Harsh Vardhan said at the Aero India show. NAL will revive its three-decade-old Saras project, which was grounded after a crash in March 2009 that killed two engineers and a pilot. The 14-seat plane, named after the Saras crane, has been reconfigured based on recommendations of an expert committee that investigated the crash. It will also be expanded to a 19-seat configuration for civilian purposes over the next two years. "Ground testing has already been done and in the next one and a half months it will begin the official flight tests and initially some 25 flights have been planned," said Mr. Vardhan. NAL needs around Rs 400 crore for two prototypes that would be funded by the Indian Air Force. "For these two limited series production aircraft, we need about 400-500 crores for the full production and the final production will be taken care of by the Air Force which they will fund the money," said NAL Director Mr. Jitendra J Jadhav. NAL will also revive its RTA-70 passenger plane project, which it first proposed in 2007, and has asked aero-engine maker Pratt and Whitney to build a turbo-prop engine for the passenger aircraft. The project is estimated to cost around Rs 4,000 crore and would involve local industry players and a global partner to take it to the global market. A feasibility study by NAL estimates around 250-300 such aircraft for India over 20 years and global demand of 7,000 planes that can complete trips of 800 km. It also could potentially replace the AN32 and HS 748 aircraft of the IAF. NAL has transferred the technology of its 2-seater Hansa, a composite light aircraft for flying training to Mesco Aerospace Pvt Ltd, to produce and market the aircraft. The plane will also be used as a platform for flight testing and experimentation of new technologies by NAL.

Source: <http://www.business-standard.com>

Air India to get its first fuel-efficient A320Neo aircraft this week

New Delhi: After a delay of about one month, Air India is all set to induct the first A320Neo aircraft into its fleet this week, which will make it the third domestic carrier to have this latest single-aisle plane from Airbus. At present, two domestic carriers — IndiGo and GoAir — operate the fuel-efficient A320Neo planes in their fleet. The national carrier has plans to induct a total of 29 A320 new engine option (Neo) into its fleet by March 2019. While Air India has already tied up with three lessors — ALAFCO, GECAPS and CIT — for leasing of 22 planes, the process to select a bidder for the remaining seven such planes is underway. "Our first Airbus A320Neo plane of the 14 such aircraft being leased from ALAFCO of Kuwait will arrive here from Toulouse," an Air India official said today. The induction of the new fuel-efficient aircraft into its fleet is aimed at augmenting the capacity in the domestic market which is growing at a rate of over 20 per cent for nearly two years now. The maker of A320Neo, European aviation major Airbus claims that these planes burn 15 per cent less fuel than the existing model. As per original schedule, Air India was to receive three such planes in this fiscal with two of them being in January itself. "The deliveries have now been rescheduled and we will be getting two of these planes this month and the remaining one in March," the official said. In the next fiscal, Air India would be taking delivery of another 15 A320Neo planes, the official added. Air India plans to deploy its first 162-seater, two-cabin class A320Neo on the key Delhi-Chennai route, the official said, adding routes for the remaining two planes were being worked out.

Source: <http://zeenews.india.com/>

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