



E-NEWS



Every Month From The Aeronautical Society of India

VOLUME - 13

DECEMBER - 2018

RELEASE - 12

Current Affairs

Technology

Business

Award

Event

Advertisements

CURRENT AFFAIRS



Akash NG : A Look at What India's Next Generation SAM Could Be

Army To Test Fully Indian Man-Portable Anti Tank Missile Shortly



TECHNOLOGY



GSLV MkIII-D2 successfully launches GSAT-29

India's GSAT-29 communication satellite was successfully launched by the second developmental flight of Geosynchronous Satellite Launch Vehicle MarkIII (GSLV MkIII-D2) from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota. GSLV MkIII-D2 lifted off from the Second Launch Pad of SDSC SHAR at 17:08 hours (IST), carrying the 3423-kg GSAT-29 satellite. About 17 minutes later, the vehicle injected the satellite into the Geosynchronous Transfer Orbit (GTO) as planned. After injection, ISRO's Master Control Facility at Hassan has assumed the control of the satellite. In the coming days, three orbit raising manoeuvres will be executed to position the satellite in the Geostationary Orbit at its designated location. GSLV Mk III is a three-stage heavy lift launch vehicle developed by the Indian Space Research Organisation (ISRO). Two massive boosters with solid propellant constitute the first stage, the core with liquid propellant form the second stage and the cryogenic engine completes the final stage. GSAT-29 is a multiband, multi-beam communication satellite, intended to serve as test bed for several new and critical technologies. Its Ku-band and Ka-band payloads are configured to cater to the communication requirements of users including those from remote areas especially from Jammu & Kashmir and North-Eastern regions of India. In addition, the Q/V-Band communication payload onboard is intended to demonstrate the future high throughput satellite system technologies. Geo High Resolution Camera will carry out high resolution imaging. Optical Communication Payload will demonstrate data transmission at a very high rate through optical communication link. After the successful launch, ISRO Chairman Dr K Sivan said: "India has achieved significant milestone with our heaviest launcher lifting off the heaviest satellite from the Indian soil. The launch vehicle has precisely placed the satellite in its intended orbit. I congratulate entire ISRO team for this achievement." Declaring GSLV MkIII operational, Dr Sivan announced that Chandrayaan-2 and Gaganyaan missions will be launched by this heavy-lifter. Mr Jayakumar B, Mission Director, GSLV Mark III said it is the guidance of the Mentors at ISRO that helped the team to march ahead while facing obstacles. "The industry partners too played a key role in this mission," he said. Mr K Pankaj Damodar, Project Director, GSAT-29 said the launch will help to bridge the digital divide. He also said several next generation payload technologies will be demonstrated with this mission soon. The success of GSLV MkIII-D2 marks an important milestone in Indian space programme towards achieving self-reliance in launching heavier satellites. The success of this flight also signifies the completion of the experimental phase of GSLV Mark III. The first successful mission of GSLV Mark III was an experimental suborbital flight in 2014. Subsequently, GSLV Mark III-D1 launched GSAT-19, a high throughput communication satellite, with a lift-off mass of 3150 kg, into GTO on June 5, 2017.



Publisher

Journal of Aerospace Sciences
And Technologies
Aeronautical Society of India
Bangalore Branch Building
New Thippasandra Post
Bangalore 560 075
Karnataka, INDIA
Telefax: +91 80 25273851
Email: editoraesi@yahoo.com
Website: www.aerjournalindia.com

Publication Team

Dr R Balasubramaniam
Dr S Kishore Kumar
Dr P Raghothama Rao
Mrs Chandrika R Krishnan
Mr Hemanth Kumar R
Mr Kumaran A KM

Advertisement – Tariff

A4 – 1 Full Page : Rs. 2000
Draft Drawn in Favour of
"Journal Office, The Aeronautical
Society of India" Payable at
Bangalore

Head Quarters

The Aeronautical Society of India
13-B, Indraprastha Estate
New Delhi 110 002, India
Tel: +91 11 23370516
Fax: +91 11 23370768

Source: <https://www.isro.gov.in/>

The editorial team invites your views, suggestions, to the News about Members Column and contributions to the e-news.

For more information about Journal of Aerospace Sciences and Technologies Log on to our Website : www.aerjournalindia.com

E-NEWS



CURRENT AFFAIRS

PSLV-C43 successfully launches HysIS and 30 customer satellites

The Indian Space Research Organisation's (ISRO) Polar Satellite Launch Vehicle (PSLV-C43) successfully launched 31 satellites from Satish Dhawan Space Centre (SDSC) in Sriharikota. The PSLV-C43 lifted off at 9:57:30 (IST) from the First Launch Pad and injected India's Hyper-Spectral Imaging Satellite (HysIS) into the 645 km sun-synchronous polar orbit, 17 minutes and 19 seconds after the lift-off. Later, 30 foreign satellites were injected into their intended orbit after restarting the vehicles fourth stage engines twice. The last satellite was injected into its designated orbit 1 hour and 49 minutes after the lift-off. After separation, the two solar arrays of HysIS were deployed automatically and the ISRO Telemetry Tracking and Command Network at Bengaluru gained control of the satellite. The satellite will be brought to its final operational configuration in the next few days. HysIS is an earth observation satellite built around ISRO's Mini Satellite-2 (IMS-2) bus weighing about 380kg. The mission life of the satellite is five years. The primary goal of HysIS is to study the earth's surface in both the visible, near infrared and shortwave infrared regions of the electromagnetic spectrum. Data from the satellite will be used for a wide range of applications including agriculture, forestry, soil/geological environments, coastal zones and inland waters, etc. HysIS had the company of one micro and 29 nano-satellites from eight countries, including Australia (1), Canada (1), Columbia (1), Finland (1), Malaysia (1), Netherlands (1), Spain (1) and USA (23). The total weight of these satellites was about 261.50 kg. Satellites from Australia, Columbia, Malaysia and Spain were flown aboard PSLV for the first time. These foreign satellites launched are part of commercial arrangements between Antrix Corporation Limited and customers. ISRO Chairman Dr K Sivan said that the team has achieved another spectacular mission 15 days after the successful GSLV-MkIII/GSAT-29 launch. "Today once again we have proved our excellence," Dr Sivan said. He said HysIS is a state-of-the-art satellite with many indigenous components developed by SAC, Ahmedabad and SCL, Chandigarh. "Our customers are very happy that their satellites are precisely delivered into orbit. We are ready for the next launch of GSAT-11 on December 5 from French Guiana and later GSLV-MkII will launch GSAT-7A from Sriharikota in December," Dr Sivan added. Mission Director R Hutton termed the launch as a grand and marvellous one with clockwork precision. "We have used a lighter version of PSLV today. It has once again proven its capabilities to launch multiple satellites into different orbits. All our team members, their family members and industry partners have played a vital role," Hutton said. HysIS Project Director Mr Suresh K said that the satellite is performing normally after the launch. PSLV is a four stage launch vehicle with a large solid rocket motor forming the first stage, an earth storable liquid stage as the second stage, a high performance solid rocket motor as third stage and a liquid stage with engines as fourth stage. Today's was the 45th flight of PSLV and 13th one in the Core Alone configuration. So far, the PSLV has launched 44 Indian and nine satellites built by students from Indian universities. The vehicle has also launched 269 international customer satellites. In the last PSLV launch on September 16, PSLV-C42 had successfully launched two commercial satellites from UK-based Surrey Satellite Technology Limited.

Source: <https://www.isro.gov.in/>

First Rafale aircraft made for India takes flight

As the political controversy over the Rafale fighter jet deal continues in India, manufacturing of the aircraft customised as per specifications of the Indian Air Force (IAF) is making progress. The first aircraft built by Dassault Aviation for the IAF, a two-seater variant, made its maiden flight in France and is designated RB 008, according to official sources. "RB stands for Air Marshal R.K.S. Bhadauria as he had a major role in the contract negotiations," an official source said. Air Marshal Bhadauria was the Deputy Chief of the IAF during the contract negotiations for 36 Rafale jets and is presently the Air Officer Commanding-In-Chief of the IAF's Training Command. In September 2016, India and France signed a \$7.87 billion Inter-Governmental Agreement (IGA) for 36 Rafale multi-role fighter jets in fly-away condition. The surprise announcement for the 36 aircraft was made by Prime Minister Narendra Modi during a visit to Paris in April 2015, citing "critical operational necessity" of the IAF. RB 008 will be the 36th aircraft to be delivered to the IAF in 2022, 67 months after the contract is signed, the source added. As per terms of the IGA, deliveries will begin 36 months after the signing of the contract and be completed in 67 months.

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

India's HAL to Double Annual Production Rate of Tejas Light Combat Aircraft From 8 to 16

India's state-owned aircraft maker Hindustan Aeronautics Limited (HAL) will set up a new production facility at Nashik in Maharashtra by 2020 to increase its annual output of Tejas Light Combat Aircraft (LCA), the head of HAL told The

E-NEWS



Economic Times on November 2. “We are setting up a new facility at Nashik to double the production of Tejas fighters to 16 from 8 per year,” HAL Chairman and Managing Director, Mr R. Madhavan, said. Notably, HAL has so far failed to meet the eight aircraft per annum quota. The Indian Ministry of Defense (MOD) placed an initial order for 40 Tejas LCA Mark-I with HAL, of which 20 Tejas LCA in initial operational configuration — 16 fighters and four trainers — have been produced so far. The follow-on production of 20 more Tejas LCA is pending final operational clearance (FOC) of the fighter jet by the Indian Aeronautical Development Agency, expected to take occur in the coming months. In another step toward FOC, the Tejas for the first time conducted a hot refueling trial earlier this year. Tejas LCA also participated in the Indian Air Force’s Gaganshakti 2018 air combat exercise this summer, which involved 1,100 aircrafts and 15,000 military personnel. The Tejas LCA is a supersonic, single-seat, single-engine multirole light fighter aircraft that has been under development by the Aeronautical Development Agency in cooperation with HAL since the early 1980s. Given the drawn out development cycle, the IAF had to repeatedly revise its requirements for the fourth-generation fighter. As I noted previously, the IAF has repeatedly stated that the aircraft’s Mark-I variant does not meet the service’s specifications: The IAF has listed several technical deficiencies found on the Tejas LCA Mark-I variant in 2017. These flaws will purportedly will be addressed in later variants of the aircraft, which will include 43 improvements over the existing version. Upgrades will include an advanced active electronically scanned array (AESA) radar system, a new electronic warfare sensor suite, and a new externally refueling capability. The IAF is also mulling placing an order for 83 additional Tejas LCA, including 73 single-engine Tejas LCA Mark-IA, and 10 tandem two-seat LCA trainer aircraft. The Indian defense minister stated in a recent interview that an order for additional aircraft has been placed. “[T]o ensure that [HAL’s] order books don’t dry out, we have given orders for 83 more,” Indian Defense Minister Nirmala Sitharaman said in an interview in October. However, the order is reportedly pending and no contract has been signed as the aircraft still has to achieve FOC. Another upgraded Tejas variant, designated Tejas Mark-II, of which the IAF could potentially order 200, will not be ready for its first test flight for at least another five years, according to reports. This may spell further trouble for HAL as it is unclear whether the service will still be interested in the latest version of the Tejas by then. Foreign competitors are aggressively pushing into the Indian military aircraft market and may offer cheaper and more effective alternatives. For example, as I reported previously, the Tejas LCA, when compared to Saab’s JAS-39 Gripen and Lockheed Martin’s F-16, has a reduced airborne endurance — 59 minutes versus three hours for the Gripen and nearly four hours for the F-16. The Tejas can also only carry a weapons payload of around three tons against nearly six tons by the Gripen and seven tons by the F-16.”

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

Rain-maker aircraft awaits key clearances

Creating artificial rains, Delhi’s quick fix solution to clear up its toxic air, is awaiting one final approval — clearance to the aircraft that will carry out cloud seeding. Official communication asking for permission is in the process. The Ministry of Environment, Forests and Climate Change received a request from Hyderabad-based National Remote Sensing Centre (NRSC) — a centre of Indian Space Research Organisation — to fly the aircraft to Delhi for cloud seeding. ET had reported on the plan for creating artificial rain for Delhi (“Pollution: Here’s a Plan to Wash Away Delhi’s Toxic Air”). Multiple approvals are required from four government departments: the Directorate General of Civil Aviation (DGCA), the Ministry of Defence (MoD) and the Indian Air Force (IAF) headquarters, and the Intelligence Bureau (IB), according to a senior official familiar with the development. This official did not want to be identified. The IAF and DGCA didn’t respond to queries sent by ET at the time of going to the press. Experts of the Indian Institute of Technology (IIT), Kanpur, currently involved in this never-before experiment to tackle pollution also told ET that clearances are required. Researchers have been ready for a week to make artificial rain happen. “We have been following up with NRSC for the last four days on the clearance for the aircraft which is yet to happen,” said Mr Manindra Agarwal, deputy director, IIT Kanpur. The official quoted above said, “We are trying to expedite the clearance process to create artificial rains in the city but as Delhi is falling in a high security zone, it would take time.” The Ministry of Environment is coordinating this initiative with government departments concerned along with IIT Kanpur and Central Pollution Control Board (CPCB). Researchers at IIT Kanpur have been ready for a week now with the salt solution for seeding the clouds. “The window is small as the cloud formation is just about right to create artificial rains. This condition suitable to create rains is good for today and tomorrow,” said Sachchida Nand Tripathi, a professor at IIT Kanpur working closely with the Central Pollution Control Board (CPCB) and Indian Meteorological Department (IMD) for the artificial rains. Artificial rain may help the city get respite, albeit short term, from the toxic air that has been shrouding the region for a fortnight. But government officials are optimistic. “The cloud formation is likely to be favourable for cloud seeding after 4 to 5 days,” said the ministry official. Cloud seeding involves changing the amount and/or type of precipitation that falls from clouds by dispersing substances (mostly salts) into the air. The dispersion is to be done

E-NEWS



from an aircraft. The NRSC aircraft has already been mounted with the instrument to spray the solution. This will be the first time that artificial rain will be used to tackle pollution in any Indian city.

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

ISRO's 'Bahubali' puts communication satellite GSAT-29 in orbit; Mission Moon next

India's space programme took a giant leap with the successful launch of GSLV MkIII-D2 mission carrying communication satellite GSAT-29. With the success of this flight, the developmental phase of GSLV MkIII vehicle programme has been completed and the vehicle's operational phase will begin. This is significant because the same rocket will be used for upcoming 'iconic' Chandrayaan-2 launch, scheduled for January, and even the human spacecraft mission planned by 2021 end. Standing 43.5 meter tall with a lift-off mass of 641 tons, India's heaviest rocket lifted-off from Second Launch Pad at Satish Dhawan Space Centre at Sriharikota (in Andhra Pradesh) at 5.08 pm roaring into clear blue skies. About 17 minutes later, the vehicle injected the satellite into the Geosynchronous Transfer Orbit (GTO) as planned. After injection, ISRO's Master Control Facility at Hassan assumed control of the satellite. In the coming days, three orbit raising manoeuvres will be executed to position the satellite in the Geostationary Orbit at its designated location. Though India Meteorological Department in its afternoon bulletin, just hours before the launch, said squally wind speed reaching 45-55 kmph gusting to 65 kmph was likely to commence along south Andhra Pradesh coast, weather remained calm and pleasant making it perfect for the launch of 'fat boy' or 'Bahubali' as GSLV MkIII is being referred.

After the successful launch, ISRO Chairman K Sivan said: "India has achieved significant milestone with our heaviest launcher lifting off the heaviest satellite from the Indian soil. The launch vehicle has precisely placed the satellite in its intended orbit. I congratulate entire ISRO team for this achievement." Dr V Somanath, Director, VSSC, said GSLV MkIII is the vehicle for the future and efforts are on to enhance the payload carrying capacity of the launcher further with semi-cryogenic stage. Mr Jayakumar B, Mission Director, GSLV Mark III, said it is the guidance of the mentors at ISRO that helped the team to march ahead while facing obstacles. **90% work by pvt Industry** ISRO Chairman complimented the Indian Industry, which carried out 85-90 per cent of the work related to both the launcher and the satellite. He said the role of industry in future missions will also be equally significant. **100 Gbps internet speed by next September**

The successful launch of GSAT-29 will propel India's Internet bandwidth significantly. According to ISRO, by September 2019, India will achieve 100 Gbps) speed on par with any developed country. ISRO Chairman K Sivan said GSAT-29 is one of the four high throughput satellites, whose combination will help India achieve 100 Gbps under Digital India programme. Out of the four, GSAT-19 was put in orbit earlier this year, while GSAT-11 is scheduled to be launched on December 4 and GSAT-20 is expected to be launched next year.

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

IISc only Indian institute in Global University Employability Ranking 2016

The Global University Employability Ranking 2016, compiled by Times Higher Education, reveals which universities recruiters at leading companies around the world think are the best at producing work-ready graduates. Bengaluru-based Indian Institute of Science (IISc), a premier institute in the country that works in the area of scientific research and higher education was ranked 38 out of 150 universities worldwide in the Global University Employability Ranking 2016, It had an overall score of 331. It is the only Indian institute to make it to the list. These 150 universities span 34 different countries, from the US to Japan. Employers voted both, for institutions in their own country and universities around the world for international recruitments. In some countries, graduate jobs are not easy to come by, but in European nations such as France, Switzerland and Germany, professional experience is built into degree programmes. Unsurprisingly then, France, Germany and Switzerland are among the best represented countries in the employability ranking, along with the United Kingdom and the United States. Both Germany and Japan have an institution in the top 10, with Chinese and Canadian universities also appearing high in the ranking.

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

India's first privately built satellite to be launched on November 19

The Falcon 9 SpaceX rocket will take off from the Vandenberg Air Force Base in California, on a rideshare mission, launching more than 70 satellites from 16 countries into a sun-synchronous polar orbit. The payload will

E-NEWS



include India's first privately owned satellite built by a start-up based in Mumbai which is meant to serve the amateur radio (HAM) community of the country during natural calamities. The mission, named the SSO-A, will be SpaceX's largest mission so far in terms of the number of satellites launched. The Indian Space Research Organization (ISRO) currently holds the record for launching 103 satellites in a single mission. It is scheduled for take off at 6.32 pm (Greenwich Mean Time) on November 19, or 12.02 am Indian time on November 20. A team of ten engineers, led by Mr Ashhar Farhan, co-founder of Exseedspace Pvt Ltd, at a lab in Hyderabad have constructed a 1U cube-sized (mini) communication satellite which will be launched by SpaceX. Speaking to TNIE, Mr Kris Nair, CEO, and founder of Exseedspace, set up in 2017, said, "This satellite will serve the ham or the amateur radio community. As a result, it will be of great help during natural calamities, when conventional communication services get disrupted." Talking about the building of the satellite, Mr Nair said, "Our ten member team of engineers led by Mr Farhan has built the satellite which aims to democratise space exploration for commercial, government and academic customers of all sizes and help them leverage the advances in space technology to achieve business, community and governance goals." The satellite will be on a polar orbit for five years after the launch and will perform 5-6 passes over India every day. With this satellite, the public will be able to receive signals on 145.90 Mhz frequency with the help of a TV tuner and USB dongle. The mission will launch more than 70 spacecraft from 50 different organizations including 15 microsats and 56 cubesats, making it the largest single rideshare mission to date from a US-based launch vehicle. The mission includes payloads from 18 countries including India, United States, Australia, Italy, Netherlands, Finland, South Korea, Spain, Switzerland, UK, Germany, Jordan, Kazakhstan, Thailand, Poland, Canada, South Africa, and Brazil. Meanwhile, the company is in talks with ISRO and other space agencies to develop more such satellites and provide commercially viable satellites.

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

SO, WHAT'S GONNA FLY HIGH AT AERO INDIA 2019

A host of Made in India aircraft and helicopters along with foreign ones will be on display (flying and static) at the Aero India 2019 which would be held at Air Force Station, Yelahanka from February 20 to 24. While a majority of Indian aircraft and helicopters are from the Hindustan Aeronautics Limited (HAL) stable, there will also be static display of the indigenously developed light business jet GENJET GLJ3X1. So far about 175 exhibitors-both Indian and foreign have registered to take part in the air show according to the organisers. Besides, 27,890 sqm space has been booked and 5,286 sqm space is still available for participants to book.

On Display From HAL

According to the organisers, the Advanced Light Helicopter (ALH MK IV), Light Combat Helicopter (LCH), Light Utility Helicopter (LUH), HAWK-I and the basic trainer aircraft, Hindustan Turbo Trainer (HTT-40) will be on display during the air show. The LCH, LUH and the HTT-40 is awaiting certification and is yet to be inducted into the Indian Air Force.

Countdown Begins: Flying Response To Aero India Show

Keep your eyes peeled for the GENJET GLJ3X1, developed by the Bangalore based Genser Aerospace & IT Pvt. Ltd. According to them, the aircraft '2+7 seat Light Business Jet'; has twin turbofan engines with cruise speed of 840 kmph and a range of 4,100 km.

From The Airbus Stables

Among the international names, Airbus is a big one. The helicopters which will be on static display from the Airbus include the Airbus H135 and Airbus H145. Among the military transport aircraft, the Airbus A400M, C295 and the ANTONOV 132D will also be on display.

What IAF Is Shopping For

During the 2019 edition, the aircraft expected to participate in the show would be from the six companies who have responded to the IAF's Request for Information (RFI) for 110 multi-role fighter jets. These include Boeing (F/A-18 Super Hornet), SAAB Aviation's (Gripen), Eurofighter Typhoon, Lockheed Martin (F-16 Fighting Falcon) and Russia's Mig-35, who have responded to the RFI. During the last edition of the air show, a total of 72 aircraft participated. The Yakovlev aerobatic team, the Skycats, the Surya Kiran Aerobatics Team and the Sarang helicopter were among the display teams. A few of months ago there were reports that the five day Aero India show which has been held in Bangalore since 1993 could move out to Lucknow. However, ending months of speculation, the Ministry of Defence in September announced that the government has decided to hold the Aero India 2019 in Bangalore.

Source: <https://bangaloremirror.indiatimes.com/>

E-NEWS



ISRO Aerospace Park, Knowledge Centre to come up in Thiruvananthapuram

ISRO Chairman Dr K Sivan visited Chief Minister Mr Pinarayi Vijayan at his office here and held discussions on the proposed Dr Kalam Knowledge Centre and Aerospace Park. Both projects, planned in the state capital, are envisaged as a joint venture of the state government and the space agency. Dr Sivan informed the Chief Minister that the procedures regarding the Aerospace Park, coming up at Kinfra Park in nearby Kazhakkottom, would be completed within a month to ink the Memorandum of Understanding. He also requested the government to help in getting official clearances for the proposed Kalam Knowledge Centre, named after former President Dr A P J Abdul Kalam, at Kowdiar here. Dr Sivan, also Secretary, Department of Space, handed over a cheque for Rs 2.7 crore, collected from ISRO centres across the country, to the Chief Minister's Distress Relief Fund. VSSC director Dr S Somanath, Liquid Propulsion Systems Centre (LPSC) director Mr V Narayanan, and the scientific advisor to Chief Minister, Mr M Chandra Dathan, were among those present.

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

The first worldwide drone standards have been unveiled to keep aircraft safe

The first ever set of global standards for drones has been launched, designed to keep aircraft safe and to make sure operators are held accountable.

What's happened: The International Organization for Standardization (IOS) has released a draft set of standards for drone operations for public consultation, open until January 21, 2019. The standards are expected to be adopted worldwide later next year.

What does the document say? There's little to disagree with here. The standards call for "no-fly zones" to ensure sufficient distance from airports or sensitive locations. The document suggests geo-fencing technology to stop flights in restricted areas. It also says there should be flight logging, training, and maintenance requirements. There are rules to ensure that operators respect privacy and data protection. Crucially, it also says a fail-safe means of human intervention is mandatory for all drone flights, establishing accountability for drone operators.

Why is it needed? Agreeing to a consistent set of industry regulations should encourage more organizations to adopt drone technology, thanks to stronger assurances on safety and security. In the Financial Times today, the head of the UK's air safety board said that half of air traffic incidents now involve drones. Alastair Muir of NATS, the British air traffic control service, called for more technology to combat the threat. Better standards should help, too.

What's next: These standards are the first of four sets covering aerial drones, with the next three set to dig deeper into technical specifications, manufacturing quality, and traffic management.

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

If IAF were to Get EA-18G Growlers, Our Enemies would be Groping in the Dark

If for other reasons, we are forced to acquire the MMRCA from international OEMs (Original Equipment Manufacturers), as a substitute for the LCA then go for the lowest cost and size equivalent to the LCA, " writes Prof. Prodyut Das in a highly readable critique of India's RFI for 110 MMRCA 'Riddle of the RFI : Symptoms of an ancient malaise? ' The logic was not lost on me as I read the engrossing essay many times over. What is the point of dabbling in Tejas Mark-II, if we are still to import pricey jets from foreign OEMs ? And if we have backed ourselves to fashion a homegrown fighter, it only goes to imply that import is just a temporary measure for us. It will buy us time to come to terms with the vagaries of a new venture. And as such, MMRCA 2.0 doesn't have to be a costly indulgence, but a low-cost obligation that'll fill the interregnum. Ideally money saved on MMRCA can then be utilised to bolster strengths of our own red hot Tejas Mark-II. Conversely, if we have doubts on our entrepreneurship in developing a world class fighter, we shouldn't be wasting precious public exchequer on Tejas Mark II in the first place. Scrap this indigenous project and better channelise the funds to importing best possible aircrafts.

There are no half measures.

Saudi Arabia has a nascent Aerospace industry. So hardly have they lost any peace on developing a local aircraft. Instead best available fighters – F-15SA and Eurofighter Typhoon have been acquired off foreign vendors. Sweden on the other hand has locally made Saab Gripen and they have little bothered to acquire any more European or American jet.

LOWEST BIDDER

While actual comparison of the costs can be made only when bids for each aircraft are submitted, the recent sales can be a decent pointer for our analysis. Look at the chart below : To add to the above, Su-35 was recently bought by China

E-NEWS



at \$85 million per aircraft while the details for the same and Mig-35 are not available to the media. It emerges that Boeing's F/A-18 E/F Super Hornet can be the cheapest buy from amongst the aircrafts in the competition. But never mind that Boeing has tied up with the only company of India that manufactures fighter aircrafts – Hindustan Aeronautics Ltd. (HAL) and Mahindra Defence Systems (MDS), it seems the very low cost of Super Hornet has been held against it. If the social media interactions reflect the mood of the nation, Super Hornet is poor cousin of more flamboyant F-16. That it is the most decorated fighter in recent US war history, has done little to add to its prestige. I also suspect that India being home to the largest poor in the world, it is a thriving place for leftist ideologies. So anything that originates from US is quickly taken as a discard that a rich capitalist country is foisting on a developing country.

Our intent instead should be how we can draw maximum value addition from a deal for F/A-18 E/F Super Hornets. Bargaining for latest iterations of AIM-120 AMRAAM, AIM-9X Sidewinder, AGM-158 JASSM (Joint Air to Surface Stand-off Missile), laser guided weapons like AGM-154 JSOW (Joint Stand-off Weapon) can be one thing. Our interlocutors can pitch in for an assurance from their US counterparts to equip Super Hornets with AGM-158C LRASM (Long Range Anti-Ship Missile), a stealthy anti-ship cruise missile under development for US Air Force and Navy in future upgrades. While other can be to take the effectiveness of Super Hornets to altogether next level by adding some E/A-18 G Growlers in the mix.

EA-18G GROWLER FOR IAF

E/A-18G Growler of the Royal Australian Air Force, 6 Squadron, RAAF Base Amberley (YAMB), taxis south on KNLF's Alpha as it prepares to participate in a morning exercise. The superb special paint scheme on this 6 Squadron Growler (A46-306, also 169153) recognises the 100 year history of the squadron. It is no secret that Hornets hunt better when accompanied with tactical jammers. Incidentally, Defence Research and Development Organisation (DRDO) is building its own High Band Jammer (HBJ) since long. But having a full aircraft devoted to jamming takes tactical warfare to an entirely different level. Now nations don't come around to making such aircraft all of a sudden. Rather there is decades of R & D to fall back on from which programmes like E/A-18G Growler germinate. America's forays into arriving at a perfect jammer have seen them make likes of EA-6A, EA-6B Prowler, EF-111A Raven to finally produce Growler, quite recently. My point is if we acquire some Growlers with Super Hornets, not only do we have a deadly pair for war, but even in peacetime, continuous fiddling with a high class jammer can propell our engineers to make our own next generation homegrown jammers. Further ahead, Boeing is looking to upgrade the Growler. The ALQ-99 radar jamming pod may be replaced by 2020 with the Next Generation Jammer (NGJ) which uses AESA technology to focus jamming power exactly where needed. Even that will perfectly fit the acquisition schedule for MMRCA 2.0 if US Govt could be convinced to share the technology with us, given that a clear India-US alliance is emerging in the world affairs.

UTILITY OF F/A-18G Growler :

Tactical Strike Aircrafts like F/A-18 Super Hornets are often up against air defences equipped with extensive radar and communications jamming equipment. While they can defeat individual hostile weapons like a Surface to Air Missile (SAM) using their on-board radar warning receivers (RWR) and defence jammers (ECM), the defending side has the advantage of seeing the big picture and thus concentrating its SAMs, radar directed guns (AAA) and fighter resources to maximum effect. Firing multiple SAMs at a single aircraft can and often will saturate the crew and jammers of F/A-18 Hornet thus increasing the likelihood of a kill. On the other hand, if it has a E/A-18G Growler flying in tow, the latter will most easily destroy the advantage of defending side by high power jamming of their Acquisition and Ground Control Intercept (GCI) radars and associated communications network. Now E/A-18G Growler carrying expensive equipment and still more expensive to train operators, is itself a lucrative target for the enemy. Therefore it also must have an ability to evade SAMs and fighters at least as good as but preferably better than the base F/A-18 Hornet it is derived from. Growler has the two wingtip missile launcher rails for AIM-9 Sidewinder, outboard pylon reserved for AGM-88 HARM anti-radiation missiles, and provision to carry two AIM-120 AMRAAM missiles at multi-mode conformal fuselage stations. Thus Growler quite ingeniously adds formidable air superiority to already robust strike capability of F/A-18 Super Hornet. As already stated, the Growler is derived with some modifications from F/A-18 Hornet. The added electronics include AN/ALQ-218 Wideband receivers on the wingtips and ALQ-99 high and low-band tactical jamming pods. The ALQ-218 combined with the ALQ-99 form a full spectrum electronic warfare suite that is able to provide detection and jamming against all known surface-to-air threats. The current pods are being updated so that Growler remains as effective as ever against emerging threats. The Growler has 9 weapon stations in all. So it can be fitted with up to five ALQ-99 jamming pods and will typically add two AIM-120 AMRAAM or AGM-88 HARM missiles. The remaining two stations can be used for conformal fuel tanks. Conformal fuel tanks are a necessity because a Growler is penalised in radius performance and unlike strike aircraft it cannot shed 4000 to 12000 lb of weight (ordnance) over the target if the going gets tough. The EA-18G also uses INCANS Interference Cancellation System that will allow voice communication while jamming enemy communications. In addition, the Growler possesses a communications receiver and jamming system that will provide suppression and electronic attack against airborne communication threats. Functionally the AN/ALQ-218 wideband receivers sit at the top of the chain – sophisticated radar warning

E-NEWS



receivers which detect and prioritise threat radars for power managed jamming by the ALQ-99. Power management is a term which refers to the allocation of available jamming power in such a way that the greatest threats receive the most power and are thus most strongly degraded. Threat parameters are passed by AN/ALQ-218 to the ALQ-99 which locks its set-on receivers on to the designated threats. Unlike conventional RWRs, the AN/ALQ-218 receiver can actually remember and analyse the threat signal waveform (employing a Frequency Memory Device and Signal Processor) and provide parameters used by the ALQ-99 Central processor to programme the allocated jammer. The ALQ-99 offers several noise/spot-noise jamming modes and have other capabilities such as false target generation. In terms of management, ALQ-99 can be operated in three primary modes. Automatic, where the AN/ALQ-218 detects threats, the computer sorts them and the jammers jam them. Semi-automatic, where the operator selects and controls the jammers, and Manual, where the operators also identify and prioritise threats.

HOW GROWLER IS EMPLOYED :

The Growler's flight performance is similar to that of the F/A-18E/F. This attribute enables the Growler to perform escort jamming as well as traditional stand-off jamming. On Primary Jamming Missions, EA-18G Growlers fly as escort jammers with deep penetration strike aircrafts like F/A-18E/F Super Hornets. Typically the aircraft all penetrate using TFR at very low level and hopefully undetected. As the strike aircraft approach the radar horizon of the target's area defences, the E/A-18G Growlers would pop up to several thousand feet and jam any radars which would be considered a threat, while the strike aircraft pound the target from tree top altitude. In stand-off missions, the EA-18G Growlers would operate at a distance from the battle front and snow enemy's long range surveillance radars from probing for our AWACS and other such aircrafts. Three Growlers networked together can generate targeting tracks for hostile radio-frequency sources in real time. Utilising faster data-links the Growler could use its EW pods to accurately locate signal sources. In a group of three planes, when one detects a signal from a source such as a cell-phone, the other two can also listen for the same signal, all three measuring the amount of time taken for transmissions to travel from the source to each aircraft to triangulate the location in a very very small area. By early 2015, the US Navy had demonstrated this concept using EA-18s equipped with Rockwell Collins' tactical targetting network technology (TTNT) and ALQ-18 receivers to acquire emissions from a target vessel and target it from a stand-off range without using their own detectable radar emissions.

CONCLUSION :

High performance tactical jamming aircraft are a necessary part of any major air power and represent the most effective means of disrupting the control of the enemy's defensive system. Once that has occurred the individual SAM and AAA systems have no means of coordinating and concentrating their fire on specific targets. This renders them essentially ineffective when confronted by the on-board defensive jammers of the attacking strike aircraft. Thus EA-18G Growlers can prove to be of immense significance to Indian Air Force. Even in itself, an F/A-18 Super Hornet will prove a unique platform of continuous air dominance for years to come. It is designed to operate in and adept between air-to-air and air-to-ground missions during the same sortie. AN/APG-79 AESA radar, Advanced Targeting Forward Looking Infrared pod (ATFLIR), AN/ALQ-67V(3) radar warning receiver, and AN/ALE-50 Towed Decoy System together provide Super Hornet improved situational awareness, pin-point accuracy, increased survivability and advanced capabilities in the challenging air battles that Indian Air Force is poised to see in the 21st century. In my view, IAF must have a look at it if the aircraft is offered for a competitive price and even consider EA-18G Growler for acquisition.

Source: Global Defence Watch

Army needs change management

Business schools are adept at teaching change management because change is inevitable and brings turbulence in its wake. The tendency to stick to established ideas and thoughts is a human trait. While considering and then applying change is a challenging process in the business world, the sheer complexity of bringing change into as complex an organisation as a standing army is simply mind boggling. The business world still has the comparative luxury of facing failure due to change and bouncing back with loss of profits and much heartburn. However, change in an army has to guarantee victory in the battlefield, the consequences of failure becoming existential in nature. The luxury of experimentation can be ill-afforded. That's why it has to be a much more managed change to sustain and guarantee success. The Indian Army has a history of change but also a history of sticking to basics. Every time situational challenges emerge, change has been effected but after very deep study and nuanced experiments over time. An interesting aspect is that there is a common complaint within its ranks that operations receive all the attention with logistics being given short shrift. The pre-eminence of the general staff is an accepted norm but no army can ever achieve its operational aims without considering the logistical balance through an envisaged operation. That's why it is important to build a cadre of officers with requisite expertise and experience in operations, training and logistics. At the turn of the millennium, a couple of interesting things happened. First the US adopted transformation as a concept. It was already an ongoing phenomenon after Gulf War I but the idea started to enter into other armies.

E-NEWS



Greater digitalisation and information-based operations forced the adoption with transformation signifying all-out change to counter future adversaries. The second was the Indian Army's complete change from response-based doctrine to a proactive one. The Army simultaneously adopted the US transformation model to re-examine its future war-fighting needs. From 2004 to 2011, transformation study was the watchword. It was sensible; the economy was doing well and we had just got past the rigours of becoming an established nuclear weapon state. It was time to change but the Army's recommendations as part of transformation found little traction. It could hardly be understood by the government which could not even perceive the changes in war-fighting doctrines. If anything came out of the recommendations of the transformation study it was the raising of the Mountain Strike Corps (MSC) which was finally sanctioned in 2013. Surprisingly with the continuing militancy in J&K and the stellar performance of the Rashtriya Rifles (RR), even the future of this force continued to remain in doubt. In 2018 we are suddenly hit by a demand to downsize because the bureaucracy feels that digitalisation should have led to reduced need for manpower. If the Chinese PLA could do it, why not the Indian Army? It was also felt that the allotted budget could not cater for such large revenue expenditure. What will never be understood by the non-uniformed community is that force structuring is based on nature of threat, the terrain configuration and the actual effect of technology and its absorption. Budget plays a role but it's a question of optimisation. All of India's disputed and quasi-disputed borders need to be manned, 365 days a year unlike the PLA. If the war has to be taken into the adversary's territory, the flanks and beyond need to be effectively held, and not notionally to prevent riposte. Digitalisation was supposed to see the success of various command, control and communication systems, test beds for which continue to remain in place for over 20 years without knowing what will finally be fielded. The question also arises whether the support organisations have served the purpose of their existence. The Military Engineering Service (MES), Defence Research and Development Organisation (DRDO), which eats into the budget without providing the optimum buck, not to speak of organisations such as the Armed Forces Headquarters Cadre (AFHQ) which somehow remain out of sync with the very people they are supposed to support and the Ordnance Factories Board which produces low grade ordnance stores at phenomenal costs. If optimisation is the watchword then the need for a non-uniformed specialised cyber and information force to back the Army's non-existing information warfare capability isn't even spoken of. The unfortunate part of the restructuring effort is that the state of civil military relations appear to be reflecting in it with hurry for change without due consideration to the actuals which were very carefully built into the transformation study which took seven years and much of it continues to remain relevant today. The MSC has become the very first casualty with its raising held up half way to save money. It is fine for analysts to pick holes in the restructuring effort. There will be matching arguments against each of the issues raised in this analysis and rightly so. However, what is important is to ensure that whatever change occurs is first validated through time-tested processes. Hurriedly convened study groups and committees with limited interaction with stakeholders, reorganisation of key formations without war gaming and exercises with troops may not provide the quality inputs needed for effective change management. It needs to be re-emphasised that change is always welcome but in the Army only if it comes with higher reassurance of victory in battle. A second chance in this field is never available. Take your chances but then learn to live with the consequences.

Source: <https://defenceupdate.in>

INS Arihant's Success Fitting Response To Nuclear Blackmail: PM Modi

India's first nuclear ballistic missile submarine, INS Arihant, has become fully operational, completing the country's nuclear triad. With the 6,000-tonne submarine in its arsenal, India will be able to strike deep inside China's territory, which otherwise cannot be reached by short-ranged land-based missile. Prime Minister Mr Narendra Modi announced today that the submarine has completed its first deterrence patrol. He thanked the crew of INS Arihant for achieving the feat. "In an era such as this, a credible nuclear deterrence is the need of the hour. The success of INS Arihant gives a fitting response to those who indulge in nuclear blackmail," he said. A nuclear ballistic missile submarine is a huge strategic asset due to its ability to remain under water for long duration, which gives it an element of stealth. The submarine can fire city-destroying missiles from a safe distance without getting detected. PM Mr Narendra Modi's cabinet colleagues have congratulated the armed forces for achieving the nuclear triad. Finance Minister Mr Arun Jaitley said it was a day of great pride for 130 crore Indians. "India achieves the nuclear triad with the first successful INS Arihant's deterrence patrol. Today is the day of great pride for 130 crore Indians and our armed forces," he wrote on Twitter. Defence Minister Mrs Nirmala Sitharaman wrote on Twitter that India joined the elite club of countries that can design, construct and operate nuclear submarines. She lauded PM Mr Narendra Modi for his leadership. Home Minister Mr Rajnath Singh also congratulated Indian sailors for achieving the nuclear triad. BJP President Amit Shah also congratulated PM Mr Narendra Modi, saying under his leadership country's strategic and economic position got enhanced. INS Arihant was under development for three decades under a highly classified programme. It comes under the direct control of the Nuclear Command Authority headed by PM Mr Narendra Modi. Having successfully completed

E-NEWS



the deterrence patrol, the INS Arihant can now be considered a fully functional underwater ballistic missile delivery platform.

Source: NDTV

HAL to roll out more Tejas fighters from new facility

State-run aerospace major Hindustan Aeronautics Ltd (HAL) will roll out more Light Combat Aircraft (LCA) Tejas from its new production facility at Nashik in Maharashtra, a top official said. "We are setting up a new facility at Nashik to double the production of Tejas fighters to 16 from 8 per year," HAL Chairman and Managing Director Mr R. Madhavan told reporters here. The company is investing Rs 1,300-crore for the Tejas fighter production augmentation, he said. The defence behemoth has two production units in Bengaluru where the advanced fourth generation multi-role light fighters are built for the Indian Air Force (IAF) combat fleet. The new facility is expected to be operational by 2020. Going forward, the additional capacity will augment the LCA production to 20 units per annum. The city-based company has an order book of Rs 64,000 crore. "We certainly like to have a better order book position. Generally, an order book covers 5-7 years of our sales, but what we have covers four years. It is slightly on the lower side, but we have pending orders which should make up," said the Chairman. An order of 83 LCAs for the IAF is pending, he said. Fresh orders are expected for the defence major within the next 3-6 months. "We are looking at orders for 83 LCA Mk-1s and 15 Light Combat Helicopters (LCH)," Madhavan said. Over the last six months, HAL received an order worth Rs 950 crore for the upgrade of 17 Dornier aircraft from the Indian Coast Guard.

Source: <https://defenceupdate.in/>

Indian Navy chief to seek urgent help from Russia for MiG-29Ks, the only fighter jets on INS Vikramaditya

Increasing the serviceability of the 45 MiG-29K aircraft, the only fighters on the aircraft carrier INS Vikramaditya, as well as other pending projects of the Indian Navy are topping the agenda of the Chief of Naval Staff Admiral Sunil Lanba four day visit to Russia starting today. Senior Naval officers confirmed to FE that, "The serviceability of the MiG-29 from the present 60 % to upto 80 % or more and there is an urgent requirement to meet with the agencies in an effort to expedite the process. There are issues related to the landing of the aircraft on the carrier and due to the heavy landing regular maintenance is required to address the wear and tear issues." The Navy chief will be meeting with the Russian Aircraft Corporation MiG and discuss maintenance related issues with them which includes problems in the airframes, engines as well as other systems onboard. State-owned Hindustan Aeronautics Ltd (HAL) is the nodal body which is expected to overhaul the engines as well as carry out any other urgent structural changes of these MiG-29k aircraft. As has been reported by FE earlier, the Indian Navy is urgently trying to acquire 57 multi-role fighters for its aircraft carrier to replace the existing fleet for the MiG-29K. "Since the procurement process is long, we need to ensure that the existing fleet of MiG-29K is in operational readiness," a naval officer explained. Global aerospace giants including Boeing Company with its F/A-18E/F Super Hornet; the French Dassault Aviation's Rafale M, Swedish Saab with Gripen Maritime and Russia's MiG-29K, have already expressed their interest in response to request for information issued by the MoD. Presently, India is the second biggest operator with almost 110 MiG-29s flying with both the Indian Navy as well as the Indian Air Force (IAF)—as the air defence fighter. The fleet of the IAF is already going through upgrades which are India specific at the HAL facility and Electronic Warfare suite which has been developed by the Defence Research and Development Organisation (DRDO). In the recent weeks, the government has cleared several major deals with Russia including the latest frigates. The deal for the Grigorovich-class 'Project 1135.6' frigates, between Goa Shipyard Ltd (GSL) and the Russia's state-run arms exporter Rosoboronexport has been inked last week in New Delhi, as has been reported by FE earlier. The deal is worth \$ one billion for two frigates which will be built at Russian Yantar shipyard at Kaliningrad. Besides meeting with top military officials including General VV Gerasimov, Chief of General Staff and First Deputy Defence Minister of Russia, the Navy chief will also be meeting with representatives of Rosboronexports as well as other agencies who are participating in various projects related to the Indian Navy. With the aim of further deepening military engagements with Russia, the Navy chief will hold wide-ranging talks with his Russian counterpart, Admiral Vladimir Korolev. The most critical issue that will be on the table for discussion includes the rupee-rouble payment route, as the Trump administration has put several Russian firms under sanctions under Countering America's Adversaries Through Sanctions Act (CAATSA). As has been reported earlier, "During the annual India-Russia summit which concluded in October, both sides had discussed the possibility of reviving the rupee-rouble route of payments," sources had told FE. "Besides visiting the Nakhimov Naval School and Admiralty Shipyard, the chief will also visit the Military Academy of the General Staff of the Armed Forces of the

E-NEWS



Russian Federation and deliver a talk on “Indian Navy’s Perspective on Maritime Security”, the official spokesperson of the Indian Navy Capt DK Sharma has been quoted.

Source: <https://defenceupdate.in/>

Akash NG : A Look at What India’s Next Generation SAM Could Be

Confident with the success of Akash-1 missile system DRDO is now moving full steam ahead with the development of the highly advanced Akash-NG i.e. Akash-Next Generation. In May 2018, L&T’s ‘milestone ceremony’ gave us a glimpse of new Akash missile. Using that poster we created 3D images of Akash-NG SAM. Since we had to extrapolate the upper section of the missile, proportions might be slightly mismatched, but I think 3D-rendering gives us an idea of how the actual thing would look like. The Akash-NG missile has a cylindrical body with four cropped delta fins at mid-body and four tail fins. Second stage air-breathing solid ramjet engine has been ditched in favor of lighter dual-pulse solid rocket motor. The new propulsion system will increase the range of the missile to 50km+. Akash-NG has six major components- radome, indigenous active RF seeker, RF/Laser proximity fuse, pre-fragmented warhead, electromechanical actuation, and dual-pulse rocket motor. The new model has substantial improvement in missile performance. The Akash-NG will not only have greater range but also the advanced signal processing and guidance system which will improve missile’s reliability and performance at extremes of engagement envelope and in a dense electronic jamming environment. Another plus point is that Akash-NG will utilize a canister-based launch system. Since the new model appears to be considerably lighter and less bulky than its predecessor, a single launcher unit is expected to carry six hermetically sealed missile canisters. Canister-based launch system would provide much longer shelf life and reliability. It also reduces overall deployment time. Akash-1 missiles are also stored in sealed canisters but they have to be mounted on launcher rails without the canister, which makes reloading a time-consuming task. According to unconfirmed reports, Akash-NG will feature an AESA Multi-Function Radar(MFR). The Addition of MFR will afford the Akash missile system capabilities it never had before. MFR will combine functions (search, track and fire control) of three different radars in one single unit. The use of AESA radar versus older PESA Rajendra radar allows for a much higher sensitivity and reliability. MFR combined with enhanced command and control system will improve overall processing and target handling capability which means that Akash-NG will have a faster reaction time and a higher level of protection against saturation attacks. It has increased the number and types of target Akash can engage. In addition to intercepting incoming PGMs, cruise missiles, and aircraft, the new SAM will also be able to destroy short-range rockets and ballistic missiles. In networked air-defence environment, Akash-NG will work with Integrated Air Command and Control System (IACCS). Akash-NG will bridge the gap between 25km Akash-1 / Akash-1S and 70 km MR-SAM and will be slotted in between this two Air Defence system to provide two-layer air defense protection to various high valued military and civilian installations against aerial targets like fighter jets, cruise missiles, and air-to-surface missiles” as well as ballistic missiles.

Source: <https://defenceupdate.in>

GSLV MkIII-D2 successfully launches GSAT-29

India’s GSAT-29 communication satellite was successfully launched by the second developmental flight of Geosynchronous Satellite Launch Vehicle MarkIII (GSLV MkIII-D2) from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota. GSLV MkIII-D2 lifted off from the Second Launch Pad of SDSC SHAR at 17:08 hours (IST), carrying the 3423-kg GSAT-29 satellite. About 17 minutes later, the vehicle injected the satellite into the Geosynchronous Transfer Orbit (GTO) as planned. After injection, ISRO’s Master Control Facility at Hassan has assumed the control of the satellite. In the coming days, three orbit raising manoeuvres will be executed to position the satellite in the Geostationary Orbit at its designated location. GSLV Mk III is a three-stage heavy lift launch vehicle developed by the Indian Space Research Organisation (ISRO). Two massive boosters with solid propellant constitute the first stage, the core with liquid propellant form the second stage and the cryogenic engine completes the final stage. GSAT-29 is a multiband, multi-beam communication satellite, intended to serve as test bed for several new and critical technologies. Its Ku-band and Ka-band payloads are configured to cater to the communication requirements of users including those from remote areas especially from Jammu & Kashmir and North-Eastern regions of India. In addition, the Q/V-Band communication payload onboard is intended to demonstrate the future high throughput satellite system technologies. Geo High Resolution Camera will carry out high resolution imaging. Optical Communication Payload will demonstrate data transmission at a very high rate through optical communication link. After the successful launch, ISRO Chairman Dr K Sivan said: “India has achieved significant milestone with our heaviest launcher lifting off the heaviest satellite from the Indian soil. The launch vehicle has precisely placed the satellite in its intended orbit. I congratulate entire ISRO team for this achievement.” Declaring GSLV MkIII operational, Dr Sivan announced that Chandrayaan-2 and

E-NEWS



Gaganyaan missions will be launched by this heavy-lifter. Mr Jayakumar B, Mission Director, GSLV Mark III said it is the guidance of the Mentors at ISRO that helped the team to march ahead while facing obstacles. “The industry partners too played a key role in this mission,” he said. Mr K Pankaj Damodar, Project Director, GSAT-29 said the launch will help to bridge the digital divide. He also said several next generation payload technologies will be demonstrated with this mission soon. The success of GSLV MkIII-D2 marks an important milestone in Indian space programme towards achieving self-reliance in launching heavier satellites. The success of this flight also signifies the completion of the experimental phase of GSLV Mark III. The first successful mission of GSLV Mark III was an experimental suborbital flight in 2014. Subsequently, GSLV Mark III-D1 launched GSAT-19, a high throughput communication satellite, with a lift-off mass of 3150 kg, into GTO on June 5, 2017.

Source: <https://www.isro.gov.in/>

TECHNOLOGY

Boeing Outlines Vision for Future of Aerospace

A decade from now, the aerospace industry will have been transformed, said Mr Dennis Muilenberg, CEO, president and chairman of Boeing. He foresees rockets, low-Earth-orbit spacecraft and more conventional passenger jets in the sky—and whatever they are, Boeing will be making them. Speaking at the GeekWire Summit, Muilenberg said that air and space travel won't have a sharp division between them—rather, the two will be integrated into a transportation landscape that includes personal air taxis, conventional aircraft, hypersonic transports and commercial spacecraft. “Within a decade, you're going to see low-Earth-orbit space travel become much more commonplace,” he told GeekWire. “Space tourism, space factories ... that whole ecosystem is evolving, and we'll be deeply involved in the transportation system that will enable access.” Boeing's involvement in that integrated future is centered around the CST-100 Starliner spacecraft, which the company intends to start carrying astronauts as early as next year. “You can think of that as our first vehicle in what in the longer term will be a portfolio of commercial space vehicles to go along with our commercial airplanes,” Muilenberg said. If that's true, Boeing's foray into spacecraft has had a rocky start. The Starliner failed a recent test of its launch abort system. And Boeing recently had to push back its target launch date for the Starliner's next major test flight—from August to late this year or early next year. With the recent Soyuz rocket mishap, there will be more pressure on Boeing and other spacecraft developers like SpaceX to produce functional—and safe—vehicles to service the ISS. If the skies are only going to get busier, then the world will need a more sophisticated air traffic management system. Boeing is already working with NASA, the Federal Aviation Administration and other industry players to meet that need with NextGen, the FAA's long-term, \$35 billion overhaul of America's aging air traffic control system which is slated to be ready by 2030. If Boeing is to be a major player in space flight, it needs to address problems in its current aircraft production. The company has had to scramble to meet the demand for its 737s, many of which were sitting on the tarmac without engines this summer. This hasn't hurt the company's financial position, though, as evidenced from its strong Q2 report. While Boeing dominates the aerospace industry it faces hungry competitors like Airbus in the air and SpaceX in orbit. But that doesn't stop Muilenberg from dreaming big for the plane maker—he boasts repeatedly that the first people to land on Mars will do so on a Boeing-built rocket.

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

Drones to help detect pests, diseases in areca nut trees: ICAR-CPCRI Kasargod

The Indian Council of Agricultural Research-Central Plantation Crops Research Institute (ICAR-CPCRI), Kasargod, has developed an intelligent drone to not only detect pests and diseases afflicting areca nut trees, but also spray pesticides to the affected ones. ICAR-CPCRI director Mr Chowdappa said the intelligent drone is an upgraded version of the drone-enabled pesticide sprayer, which they had developed in collaboration with Bengaluru-based General Aeronautics Pvt Ltd. He said with the help of the drone, farmers can detect pests and diseases just by sitting in front of a computer. Data about all forms of pests and diseases are fed into the system using artificial intelligence and the drone will help identify the problem. The system will also be able to identify new pests or diseases. Since the drones cost Rs 2-3 lakh each, the CPCRI expects agriculture and horticulture bodies or private agencies to buy them and rent it out to farmers.

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

E-NEWS



India revives its dream of manufacturing passenger aircraft

It was March 6, 2009. A 14-seater prototype aircraft called Saras Prototype 2 crashed during a trial flight in the outskirts of Bengaluru, killing all three crew members — two pilots of the Indian Air Force and a flight engineer. During the investigation, the cockpit voice recorder disclosed the commander calling out, “aircraft has departed”, just 10 seconds before the crash, indicating that the plane had gone out of control as soon as it took off. The 75-page investigation report pinpointed human errors, but did not spare the manufacturer of the plane, Bengaluru-based National Aerospace Laboratories (NAL), for devising engine relight procedures — a midair test that involves switching off an engine before switching it on again — without consulting the propeller manufacturer MT-Propeller of Germany. The plane had lost altitude and crashed, but the tragedy had a direct fallout: India’s dream project of manufacturing a small civilian plane, the Saras — the Sanskrit word for crane — was stuck in limbo. By 2016, NAL, the agency that comes under the administrative control of the Council of Scientific and Industrial Research (CSIR), announced that its Rs 300 crore fund for the project had dried up, forcing it to suspend Saras for the time being. It was a project that began in 1991. In fact, there was another prototype — the Saras PT, which flew successfully many times since 2004. It has been modified as the 14-seater Saras PT1N and flown again earlier this year, for a surprise trial. Something much bigger than Saras is in the offing now. Nine years after the PT-2 crash, the Centre is thinking of indigenously manufacturing aeroplanes for civilian use. Earlier this week, a 21-member jumbo expert committee, headed by the civil aviation secretary, was set up to look into the various aspects of manufacturing planes and helicopters in India, apart from finding ways to upscale and diversify production of aero-components. Significantly, this is the second panel being set up in the last two and a half months; the first was headed by the ministry’s economic adviser, Mrs Vandana Aggarwal, with a mandate to give a roadmap for creating a special purpose vehicle (SPV) to develop what it calls regional transport aircraft, or RTA. The need for such a segment has been increasingly felt after the government rolled out its UDAN scheme for regional connectivity a couple of years ago. “What’s being discussed is the feasibility of manufacturing aircraft of 19- to 100-seater,” an official connected to the panel told, adding that its recommendations would be ready by the end of this month. This panel, constituted on August 30, has four members — a general manager-ranked officer from Hindustan Aeronautics Limited (HALNSE 2.90 %), a group director of Aeronautical Development Agency (ADA) and senior scientists Mr Abhay Pashilkar and Mr RV Venkatesh, both belonging to NAL, the creator of Saras. Rs 80 crore is earmarked for the purpose of designing the regional transport aircraft manufacturing project. “The Government of India is fully committed to the development of commercial aero related manufacturing in India,” Minister for Civil Aviation Suresh Prabhu told, adding how two committees would engage in deliberations simultaneously. “Both the Government of India and Indian industry are serious (in manufacturing civilian planes),” he says.

Bigger Planes

Though information on a likely road map for manufacturing aeroplanes in India is still sketchy, two things are amply clear. First, unlike the earlier avatar Saras, which was a small, 14-seater, this round of manufacturing may embark on building relatively bigger aircraft, up to 100-seater and even more. There are 1,358 aircraft in India, including private ones and those used for training purposes, as on July 12, 2018. There are 620 aircraft of scheduled Indian operators. Of these 79 planes have less than 100 seats. In that category, 70 aircraft have 70 seats and above. The smaller ones include three 50-seater CRJ-200 aircraft flown by Zoom Air, two 48-seater ATR 42-300 of Alliance Air and four 18-seater Beechcraft 1900D planes of Air Deccan and Air Odisha. The data, compiled by the Directorate General of Civil Aviation (DGCA), throws up the question whether there will be any demand for a 14-seater, Saras-type aircraft — something that was conceived back in the 1990s, even though the government tries to revive the project. Airlines in India, which foresee growing air connectivity to smaller cities, may prefer 50-to-70-seater planes rather than smaller ones. However, state-owned Hindustan Aeronautics Limited (HAL) is scouting for buyers for its 19-seater Dornier-228, hitherto flown only for military use, saying the aircraft is cheaper and has low maintenance costs. It was in December last year that HAL obtained licences for the use of Dornier for civilian purposes. Second, unlike in the past, the government may engage private players — either foreign or Indian — for manufacturing aeroplanes. It’s unlikely that the aircraft will be a pure NAL-CSIR venture like the Saras, says an official in the know. That could propel the government into a turbulent zone. Already, the partnership of Dassault Aviation and the novice in the field, Anil Ambani-led Reliance Defence, in the Rafale fighter jets deal has become a political hot potato. “We will follow due diligence .. Founder of Air Deccan, Captain GR Gopinath, bats for the involvement of private sector, saying the government must not get into the manufacturing of civilian aircraft. “India must create a global aircraft brand with great quality and at a good price point. The idea is to tap the global market, like Brazil’s Embraer and Canada’s Bombardier have demonstrated.” Already, pressure is mounting on India to plunge into the manufacturing of civilian aeroplanes after China came out with models such as COMAC C919, a 168-seater, narrow-body jet, which many aviation experts happily compare to Airbus A320neo and Boeing 737 MAX. The aircraft is likely to be used by China Eastern Airlines by 2021, according to various news reports. In India, sarkari hurdles are more complex. Even after the crash of Saras PT-2 in 2009, the Government of India continued its dream project for some time. By then, various stakeholders such as CSIR, Department of Defence

E-NEWS



Production and the Civil Aviation Ministry were not on the same page, resulting Even after the crash of Saras prototype aircraft, we continued our efforts under a regional civil aviation project. It can now be reignited only if there is a clear ownership of it, with no turf war between government departments, says Nasim Zaidi, who first served as DGCA (2008-10) before getting elevated as secretary in the Ministry of Civil Aviation (2010-12). Maybe there will be less confusion now on who would pilot the new aeroplane project, after the government, in July last year, changed the allocation of business rules, allowing the Civil Aviation Ministry to pursue the development of commercial aero-related manufacturing and its ecosystem, a subject that was handled by the Department of Defence Production. There's no doubt now who the pilot is. The only uncertainty is whether there will be a clear sky ahead.

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

New space industry emerges: on-orbit servicing

Imagine an airport where thousands of planes, empty of fuel, are left abandoned on the tarmac. That is what has been happening for decades with satellites that circle the Earth. When satellites run out of fuel, they can no longer maintain their precise orbit, rendering them useless even if their hardware is still intact. "It's literally throwing away hundreds of millions of dollars," Al Tadros, vice president of space infrastructure and civil Space at a company called SSL, said this month at a meeting in the US capital of key players in the emerging field of on-orbit servicing or repairing satellites while they are in space. In recent years, new aerospace companies have been founded to try and extend the lifespan of satellites, on the hunch that many clients would find this more profitable than relaunching new ones. In 2021, his company will launch a vehicle — as part of its Robotic Servicing of Geosynchronous Satellites (RSGS) program — that is capable of servicing two to three dozen satellites in a distant geostationary orbit, some 22,000 miles (36,000 kilometres) from Earth where there are about 500 active satellites, mostly in telecommunications. This unmanned spacecraft will be able to latch onto a satellite to inspect it, refuel it, and possibly even repair it or change components, and put it back in the correct orbit. Mr Tadros describes it as "equivalent to a AAA servicing truck in geostationary orbit." And "it's financially a very, very big opportunity," he adds. Telecommunications giant Intelsat, which operates 50 geostationary satellites, chose a different option and signed a contract with Space Logistics, a branch of Northrop Grumman, for its MEV, a "very simple system" vice president Ken Lee told AFP is much like a "tow truck." When it launches in 2019, the spacecraft will attach itself to a broken down satellite and reposition it in its correct orbit. The MEV will stay attached and use its own engine to stay in orbit. On-orbit servicing could also help cut down on the perplexing problem of mounting space debris. Of the 23,000 space objects counted by the US military, just 1,900 are active satellites. The rest — which move at speeds of some 12-19,000 miles (20-30,000 kilometers) per hour — includes nearly 3,000 inactive satellites, 2,000 pieces of rockets (such as the second stages of rockets) and thousands of fragments produced by two key events: the deliberate missile explosion of a Chinese satellite in 2007, and the 2009 collision of an Iridium satellite with an aging Russian one. No short-term solution has been identified for small-scale space junk, but some companies would like to be able to remove defunct satellites from orbit. Since 2008, France has required satellite operators to take steps to "deorbit" their spacecrafts by programming them to re-enter Earth's atmosphere in 25 years so that they burn up, according to Laurent Francillout, head of space security at the French National Center for Space Studies (CNES). When it comes to satellites in geostationary orbits, their end-of-life option is to go farther from Earth to a "graveyard orbit" 200 miles (300 kilometres) further away. "We are trying to promote these principles" in other countries, Francillout told AFP. A small Japanese company founded in 2013, Astroscale, is developing a system to approach and capture space debris and broken satellites. Though it doesn't have a clientele yet, director of operations Chris Blackerby anticipates the business would be "very viable." A test launch is planned for 2020. Airbus's future "Space Tug," planned for 2023, is being built to grab old satellites and push them down to 125 miles (200 kilometres) above Earth so they burn up. The problem of space junk is only getting worse. The number of satellites in space has already risen 50 percent in five years, according to the Satellite Industry Association, and growth continues. Meanwhile, debate is roiling in the United States over the need for better international regulation of space traffic, aimed at avoiding accidents and managing future conflicts. "We don't want the Wild West," said Mr Fred Kennedy, director of the Tactical Technology Office at DARPA, the technological research arm of the Pentagon, noting that the United States, with its fleet of military satellites, is keen to establish sound practices beyond the boundaries of Earth.

Source: <https://m.dailyhunt.in/>

NASA is braced for "seven minutes of terror" as its InSight probe prepares to land on Mars

After a journey of almost 300 million miles, NASA is about to attempt to land its InSight probe on the surface of Mars.

E-NEWS



What's happening: InSight launched May 5 2018, and scientists at NASA's Jet Propulsion Laboratory are now making the final course adjustments before the landing. It is due to land at about noon US Pacific time (8 p.m. GMT).

Nerve-wracking: This is going to be a white-knuckle ride. The probe will experience the so-called "seven minutes of terror" that you might remember from Curiosity's successful landing six years ago. InSight will streak through Mars's thin atmosphere at 12,300 miles per hour and then have to scream to an almost halt of just 5 miles per hour. All this, in less than seven minutes. The probe is borrowing its landing technology from the successful 2008 Phoenix mission. It will use a parachute to slow down before it fires its 12 thrusters just before landing on its three shock-absorbing legs. It's aiming to land on a flat area known as Elysium Planitia.

Will it work? Maybe. Plenty might go wrong. In fact, more than half of all Mars missions have failed. A European landing attempt by the Schiaparelli probe ended in calamity in 2016 when a computer error sent it into an uncontrollable spin and it crash-landed into the Martian surface, leaving a crater. (Some failures could have been avoided. The infamous Mars Climate Orbiter failed because some engineers were using metric, and others were using imperial...)

Why it matters: Unlike other rovers on the planet, InSight is there to dig down beneath its red surface. Once it's safely in position, its robot arm will place science experiments on the ground. One, HP3, will delve up to 16 feet beneath the surface to take Mars's temperature. The other experiment is a seismometer that will look for signs of marsquakes. Together they will provide scientists with precious information about how rocky planets like Mars and Earth form, find out how tectonically active Mars is, and gauge how often it is hit by meteorites.

All the gang: That's not all. Two tiny CubeSats are flying in formation behind InSight as part of the Mars Cube One mission. They will help relay data from InSight back to mission control at JPL.

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

HAL plans 3rd LCA line to keep workforce engaged

Conceding that its employees trained to work on fixed wing aircraft will see a reduction in work once it delivers the remaining Su-30 MKI planes Su-30 planes, HAL has now decided to open a third manufacturing line of Light Combat Aircraft (LCA) Tejas at its Nashik facility, which so far has only made the Su-30. The last Su-30 will be delivered by March 2020. The Hawk and Jaguar projects already completed and just 23 of the Su-30s pending delivery, thousands of HAL workers will have little or no work until new orders come. HAL CMD R Madhavan, said: "While the repair and overhauling work at Nashik will still be there, it is true that a section of those workers will have no work. So we've decided to start a third LCA line at Nashik." The operation of the third line, however, depends on HAL getting the orders for 83 Tejas cleared by the Defence Acquisition Committee (DAC), which is currently stuck with the Cost Committee set up by the Centre, which feels that the cost quoted by HAL is too high. "We've submitted all clarifications to the committee. You cannot compare the cost of the IOC (initial operational clearance) configuration, which had nothing to the FOC (final operational clearance) configuration which has a lot of new equipment added. The cost has gone up because of that. Now, if you want the moon, you will have to pay for it," Mr Madhavan said. He did not, however, give out details of what HAL had quoted for each Tejas. HAL is already spending Rs 1,300 crore to augment LCA production and make 16 aircraft annually, and the third line will be part of this. "With that we hope to achieve an annual production rate of 20 planes a year," he said. At present HAL has orders for 40 Tejas—16 in IOC configuration and the remaining in FOC configuration—and orders for the 83 is important for the PSU to keep its production going. Mr Madhavan said that on the rotary wing side, the PSU has enough orders to keep its workforce engaged, as reported by TOI earlier. "We are also hopeful of bagging order for the light combat helicopter (LCH) and the light utility helicopter (LUH) in the future besides the Kamov helicopters which will be a joint venture with Russia," he said.

IAF pays due partly

Mr Madhavan also confirmed that the PSU has more than Rs 7,000 crore dues owed by the armed forces—more than 70% of which must come from cash-strapped Indian Air Force (IAF)—and that this payment would make its cash position better. "Just a few days ago the IAF paid Rs 2,000-odd crore which has helped our cash position, and we will be in a better position once the remaining is paid too...the army and navy owe us a negligible amount," he said. While conceding that the company could do with more orders than its book reflects, Mr Madhavan said: "We generally like to have an order book that would take care of sales for about five to seven years, but the Rs 62,000 crore or Rs 64,000 crore we have now is enough only for three-and-a-half years. That said, we are hopeful that the LCA and LCH orders come through soon," he said.

Source: <https://defenceupdate.in>

E-NEWS



Pakistan has cost-effective solution to India's latest Ballistic Missile Defence System : Report

Pakistan has “cost effective solutions” to India’s latest ballistic missile defence system and would also find a counter to its nuclear capable submarine, a media report said quoting a senior official of the country’s top strategic body. Addressing a conference on ‘Nuclear Deterrence and Strategic Stability in South Asia’ hosted by the Strategic Vision Institute (SVI), Adviser to the National Command Authority (NCA) Lt Gen (retd) Mr Khalid Kidwai also said that Pakistan will remain unfazed as it has adequate response options that would disallow any disturbance of the strategic balance or strategic stability. “The history of our strategic force development clearly indicates that Pakistan has never allowed this (strategic) balance to be disturbed to our disadvantage; we have always found effective solutions to redress induced imbalances from time to time,” Gen Mr Kidwai was quoted as saying in by Dawn newspaper. He said Pakistan would not follow India in developing a defence system against ballistic missiles because it found little value in such systems, but would continue to seek to redress the imbalances caused by India’s moves. “Pakistan remains unfazed and as before, we have adequate response options which will disallow any disturbance of the strategic balance or strategic stability. That fundamental policy will prevail,” he said. Talking in the context of India-Russia deal for S-400 missile systems, he said India had been working on the development of a multi-layer ballistic missile defence (BMD) system for over a decade now. Besides the S-400 deal, India has large-scale cooperation with Israel for the development of the BMD. “Much hype has been created around this particular technology induction and some have gone to the extent of calling it a game changer for South Asia,” he said, adding that “this was wrong”. Lt Gen Mr Kidwai said Pakistan had already possessed “cost-effective solutions” to take care of India’s BMD in the shape of MIRV (multiple independently targetable re-entry vehicle) capability and four categories of cruise missiles. He said India’s BMD only had symbolic value and “Pakistan’s answer (to it) is available today”. The NCA adviser also said Pakistan had long ago taken “conscious decision” of not developing an anti-ballistic missile system because of the reasons that remain valid even today. He maintained that Pakistan’s response to India’s nuclear-powered ballistic missile submarine INS Arihant too could be found in full spectrum deterrence, which implied possession of a full array of strategic, tactical and operational weapons, having appropriate weapons yield, coverage and numbers, and liberty to choose targets. Nuclear-powered submarine INS Arihant had successfully completed its first deterrence patrol, taking India into a club of a handful of countries which have the capability to design, construct and operate Strategic Strike Nuclear Submarine (SSBN). Meanwhile, SVI president Dr Zafar Iqbal Cheema said India was looking for space for fighting a limited war with Pakistan, but Islamabad was trying to deprive it of that opportunity by coming up with responses like tactical deterrence. “This is our contribution to peace,” he added. India, he claimed, was pushing the region into an arms race that would have long-lasting consequences.

Source: <https://defenceupdate.in/>

Why India may not test Agni 6 even if DRDO is ready with technology?

Agni 5 is India’s most advanced missile and it has been inducted into the service after successive trials. After Agni 5 project ended, there were speculations that the DRDO may have begun working on an ICBM with longer range and payload carrying capabilities. Many reports have claimed that the DRDO a three-stage Agni VI missile. India has not made any clear statement on the development of Agni 6 which, many opine, may have range between 8,000 km to 10,000 km. DRDO usually has a development gap between each Agni-series of around 4-5 years. It has been over 5 years since Agni-V was developed and this has led to speculation that its successor could be ready. Agni 6 could be a three-stage solid fuel ICBM missile which will be heavier and thicker than the Agni-V. Agni-VI could possibly be able to carry 3 tonne warheads thrice that of Agni-V which can carry only 1.1 Tonne warheads. Agni-VI will be the first missile to have the capability to carry 4 or 6 multiple independently targetable re-entry vehicles (MIRV) payloads. The question of MIRV technology is tricky, as some reports suggest that India may already have tested Agni 5 with MIRV technology. DRDO or the government has made no official statement on any Indian missile capable of MIRV. The range of Agni 5 itself is a mystery of sorts as China claims that it can travel as far as 8,000 kms. The DRDO claims that Agni 5 has a range of 5,000 kms. Range of ballistic missiles is a contentious issue. Many European nations and experts in the US argue that why should India develop a 10,000 kms plus range ICBM when its furthest rival is China. If India unveils Agni 6, then it may irk the US and some European countries. India would be risking sanctions if it blatantly goes ahead and tests Agni 6. India is a rising economic power and at this juncture, it would not like to sour economic ties with Europe. A missile of 10,000 km range is bound to make European nations uncomfortable and this may have an impact on trade ties. So, even if the DRDO is ready with the technology, Indian government is very unlikely to unveil, or even acknowledge the existence of Agni 6 ICBM.

Source: <https://defenceupdate.in/>

E-NEWS



China's J-20 Stealth Fighter to Pursue Targets at Greater Distances – Reports

The fifth-generation Chinese Chengdu J-20 stealth fighter, which entered military service last year and participated at Airshow China 2018 in Zhuhai, will now be able to strike targets at greater distances, according to Beijing. China Central Television revealed that the aircraft has been equipped with a retractable refuelling probe embedded on the right side of the cockpit, to help the fighter to maintain stealth while flying greater distances, the Air Force Times reported. Previously it had been reported that the J-20 struggled to remain in stealth mode, and it had been decided to go with a retractable probe, as a consistently exposed probe would make the J-20 visible to enemy radar systems. Another feature to help the J-20 remain stealthy is allowing four of the six onboard missiles to be stored internally, Chinese military experts told China's Global Times. The exact range of the stealth fighter — nicknamed Powerful Dragon — is unknown. The Air Force Times suspected that the aircraft has a combat radius of 1,100 kilometres, allowing it to conduct long-range strikes and intercepts. With aerial refuelling capability, the J-20 can extend its reach, allowing China to better patrol disputed waterways. The J-20's chief designer said, cited by the Air Force Times, that certain capabilities were unable to be presented at the recent airshow, noting that the world would have to wait and see what the J-20 had to offer. The J-20 — a combat platform which according to Chinese experts is superior to the US F-22 Raptor and the F-35 Lightning II Joint Strike Fighter — was incorporated into Chinese combat units in February. It was tested in combat training exercises, however, according to South China Morning Post, the aircraft is expected to receive new engines which will allow the warcraft to 'achieve its full potential,' according to reports.

Source: Sputnik News

Army To Test Fully Indian Man-Portable Anti Tank Missile Shortly

The Indian Army is all set to get its first ever of an anti-tank weapon fully developed and built in India. After decades using weaponry from Russia and France, and with deals with the United States and Israel either collapsing or adrift, in a few months, an Indian infantry team will be operating a comparable Indian-made weapon for the first time ever. Breaking cover this September with a series of debut test firings, India's fully indigenous man portable anti-tank guided missile (MPATGM) will be picked up by the Indian Army. A test team will join the development effort for a series of user-assisted flight trials in the first quarter of 2019. These trials will be crucial to fine-tuning the missile system to the Army's specifications. In the weeks since the system first emerged in public, more is now known about it. For instance, we now know the baseline MPATGM system sports a range of 2.5 km, not 4 km as earlier speculated. In signature style, the missile's developer — a cluster of labs under India's DRDO — has officially declared this month in internal literature that the MPATGM 'will be comparable to the best ATGM systems in the world, viz., Javelin by US and Spike-MR by Israel.' The mention of those two systems is no coincidence — India has in the past rejected the Javelin system and continues to dither over a purchase of the Israeli Spike. Since the MPATGM program was sanctioned in January 2015, the DRDO has consistently offered that the system is worth waiting for. The program's scope includes design and development of a third generation ATGM with a launch tube (LT) and launcher and command launch unit (CLU), demonstration of the system performance through ground testing and flight testing. A group of laboratories is currently working to complete initial development flight trials before the Indian Army comes on board. The Defence Research and Development Laboratory (DRDL) in Hyderabad oversees the project, and handles missile system studies, control and guidance design and the aerodynamic and structural design and testing. The DRDL receives distributed technological inputs from a list of laboratories include the RCI (Hardware-in-Loop testing and evaluation of control algorithm incorporating sensor package, control actuation system and integrated electronics hardware), HEMRL (propellant for launch motor and flight motor), TBRL (tandem warhead), ARDE and IRDE (target acquisition system). As with most indigenous weapons programs, the MPATGM is working out technological hurdles. For instance, the DRDO reveals, "The third-generation ATGM having fire and forget capability works on the homing signal provided by a miniature Image Infrared Seeker (IIR) housed in its front end for guidance. Configuring the optical module to focus the image on the detector and realization of the signal processing electronics to achieve the 2.5 km range with the available space within a missile of 120 mm diameter was really a challenging task." On the twin September tests, the DRDO says, "Two pre-programmed control missions have been executed to prove vehicle controllability as well as manoeuvrability with realistic guidance command. The missile was successfully tested at KK Ranges, Ahmednagar for maximum range trajectory in top attack mode on 15 September 2018 and for minimum range trajectory in top attack mode on 16 September 2018. The successful missions proved the controllability of the missile aero configuration along with major subsystems, viz., propulsion, control system and onboard integrated electronics hardware." A set of guidance missions are expected to be held at the KK Ranges in Maharashtra's Ahmednagar this month and the next before the team gets down to preparing for

E-NEWS



joint trials with an Indian Army infantry team. While the Indian Army has failed to close a deal so far with Israel for the Spike ATGM system, it continues to receive briefings and pitches on hardware from other countries. Most recently, the Army received briefings from MBDA for the MMP ATGM 5 system as a possible man-portable system, as well as for the Future Infantry Combat Vehicle (FICV) and BMP upgrade programs.

Source: LiveFist Defence

Akash v/s Spyder : UAE will be the first country in the Gulf to get Made in India Akash

At the recently concluded visit by a high-level defence delegation from UAE, 'Made in India' Akash surface-to-air missile system (SAM) was high on the agenda. Sources confirmed to FE Online that the delegation led by UAE Minister of State for Defence Affairs, Mohammed Ahmed Al Bowardi Al Falacy is keen on buying this missile which has been indigenously made by the Defence Research and Development Organisation (DRDO). If the missile which is totally indigenous is being produced by defence PSU Bharat Electronics Ltd (BEL), has an interception range of 25-km, is exported to UAE, it will be the first time ever that India would have exported a system like this to a Gulf country. The missile meant to keep fighter aircraft, helicopters and drones from attacking critical installations is comparable to the SPYDER (Surface-to-air PYTHON and DERBY) Missile of Israel. The SPYDER is a short and medium range mobile air defence system developed by Rafael Advanced Defense Systems with assistance from Israel Aerospace Industries (IAI). India's Akash is packed with a battery that can track and attack several targets simultaneously; the missile can carry a warhead of 60 kgs and can hit the target up to 30 Kms. The SPYDER is a low-level, quick reaction missile expected to neutralise hostile targets up to 15 km away and at heights between 20 and 9,000 metres. The Indian Air Force (IAF) has already inducted the SPYDER Missile along with the homemade Akash surface-to-air missile (SAM) with a range of 25 km as part of a strategic planning for a double layer approach to defend critical assets and locations in the country. The Israeli Missile can provide air defence for fixed assets and for point and area defence for mobile forces in combat areas fitted on either Tata Trucks or Scania P-series truck, or a Dongfeng truck. However, the Akash Missile can be launched from static or mobile platforms and can handle multi-target and destroy manoeuvring targets such as unmanned aerial vehicles (UAV), fighter aircraft, cruise missiles and missiles launched from helicopters. The system also defends vulnerable areas in all weather conditions against medium-range air targets being attacked from low, medium and high altitudes. India has made certain changes in its Defence Export Policy which would enable it to export different platforms to friendly nations. As reported by FE Online earlier, the UAE government is possibly looking at the DRDO-developed Astra 70-kilometer range air-to-air missile too to be fitted on the Mirage fighter planes that it is operating.

Source: <https://defenceupdate.in>

BUSINESS

Odisha Aerospace and Defence Manufacturing Policy rolled out

Odisha government rolled out Odisha Aerospace & Defence Manufacturing Policy, 2018 ahead of the second edition of 'Make In Odisha Conclave' held here from November 11 to November 15, 2018. The policy, which has been approved by the state cabinet, will be placed before investors at the conclave, an official said. The policy aims at carrying forward the process of industrialisation through promotion of aerospace and defence manufacturing enterprises, to generate employment opportunities and promote value addition, he said. To attract investment in aerospace and defence manufacturing in the state, the policy proposed to extend subsidy upto 50 per cent of the cost of land, building, plant and machinery to the special purpose vehicle for setting up the first state-of-the-art Aerospace and Defence Park in the state, the official said. The ceiling will be Rs 50 crore for common facility centre, Rs 30 crore for technology innovation centre and Rs 25 crore for testing centre to be established with private participation. The policy also provides capital grants of 50 per cent of the infrastructure cost limited to Rs 10 crore for subsequent aerospace and defence parks. The policy will also extend a capital subsidy of Rs 100 crore for the first three OEMs (original equipment manufacturer) for setting up manufacturing facilities in the state with investment of at least Rs 1000 crore and generating 1000 domiciled employment, the official said. In addition, for the first three OEMs setting up manufacturing units in the state the interest subsidy will be allowed up to a limit of Rs 10 crore per annum and Rs 5 crore per annum based on investment in plant and machinery for an amount of more than Rs 500 crore and between Rs 100 crore to Rs 500 crore respectively. This provision is designed to attract key players to setup units in the state, which in turn will provide impetus for further development of ancillary and downstream units in the state, he said. Other units, will be entitled to 10 per cent capital subsidy upto Rs 50 crore, as per the policy. New A&D manufacturing units shall be entitled to interest subsidy for timely

E-NEWS



payment at the rate of five per cent per annum on term loan availed from public financial institutions/banks for a period of five years from the date of commencement of production subject to a total limit of Rs 10 lakh for micro enterprises, Rs 20 lakh for small enterprises, Rs 40 lakh for medium enterprises and Rs 1 crore for non MSME units, it said. Besides, micro, small and medium units will have support of reimbursement of cost towards Employees' State Insurance and Employees' Provident Fund for employment of skilled and semi-skilled workers domiciled in the state. Provisions for other incentives such as land at concessional rate, exemption of premium for conversion of land an stamp duty, reimbursement State Goods & Service Tax (SGST) and others are proposed to be extended. Besides, the enterprises to come up in the industrially backward districts of Kandhamal, Gajapati, Mayurbhanj along with the KBK (Kalahandi-Bolangir-Koraput) districts will be extended additional incentives, it said.

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

Eaton Aerospace to set up plant in Bengaluru

Eaton Industrial Products Pvt Ltd has decided to set up its first aerospace division at the Bangalore Aerospace Park with an investment of Rs 50.50 crore. The company, a part of the \$20 billion US-based power management firm, has decided this close on the heels of Boeing's decision to set up an electronics manufacturing and avionics assembly facility at the same area. Boeing is expected to make an investment of Rs 11.52 billion. Quoting sources in Karnataka government said, "The state government's single window clearance committee at its meeting held on 1st August discussed the investment proposal and cleared it." The facility of Eaton will come up at the Devanahalli Aerospace Park. The company has acquired a total land parcel of 2.75 acres and expected to generate direct employment of about 109 persons.

Source: <http://bizshorts.in/>

AWARDS

Two IISc. researchers among six winners of Infosys science prize

The tenth edition of the Infosys Prizes was announced in Bengaluru. Six scientists and researchers in the fields of engineering and computer sciences, humanities, life sciences, mathematical sciences, physical science and social sciences were selected by a jury which included Nobel laureate Mr Amartya Sen, former Chief Economist Mr Kaushik Basu and eminent mathematician Mr Srinivasa S.R. Varadhan. The prize carries a gold medal, citation and a purse of \$100,000. Among the winners, Mr Navakanta Bhat, professor, Indian Institute of Science, Bengaluru, and chairperson, Centre for Nano Science and Engineering, IISc, was named for his contributions to the field of engineering and computer science. "Mr. Bhat is recognised for developing novel electrochemical sensors that replace conventional enzyme and antibody based biosensors by fundamentally more stable sensors based on chemical ligands and metal ions. These can lead to better and cheaper testing for diabetes, liver and kidney functions," read the jury citation. Ms Kavita Singh, Professor and Dean, School of Arts & Aesthetics, Jawaharlal Nehru University, New Delhi, was awarded the prize for humanities for her study of Mughal, Rajput and Deccan art, as well as her in-depth writing on the historical function and role of museums. The award for life sciences went to Ms Roop Mallik, Associate Professor, Department of Biological Sciences, Tata Institute of Fundamental Research, Mumbai. He was chosen for his work on molecular motor proteins, which are crucial for the functioning of living cells. In the field of mathematical sciences, Ms Nalini Anantharaman, professor and Chair of Mathematics, Institute for Advanced Study, University of Strasbourg, France, was named for her work related to "quantum chaos" and Mr S.K. Satheesh, professor, Centre for Atmospheric & Oceanic Sciences, Indian Institute of Science, and Director, Divecha Centre for Climate Change was awarded for his scientific work in the field of climate change. He received the award in the physical sciences category. In the social sciences category, Mr Sendhil Mullainathan from The University of Chicago Booth School of Business was named for his work in behavioural economics. The winners will be felicitated on January 5, 2019, in Bengaluru by mathematician Ms Manjul Bhargava. The Infosys Science Foundation was formed by the trustees of the software company, Infosys, in 2009 to encourage "basic science research." Since its inception, the foundation has given away prizes to 62 scientists and researchers. From village to science lab From growing up in a small village in northern Karnataka, where even a radio was a novelty, to creating nanoscale transistor devices and low-powered sensor devices, Mr Navakanta Bhat, professor, Indian Institute of Science, Bangalore, and Chairperson, Centre for Nano Science and Engineering, IISc, has come a long way. And he credits this to his ability to dream big. "The first time electronics caught my fascination was when I was a high school-going child. My uncle, who was

E-NEWS



studying in REC Surathkal (today's National Institute of Technology), had introduced a tape recorder in a very remote village in the State. It opened my eyes about what technology could do to transform lives. That is when I decided to pursue electronics," he said, adding that his education in Kannada medium did not deter him to pursue his dream. He went on to study engineering from Mysore and later micro-electronics from IIT-Bombay. He worked for Motorola in the U.S. before joining IISc in 1998. "A group of us created the nano fabrication centre at IISc, which today is among the top 10 such centres in the world," he said. The second winner from IISc, Professor Mr S.K. Satheesh, also shares a similar life journey; he grew up in a remote village in Kerala. "The turning point in my life was when I was selected in Indian Space Research programme at the Vikram Sarabhai Space Centre. For the last two decades, I have been working at IISc on light-absorbing microscopic particles in the air which influence the energy balance of the atmosphere," he said. "Mr. Satheesh's work on measuring, quantifying and analysing the impact of black carbon aerosols are important to not only climate science but also to our society that has to mitigate and cope with climate change, possibly the most important threat to humanity," said Mr Shrinivas Kulkarni, professor of Astronomy and Planetary Science, California Institute of Technology and the Jury Chair.

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

EVENT



THE AERONAUTICAL SOCIETY OF INDIA

13-B, INDRAPRASTHA ESTATE, NEW DELHI-110002
Ph.: 23370516, 23370058 Fax: 011-23370768
Email: aerosoc@bol.net.in Web: www.aerosocietyindia.in

The Aeronautical Society of India Invites entries for

(A) HAL ESSAY COMPETITION – 2018

(Sponsored by Hindustan Aeronautics Limited)

SUBJECTS.

- i) "Industry 4.0 and its implications to Aerospace Manufacture".
- ii) "India : Largest Growing Domestic Aviation Sector", Critical factors for Sustainable and Inclusive Growth, Current Market Scenario and Future Prospects.

(B) PHL ESSAY COMPETITION – 2018

(Sponsored by Pawan Hans Helicopters Limited)

SUBJECTS.

- i) "Conflict Management in Aviation : Commercial Interest Vs Passenger Comfort".
- ii) "Challenges of customer satisfaction in helicopters operations in India".

- Best Entry on each of the four subjects shall be rewarded with a cash prize of Rs. 5000/- and a certificate.
- An Entry should not be more than 3000 words and be submitted in three typewritten copies. Author to provide his/her name, address, date of birth, employment status/parent organization, Mobile/telephone/fax nos., and email id for further communications. Also one Passport size photograph of the author is to be enclosed along with each entry.
- Last date for receiving the entries is 15 Jan 2019. Result of the competitions would be announced by 31 Jan 2019.
- This Award is restricted to once in three years to a particular individual.
- For further queries, contact : Secretary (Admn) on Phone 011-23370516, 23370768(Fax), email : aerosoc@bol.net.in Web : www.aerosocietyindia.in
- The Society reserves the copy right of the entries. Decisions of the Society on the subject shall be final.

05 Dec 2018.
New Delhi.


(Yatindra Kumar)
Secretary (Admn)

(Please give wide publicity of this announcement.)

ADVERTISEMENTS

E-news is bringing out an exclusive slot for individuals to advertise for career opportunities. Industries and Institutions can promote advertise at very nominal charges product ranges as well as airline operators to present route and tariff offers.