



CURRENT AFFAIRS



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HAL Produced FOC Standard LCAs Join IAF Stable

HAL produced FOC standard LCA Tejas has been inducted into IAF Squadron ‘The Flying Bullets’ at a function at Sullur (Tamil Nadu) today, marking another milestone for HAL. “We are proud to deliver a much lethal aircraft than the IOC block. Apart from all the capabilities of IOC aircraft, the FOC variant additionally comes with Air- to-Air refueling capability, close combat gun, additional drop tanks, BVR missile capability, updated avionics and flight control software suite”, says Mr. R. Madhavan, CMD, HAL. The FOC variant will reduce the maintenance man hours and turn-around time resulting in enhanced support for IAF missions. Four more FOC-LCAs are in the advanced stages of production and testing and expected to join the Squadron soon. HAL commenced the training for both air crew as well as maintenance crew for FOC aircraft and the first batch of trained air warriors are already with the 18 Squadron.

Source: <https://hal-india.co.in/>

CURRENT AFFAIRS

IAF choppers to be pressed into service for anti-locust ops

Indian Air Force choppers will now be deployed to tackle the locust menace. The agriculture ministry is importing high-powered spraying equipment that will be fitted on five Mi-17 helicopters for IAF for spraying on locust swarms. "A high-power spraying equipment is being imported from EU to be fitted on five Mi-17 helicopters of the IAF. The close collaboration between different ministries, IAF, Army Aviation Corps and the industry will help us win against the worst locust attack in 27 years. An empowered committee is negotiating with helicopter companies and an agreement is expected soon, subject to DGCA clearance," said a senior aviation ministry official. The aviation ministry had last month allowed the agriculture ministry use of spray drones to spray for anti-locust operations. "An inter-ministerial empowered committee conducted fast-track negotiations with bidders and work orders have been issued to five drone companies. The drone-squads will reach the hotspots — Barmer, Phalodi, Nagaur and Bikaner, early next week," said the official. "In 2-3 years, as demand rises and drone prices fall, we hope to have village-based entrepreneurs who provide drone services for crop mapping, analytics, yield improvement advice and spraying. Just like people who loan out tractors, seeders and harvester-combines," the official added.

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

Amidst tension on borders, IAF building emergency airstrip in Kashmir

Amidst prevailing tension on borders with China and Pakistan, Indian Air Force (IAF) has started construction of an emergency three-kilometre-long runway parallel to a stretch of Srinagar-Jammu National Highway in southern Anantnag district. The construction work started and is going at a fast pace. Currently, the earth filling work is being done on the stretch which is being executed by a lesser-known local construction company - Fetch Constructions. Sources said that work on the runway adjacent to the National Highway (NH-44) in Bijbehara area is going on at war footing. "On completion, it will serve as an alternate runway facility for fighter jets in case of any emergency," they said. On completion, it will be the third airstrip in the Kashmir Valley, after those in Awantipora and Srinagar, that will be used by the IAF for its exercises. Major General, A Sengupta, General Officer Commanding (GOC) of Awantipora-based Victor Force said the runway is being constructed by the IAF. However, he declined to further comment on the issue. Officials of the National Highways Authority of India (NHAI) also confirmed that the 'emergency landing and runway strip' was under construction. They said they did not have operation details. No IAF official was available for comment. A senior Army official said the construction of the runway had nothing to do with a stand-off with Chinese troops along the Line of Actual Control (LAC) in Ladakh Union Territory. "Future highways could be the latest force multiplier for the Air Force," he said, adding that some public roads had been designed to serve as runways for its warplanes to "provide an alternative for launching operations if key airfields are bombed out by the enemy". The IAF, he said, had firmed up an ambitious plan for emergency airstrips in "important sectors". "This (construction of the runway) is part of that plan," the officer added. "The decision was taken in June last year. This strip is among the 13 other such strips to be constructed across the country," he said.

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

HAL awaiting approval for Mk-1A manufacture: CMD

Hindustan Aeronautical Ltd (HAL) is awaiting approval from the Cabinet for manufacture of LCA Mk-1A, the improvised version of Mk-1 to be supplied to Indian Air Force (IAF), a top official said. The Cabinet's approval should have been received earlier, but was delayed due to the COVID-19 situation and the company is expecting it during the third quarter of the financial year, HAL Chairman and MD, R Madhavan told reporters at Sullur near here, on the sidelines of handing over Tejas Mk-1 FOC to the IAF. HAL has an order of 83 such fighter aircraft and once it received the approval it would start supplying by 2023, in 36 months, he said. Similarly, another version Mk-2 is under design stage, which will be more advanced than the previous variants, he added. Stating that the FOC variant will reduce the maintenance man hours and turnaround time resulting in enhanced support to IAF missions, Madhavan said 16 more such FOC fighters will be delivered soon, by increasing the manufacturing capacity from eight to 16. When asked about setting up an assembling unit in Coimbatore, which has a defence manufacturing corridor, Madhavan said of the more than

2,000 vendors, the city has a major share and there was no plan to set up a unit so far. To another question on exports, the official said that HAL was very much interested in supplying to other countries. Air officer Commander in Chief Southern Air Command, Amit Tiwari, who was present, said that IAF had enough war planes and there was no shortage as such.

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

IAF chief calls for big push to indigenous defence production

Chief of Air Staff Air Chief Marshall R K S Bhaduria called upon the defence manufacturing industry to grab the opportunity presented by the current situation and work together with IAF to “change the face of Indian defence industry”. Operationalizing No 18 Squadron of the Air Force, equipped with indigenously made final operations clearance (FOC) version of light combat aircraft (LCA) Tejas Mk1 at Suler in Tamil Nadu, Bhaduria urged the defence industry to synergize with other stakeholders to design and develop aviation systems suitable for air force. Addressing members of the squadron, delegates from Hindustan Aeronautics Limited and Aeronautics Development Agency after the official ceremony, Bhaduria said a lot of work was happening in IAF in order to fine tune its capabilities. This fine tuning on technology and capability fronts was being done as far as possible within the country. “Only when it is absolutely essential, we seek capability outside,” he said, underlining the significant role the defence industry could play in the current phase to cater to the needs of the IAF to design and develop suitable indigenous defence systems. “So much is possible within the country,” he said. Noting that IAF was close to signing the contract for 83 Tejas Mk 1A fighter crafts with HAL, he said the mission and requirement of IAF for the next two to three decades was to seek indigenously made systems, from Tejas Mk 2 crafts, radars and technologies among other things. Bhaduria stressed more than once on the need for synergy and working together by defence design, development, production sectors with the Air Force. “We should be able to grab this opportunity and change the face of defence industry in the country in the next 10 to 20 years. If you do not act now, you will lose time and opportunity,” he said. Bhaduria noted that in trying to change the face of the defence industry, budget will be an issue, but budget constraints should not become an excuse for the industry to not take off. Earlier, Bhaduria said the operationalization of No 18 squadron was a moment of pride for Suler Air Force Station, the Air Force and the defence manufacturing industry. With the operationalisation of “Flying Bullets” and induction of Tejas, Suler now has two squadrons equipped with Tejas. “Flying Daggers”, the No 45 squadron operationalised at Suler in 2018, was the first to induct Tejas, but an initial operational clearance (IOC) version. The current version inducted into No 18 squadron is an improvised one, after incorporating the feedback given by airforce pilots. HAL chief managing director R Madhavan, Girish S Dheodhare, Director of ADA, and Air Marshal Amit Tewari, Air officer commanding-in-chief of Southern Air Command were present. The famed No. 18 Squadron which participated in 1971 Indo – Pakistan war was formed 1965 but was decommissioned in 2016 and has been resurrected now at Suler. “As time goes on, No 18 and No 45 squadrons will become the core of our growth in terms of combat capabilities,” Bhaduria said.

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

IAF set to raise second LCA squadron in Suler

The Indian Air Force is all set to raise its second squadron of the locally made light combat aircraft Tejas at Suler in Tamil Nadu on May 27, people familiar with the development said. The IAF’s first Tejas squadron was raised at the Suler air base in 2016 with two aircraft and more planes joined the fleet progressively. IAF chief Air Chief Marshal RKS Bhaduria is expected to travel to Suler for the event. The second squadron is being raised with the first aircraft in the final operational clearance (FOC) configuration and more will be added later, officials said. The IAF has so far ordered 40 LCAs, split in the initial operational clearance (IOC) version and the more advanced and FOC configuration. The first squadron consists of IOC aircraft. “The raising of the squadron, though delayed, is welcome news. Hindustan Aeronautics Limited has to speed up production of the Tejas to meet the trust placed on it by the IAF; eight Tejas per year is just not acceptable,” said Air Vice Marshal Manmohan Bahadur (retd), additional director general, Centre for Air Power Studies. In March, the defence ministry gave the green light to the purchase of 83 LCA Mk-1A advanced Tejas jets from HAL. The contract is expected to be inked in the coming months. The deal, expected to be worth Rs 38,000 crore, is critical for HAL to prevent a complete halt of production at its facilities. HT reported on January 11 that HAL’s order books are empty beyond 2021-22 and new orders from the armed forces — especially for the 83 jets — are critical for continuity in production. The LCA Mk-1A will come with additional improvements over the FOC aircraft, making it the most advanced Tejas variant so far. The Mk-1A variant is expected to come with digital radar warning receivers, external

self-protection jammer pods, active electronically scanned array radar, advanced beyond-visual-range missiles and significantly improved maintainability. HAL is expected to deliver the first Mk-1A jet to the IAF three years after the deal is signed. The IAF is struggling with a shortage of warplanes. Compared to an optimum strength of 42-plus units required to fight a two-front war, the count of the IAF's fighter squadrons has shrunk to 31. The first four of the 36 Rafales ordered from France are expected to arrive in India by July-end.

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

There will be no delay in supply of Rafale jets to India: France

There will be no delay in delivery of 36 Rafale jets to India as the timeline finalised for the supply of the fighter jets will be strictly respected, French Ambassador Emmanuel Lenain has said. France is reeling under swelling cases of coronavirus infection and there were apprehensions that the delivery of Rafale jets could be delayed due to the pandemic. Over 1,45,000 people were infected by the virus there, while the death toll stood at 28,330. However, Mr. Lenain asserted that the original timeline for the delivery of the jets will be adhered to. "The contractual delivery schedule of the Rafale jets has been perfectly respected till now, and, in fact, a new aircraft was handed over to the Indian Air Force in end-April in France, in keeping with the contract," Mr. Lenain told PTI. Defence Minister Rajnath Singh received the first Rafale jet at an airbase in France on October 8. "We are helping the Indian Air Force in arranging for the ferry flight of their first four Rafales from France to India as soon as possible. So there's no reason today to speculate that the schedule will not be maintained," the envoy said. India had signed an inter-governmental agreement with France in September 2016 for the procurement of 36 Rafale fighter jets at a cost of around ₹ 58,000 crore. The IAF has been maintaining that the Rafale jets would significantly enhance its combat capability. The aircraft is capable of carrying a range of potent weapons. European missile maker MBDA's Meteor beyond visual range air-to-air missile and Scalp cruise missile will be the mainstay of the weapons package of the Rafale jets. Meteor is the next generation of BVR air-to-air missile (BVRAAM) designed to revolutionise air-to-air combat. The weapon has been developed by MBDA to combat common threats facing the U.K., Germany, Italy, France, Spain and Sweden. Guided by an advanced active radar seeker, Meteor provides all weather capability to engage a wide variety of targets from fast jets to small unmanned aerial vehicles and cruise missiles. Besides the missile systems, the Rafale jets will come with various India-specific modifications, including Israeli helmet-mounted displays, radar warning receivers, low band jammers, 10-hour flight data recording, infra-red search and tracking systems. The IAF has already completed preparations, including readying required infrastructure and training of pilots, to welcome the fighter aircraft. The first squadron of the aircraft will be stationed at Ambala air force station, considered one of the most strategically located bases of the IAF. The Indo-Pak border is around 220 km from there. The second squadron of Rafale will be stationed at Hasimara base in West Bengal. The IAF spent around ₹ 400 crore to develop required infrastructure like shelters, hangars and maintenance facilities at the two bases. Out of 36 Rafale jets, 30 will be fighter jets and six will be trainers. The trainer jets will be twin-seater with almost all the features of the fighter jets. The Congress raised questions about the deal, including on rates of the aircraft, and alleged corruption, but the government has rejected the charges. There will be no delay in delivery of 36 Rafale jets to India as the timeline finalised for the supply of the fighter jets will be strictly respected, French Ambassador Emmanuel Lenain has said. France is reeling under swelling cases of coronavirus infection and there were apprehensions that the delivery of Rafale jets could be delayed due to the pandemic. Over 1,45,000 people were infected by the virus there, while the death toll stood at 28,330. 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Source: <https://www.thehindu.com/>

DPSU, private sector integration need of the day: Air Chief Marshal RKS Bhadauria

The focus on Make in India and its big acquisition programmes will give a boost to indigenous industry in this hour of need, says Air Chief Marshal Rakesh Kumar Singh Bhadauria. He says even programmes with foreign content, like the acquisition of 114 medium combat jets, will evolve to maximise technology transfer and localisation. Excerpts of an interview with Manu Pubby on defence production reforms and FDI limit increase: Overall the steps will have a serious impact on our ability to energize Make in India. The aviation sector is capital and technology intensive and will get a lot of boost from the steps. The increase in FDI limit should be seen along with the fact that MSMEs are being supported. The 49% cap did not have the kind of impact desired but this (the new 74% limit) will create a big impact. The challenge, I see, is for DPSUs to integrate with the private sector. The whole of industry has to work together. On procurement priorities: The order for 83 LCA Mk1A is a very big priority for us. It will naturally fit into the new regime and despite the issue of budgets, it is something we would want to go ahead with and, I am sure, it will get finalised soon. It will help HAL, the MSMEs as well as the private sector. Our focus is on this order for many reasons—the first 40 LCAs on order are more or less through and we need to have the order for continuity. We need to take the LCA programme to its max potential and for that we are already launching the Mk II programme as well. The other priority is the HTT 40 basic trainer that is close to getting finalised. This is an area in which we want work to quickly finish. It is a priority as we have closed the issue of procuring additional Pilatus trainer, so it is important that these aircraft come. On acquiring 114 medium combat aircraft and transport planes: The 114 project is work in process but there would be a substantial shift towards moving the entire manufacturing to India. This will be totally under Make in India and we need to address issues so that an entire transfer of technology takes place. The manufacturing capacity of this class of aircraft has to be brought into our industry. Capability wise, this is a very important project for the air force. We will follow it up after the LCA order. The contours of the programme will change and align with current directions and the need of the hour. The C 295 (transport plane programme with Tata-Airbus) is at the final stages. It is under process in the acquisition wing of the ministry of defence. In the transport stream, it is again an important Make in India project and from the industry perspective, it will bring in manufacturing capability in this segment. On managing budget constraints: We are targeting a bit of saving in the revenue side and re-prioritising capital spending as well. This year, a lot of training (and foreign exercises) have been put off and that will help save something. We will also have to stagger procurement projects and we want to help and support the indigenous industry in this hour of need. The challenge is to find new ways of tackling budget concerns and the industry also needs to find innovative solutions. If upfront advances and milestone payments can be reduced, it is as good as staggering payments for later years. On Rafale delivery and other fighter purchases: There has been an impact on the Rafale production as well as on the training side. We expect the first batch to come by end of July and in terms of production, there would be some impact but as we go along, it will get mitigated. The Su 30 MKI upgrade programme is also being processed as HAL will soon be out of work at its production facilities. Along with that, the MiG 29 project (purchase of 21 aircraft from Russia) is also on.

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

IAF to acquire 450 fighter aircraft in future, says Air Force Chief RKS Bhadauria

In the future, the Indian Air Force is planning to acquire 450 fighter aircraft for deployment on the northern and western frontiers of the country, Air Force Chief RKS Bhadauria said. The list of aircraft planned to be inducted by the Air Force include 36 Rafales, 114 Multirole Fighter Aircraft, 100 Advanced Medium Combat Aircraft (AMCA) and over 200 variants of the Light Combat Aircraft. "In the next 15 years, 83 LCAs are our primary focus, after that LCA Mark 2 will come in we are looking at close to 100 of those, that makes it near 200 of LCA class," Bhadauria told ANI in an interview. "AMCA, we are looking at six squadrons, so that puts it close to 100 (aircraft). So, in the indigenous domain areas

which are already frozen in terms of our requirement, in terms of our understanding with DRDO in the fighter (segment)," said the Air Force Chief. He added that the induction of these fighters would take place over a period of the next 35 years as the inductions have to be planned to keep in mind the future requirements. The Air Force Chief said: "In the trainer aircraft segment, we are looking at 70 HTT-40 as a support aircraft to the Pilatus fleet. So, we are looking at 370 odd indigenous aircraft." The IAF chief said that currently it was the best time from the point of view for indigenous production and said, "It is now the perfect time for industries to respond and come up with solutions which are rapidly put in place and come up to the challenge of delivering these aircraft." On plans to acquire 114 multirole fighter aircraft, he said, "this project is in the middle-weight and is in the Rafale class, in this issue, we will deal with it in the Make in India region, with an increase in FDI, with support to the private sector. I think in future this will bring in technology which is required to support the aviation sector. I think it is important to have another generation of aircraft in terms of capability, technology as we go along." A few months ago, the Indian Air Force was facing a shortage of around 10 squadrons of Combat Aircraft in view of phasing out of the MiG-21 and MiG-27 fighters planes.

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

Savings from delayed foreign deals to push indigenous projects

The defence ministry has initiated a process to identify potential savings that can be made this year due to delays in production orders placed on foreign companies and could channel some of the resources to fast-track indigenous programmes that hold the key to sustaining local industry. Source said that foreign equipment manufacturers are being approached to understand which programmes are likely to see delayed deliveries and the way forward would be to defer payments for late deliveries, without invoking the penalty clause. Once the exercise is complete, the ministry would be able to understand how much of its committed liability payments could be freed up this year and could be channelised for Make in India projects. Several large ongoing programmes consume 90% of the defence capital budget, including the Rafale fighter jet deal, which is likely to see delayed deliveries by three to six months. With these large payments likely to be deferred, there is fresh focus on seven Make in India programmes that are in the final stages of signing and have the potential of sustaining more than 2,000 defence manufacturing units and MSMEs. The largest of these is the Rs 39,000 crore order for 83 Light Combat Aircraft (LCA) that is currently awaiting a nod from the Cabinet Committee on Security (CCS). The order for two regiments of Akash air defence missiles worth over Rs 6,000 crore is also in the final stages and could be fast tracked to be signed this year. The third project that could be fast-tracked is the order for six regiments of Pinaka Multi Barrel Rocket Launchers (MBRL) that has been pending since 2017. On the shipbuilding front, four big projects hold the key to private sector yards making it out of the Covid-19 crisis. These include the order for eight Fast Patrol Vessels While combined, these programmes are worth much more than the capital budget, kick-starting them would require only a 10% advance payment that could be channelised from savings made from foreign payments.

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

Third aircraft carrier not required as military's focus is on land borders

India's military engagements are focused on defending the Line of Actual Control (LAC) and dominate and prevent infiltration along the Line of Control (LoC), defence sources said questioning the need of a third aircraft carrier in the present circumstances and budgetary constraints. "The immediate requirement is to have a strong Army duly supported by a capable Air Force," sources said. "The Navy will require to project power in the Indian Ocean Region (IOR) and locate and degrade enemy ships. For this we may not require a large number of aircraft carriers. It can be accomplished by a combination of smaller ships, submarines, good information, Surveillance and Reconnaissance (ISR) and missile systems," sources said. With impending budget cuts, Chief of Defence Staff (CDS) Gen. Bipin Rawat had earlier questioned the priority of the third aircraft carrier and said naval aviation assets can be utilised on land borders when not utilised at sea. Sources pointed that China too had decided to invest in an aircraft carrier after it developed overall military prowess. Its force modernisation, which began in 1978, focused on military and developed capabilities to strengthen it which could settle land borders, which they have done successfully except with two nations, sources said. "They are now focusing on generating sea power and air power as they are moving towards becoming a global power." With several big ticket acquisitions lined up, Navy sources had recently said they are undertaking a fleet optimisation measure with focus on adopting unmanned platforms. However, the Navy is firm on the need for both a third aircraft carrier and the next line of six advanced submarines under Project-75I. With the Finance Minister announcing several measures to support domestic defence manufacturing and also reduce the import bill, sources said the military, heavily dependent on imports, has to "look inwards at indigenisation, only when the political leadership steps in". Do

we have an immediate requirement of a large Navy to fulfil our geo-political aspirations like securing IOR, Sea Lanes of Communication (SLOCS) and counter China? the source asked stating this was done by the U.S. and the U.K. during the cold war era to protect far away territories and to keep military confrontation away from home soil. "This is not the case for India in the immediate future." India is grappling with two strong military powers with land borders and past military engagements have all been land centric. Future war scenarios will be short and swift with limited objectives along limited axis, the source said adding the Navy has seen action only twice, 1965 and 1971, on the sidelines of the land operations and the aircraft carrier had minimum role. The Karachi harbour attack in 1971 was executed by missile boats, sources said. The Navy envisages its force structure centred around three aircraft carriers with one carrier each on the East and West coasts while one is in refit and maintenance. The proposed third carrier or the Indigenous Aircraft Carrier (IAC)-II is envisaged to displace 65,000 tonnes, conventionally powered and a steam-launched catapult for launching and recovering aircraft.

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

ISRO receives patent for highland soil simulant for future lunar missions

Indian Space Research Organisation (ISRO) has received a patent for its method of manufacturing highland lunar soil simulant. The simulant is made in bulk from similar rock samples identified and picked out from Sittampundi Anorthosite Complex, almost 67 km from Salem, in Tamil Nadu. The procedure has satisfied all aspects such as mineralogy, bulk chemistry, grain size distribution and geo-mechanical properties. The method used for preparing the lunar simulant is cost-effective, reproducible and easy to scale up, said the patent specification filed by the Space Agency. The simulant is quite similar to the regolith (loose unconsolidated rock and dust that sits atop a layer of bedrock according to Encyclopaedia Britannica) of lunar highland region. It can be used to control the mobility of the rover for scientific exploration and for the study of geo-technical or mechanical properties of lunar soil. The simulant could also be used for fundamental theoretical and experimental research for constructing civil engineering structures on the surface of the Moon, and to make headway in lunar locomotive engineering. There are bright and dark areas on the Moon's surface. The dark areas are called Maria or mare, which are mostly flat, while the highlands are heavily cratered and mountainous. ISRO's patent application claims that most of the countries produced simulants representing lunar mare region, while the highland crust occupies 83 per cent of the lunar surface. Yet, only a limited number of simulants represent the regolith of this region. It is difficult, expensive, and time-consuming to produce simulants in large numbers. Hence, there is a need for low-priced simulants for diverse lunar applications in order to minimise mission risk. The inventors have ingeniously arrived at a method to make a lunar simulant that has a chemical and mineralogical composition, and mechanical and geotechnical properties that are similar to those of lunar soil. "Most future missions propose for soft landing on the lunar highland region. Hence there is an urgent need for bulk quantity of lunar soil simulants that represent the highland lunar crust," it said in the patent specification filed in 2014. ISRO added that its simulant is exclusively manufactured to represent lunar highland region and should also be useable in diverse lunar applications to provide lowest possible risk. It may be recalled that for Chandrayaan-2, India's first moon landing experiment, ISRO had developed lander and rover indigenously after the Russian promise to offer the technology did not come up. These were tested in a simulated atmosphere with support of surface created by rocks transported from Salem. These rocks were similar in composition to the Moon's surface. Reports said the rocks were crushed to the required size and moved to Bengaluru where the facility was created. The mission, with an orbiter, a rover and a probe, successfully placed the orbiter which will have an extended lifespan of seven years, while the lander crashed on the Moon's south pole in September 2019. Several countries have been developing and producing lunar simulants, including the US, Japan and China, and several attempts has been made in the past to reproduce the lunar environment for research purpose. There has been renewed interest by many of these countries in probing Earth's only natural satellite for its mineral content in the recent past. Reports quoting ISRO in 2019 said the space agency has plans to explore a joint satellite mission in Moon's polar region in collaboration with Japan Aerospace Exploration Agency (Jaxa). According to reports, ISRO has announced a Chandrayaan-3 mission similar in configuration to the second Moon mission. It said that Chandrayaan-2 was a highly complex mission, as it brought together an Orbiter, Lander and Rover to explore the Moon's south pole. This mission was unique in that it aimed at studying not just one area of the Moon but all areas combining the exosphere, the surface as well as the sub-surface of the satellite in a single mission. "The Moon is the closest cosmic body at which space discovery can be attempted and documented. It is also a promising test bed to demonstrate technologies required for deep-space missions, said ISRO in its Chandrayaan-2 mission page. Chandrayaan-2 was aimed for enhancing our understanding of the Moon, stimulate the advancement of technology, promote global alliances and inspire a future generation of explorers and scientists,"

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

TECHNOLOGY

International Aviation Project: What I Learnt....

Out of intense complexities, intense simplicities emerge. - Winston Churchill

International projects have complexity written all over them. Despite all the technological advances, the complexity will probably continue to increase. Time zones, cultural differences, and native languages are not going away. Keep in mind that while technology is here to help us improve the way we connect with colleagues across the globe, the success of your project still depends heavily on human interactions.

Without complexity there is no intensity.

I had the opportunity to work with a multi-national, multi-cultural, and multi-functional team for fighter aircraft upgrade project. Distance, culture and language are three factors that can get in the way of communication and create problems for the project. Here are some lessons which I learnt while trying to align the global team for the project.

Addressing physical separation: One of the toughest obstacles is the distance between players that can have a negative impact on the outcome of your project. Here are some tips to keep in mind so that communication and coordination don't suffer and ways to reduce the challenges that physical separation brings.

- Plan face to face meetings early in the project. Invest the time to bring your team together in a face-to-face meeting at the time of kick-off or at the beginning of the phase of work. This sends a strong message to everyone that it's important and that there's an interest in making sure everybody works together.
- By meeting somebody just once in person, helps create a connection and improve cooperation.
- Make collaboration a top priority. This can be complimented by establishing a system that rewards people for working together and celebrating success together.
- Promote transparency as a core value in your team charter. Transparency helps people be mindful to be open to share in real-time the status of a task and to notify everyone immediately if a problem arises whether minor or big.
- Adopt technology and software to help simulate face-to-face human interactions, the best way possible. Video conferencing for example is better than just audio conferencing as it will help people feel closer than they really are. Having a single common data-sharing platform that every participant has access to, helps build a one team identity.

Adapting to Time Zones: It's quite possible that there will be someone on your global team that is ready to go to sleep when you're just getting into the office. Each subgroup will live and behave based on their own local time which can hinder coordination and synchronization of tasks in your project.

- Make sure everyone communicates time with the correct UTC time zone standard. Make it a habit to add the specific time zone of a meeting, the hours, and the offset in hours.
- Use the 24 hour way of writing the hours so you can avoid using p.m. or a.m. While 0400 is 4:00 a.m., 1600 is 4:00 p.m.
- Build consensus for meeting timing and plan adequate lead time for responses by considering the availability of your colleagues and when they will be receiving your requests. Don't expect someone will be reading your email when it's 0200 hours in their local area.
- Considering time differences, availability, and lead time will result in a happier and cooperative team.

Diverse culture: Trying to communicate with someone from another culture is often problematic when their values are different than yours. Train every team member on cross-cultural communication which will pay off very quickly.

- Be respectful of everyone from any culture. Show respect and you'll receive respect back.
- Avoid generalizing based on where a person is from. Trying to fit everyone into this or that frame can lead to misunderstandings and feelings of disrespect.

- Encourage team members to learn something about other members' cultures and traditions and thus leverage culture for a successful outcome.

Language barrier. The nature of international projects is to work with people that may not speak your own language or even if they do, it may not be at a sufficiently high level. This alone can lead to misunderstandings.

- Choose a common language of your team. All players should be trained to speak at a technical level with vocabulary and terms from business situations and project management concepts. For aviation projects I strongly recommend the use of ICAO terminology for aviation projects.
- Always speak slowly during the meeting with global team members. The team members may not be as fluent and they may have a problem in understanding your accent. It took me more than a week to fully understand Russians when they spoke English. Cater time for 'training ears' in your project schedule.
- Summarize at the end. It is always a good habit to take confirmation from all the members as to their understanding and commitment of work discussed. This leaves no room for confusion and misunderstanding. It also keeps everyone alert and mentally present during the meeting.

Going beyond the normal. Leaders for whom success is not what you accomplish in life but what you inspire others to do. These are few tips I learnt from my bosses and seniors in blue uniform which I as usual brushed aside initially during the project days however felt their impact after we were past the halfway milestone.

- Learning to speak other languages will always be a big plus for your project aside from the respect it shows your international partners. In my opinion this had the biggest impact on the outcome of the project I was involved in.
- Sending agenda points well in advance for a meeting, subsequently preparing minutes of meeting and action points after the meeting is another lesson which is a legacy from my service days that has a very positive outcome on the project.
- Celebrate national festivals and holidays of the team members. If that is not possible due to physical distance, an appropriate video call would be the next best approach.
- Take advantage of diversity. As a team leader you are likely to appreciate diverse approaches to the work and discover different solutions to the problem. Take the best advantage.
- Make effective communication, everyone's responsibility. Insist on simple written and verbal communication without the use of idioms and phrases.
- During written communication avoid the use of capital letters or exclamation marks in letters or while texting.
- Avoid the use of Emojis in business communication.
- For the project, if required take a professional help of interpreter or translator as the case may be. There would always be delays and loss of communication due to interpretation or translation. My recommendation would be to factor this in your schedule and multiply it with the range varying between 2 to 4.

Simplicity and complexity need each other. Always expect the unexpected in International Projects. Thank you, and I wish you many successes.

Author : Wg Cdr Anil Goyal (Retd) Test Pilot

BUSINESS

HAL may enter as government revisits Navy chopper plan

The defence ministry is re-evaluating its big 'Make in India' plan to manufacture naval utility helicopters. The companies have been asked to explain if the programme has export potential and the Centre is also looking at giving Hindustan Aeronautics Limited (HAL) a chance to enter the competition. The Rs 21,000-crore plan to manufacture naval utility helicopters in partnership with a foreign vendor has been in the works for over a year and important decisions on going

to the next step of technical evaluation have to be taken shortly. Sources said queries have been sent to Indian and foreign companies bidding for the project to understand if there are plans to continue the line beyond the 111 helicopters envisaged to meet exports in both civil and military markets. The ministry is also assessing if a lesser number of choppers were to be ordered, what the impact would be on technology transfer and cost viability. There is an apprehension that the project could be cut down in numbers as the ministry is revising all procurement plans due to an anticipated budget cut. Sources also said the HAL, which has been making a strong pitch for its Advanced Light Helicopter (ALH), could get a chance to enter the competition if it is able to develop compliant prototypes, within a specified period of time. The state-owned company has been pitching a naval variant of the ALH with folding rotor blades and tail but is yet to develop a prototype.

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

ISRO to tap startups to build local tech for Gaganyaan, future missions

India's space agency will tap startups to develop food and medicines for astronauts, better tools to access machines in a spacecraft and green engines for its maiden human space flight Gaganyaan-1. It will also potentially help them build products and solutions that they can exploit commercially. "We have already made the announcement of opportunities for research organisations and academics, it will expand to startups and industry," Indian Space Research Organisation (ISRO) Chairman K Sivan told ET. Last month, ISRO identified a set of 17 technologies that it invited researchers to develop locally at lower costs for use in its Gaganyaan missions. These included food and medicine for astronauts during space voyages, life support systems including a spacesuit, inflatable habitats and anti-radiation and thermal protection technologies for spacecraft to bring the astronauts back to earth safely. The space agency has already indicated that it was looking at several humanspace flight missions, housing a space station and eventually aim to send human beings to the moon. It has set up a small group to do a feasibility study for a manned mission to the moon. "This opens up opportunities for new types of companies to come up in India," said Awais Ahmed, founder and CEO of Pixxel, a homegrown startup that is building India's first private remote sensing satellite fleet. "There will be Indian startups doing biological experiments, private habitats in space and robotic arms that will benefit." ISRO should also share its intellectual property for the technologies, except for those that are very strategic, to any private entity that develops them, he added. Sivan said ISRO has opened up its facilities to private players, including helping a consortium of companies led by Larson & Toubro and HALNSE 7.51 % build its homegrown rocket - polar satellite launch vehicle (PSLV). India has sent four Air Force pilots to Russia for training, the first set of potential astronauts for the Gaganyaan-1 mission, which is expected by 2022. The space agency has built a spacecraft that can carry three astronauts.

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

ISRO turnover to zoom if units converted into separate entities: Official

The sum of the turnover of Indian space agency's various divisions if spun off into different business entities will surpass that of its behemoth parent owing to focused leadership and innovation, said a senior official of the Indian Space Research Organisation (ISRO). He said the best of the efforts in innovation in such a large industry, the conversion in product outputs are meagre to the extent of 5 to 10 per cent. "If ISRO is restructured in terms of smaller single-focus business entities like payload, satellite, rocket engine production, launcher integration and launch services, tracking and satellite maintenance services, the sum of turnovers of these individual entities will surpass substantially in comparison to the same by the ISRO behemoth," said Tapan Misra, Senior Advisor, ISRO and former Director, Space Applications Centre, ISRO. "The reason for improvement will be the encouragement of innovation by single focus leaderships. Many mammoth MNCs like Google, Microsoft, Space X, Boeing, and many others co-opt or fund or usurp innovative startups to create and absorb innovations. In India to reach this level, we may have to wait a few more years," Misra said. He said every industry will come to a saturation point in terms of product output and even an increase in input resource-capital and manpower, there will be hardly any increase in output beyond saturation point. "Innovation in business processes or manufacturing methods and strategies can improve efficiency. It means the saturation point can be achieved with lesser input resources. On the other hand, innovation on simplification of product design or bringing in more productive capital goods, i.e., the more efficient machinery to manufacture the products will raise the saturation output at same or lesser resources," Misra said. Behemoths like ISRO with multiple focus points will be resistant to innovations owing to inertia and occupation of leaders' mind, to run the behemoth industry itself in

the present avatar, he added. Pointing out technology will become stagnant and innovations discouraged in the absence of competition, Misra said that monopoly does not incentivise the emergence of capable, forward-looking and risk-taking innovative leadership. According to him, many of the monopolies were established, with sagacious minds as leaders, with an aim to bring the country in the front line of strategic sectors. "Unfortunately, many wise men prefer less competent subordinates and successors in order to satisfy their desire of stranglehold in the organisation when in service and out of service. This leads to the gradual degradation of the leadership quality with successive transitions, leading to stagnation in technology and services," he said. Market forces can play a role in promoting effective leadership as the profit and expansion are the prime motivation. It leads to re-emphasis of merit and leads to a better innovative environment.

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

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