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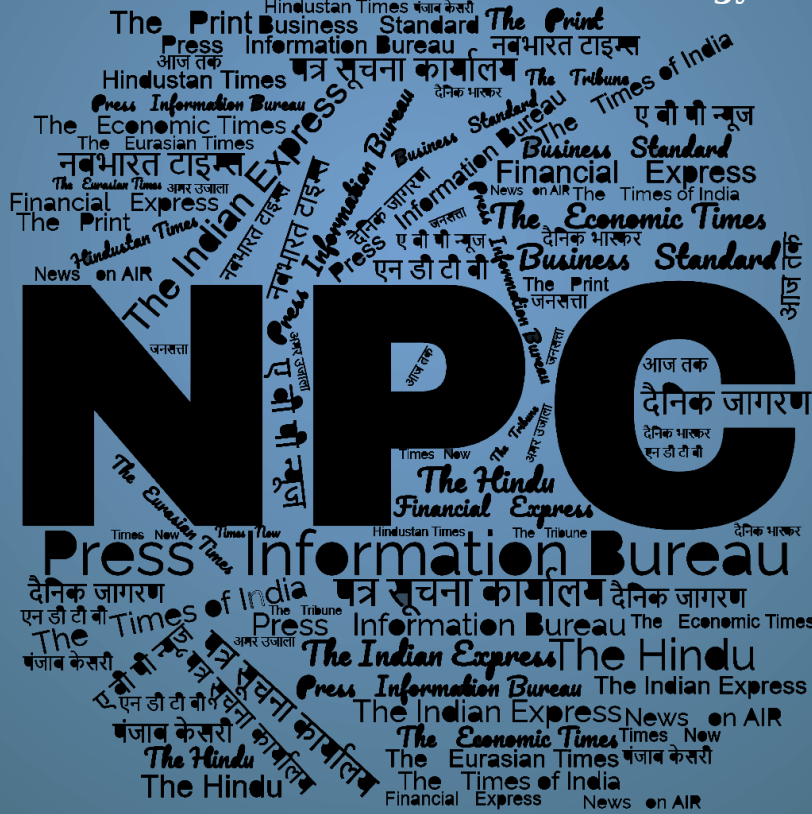
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# समाचार पत्रों से चयित अंश Newspapers Clippings

डीआरडीओ समुदाय को डीआरडीओ प्रौद्योगिकियों, रक्षा प्रौद्योगिकियों, रक्षा नीतियों, अंतर्राष्ट्रीय संबंधों और विज्ञान एवं प्रौद्योगिकी की नूतन जानकारी से अवगत कराने हेतु दैनिक सेवा

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## **Indian ADA to Roll Tejas Mark II Prototype with F-414 Engine by 2024 End**

On the eve of the historic India-US F-414 jet engine deal, both Aeronautical Development Agency (ADA) and the Hindustan Aeronautics Limited (HAL) have geared up to produce Tejas Mark II fighter by 2027-28 with the former ready to roll out the GE-414 powered prototype by 2024 end. The GE-414 engine, which will be manufactured in India under 100 per cent transfer of technology (TOT) after approval from US Congress, will power not only Tejas Mark II but twin-engine advanced multi-role combat aircraft (AMCA-I) and twin-engine deck-based fighter (TEDBF).

Given that India has plans to produce at least six squadrons of Mark II fighters for the Indian Air Force after 83 F-404-powered Tejas Mark I A have been produced and handed over to the military. With eight F-414 jet engines already procured by the ADA, design frozen, and critical design review already approved by the IAF, the agency will roll out the Mark II prototype by 2024 end for testing and operational clearance.

As PM Narendra Modi and his national security team have been able to deliver on F-414 engine through the “Make in India” route, the HAL has girded up for the upcoming challenge as the PSU will focus only on manufacturing the GE engine as no less than 500 aircraft engines have to be produced in India. It is understood that the HAL Bengaluru division and even the Nashik division may be tasked to take up the job and start production in collaboration with the GE. HAL already has experience in manufacturing aircraft engines as it was assembling AL31 FP after burning turbofan engines for the Russian SU-30 MKI assembly in India.

According to experts, HAL will fully focus on the production of Mark II fighter as well as the GE-414 engine after the production line of Mark I A tapers off.

The American defence major General Electric and HAL will sign an MoU for the manufacture of the F-414 engine on July 22 and exchange instruments before Prime Minister Narendra Modi and US President Joe Biden in Washington.

While the ADA under the DRDO is confident that it will deliver on Mark II on time, pressure will now be on HAL to energize the workers of PSU to meet the challenge ahead. Even as the engine will have to be produced by GE-HAL, the government may think of a special-purpose vehicle to produce Mark II fighters to meet the deadlines of the IAF.

<https://www.hindustantimes.com/india-news/indian-ada-to-roll-tejas-mark-ii-prototype-with-f-414-engine-by-2024-end-101687323218990.html>

# DRDO on Twitter



**DRDO** ✓  
@DRDO\_India



[#DRDOUpdates](#) | Air Direction and Helicopter Control Simulator (ADHCS) developed by ISSA, Delhi based DRDO labs can provide real-time operational environment scenario to trainees. ADHCS is part of ISC 'Dhruv' inaugurated by Raksha Mantri today.



**A. Bharat Bhushan Babu** ✓ @SpokespersonMoD · 21h

Raksha Mantri Shri @rajnathsingh, today inaugurated Integrated Simulator Complex 'Dhruv' at Southern Naval Command, Kochi to enhance practical training of @indiannavy personnel.

Read for more: [pib.gov.in/PressReleasePa...](http://pib.gov.in/PressReleasePa...)

@DefenceMinIndia

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@PIB\_India



2:35 pm · 21 Jun 2023 · 8,108 Views



DRDO

@DRDO\_India

#DRDOUpdates | DRDO labs organised special yoga sessions across the country to celebrate the #InternationalDayofYoga2023. On this occasion, Ms Amrita Sharma, Yoga Instructor, @mdniy delivered insightful talk on 'Importance & benefits of Yoga' at DRDO Bhawan. @SpokespersonMoD



1:58 pm · 21 Jun 2023 · 6,860 Views

## Defence News

## Defence Strategic: National/International



Press Information Bureau  
Government of India

Ministry of Defence

Wed, 21 Jun 2023

### **Raksha Mantri Shri Rajnath Singh Inaugurates Integrated Simulator Complex 'Dhruv' in Kochi to Enhance Practical Training of Indian Navy Personnel**

Raksha Mantri Shri Rajnath Singh inaugurated the Integrated Simulator Complex (ISC) 'Dhruv' at Southern Naval Command, Kochi on June 21, 2023. The ISC 'Dhruv' hosts modern state-of-the-art

indigenously-built simulators which will significantly enhance practical training in the Indian Navy. These simulators are envisaged to give real-time experience on navigation, fleet operations and Naval tactics. These simulators will also be utilised for training of personnel from friendly countries.

Amongst the many simulators envisaged in the complex, the Raksha Mantri visited Multi-Station Handling Simulator (MSSHS), Air Direction and Helicopter Control Simulator (ADHCS) and Astronavigation Dome. The Ship Handling Simulators produced by ARI Pvt Ltd, New Delhi have been exported to 18 countries. The Astronavigation Dome developed by Infovision Technologies Pvt Ltd is the first-of-its-kind in the Indian Navy.

The ADHCS - developed by Institute for Systems Studies and Analysis, a DRDO laboratory - would be able to provide real-time operational environment scenario to trainees. These technologically advanced simulators are indicative of the 'Aatmanirbhar Bharat' initiative and promise great defence export potential for the nation. Some of the other indigenously developed simulators in the Complex include Combat Management System and Maritime Domain Awareness Lab. During the inauguration, Shri Rajnath Singh also interacted with senior representatives from the firms involved in the development of these simulators.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1933880>



**Press Information Bureau**  
**Government of India**

**Ministry of Defence**

*Wed, 21 Jun 2023*

## **9th International Day of Yoga: Raksha Mantri Performs Yoga with Armed Forces & Indian Coast Guard Personnel Onboard INS Vikrant**

**Appeals to people to include the practice in their daily routine for physical, mental & spiritual well-being**

**“Yoga is a zero budget medium; It involves zero investment & provides incredible profits”**

**Yoga Day is proof that the world is acknowledging & adopting Indian culture: Shri Rajnath Singh**

Embracing the spirit of unity and well-being, Raksha Mantri Shri Rajnath Singh performed Yoga with the personnel of the Armed Forces & the Indian Coast Guard onboard India's indigenous aircraft carrier INS Vikrant on the occasion of 9th International Day of Yoga on June 21, 2023. Chief of the Naval Staff Admiral R Hari Kumar, his wife who is the President of Naval Welfare and Wellness Association Smt Kala Hari Kumar, Chief Hydrographer to the Government of India Vice Admiral Adhir Arora, Controller of Personnel Services Vice Admiral Krishna Swaminathan and Chief of Staff, Southern Naval Command Rear Admiral J Singh were also present along with over 800 personnel, including 120 Agniveers.

Against the backdrop of a beautiful blue sky & a calming breeze, the deck of INS Vikrant provided an awe-inspiring setting to celebrate the ancient Indian practice which is cementing its importance across the globe due to the multiple benefits it offers towards physical, mental & spiritual well-

being. Expert yoga instructors guided the participants in performing various asanas (poses) and breathing exercises with the aim to promote physical fitness, mental calmness and spiritual healing.

After the sessions, the Raksha Mantri felicitated the yoga instructors and interacted with the participants. He termed the global celebration of the practice as a matter of great pride for the nation as the world is acknowledging and adopting Indian culture. He highlighted the Government's efforts to spread Yoga across the globe, stating that India has succeeded in presenting the message to the world that the practice provides multiple benefits to the whole of humanity.

Shri Rajnath Singh appealed to the people to include Yoga in their daily routine as it unites the body with the mind, besides connecting a human being with nature and the divine, while acting as a stepping stone to achieve spiritual consciousness. He described Yoga as an equivalent to 'Amrit' which paves the way for physical, mental & spiritual well-being and opens up numerous possibilities for nurturing the mind, body & soul, while offering holistic healing at a deeper level in the day-to-day lives of the people.

The Raksha Mantri likened the body as the hardware of a computer and mind as the software, emphasising that Yoga strengthens both the aspects for efficient overall functioning. "Yoga is a zero budget medium that negates physical, mental and spiritual disturbances. It involves zero investment & provides incredible profits. The importance of Yoga was seen during the Covid-19 pandemic, when people who made the practice an integral part of their daily routine were relatively less affected by the virus. According to various researches, yoga played a crucial role in increasing the immunity in people during the pandemic," he said.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1933868>

## THE ECONOMIC TIMES

Wed, 21 Jun 2023

### **Indian Army Conducts Yoga Sessions at Over 100 Locations along Borders, forms 'Bharatmala'**

Indian Army personnel on Wednesday conducted yoga sessions at more than 100 locations along the country's land and maritime borders, forming a 'Bharatmala' on the occasion of the International Day of Yoga. The troops and their families, including children, as well as defence civilians participated in the events, the Army said in a statement, adding the locals were also included in yoga activities.

Army Chief General Manoj Pande was the chief guest at the mass yoga event organised at Cariappa Parade Ground, Delhi Cantonment, it said.

Continuing with the enhanced India-Africa partnership, an outreach was also organised in African nations through Indian Army troops deployed in United Nations Mission areas and in Training Teams as part of the UN contingents, the Army statement said.

Recognising its universal appeal, the United Nations in December 2014 proclaimed June 21 as the International Day of Yoga by a resolution. The day aims to raise awareness worldwide of the many benefits of practising yoga.

<https://economictimes.indiatimes.com/news/defence/indian-army-conducts-yoga-sessions-at-over-100-locations-along-borders-forms-bharatmala/articleshow/101162284.cms>



**Press Information Bureau  
Government of India**

**Ministry of Defence**

*Thu, 22 Jun 2023*

## **India-United States Defence Acceleration Ecosystem (INDUS X) Launched in Washington DC, U.S.**

INDUS X factsheet released for operationalising the ‘Defence Innovation Bridge’ under Initiative on Critical and Emerging Technologies (iCET)

India-United States Defence Acceleration Ecosystem (INDUS X) was launched at an event in Washington DC, USA on 21 June 2023. The INDUS X event was co-organised by Innovations for Defence Excellence (iDEX), Ministry of Defence, and US Department of Defence (DoD) and hosted by US-India Business Council (USIBC).

Shri Anurag Bajpai, Joint Secretary (Defence Industries Promotion), MoD, led the Indian delegation in the two-day INDUS-X event on 20-21 June 2023. A reception for Indian and US Government representatives, defence start-ups, think tanks, incubators, investors, industries and other stakeholders was organised on 20 June 2023. Amb. Eric Garcetti, the US Ambassador to India, gave the keynote address.

Mr. Frank Kendall, US Secretary of the Air Force, gave the opening keynote address on 21 June at the INDUS-X event. He stated that the India-US relationship is growing exponentially. He emphasised that there is enormous potential for startups of both nations to collaborate in deeptech innovations, especially in Space and Artificial Intelligence (AI) domain.

Shri Anurag Bajpai, in his welcome remarks on “Investing in the Future of US-Indian Defence relations”, hailed the launch of iCET as a landmark event in India-US relationship. He said this was an opportune moment for this event, as the leaders of the two largest and oldest democracies of the world meet in Washington. The Joint Secretary stressed on the co-development and co-production of advanced technologies by Indian and US start-ups. He further asked the participants to develop mechanisms for future collaboration across industries, academia, and investors. The Joint Secretary also gave an overview of the Make in India initiative, focussing on Aatmanirbhar Bharat and the philosophy of “Make in India, for the world”.

The event also saw a first-of-its-kind joint showcasing of innovative technologies by Indian and US start-ups. 15 Indian start-ups and 10 US start-ups, from multiple domains of maritime, AI, autonomous systems, and space, showcased their technologies to Indian and US stakeholders. The exhibition was visited by senior US officials, including Congressman Ro Khanna, who serves on the House Armed Services Committee as ranking member of the Subcommittee on Cyber, Innovative Technologies and Information Systems (CITI) and as co-chair of the Congressional Caucus on India and Indian Americans, and by Radha Iyengar Plumb, Deputy Under Secretary of Defense for Acquisition and Sustainment, US DoD.

Two panel discussions and two roundtables were held, focussing on deepening collaborations across various domains, including government, academia, and industry especially startups. Discussion on export control regulations were also held.

An INDUS X factsheet was released at the event.

<https://pib.gov.in/PressReleasePage.aspx?PRID=1934311>



## **HAL Signs MoU with Argentina Firm for Aerospace Collaboration**

State-owned plane maker Hindustan Aeronautics Limited (HAL) has signed a memorandum of understanding with its Argentine counterpart Fabrica Argentina de Aviones (FAdeA) for possible collaboration in the aerospace sector at a time when the Indian firm is in talks with the South American country to export the indigenously-built light combat aircraft (LCA) amid India's push to gain a toehold in foreign defence markets, officials aware of the matter said on Wednesday.

The MoU was signed at the ongoing Paris Air Show, the world's largest.

"HAL and FAdeA signed an MoU during Paris Air Show, 2023 towards exploring the possibilities of collaboration in the field of MRO (maintenance, repair and overhaul) and to meet any offset requirements in case of probable sale of HAL-made platforms in the Latin American region," HAL said in a statement.

Rules governing defence acquisition in different countries lay down that in all high-value capital purchases, it is mandatory for foreign vendors to invest a certain percentage of the value of the purchase in that country to boost its indigenous capabilities. India's offset policy, for instance, seeks to leverage capital acquisitions to develop the domestic defence industry by making it mandatory for foreign military contractors to invest in the country at least 30% of the value of all contracts worth more than ₹300 crore.

Argentina has projected a requirement for 15 new fighter aircraft, and HAL believes that the LCA Mk-1A will meet that country's needs, the officials said. Teams from the Argentine Air Force have visited HAL and flown the LCA, they said. To be sure, the JF-17 fighter aircraft, jointly developed by China and Pakistan, is also a contender for the Argentine order.

"Argentina is a significant country in South America and holds good export potential for India. We must try and tap that potential. HAL is laying the groundwork for that, and the LCA is a strong contender for a possible fighter jet order from Argentina," said Air Marshal Anil Chopra (retd), director general, Centre for Air Power Studies.

While the LCA project is on track, several HAL programmes have been hit by delays and compelled the armed forces to look for alternatives. These include the basic trainer aircraft, intermediate jet trainer and the LCA project itself. The Indian Air Force raised its first LCA squadron with two aircraft in July 2016 even though the project was sanctioned in 1983 as a replacement for the Soviet-origin MiG-21 fleet.

IAF has inducted several of 40 earlier variants of the LCA, ordered 83 improved Mk-1A variants in 2021, and is now looking at ordering the newest variant of the aircraft, LCA Mk-2. The first Mk-1A aircraft will be delivered to the IAF in February 2024, with the rest slated to join its combat fleet by 2029.

In April, HAL launched a third LCA production line in Nashik to ramp up the production of the fighter jet from the current 16 to 24 in anticipation of more orders. The other two production lines are in Bengaluru.

India has set a defence export target of ₹35,000 crore by 2024-25. In November 2022, Indian defence firm Kalyani Strategic Systems Limited won an export order worth \$155.5 million for supplying artillery guns to a friendly foreign country (believed to be Armenia), the first order won

by a local company for the 155mm weapon system. That order came on the back of the Philippines ordering BrahMos missiles and Armenia choosing to buy Pinaka multi-barrel rocket launchers from India.

Military exports have risen sharply, and imports have recorded a drop on the back of policy initiatives and reforms during the past nine years, the officials said.

Exports grew 23 times between financial year 2013-14 and 2022-23 (from ₹686 crore to ₹16,000 crore), while the spending on sourcing weapons and systems from foreign countries dropped from 46% of the total expenditure in 2018-19 to 36.7% in December 2022, the government said in May. The defence report card came at a time when the government was showcasing its achievements in different areas on its ninth anniversary.

India on May 19 announced that the value of defence production in the country crossed ₹1 lakh crore for the first time on the back of key reforms to spur growth in the sector. The figure stood at ₹1,06,800 crore in FY 2022-23 compared to ₹95,000 crore in FY 2021-22 and ₹54,951 crore five years ago.

India produces a raft of weapons and systems including the LCA, different types of helicopters, warships, tanks, artillery guns, warships, missiles, rockets and a variety of military vehicles.

India has sharpened its focus on the defence manufacturing sector during the last five years and taken several measures to achieve self-reliance. These include banning the import of a range of weapons, systems and parts, creating a separate budget for buying locally made military hardware, increasing foreign direct investment from 49% to 74% and improving ease of doing business.

India is eyeing a turnover of ₹1,75,000 lakh crore in defence manufacturing by 2024-25.

<https://www.hindustantimes.com/india-news/hal-signs-mou-with-argentina-firm-for-aerospace-collaboration-101687373991757.html>



*Wed, 21 Jun 2023*

## **Paris Air Show: HAL Showcases Indigenized Platforms and Future Projects; Attracts International Attention**

Several countries including Vietnam and Madagascar expressed interest in various platforms made by state owned Hindustan Aeronautics Limited (HAL) at the Paris Air show.

Company officials confirmed to Financial Express Online that defence delegations from Madagascar and Vietnam held discussions in the indigenous platforms including the Light Combat Aircraft (LCA) `Tejas`, Light Combat Helicopter `Prachand` and HTT 40. "Almost 20 prospective countries' delegations were specifically invited to explore potential exports from the state owned HAL," they added.

In a stunning display of India's technological prowess, the HAL Chalet with the theme of "Indigenized Platforms and Future Projects of HAL" drew a lot of attention as the models of various platforms were displayed. Also on display were fixed-wing platforms such as the Trainer HTT40 and Maritime Do228 along with the LCA Tejas Fighter. The HAL Chalet became a testament to India's capabilities, proudly exhibiting its range of rotor wing platforms, including the

ALH Dhruv, ALH MR, LCH Prachand, ALH WSI, and LUH. These homegrown creations were crafted in India but designed to make a significant impact worldwide.

While the defense delegations engaged in discussions, meetings with business partners were also strategically scheduled to explore future projects. These interactions served as catalysts for innovative collaborations and presented HAL with promising business opportunities.

The HAL Chalet, not only celebrated India's commitment to indigenization but also ignited international interest in HAL's future projects. The event marked a significant milestone in India's quest to position itself as a major player in the global defence industry.

With its headline-grabbing showcase, the HAL Chalet captured the attention of the world, shining a spotlight on India's homegrown military platforms and its ambitions for the future. This event exemplified India's determination to forge international partnerships and attract foreign armed forces to explore the technologically advanced solutions offered by HAL.

Who was present at the Chalet?

According to HAL, it was inaugurated by Jawed Ashraf, Ambassador of India to France and Monaco in the presence of Secretary Civil Aviation Rajiv Bansal, Dr Samir V Kamat, Secretary, DD R&D & Chairman DRDO, Ananthakrishnan CB, CMD, HAL and other senior officials.

<https://www.financialexpress.com/business/airlines-aviation-paris-air-show-hal-showcases-indigenized-platforms-and-future-projects-attracts-international-attention-3135255/>



*Wed, 21 Jun 2023*

## **Predator Drones to be Operated by Joint Tri-services Command, Orders for 31 UAVs Placed after Scientific Assessment**

As many as 31 Predator drones, to be acquired by India from the US soon, would be operated by the tri-services jointly.

Speaking to ANI, a senior defence official said, "The decision to buy 31 (Predator or Reaper) drones for taking care of complete surveillance requirements was taken after a scientific assessment."

"The Predator drones would be operated by a joint tri-services command, which will include officers and men from all three services. The proposal in this regard in the defence acquisition council was also sent by the tri-services headquarters," the official said.

A detailed scientific analysis was carried out by officers from the tri-services to arrive at the number of unmanned aerial vehicles of this long endurance variety.

"The analysis done under the Chief of Defence Staff and his integrated defence staff team suggested that for looking after the land borders and the aerial surveillance, 16 birds (attack drones) would be required," the official added.

"For looking after the maritime borders and the islands, the study suggested that India would require 16 drones," the official said.

"All the future deals by the tri-services, including ones for helicopters, drones and air defence weapon systems, would be done in the same manner," the official added.

India and the US are expected to ink the deal for the acquisition of 31 Predator drones during Prime Minister Narendra Modi's maiden state visit to the US.

India shares vast maritime and land boundaries with two major adversaries -- Pakistan and China -- and requires constant monitoring of their activities to safeguard its national security interests.

The Predators, also called the MQ-9 Reaper, can fly up to 36 hours at a stretch and can be used for focused monitoring of any specific point or area of interest.

Indian personnel would also, very soon, be provided training to deal with the ground-station equipment and the birds, both in both India and the US where it is manufactured.

<https://www.aninews.in/news/national/general-news/predator-drones-to-be-operated-by-joint-tri-services-command-orders-for-31-uavs-placed-after-scientific-assessment20230621202218/>

## THE TIMES OF INDIA

*Thu, 22 Jun 2023*

### **Armed Drones, Jet Engines to Take Defence Ties with US to Next Level**

The already expansive defence relationship between India and the US is set to register a quantum leap during the Modi-Biden summit with the twin pacts on the joint manufacture of GE-F414 fighter jet engines and the sale of armed MQ-9B Predator drones, both a first for a non-military ally of the US.

India's proposed \$3.5 billion acquisition of the 31 drones — 15 Sea Guardians for Navy and eight Sky Guardians each for Army and IAF — will hugely boost its capabilities for long-range ISR (intelligence, surveillance and reconnaissance and strike missions both in the Indian Ocean Region (IOR) as well as its land borders with China and Pakistan.

Officials hope the co-production of the GE-F414 INS6 turbo-fan engines in India to power the indigenous Tejas Mark-2 fighters — existing Tejas Mark1 jets have GE-F404 engines procured without any transfer of technology (ToT) — in turn will pave the way for a robust defence-industrial collaboration in other arenas as well.

These range from Stryker armoured fighting vehicles and long-range artillery to smart munitions and underwater domain awareness. Despite divergences on Russia and other issues, the jet engines and drones together underscore the expanding strategic convergence between India and the US to stave off China's ever-growing aggressive challenge in the Indo-Pacific.

The US, of course, is also very keen to wean India off its huge dependence on Russian military wares. India is a willing partner in the quest, though it remains steadfast on retaining its strategic autonomy. India has over the decades failed to build its own jet engines and armed HALE (high altitude, long-endurance) drones, both of which are critical technologies required to overcome its strategically vulnerable position as the world's largest arms importer.

With the US itself bagging lucrative Indian military deals worth over \$21 billion in just the last 15 years, an official said, "We want to move away from this mere buyer-seller relationship." The MoU between General Electric and defence PSU Hindustan Aeronautics to jointly produce GEF414 engines in the 98 Kilonewton thrust class, with 80% to 100% ToT, is expected to herald a new era.

“The GE-F414 engines, which power American F/A-18 Super Hornets and Swedish Gripen fighters, were finally on offer now after several years of talks and bureaucratic hurdles.” “The GE-F414 engine factory in India should hopefully come up in two-three years. But in the future, we will require more powerful 110 Kilo -newton engines for our planned fifth-generation stealth AMCA (advanced medium combat aircraft) project,” he added.

Similarly, the procurement of 31 MQ-9B drones, with their associated mobile ground control systems, Hellfire air-to-ground missiles, precision-guided munitions and other associated equipment, is to meet “immediate operational requirements”.

“With MRO (maintenance, repair, over-haul) facilities for the MQ-9B to be set up in India, which can cater to countries like Japan and Australia, DRDO should get the experience to build such drones in the future,” another official said. Once the contract for the MQ-9B drones is inked under the US government’s foreign military sales programme (FMS) after formal technical commercial negotiations, India hopes to induct the first lot of 10 in one to two years, with the others coming in batches every six months.

“We want to complete the induction in six seven years. But it will depend on the production capacity of General Atomics,” the official said. India, incidentally, has been effectively using two unarmed Sea Guardians, acquired by the Navy on lease since September 2020, for ISR missions in the IOR as well as the 3,488-km Line of Actual Control with China.

<https://timesofindia.indiatimes.com/india/armed-drones-jet-engines-to-take-defence-ties-with-us-to-next-level/articleshow/101172223.cms>

## THE ECONOMIC TIMES

Wed, 21 Jun 2023

### **Security of Supply Arrangement, Reciprocal Defense Procurement Agreements will Bring Indo-US Defence Industries Together: Pentagon**

As India and the US are set to begin negotiations on two transformational deals -- Security of Supply Arrangement (SOSA) and Reciprocal Defense Procurement Agreement (RDP), the Pentagon has said that the defence industries of the two nations will come together once the negotiations conclude. RDP will allow Indian businesses to service DoD procurement contracts; and allow US businesses to service MOD procurement contracts while the SOSA will allow DoD to move Indian orders for US equipment to the front of the line.

This is particularly helpful during crises when one country has urgent needs, but American vendors are struggling to prioritise between their customers. "Both agreements would promote long-term supply chain stability. So those are initiatives that will take probably years to negotiate, but we're committed to starting those negotiations," a Defense Department official told PTI on Tuesday.

Announced during the recent trip of Defense Secretary Lloyd Austin to India, SOSA and RDP agreements are part of a new Roadmap for US-India Defence Industrial Cooperation.

"It commits us to long-term supply chain integration and specifically to beginning negotiations on a security of supply arrangement and reciprocal defence procurement arrangement. These will be transformational agreements when they are concluded that will do a tremendous amount for

actually bringing the Indian and defence industrial bases more closely together in the future," a senior defence department official said.

"SOSA is something that allows on both sides, more rapid access to critical supplies, minerals technologies that we can access those more rapidly when we need them," the official said in response to a question.

RDP MOUs are binding international agreements that relate to the research, development, or production of defence equipment, or to the reciprocal procurement of defence items.

They involve a mutual commitment not to discriminate against the supplier of the other country for agreed-upon items, the official said.

SOSAs allow the DoD to request priority delivery for DoD contracts, subcontracts, or orders from companies in the country with whom the agreement is signed.

SOSA also allow the signatory nations to request priority delivery for their contracts and orders with US firms.

<https://economictimes.indiatimes.com/news/defence/security-of-supply-arrangement-reciprocal-defence-procurement-agreements-will-bring-indo-us-defence-industries-together-pentagon/articleshow/101156102.cms>

# THE ECONOMIC TIMES

*Thu, 22 Jun 2023*

## **Two Key Pacts to Open US Defence Sector for Indian Firms**

Besides acquiring fighter jet engine technology and high-performance drones from the US, India is working on two key agreements that will open the multi-billion-dollar American defence market for Indian companies.

Initial discussions have started on the Security of Supply Arrangement (Sosa) and Reciprocal Defence Procurement Agreement (RDP). Once negotiated, it will drastically increase opportunities for Indian manufacturers to engage with US defence majors.

The negotiations are expected to take time but have been mentioned in the Indo-US roadmap for defence industrial cooperation that will get a significant boost during the PM's ongoing visit.

It is learnt that Indian industry has made representations to the defence ministry and higher levels of the government for expediting the agreements as they would enable Indian entities to be qualified as suppliers and contractors for US Department of Defence orders.

Once the RDP is finalised, India will join a list of countries accorded the status of being Defence Federal Acquisition Regulation Supplement (Dfars) compliant. Only 26 countries are qualified to supply significant components and parts for American military orders. The agreement will open big doors for the manufacturing sector in terms of orders for castings and other components made of steel, copper, nickel, titanium and zirconium needed for US military orders. It will also co-align the defence manufacturing ecosystems of the two countries.

"The new defence industrial roadmap and associated agreements will see Indian companies getting the opportunity to more comprehensively plug into the US defence industrial base. There are signals from both governments that there will be significant movement on tech releasability issues, accelerating the US-India defence cooperation," Aerospace and Defence, US-India Business Council director Pushan Das said.

India exports weapons to over 80 nations, with the US a prominent customer. Significant exports are done by Indian companies that have orders from US defence majors to supply parts of platforms like the F16, Chinook and Apache copters, among others.

Industry insiders say getting Dfars compliant status will go a long way in achieving the Indian target of exceeding \$5 billion defence exports annually.

The US remains the largest defence spender and the Indian industry wants access to the market. Defence experts said that RDP basically provides a waiver of American laws that otherwise restrict the federal government from procuring goods from non-domestic sources.

<https://economictimes.indiatimes.com/news/defence/two-key-pacts-to-open-us-defence-sector-for-indian-firms/articleshow/101171682.cms>



*Wed, 21 Jun 2023*

## **U.S. Remains Deeply Confident in India's Diversification of Defence Equipment, Says Pentagon's Deputy Press Secretary Sabrina Singh**

The U.S. remains deeply confident in India's diversification of military equipment and believes that Washington's proposal for industrial cooperation will further integrate the defence industries of the two countries, the Pentagon has said.

Pentagon's Deputy Press Secretary Sabrina Singh told reporters at a news conference on June 20, that the U.S. encourages all its partners and allies to avoid transactions with Russia.

"We welcome Prime Minister Narendra Modi's visit to the United States this week. Defence Secretary Lloyd Austin visited India just two weeks ago and was able to meet with his counterpart Rajnath Singh, there. What we always will continue to urge our allies and partners around the world is to avoid transactions with Russia," she said, referring to the sanctions imposed on Moscow. Mr. Modi is visiting the U.S. from June 21-24 at the invitation of U.S. President Joe Biden and First Lady Jill Biden.

"We remain deeply confident in India's diversification of equipment, and over the past decade, our proposal for industrial cooperation will further integrate the U.S. and Indian defence industries. So, I think I'll just leave it at that," Ms. Singh said.

"That's something that we've continued to reiterate with Turkey, with India, and with others. I think, there are very different and two different cases, and when it comes to India, we remain confident in their diversification of equipment and our ability to integrate with them as well," she said. "I'm not going to get ahead of any announcements that might come out from the White House or any other agencies," Ms. Singh said when asked about the possible defence deals that could be signed during Mr. Modi's visit.

India signed a \$5 billion deal with Russia in October 2018 for purchasing five units of the S-400 air defence missile systems, despite a warning from the previous Donald Trump administration that going ahead with the contract may invite U.S. sanctions. The S-400 is known as Russia's most advanced long-range surface-to-air missile defence system. The 'Triumpf' interceptor-based missile system can destroy incoming hostile aircraft, missiles and even drones at ranges of up to 400 km. Russia started delivery of the first regiment of the missile systems in December 2021 and it has been deployed to cover parts of the border with China in the northern sector, as well as the frontier with Pakistan.

In February 2023, Russia said it will soon complete the supplies of the third regiment of the S-400 Triumf surface-to-air missile systems to India as both sides are committed to the contract.

Russia has been a major supplier of military hardware to India. The two countries have been holding discussions on what kind of payment mechanisms can work between them in view of the western sanctions on Moscow.

<https://www.thehindu.com/news/international/us-remains-deeply-confident-in-indias-diversification-of-defence-equipment-says-pentagons-deputy-press-secretary-sabrina-singh/article66993175.ece>



Thu, 22 Jun 2023

## India's Jet Engine Deal with the US and why it Matters

By Amrita Nayak Dutta

A landmark agreement to facilitate the transfer of at least 11 critical jet engine technologies is likely to be announced during Prime Minister Narendra Modi's ongoing official State Visit to the United States. It is anticipated that a deal will be announced between the American multinational corporation General Electric (GE) and Hindustan Aeronautics Limited (HAL) for the manufacture under licence in India of GE's F414 engine for the indigenous Light Combat Aircraft (LCA) Tejas Mk2.

The likely agreement for transfer of technology was discussed in the talks between Defence Minister Rajnath Singh and US Secretary of Defense Lloyd Austin in New Delhi earlier this month, and was a key highlight of National Security Advisor Ajit Doval's meeting with his American counterpart Jake Sullivan in February, when the US-India Initiative on Critical and Emerging Technologies (iCET) was operationalised.

### INSIDE THE F414 MILITARY AIRCRAFT ENGINE

**FAN**

- New high-flow design
- Stage 2/3 blisk

**COMBUSTOR**

- New annular combustor with multi-hole cooling design

**HIGH PRESSURE TURBINE (HPT)**

- Single crystal HPT blades
- Boltless retainers
- Thermally matched rotor/stator

**LOW PRESSURE TURBINE (LPT)**

- Single crystal HPT blades
- Boltless retainers
- Thermally matched rotor/stator

**ENGINE SPECIFICATIONS**

Maximum diameter	<b>35 in</b>
Length	<b>154 in</b>
Thrust Class	<b>22,000 lb</b>
Airflow	<b>170 lb/sec</b>
Pressure Ratio	<b>30:1</b>

**HIGH PRESSURE COMPRESSOR (HPC)**

- Stage 1/2 blisk
- Stage 3 blisk

**ADVANCED CONTROLS**

- Dual channel. Full Authority Digital Engine Control (FADEC)
- Advanced engine analytics capability

**AFTERBURNER & NOZZLE**

- Air-cooled flame holder system
- Ceramic Matrix Composite (CMC) seals



## **The GE-414 engine**

The turbofan engine, part of GE's suite of military aircraft engines, has been in use by the US Navy for more than 30 years, according to the GE Aerospace website. More than 1,600 F414 engines have been delivered, adding up to more than 5 million engine flight hours on a wide variety of missions.

The engines are in the thrust class of 22,000 lb or 98 kN, and feature advanced technology such as Full Authority Digital Electronic Control (FADEC) — the latest aircraft ignition and engine control system that controls engine performance digitally — according to GE.

The use of advanced materials and cooling techniques improve performance and extend component life, the manufacturer's website says.

## **F414-powered jets**

Eight nations have F414-powered aircraft in operation or on order, according to GE.

F414-GE-400 engines power the US Navy's Boeing F/A-18E/F Super Hornet and EA18G Growler electronic attack aircraft. Saab's Gripen E/F fighters use the F414G, the single-engine variant of the F414-GE-400. The manufacturer's website says F414 engines could also power emerging platforms such as the Korean KF-X.

## **For Indian aircraft**

The India-specific version of the engine, F414-INS6, was selected by the Aeronautical Development Agency (ADA) of the Defence Research Development Organisation (DRDO) for the LCA Tejas Mk2. The LCA Tejas is powered by a single GE-404-IN20 engine. The GE-404 engine, the basic design of which has been replicated in the F414, was developed in the 1970s.

F414 engines may also power the prototypes and the initial batch of the Advanced Medium Combat Aircraft (AMCA), India's futuristic fifth generation fighter aircraft for its Air Force. The GE website mentions the AMCA as a possible recipient of the engine, even though it will likely face competition from other jet engine makers such as Safran SA of France and Rolls-Royce of the United Kingdom.

Safran and HAL have co-developed the Shakti engine for the indigenous Advanced Light Helicopter (ALH) Dhruv and Light Combat Helicopter (LCH) Prachand.

## **Why the deal matters**

Only a handful of countries — such as the US, Russia, the UK, and France — have mastered the technology and metallurgy needed to manufacture an engine that can power combat aircraft. India is not in this list, its push for self-reliance in manufacturing several critical technologies, including cryogenic rocket engines, notwithstanding.

The DRDO's Gas Turbine Research Establishment (GTRE) first worked on developing the GTX-37 engine for the LCA. Subsequently, the ambitious Kaveri engine project was sanctioned in late 1989.

Nine full prototype engines and four core engines have been developed, 3,217 hours of engine testing has been carried out, and Altitude Tests and Flying Test Bed (FTB) trials have been completed — but the engines have not been found suitable for fighter aircraft. There was a major shortfall in the wet thrust of the engine, which generated only 70.4 kN as against the targeted 81 kN.

In 2011, the Comptroller and Auditor General (CAG) pulled up the GTRE for its inability to produce the engine for the LCA despite heavy cost overruns.

While the LCA Tejas was integrated with the GE-404 engine, the government told Parliament in 2021 that technological capabilities built through the Kaveri engine project would be utilised, including as derivatives in drones.

The countries that have the technology to manufacture advanced engines for fighter aircraft have been traditionally unwilling to share them. That is why the anticipated deal to manufacture GE's F414s in India is pathbreaking. The pact will bring an end to India's long-drawn pursuit of advanced combat jet engine technology.

<https://indianexpress.com/article/explained/ges-f414-jet-engine-lca-tejas-boeing-super-hornet-8678400/>

# THE ECONOMIC TIMES

Thu, 22 Jun 2023

## As Reality Checks in, New Delhi Ticks American Military Boxes

*By Pranab Dhal Samanta*

India has always been watchful of the extent of its defence relationship with the United States. The fear of losing political capital through military dependency has often outweighed all other security considerations. And this doubt has lurked on all governments.

Which is why a potential jet engine deal and the purchase of 31 MQ 9B Predator/Sea Guardian drones could prove to be a big turning point. Both these deals are an investment into a long-term security strategy. The idea is that GE 414 jet engine is the start of a plan that will eventually build into the AMCA (Advanced Medium Combat Aircraft), providing a long-term India-made fighter jet option. The acquisition of MQ 9 B drones is a clear edge on China, which does not have a competing High-Altitude Long Endurance drone that can operate from about 30,000 feet for about 30 hours.

The important part is these are grounded on a platform of political trust with the US, which is mirrored by far-reaching commitments to remove regulatory barriers to translate this trust into actual cooperation. But for all this to happen, India had to shed its old political inhibitions on sensitive military cooperation with the US. That's the deeper shift necessitated by reality checks to old security assumptions.

### **RELIABILITY**

The first reality check was on the reliability of military supplies. What are a country's options if its main military adversary is a dominant ally of its principal military supplier? Russia, India's longstanding defence partner, is in such a situation. It can never deny China access to military technology supplied to India, which is an edge Beijing already has on New Delhi.

### **SUPPLY**

The second check is that Russia's ability to service and supply, especially on high-end tech is vastly debilitated by western sanctions due to the war with Ukraine. India does not have the comfort to wait or delay, especially in the backdrop of amassing Chinese troops across the Line of Actual Control.

### **INHIBITIONS**

The third reality check is that New Delhi's inhibitions to partner with the US have been effectively deployed by Pakistan and China against India. Both have used this tentativeness to leverage their ties with the US in the 1970s and 1980s. While China developed access to American tech ecosystem, Pakistan obtained cutting edge military equipment like the F-16s. In other words, India's reluctance was a gain for its adversaries as the US sought to build partnerships in the region. Deeper defence engagement with the US, for one, removes the possibility of Washington undermining India's security interests, which at present are very much aligned.

#### **AND THE FINAL ONE**

The final reality check, of course, has been on the prospects of building a mutually beneficial relationship with China, one of peaceful coexistence that would define the onset of the Asian century. This assessment now stands debunked. China's actions on India and in the rest of Asia, including the South China Sea, bares Beijing's intent of turning the Asian century into China's century. That revelation on the barren slopes of Ladakh has left no doubt in India as to where the real threat to its political authority is coming from, which is why it must chart a new course focusing on the opportunities while managing the risks.

<https://economictimes.indiatimes.com/news/india/view-as-reality-checks-in-new-delhi-ticks-american-military-boxes/articleshow/101171948.cms>



*Thu, 22 Jun 2023*

## **US Offers Stryker Armoured Vehicles and M777 Gun Upgrade to India**

Indo-US defence cooperation is set to take an orbital jump after Prime Minister Narendra Modi meets US President Joe Biden on Thursday in Washington, with the Pentagon offering New Delhi the "Stryker" family of eight-wheeled armoured fighting vehicles and upgradation of M777 towed howitzers, apart from MQ-9 Reaper drones and the manufacturing of GE-F414 aircraft engines in India under 100% transfer of technology.

According to officials based in New Delhi and Washington, while the final decision on both Stryker and upgradation of M777 light weight howitzer depends on the conditions offered by the US, the defence equipment deals will be a significant component of the outcomes of the visit which will also see the signing of a deal with Micron for a \$ 2.7 billion chip plant in India and a pact on quantum computing and artificial intelligence.

Produced by General Dynamics Land Systems, the Stryker is an eight into eight wheel drive V-hull armoured infantry vehicle for rapid combat response to any insurgency or war-like situation. Armed with a 30 mm cannon and 105 mm mobile gun, the Stryker was used to good effect by the US army and the NATO forces to counter the Taliban in Afghanistan. The US is offering the infantry combat vehicle to India and the Modi government is interested in the local manufacture of the armoured vehicle under the "Atmanirbhar Bharat" route.

India already has 145 M777 howitzers, 120 of which were made by Mahindra Defence Systems in business arrangement with BAE systems.

According to the officials cited above, the US is also offering to upgrade 155 mm M777 howitzers with precision-guided long range ammunition to counter the artillery challenge on India's northern borders. India already has 145 M777 howitzers, 120 of which were made by Mahindra Defence

Systems in business arrangement with BAE systems. Given the light weight of the gun, the M777 can be transported by helicopters to mountain tops in case of any emergency in Jammu and Kashmir or Arunachal Pradesh.

While India and the US have an MoU over cyber security cooperation, the ties will get further cemented and the mutual convergence will be reflected in the joint statement issued at the end of PM Modi's visit to the US.

The biggest deal is expected to be for the F-414 aircraft engines that will power indigenously manufactured fighters for the coming decade as well as "hunter-killer" Reaper drones, which will counter the challenge faced by India from China, which has armed drones and has also sold them to Pakistan.

<https://www.hindustantimes.com/india-news/us-offers-stryker-armoured-vehicles-and-m777-gun-upgrade-to-india-101687398408474.html>



*Thu, 22 Jun 2023*

## **NATO's Growing Shadow over the Asia-Pacific**

*By E D Mathew*

Is the shadow of the North Atlantic Treaty Organisation (NATO) looming over India and the Asia-Pacific region? If one heard China's Defence Minister Li Shangfu at the Shangri-La Dialogue, Asia's largest security summit held in Singapore early this month, it is very much so. Taken together with a push to impose a security agenda on the Quadrilateral Security Dialogue, or Quad, the Asia-Pacific is turning out to be a major theatre of big-power rivalry. That puts India in a quandary.

Forging "NATO-like" alliances would plunge the region into a "whirlpool of disputes and conflicts," Li warned at the summit, which was also attended by US Defence Secretary Lloyd Austin. "Today's Asia-Pacific needs open and inclusive cooperation, not buddying up into small cliques," Li said. The "cliques" in question are the Australia, UK, and US (AUKUS) security pact as well as the Quad, of which India is a member along with Australia, Japan and the US.

Li's warning comes in the wake of a US House Select Committee recommending the inclusion of India in NATO Plus, a security arrangement that currently includes NATO and five aligned nations—Australia, New Zealand, South Korea, Japan and Israel. India has, however, brushed aside the idea, with External Affairs Minister S Jaishankar saying that the "NATO template does not apply to India."

In what is going to be the first of its kind in the Asia-Pacific region ("Indo-Pacific" in American lingo), a NATO liaison office will open in Tokyo next year. Last month, Britain and Japan signed a new strategic partnership and agreed to "deepen" collaboration between NATO and Tokyo. During the Shangri-La summit, British Defence Secretary Ben Wallace said having such an office in Japan is "in the interests of NATO".

In addition, NATO plans to further strengthen collaboration with its four major partners in the Asia-Pacific region—Australia, Japan, New Zealand and South Korea, a recent report in Nikkei Asia said. The alliance will formulate an Individually Tailored Partnership Program with all four countries—an upgrade to a higher form of partnership. Its details will be thrashed out during the

forthcoming NATO summit in Vilnius, the capital of Lithuania, on July 11 and 12, which all four leaders are expected to attend.

The curiously named House Select Committee on the Strategic Competition between the United States and the Chinese Communist Party is chaired by Republican and China hawk Mike Gallagher who views the competition between China and the US as an “existential struggle”. According to the Select Committee, including India in NATO Plus “would build upon the US and India’s close partnership to strengthen global security and deter the aggression of the CCP across the Indo-Pacific region.”

“Winning the strategic competition with the Chinese Communist Party and ensuring the security of Taiwan demands the United States strengthen ties to our allies and security partners, including India,” says the report. Interestingly, India is being called up to the defence of Taiwan, with which New Delhi has no formal diplomatic relations. Nor does Taiwan appear anywhere in India’s defence calculations.

Meanwhile, there is a push to make the Quad embrace a security agenda. A report by the United States Studies Centre at the University of Sydney, released early this month, argues that the Quad needs more muscle to live up to its potential and for that, the group should focus on a security agenda, especially maritime security, to serve as a deterrent to China. The purpose is to make the Quad “capable of providing mutual support in crisis or conflict situations, even if its members are not aligned on policy or directly involved in combined operations.”

Although accused by Beijing of being an anti-China coalition, the Quad has hitherto refrained from deepening cooperation in the security realm. It has limited itself to contributing to global health as a provider of vaccines, working on climate change, building infrastructure, and cooperating in space. New Delhi has serious qualms about being part of a security alliance against China. The new report aims to whittle down such reservations and make the Quad countries share their capabilities to “seamlessly refuel, resupply and repair ships and aircraft from any of its members, and foster the ability to do so at very short notice.”

Amidst growing concern over China’s increasing naval activities in the region, some Asia-Pacific nations are already taking proactive measures to counter Beijing’s advances. Japan has announced plans to increase its defence budget by a whopping 56%. An AUKUS agreement will lead to Australian naval forces hosting nuclear-powered submarines. The Philippines has identified four additional military bases for the use of US troops.

With the Asia Pacific accounting for 60% of the world’s GDP and over half of the global population, the region will be the engine of the global economy in the coming decades. China’s looming presence over the region adds another dimension. Beijing has territorial disputes with Japan, Indonesia, Brunei, Malaysia, the Philippines and Vietnam. India is on a permanent border standoff with China, having fought a full-scale war in 1962 and being embroiled in several territorial disputes over the years.

A NATO overreach to the Asia-Pacific will pose a major challenge to New Delhi’s much-touted “strategic autonomy”. The push to transform Quad into a security alliance focusing on China will also have the same effect.

India has resisted being drawn into rival blocs over Ukraine until now. Its refusal to take sides has brought the country under intense questioning in the West. Having moved on from its traditional non-alignment, New Delhi now boasts of “multi-alignment” as its new foreign policy mantra.

“So far, India has done an impressive job of maintaining its balancing act. Whether it can continue to do so in the years ahead is an open question,” says Nirupama Rao, former Ambassador to both

China and the US. A prolonged invasion “could lead India to tussle more with Washington as the United States pushes harder for neutral states to come off the sidelines,” she says.

Although an Asian NATO remains a pie in the sky for now, an extended war over Ukraine will force India and the Asia-Pacific nations to bear the brunt of increasing big-power rivalry in the region.

<https://www.newindianexpress.com/opinions/2023/jun/22/natos-growing-shadow-over-the-asia-pacific-2587261.html>

## Science & Technology News

INDIA  
TODAY

Wed, 21 Jun 2023

### **Skyroot Successfully Tests Engine that will Help Vikram-I Fly Stable**

Skyroot Aerospace successfully conducted the flight qualification test of the Raman-I engine, which will be used for roll attitude control in the company's under-development Vikram-I rocket.

The engine underwent a test fire at the Liquid Propulsion Systems Centre of the Indian Space Research Organisation (Isro), making Skyroot the first private company to utilise this facility.

"We are thrilled to announce the successful flight qualification testing of our Raman-I engine, used for roll attitude control of the Vikram-I rocket. This test holds significance as it is the first-ever test conducted at the Liquid Propulsion Systems Centre (LPSC) of Isro by a private company," the company stated in a tweet.

The Raman-I engine will be employed for roll attitude control, which ensures the rocket's ability to manage its rotation and orientation. Maintaining a stable roll attitude is vital to guarantee the rocket's stability during ascent. Uncontrolled rotation can result in instability, making it challenging to precisely control the rocket's trajectory.

The system assists in adjusting the rocket's aerodynamic properties during flight. By altering the rocket's orientation along the roll axis, it can optimize its aerodynamic profile, decreasing drag and enhancing overall efficiency. Skyroot made history by becoming the first private company to launch a rocket from India with Vikram-S. The indigenous Vikram-S was launched from the Satish Dhawan Space Center in Sriharikota, marking India's entry into commercial space exploration.

The Telangana-based startup deployed three student-made payloads, including one developed by SpaceKidz India, involving students from various countries. The test fires the stage for the launch of Vikram-1, which is anticipated to occur by the end of this year.

Skyroot has been developing three variants of the Vikram rocket. While Vikram-I can carry 480 kilograms of payload to Low Earth Orbit, Vikram-II is designed to lift off with 595 kilograms of cargo. Meanwhile, Vikram-III can launch with 815 kg to 500 km Low Inclination Orbit.

<https://www.indiatoday.in/science/story/skyroot-aerospace-successfully-tests-engine-that-will-help-vikram-1-fly-stable-2396040-2023-06-21>

