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2023

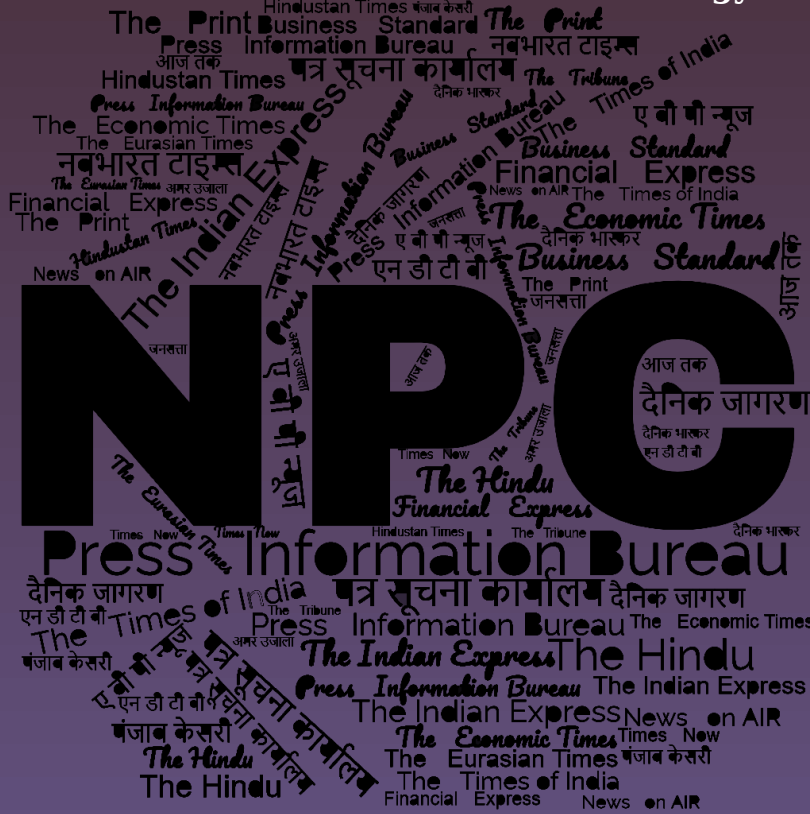
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# समाचार पत्रों से चयित अंश Newspapers Clippings

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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**DRDO News**

**DRDO Technology News**



*Wed, 05 Jul 2023*

## **Amarnath Yatra: Pilgrims Getting Quality Treatment in DRDO Hospital in Baltal**

Pilgrims, as well as locals from Kashmir, are getting quality treatment in a hundred-bedded Defence Research and Development Organisation (DRDO) Hospital at Baltal base camp in Sonamarg of Jammu and Kashmir during the ongoing Amarnath Yatra. The hospital was recently inaugurated by the UT's Lieutenant Governor Manoj Sinha with an aim to provide the best healthcare facilities for pilgrims and other people associated with the Yatra. During the Yatra, pilgrims often face oxygen-related problems which resulted in the construction of this 100-bedded fully equipped DRDO hospital, aimed to take care of patients. The hospital has a good number of beds with proper oxygen facilities and the government is also providing all test facilities including X-Rays, ECG, ultrasound, and medicines, free of cost. The 43-day-long Amarnath Yatra commenced with all religious fervour from the twin tracks of Pahalgam in Anantnag district and Baltal in Ganderbal district on July 1, and it will culminate on August 31.

<https://www.aninews.in/videos/national/amarnath-yatra-pilgrims-getting-quality-treatment-drdo-hospital-baltal/>

**Defence News**

**Defence Strategic:  
National/International**



**Press Information Bureau  
Government of India**

**Ministry of Defence**

*Wed, 05 Jul 2023*

## **Raksha Mantri Shri Rajnath Singh to Preside over MoD 'Chintan Shivir' in New Delhi**

Raksha Mantri Shri Rajnath Singh will preside over a day-long 'Chintan Shivir' of Ministry of Defence (MoD) in New Delhi on July 06, 2023. It may be recalled that, last month, Department of Defence (DoD), Department of Defence Production (DDP), Department of Military Affairs (DMA), Department of Ex-Servicemen Welfare (DESW) and Defence Research & Development

Organisation (DRDO) organised separate brainstorming sessions, during which they discussed critical issues & ways to enhance their productivity. The departments had identified an array of themes, on which eminent subject matter experts addressed the officers and shared their insights.

The Raksha Mantri will review the takeaways of the brainstorming sessions and discuss ways to implement the recommendations borne out of these deliberations. Raksha Rajya Mantri Shri Ajay Bhatt, Chief of Defence Staff General Anil Chauhan, Chief of the Army Staff General Manoj Pande, Defence Secretary Shri Giridhar Aramane and other senior civil & military officials of MoD will also attend the day-long meeting.

The themes, which were covered during the sessions, are as follows:

### **Department of Defence**

Cyber Security Challenges to the National Security

Comprehensive approach to National Security

Performance Audit

Sainik School Education System

Capacity Building in Defence Acquisitions

### **Department of Defence Production**

Enhancing Production and Defence Exports

Increasing Aatmanirbharta: Road ahead for indigenisation

Industrial Ecosystem and Skilled Workforce

Enhancing Level Playing Field

Quality Reforms

### **Department of Military Affairs**

Integrating & optimising Human Resource aspects

Training & Operational issues towards achieving greater synergy

Modernisation & capability augmentation of Armed Forces in the realms of strategic domain

Measures to identify & abolish colonial practices and obsolete laws.

Further incorporate the country's own ethos and practices in functioning of the Armed Forces.

### **Department of Ex-Servicemen Welfare**

'Leveraging SPARSH for better pension services and other welfare measures for veterans'

'Resettlement of veterans by improving employability and promotion of entrepreneurship for start of micro enterprises by veterans'

'Improvement in the health services of the veterans'

### **Defence Research & Development Organisation**

DRDO - Academia Partnership: Opportunities & Challenges.

Integrating Industry with Defence R&D

Catalysing Defence R&D within Industry and Academia

<https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1937546>

## **Indian Naval Air Squadron 324 Celebrates First Anniversary at INS Dega in Visakhapatnam**

Indian Naval Air Squadron 324 (INAS 324) at INS Dega in Visakhapatnam celebrated its maiden anniversary on Tuesday.

"Indian Naval Air Squadron 324 (INAS 324) at INS Dega, Visakhapatnam celebrates its maiden anniversary today. Indian Naval Air Squadron 324 is equipped with indigenous ALH Mk III helicopters," an official statement said.

"It embodies the spirit of Aatma Nirbhar Bharat. Their deployment significantly enhances maritime surveillance capability and strengthens coastal security along the east coast. With the inclusion of removable Medical ICUs, the aircraft also has the ability to provide critical medical support during emergencies," it added.

The crew upholds their motto "Nidruvith Dhrud Veeryvath" - "Faithful, Tenacious, Fearless", the statement said.

Meanwhile, the Indian Navy is planning to extend the lease of the two Predator drones which have flown more than 12,000 hours for surveillance across the country including the boundary with China.

The two drones were inducted by the Indian Navy under the emergency powers on lease in November 2020 during the initial phase of the military standoff with China and have been used extensively by the force. "We are planning to extend the lease of these two Predator drones as the contract is set to get over by the end of this year," defence sources told ANI.

The two drones of the older version of the Predators were taken on lease along with the ground control stations and other equipment.

After extensive flying operations and use of these drones for surveillance requirements of the Indian Army and Indian Air Force, it has now been decided that the defence forces would get a total of 31 of the latest Predator MQ-9B drones which will be used for surveillance.

The drone deal was announced by India and the US during Prime Minister Narendra Modi's state visit to the US.

<https://economictimes.indiatimes.com/news/defence/indian-naval-air-squadron-324-celebrates-first-anniversary-at-ins-dega-in-visakhapatnam/articleshow/101511124.cms>



## **Japan, India Maritime Exercise- JIMEX23 Commences in Visakhapatnam**

The seventh edition of the bilateral Japan-India Maritime Exercise 2023 (JIMEX 23) hosted by the Indian Navy, commenced on Wednesday at Visakhapatnam.

It aimed to foster mutual cooperation and reaffirmed the shared commitment towards maritime security in the region, informed an official release.

The edition, being conducted at Visakhapatnam from July 5-10, marks the 11th anniversary of JIMEX, since its inception in 2012.

Japan Maritime Self Defence Force (JMSDF) units under the command of Rear Admiral, Nishiyama Takahiro, Commander Escort Flotilla One, and Indian Naval ships under the command of Rear Admiral Gurcharan Singh, Flag Officer Commanding Eastern Fleet are participating in the exercise.

JIMEX 23 will witness the participation of INS Delhi, India's first indigenously built Guided Missile Destroyer, INS Kamorta, an indigenously designed and built Anti-Submarine Warfare Corvette, fleet tanker INS Shakti, a submarine, maritime patrol aircraft P8I and Dornier, ship-borne helicopters and fighter aircraft, the release stated.

JMSDF will be represented by the guided missile destroyer JS Samidare and its integral helicopters.

The exercise will be conducted over six days in two phases - a Harbour Phase at Visakhapatnam comprising professional, sports and social interactions, after which, the two navies will jointly hone their warfighting skills at sea and enhance their interoperability through complex multi-discipline operations in the surface, sub-surface and air domains.

Having grown in scope and complexity over the years, JIMEX 23 provides an opportunity to learn from each other's best practices and facilitates operational interactions between Indian Navy and JMSDF to foster mutual cooperation and reaffirm their shared commitment towards maritime security in the region, the release added.

<https://www.aninews.in/news/world/asia/japan-india-maritime-exercise-jimex23-commences-in-visakhapatnam20230705221719/>



*Thu, 06 Jul 2023*

## **French President Macron's Advisor in Delhi, to Hold Talks with Ajit Doval**

Emmanuel Bonne, diplomatic advisor to French President Emmanuel Macron is scheduled to arrive in the Indian Capital for a day trip on Thursday to finalize the bilateral agenda and possible outcomes of Prime Minister Narendra Modi's two day visit to Paris next week.

While South Block is tight-lipped about the visit, HT learns that Bonne will hold intense parleys with National Security Advisor Ajit Doval ; he is also expected to call on Prime Minister Narendra Modi before departing for France the same night.

Bonne and Doval are counterparts in the India-France strategic dialogue and know each other well, and Thursday's meetings are expected to set the stage for the bilateral meeting between PM Modi and President Macron on July 13 and the gala show on Bastille Day on July 14.

India and France are close allies with common interest in the fight against terrorism and in the Indo-Pacific. The two countries have deep political ties -- to the extent that France does not supply weapons or platforms to India's adversaries in the north and the west.

France has offered to co-develop and manufacture higher thrust engines in India to power the future twin engine combat aircraft developed by DRDO. While the India-France strategic relationship runs very deep, Paris has also offered to build Scorpene submarines for other countries at Mazagon Dockyards Limited (MDL) to ensure that the current facility, which has completed the Kalveri class submarines under Project 75, does not go to seed for want of orders. This apart, the French have also offered to manufacture top end missiles and loiter ammunition in India under the “Atmanirbhar Bharat” route.

Although the Modi government is still to take a final call, the Indian Navy has recommended the purchase of 26 (including eight trainers) Rafale-Maritime jet fighters for aircraft carrier INS Vikrant through the G2G or government to government route after testing the aircraft along with US made F-18 fighters at Goa shore based testing facility last year. This decision may be taken later as INS Vikrant is currently undergoing a refit at Cochin Shipyard.

With both India and France are looking towards making PM Modi’s visit to Paris pathbreaking, Bonne and Doval are expected to exchange thoughts on the present environment in Europe due to the on-going Ukraine war and review the situation in the Indo-Pacific with the Chinese PLA expanding its footprint to the Far Pacific and even the Atlantic Ocean.

<https://www.hindustantimes.com/india-news/emmanuel-bonne-to-visit-india-for-bilateral-talks-and-preparations-for-pm-modi-s-visit-to-paris-101688584113176.html>



Wed, 05 Jul 2023

## **China’s Gallium Export Controls put US Defence Industry in a Bind, India Sees Opportunity**

China’s new export controls on gallium could have a significant impact on the US defense industry. Gallium is a key component in advanced radar systems, and China is the world’s leading producer and supplier of this material. As a result, the US may face difficulties in obtaining gallium for its defense systems, which could have a negative impact on its military capabilities.

China will begin enforcing export controls on gallium and germanium, as well as several chemical compounds containing these materials, from August 1st, 2023. This was announced on Monday by the Ministry of Commerce and General Administration of Customs of that country.

Exports of certain items will require approval from the Chinese government, according to a notice released by the Ministry of Commerce and General Administration of Customs. The Chinese government’s decision to impose export controls on gallium and germanium is a move to protect its national security and interests.

### **About Gallium and Germanium**

Gallium and germanium are essential materials in the production of semiconductors and other electronic components, according to observers. And are essential materials in the production of semiconductors and other electronic components. Germanium is used in fiber optics and semiconductors, while gallium is used in the manufacture of chipsets for electronic devices such as computer motherboards and portable phones.

Chinese military analysts have warned that the new export controls on gallium could have a significant impact on the US defense industry, which is already facing challenges in obtaining this

material. This could give China a strategic advantage in the military competition between the two countries.

Gallium arsenide (GaAs) and gallium nitride (GaN) are the essential materials used in the production of transmit-receive modules for active electronically scanned array (AESA) radars, which are widely used on modern warplanes, warships, and ground installations.

US defense companies Raytheon and Northrop Grumman are reportedly developing new AESA radar systems based on gallium nitride (GaN), which offer superior performance over previous systems that used gallium arsenide (GaAs). The latest radars for the F/A-18E/F carrier-based fighter jet and the F-35 stealth fighter jet also incorporate GaN.

China's list of export controls includes both gallium arsenide (GaAs) and gallium nitride (GaN) and it is the world's leading producer of gallium, accounting for about 85% of global reserves. This means that the United States and other Western countries would face significant challenges in avoiding using Chinese gallium without incurring significant costs.

The United States has been increasingly deploying its warplanes and warships near China's borders, in what experts say are clear attempts to contain China's development and harm its national security. These deployments include close-in reconnaissance, provocative transits, and exercises, as well as arms sales to Taiwan.

### **India's Gallium and Germanium Gap**

India is dependent on imports of germanium and gallium as it has limited reserves of these materials, and the country's production capacity is not sufficient to meet domestic demand. Depending on availability and price India imports about 90 percent of its germanium and 80 percent of its gallium from countries like China, Germany and South Korea.

### **India's Potential Sources of Germanium and Gallium**

**Bauxite ores:** Gallium is a trace element in bauxite ores, which are the main source of aluminum. India has significant reserves of bauxite ores, and there is potential to recover gallium from these ores.

**Zinc ores:** Germanium is a trace element in zinc ores, which are also a major source of zinc. India has significant reserves of zinc ores, and there is potential to recover germanium from these ores.

**Coal ash:** Gallium is also found in coal ash, which is a byproduct of coal combustion. India is a major producer of coal, and there is potential to recover gallium from coal ash.

However, it is important to note that the recovery of germanium and gallium from these sources is not currently economically viable. This is because the concentration of these materials in the ores is relatively low, and the cost of extracting them is high.

However, with technological advances and increased demand for these materials, it is possible that the recovery of germanium and gallium from these sources could become economically viable in the future.

In addition to these potential sources, India is also exploring the possibility of developing new sources of germanium and gallium. For example, the Indian government is funding research into the development of new technologies for the extraction of these materials from seawater.

If these technologies are successful, India could become a major producer of germanium and gallium in the future.

<https://www.financialexpress.com/business/defence-chinas-gallium-export-controls-put-us-defence-industry-in-a-bind-india-sees-opportunity-3157598/>



## **Philippine Army Explores BrahMos Missile Deal with India to Strengthen Maritime Defence**

In a bid to bolster its coastal defence capabilities, the Philippine Army is actively pursuing plans to acquire batteries of the BrahMos supersonic anti-ship cruise missile. Negotiations have commenced with India's BrahMos Corporation, and orders are expected to be placed later this year. This development comes on the heels of the Philippine Navy's recent order for three batteries of BrahMos missiles, highlighting the country's commitment to enhancing its maritime defence capabilities.

The Philippine Navy's order for the BrahMos supersonic anti-ship cruise missile marks a notable step towards modernizing naval assets and strengthening coastal defence. With delivery anticipated by December, the missiles are designated for use by the Philippine Marine Corps. The BrahMos missile's renowned high speed and accuracy will significantly enhance the Philippine Navy's capacity to deter potential threats in the maritime domain.

### **Philippine Army's pursuit reinforces coastal defense roles**

Recognising the success of the Philippine Navy's BrahMos order, the Philippine Army has initiated negotiations with India's BrahMos Corporation to procure additional batteries for the supersonic anti-ship cruise missile. The Army intends to deploy these advanced missiles along the country's coastlines, reinforcing its coastal defence roles. By leveraging the BrahMos missile's capabilities, the Philippine Army aims to enhance its ability to safeguard territorial waters and critical coastal infrastructure.

Furthermore, India's offer of a line of credit to meet the defence requirements of the Philippines underscores the growing partnership and signifies the potential for further strengthening defence ties between the two nations. The offer of financial assistance demonstrates mutual trust and cooperation in addressing shared security concerns.

### **Training ensures expertise in BrahMos Missile system**

Earlier this year, 21 personnel from the Coastal Defense Regiment (CDR) of the Philippine Army underwent comprehensive training in India on the BrahMos anti-ship missile system. This training highlights the commitment of the Philippine Army to equip its personnel with the necessary expertise to effectively operate the BrahMos missiles for coastal defence operations. The training program ensures that the Philippine Army is prepared to maximize the capabilities of the BrahMos missile system to protect the country's coastal areas.

As negotiations progress and the acquisition of BrahMos missiles by the Philippine Army materialises, the country takes significant strides in enhancing its coastal defence capabilities. This strategic move demonstrates the Philippines' commitment to protecting its maritime interests and securing its territorial waters in collaboration with international partners.

<https://www.republicworld.com/india-news/general-news/philippine-army-explores-brahmos-missile-deal-with-india-to-strengthen-maritime-defence-articleshow.html>

## **Modernizing India's Submarine Fleet: A Vital Step towards Naval Strength**

*By Huma Siddqui*

The Indian Navy, recognizing the urgent need to maintain its sub-surface fleet, has taken a significant step towards strengthening its naval capabilities.

A contract has been inked for the Medium Refit with Life Certification (MRLC) of the HDW-class submarine INS Shankush between Ministry of Defence and Mumbai based Mazagon Dock Shipbuilders Limited (MDL). This contract according to the Ministry of Defence statement is for Rs 2,725-crore.

This contract marks the second HDW submarine to undergo MRLC, with the first one nearing completion. With the navy facing challenges in maintaining its depleting sub-surface fleet, this initiative is very significant.

### **Revitalizing the Submarine Fleet:**

The MRLC project aims to extend the operational life of seven submarines, consisting of four Russian-origin Kilo-class submarines and three German-origin HDW-class submarines. The first HDW-class submarine, INS Shishumar, has been undergoing life extension since October 2018 and is expected to be completed by August. INS Shankush, the second HDW-class submarine, is projected to be combat-ready and join the active fleet by 2026 after the MRLC process. These upgrades will equip the submarines with enhanced combat capabilities, reinforcing the country's maritime defense posture.

### **Challenges and Delays:**

While progress is being made on the MRLC program, challenges have arisen along the way. The fourth Kilo-class submarine, destined for MRLC, is currently delayed due to the unavailability of transport docks caused by the ongoing war in Ukraine. However, the Ministry remains committed to resolving these logistical issues and ensuring the timely completion of the project. Despite setbacks, the Indian Navy's determination to overcome obstacles is evident, as seen when INS Sindhuratna reached Mumbai after a 97-day journey covering 10,000 miles, due to transportation challenges.

### **Boosting the Indian Industrial Ecosystem:**

Beyond its immediate military implications, the MRLC project holds substantial significance for the Indian industrial ecosystem. The Defence Ministry emphasizes the development of MDL as a Maintenance, Repair & Overhaul (MRO) hub, fostering an environment that supports the country's defense industries. According to an official statement issued by the Ministry of Defence, this undertaking involves collaboration with more than 30 Micro, Small, and Medium Enterprises (MSMEs). The Ministry statement has said that significant employment opportunities to the tune of almost "1,200 man-days per day" are expected to be generated throughout the duration of the project.

### **The Path to Self-Reliance:**

The MRLC initiative aligns with India's vision of achieving self-reliance in defense production, an objective highlighted by the Defence Acquisition Council's approval of the program in 2014. This endeavor demonstrates India's determination to enhance its defense capabilities domestically and reduce reliance on foreign imports. By modernizing and extending the lifespan of existing submarines, the Indian Navy bridges the gap until the procurement of new submarines under Project-75I is realized.

<https://www.financialexpress.com/business/defence-modernizing-indias-submarine-fleet-a-vital-step-towards-naval-strength-3156466/>

# THE ECONOMIC TIMES

Wed, 05 Jul 2023

## **US-India, Brothers in Arms: How to Best Develop India's Indigenous Defence Capabilities**

*By Pushan Das and Arjit Roshan*

Prime Minister Narendra Modi's state visit to the US in June has sparked unprecedented momentum in the India-US defence ties. As competition in the Indo-Pacific escalates, the US is keen to give India access to top-grade military technology and flesh out the latter's role as a 'major defence partner'.

But, for Delhi, stronger defence ties with the US are not an achievement. The Centre is invested in Aatmanirbhar Bharat. So, the success of Indo-US defence ties will be measured by the degree to which they can help develop an indigenous defence supply chain. GoI's strategy has been to lift FDI caps in the sector, while designating key equipment for domestic procurement via an indigenisation list and earmarking capital expenditure. Although this dual-track strategy is prudent, results have been mixed.

While liberalised FDI caps have attracted the interest of foreign firms in defence production in India, the country's domestic base lacks the capacity to deliver on the necessary timelines due to barriers like product complexity and the lack of economies of scale. As a result, the Centre will often pivot to the government-to-government (G2G) procurement pathway, which bypasses indigenisation requirements.

This pattern runs counter to GoI's ambitions to incentivise domestic production, but reflects the reality that India's defence ecosystem cannot fulfil immediate security needs. Therefore, the policy conundrum India faces is filling these immediate needs while simultaneously building out its underdeveloped domestic defence ecosystem.

The India-United States Defence Acceleration Ecosystem (INDUS X) initiative, which was launched on June 21, offers a promising approach that parallelly services the immediate and long-term imperatives. Launched during Modi's visit under the aegis of the Initiative on Critical and Emerging Technology (iCET), INDUS X is an initiative that seeks to incubate ties between Indian and American defence and space startups, 'primes' (major defence companies), academia and financial institutions.

Enabled by the new defence industrial roadmap framework, INDUS X can foster partnerships between Indian startups and American primes. These partnerships can leverage the ability of established firms to deliver capabilities to India quickly while also serving as an onboarding process for Indian startups, where they can learn global best practices.

These partnerships are generational investments into India's national strength. While these Indian startups may be akin to junior partners today, many will grow to become major defence manufacturers, supporting India's self-reliance and becoming global defence exporters in the future.

One of the major barriers to these partnerships has been tech-release regulations. Historically, America's national security apparatus has been wary of tech bleed to non-allied countries. India has also been reluctant to purchase equipment loaded with 'black boxes' that undermine a country's ability to independently upgrade, maintain and arm its defence platforms with indigenous weapons systems.

But as the US and India increasingly signal that they consider themselves as part of the same 'high-trust ecosystem', these legacy friction points are being ironed out under iCET - which facilitated the tech transfer of the General Electric F414 jet engine to Hindustan Aeronautics Limited (HAL). If both governments commit to the iCET framework to promote tech transfer across more domains, they can foster more Indo-US defence partnerships that will translate into indigenous Indian capabilities down the line.

So far, the main thrust of the defence relationship has been in operationally relevant capabilities like intelligence, surveillance and reconnaissance (ISR) and maritime patrol platforms, which include the Boeing P-8I and Sikorsky MH-60R Romeos, which deliver an anti-submarine warfare capability unmatched in the Indo-Pacific.

The General Atomics SeaGuardian drones will soon supplement that integrated and interoperable capability by providing persistent ISR capacity. Going ahead, there is a case for investing more in autonomous and disruptive warfighting systems at sea and in the air as they have lower acquisition and sustainment costs and offer the potential benefits of exploiting rapid innovation cycles.

But bureaucratic bandwidth and investment capital are scarce resources. In the case of the GE F414 deal, a push from the top cut through the complex bureaucracies in both countries.

To meet the urgent needs, India and the US must be laser-focused on resource allocation. Previous technology cooperation mechanisms between the US and India in the form of the Defence Technology and Trade Initiative (DTTI) and joint working groups on jet engine and aircraft carrier technology have produced marginal results.

Both countries should identify where tech transfers and collaborations between startups and primes can fill specific capability gaps that give India an asymmetric advantage on the battlefield. The defence industrial roadmap and associated agreements, like the Reciprocal Defence Procurement (RDP) agreement and Security of Supply Arrangement (SoSA) will enable those collaborations from a policy standpoint, ensuring greater predictability for demand, and requirement-based collaboration will be key to commercially viable collaborations.

An India with strong indigenous defence capabilities is in US and global interests. However, this capability cannot be developed in isolation but through partnerships.

Modi's US visit has signalled recognition of this fact. Ultimately, India and the US will not only rely on themselves but also on one another to defend their sovereign interests and secure a rules-based order.

<https://economictimes.indiatimes.com/opinion/et-commentary/us-india-brothers-in-arms-how-to-best-develop-indias-indigenous-defence-capabilities/articleshow/101523455.cms>

## ISRO Moon Mission: Chandrayaan-3 Spacecraft Integrated with Launch Vehicle

Indian Space Research Organisation (ISRO), which is planning to launch the Chandrayaan-3 moon mission in July, has integrated the spacecraft with the launch vehicle — Launch Vehicle Mark-III (LVM3).

On July 5, ISRO tweeted: Today, at Satish Dhawan Space Centre, Sriharikota, the encapsulated assembly containing Chandrayaan-3 is mated with LVM3. ISRO has, so far, not announced the date of the launch. However, the launch window for the Chandrayaan-3 is between July 12 and 19.

ISRO Chairman S. Somanath has said that the space agency would pick the earliest possible date to launch the mission. Chandrayaan-3 is India's third moon mission, and is a follow-up to Chandrayaan-2, to demonstrate end-to-end capability in safe landing and roving on the lunar surface. Chandrayaan-3 consists of an indigenous lander module (LM), propulsion module (PM), and a rover with an objective of developing and demonstrating new technologies required for inter-planetary missions.

According to ISRO, the lander has the capability to soft land at a specified lunar site, and deploy the rover, which will carry out in-situ chemical analysis of the lunar surface during the course of its mobility. The Lander and the Rover have scientific payloads to carry out experiments on the lunar surface. The main function of PM is to carry the LM from launch vehicle injection till final lunar 100-km circular polar orbit, and separate the LM from PM. Apart from this, the Propulsion Module also has one scientific payload, as a value addition, which will be operated post-separation of the Lander Module.

After its launch in mid-July, as in the case of India's previous moon mission, Chandrayaan-2, the orbital raising will take place. The lander and orbiter will orbit the moon before touching down on the moon.

Mr. Somanath had earlier said that ISRO has added more fuel to the lander, along with new equipment, and also strengthened it. Chandrayaan-3 will be going in the same path as its predecessor, and will also be landing at the same site.

<https://www.thehindu.com/sci-tech/science/isro-moon-mission-chandrayaan-3-spacecraft-integrated-with-launch-vehicle/article67044758.ece>

**mint**

Wed, 05 Jul 2023

## Satellite Launch Costs in India to Drop further: V.K. Saraswat

Satellite launch costs in India are set to drop further, encouraging more countries to use Indian launch vehicles after the government opened up the space sector to private companies and made

available state-owned agencies' services to private players, NITI Aayog member and defence scientist V.K. Saraswat said in an interview.

Saraswat said more startups are coming up in the space sector, and satellite launches by private and academic institutions have been going up. The government had in June 2020 announced plans to encourage private participation in all space activities to help make the country self-reliant in this sector and to use the sector as a catalyst for industrial development. A key focus area was to let the private sector have access to public sector space infrastructure.

Saraswat said the facilities of the Indian Space Research Organisation (ISRO) have now been made available to the private sector. The private sector is encouraged to develop application-based satellites, aiding new startups in the space sector.

Opening up the space sector has given a major push to the sector, and this acts as a force multiplier, he said, adding that the indirect impact of that is the creation of employment opportunities for experts and others.

"It also gives you advantages in terms of utilizing those space technologies for other civilian purposes and leads to multi-dimensional growth of the space sector. This will also reduce the cost of launching satellites significantly.

Today we are launching satellites at a cost of about \$30,000 to \$40,000 per kg (of payload), but I personally believe that the time will come, with the participation of the private sector and also international collaboration, (when) the cost of launching satellite will (further) come down. Only time will tell by how much, but certainly, there is a very good possibility of that," Saraswat said.

The sector is already seeing growth in a big way, with the number of satellite launches by academic institutions and the private sector, including startups, using the vehicles of the Department of Space, going up. "That itself shows a significant contribution coming from the private sector."

"They are building new payloads and different types of satellites, including nano, micro and mini-satellites," Saraswat said.

Saraswat said that India has the potential to become a hub for satellite launches.

"That will be the future. Already India has been launching satellites for other countries, but with the private sector participation in the sector, we will further attract other countries to come to launch their satellites with Indian launch vehicles. There is no doubt about it. We have already been launching satellites for other countries, but I think this will increase because space is becoming a service now. We are quite competitive as far as the cost of launching a satellite is concerned. Indian costs are much lower compared to, say, America's costs. We have a bright future, and I think the market can be exploited by major initiatives from the private sector," Saraswat said.

As of March, the Indian space technology sector had 167 registered startups, according to the department of space. Additionally, 44 foreign satellites were launched using ISRO's launch vehicle in 2022, and 37 foreign satellites were launched up until March 2023, according to the department's data.

<https://www.livemint.com/news/india/indias-lower-satellite-launch-costs-set-to-attract-more-countries-encourage-private-sector-and-startups-11688575713494.html>

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