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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

A Daily service to keep DRDO Fraternity abreast with DRDO Technologies, Defence Technologies, Defence Policies, International Relations and Science & Technology



## CONTENTS

S. No.	TITLE		Page No.
	DRDO News		1-2
	DRDO Technology News		1
1.	NPOL Scientists Win DRDO Awards	The Times of India	1
	DRDO on Twitter		2
	Defence News		3-19
	Defence Strategic: National/International		3-19
2.	Extended Continental Shelf Next Step	The Economic Times	3
3.	Indian Army Celebrates 75th International Day of UN Peacekeepers	ANI	4
4.	Army, Navy, Air Force to Come Together for 'Theatre Command System', Say Defense Officials	India Today	5
5.	Rajnath Singh Wants Indian Military to Boost R&D. But Defence Finance is Complex Territory	The Print	6
6.	India's Defence Sector is Embracing Self-Reliance in Manufacturing and Technology	Financial Express	8
7.	Defence Minister Rajnath Singh Attends Swearing-in Ceremony of Nigerian President	The Print	10
8.	CBI Books Rolls Royce, BAE Systems for Alleged Corruption in Hawk Aircraft Deal	Hindustan Times	11
9.	China Declines US Request for a Meeting Between Defence Chiefs	The Times of India	12
10.	North Korea Says it will Launch its First Military Spy Satellite in June	The Times of India	13
11.	Israeli Navy Successfully Tests C-Dome Defense System	ANI	14
12.	US DoD to Maximise Cyber Capabilities through 2023 Cyber Strategy	Army Technology	15
13.	US Patriot Anti-Missile Systems Ensure 100% Interception: Ukraine's Zelenskyy	The Economic Times	16
14.	Inside South Korea's Race to Become One of the World's Biggest Arms Dealers	Reuters	17
	Science & Technology News		20-25
15.	ISRO Successfully Launches 2nd-Gen Navigation Sat	The Times of India	20
16.	'Chandrayaan-3 to be Launched in July': ISRO Chief	Hindustan Times	20
17.	ISRO Looking at Testing Gaganyaan Crew Module Mission by July, Says Chairman Somanath	The Hindu	21
18.	China to Send First Civilian into Space on Tuesday	The Hindu	22
19.	China to Send Astronauts to Moon by 2030 as Space Race Intensifies	The Indian Express	23

**DRDO** News

## DRDO Technology News

# THE TIMES OF INDIA

Tue, 30 May 2023

## **NPOL Scientists Win DRDO Awards**

Two scientists of Naval Physical and Oceanographic Laboratory (NPOL), Kochi, bagged DRDO awards.

While scientist 'E' Pratheek Suresh Kumar was conferred with the Young Scientist Award, technician 'C' Shysimol V, was conferred with Award for Excellence in Technical Support. The awards, including a citation and a cash incentive, were presented by department of defence R&D secretary and DRDO chairman Samir V Kamat at the DRDO Awards function held in New Delhi on Friday.

Kumar received the award for his contributions to the design and development of state-of-the-art hardware and software for signal processing applications.

Shysimol received the award for her outstanding contributions in assembly, testing and integration of PCBs and frontend sub-systems, its experimental validations and proactive participation in field trials in multiple projects of NPOL. Meanwhile, scientist 'G' (retd) Reji John, who is currently an Emeritus Professor at Cochin University of Science and Technology, received Scientist of the Year Award.

https://timesofindia.indiatimes.com/city/kochi/npol-scientists-win-drdo-awards/articleshowprint/ 100609205.cms

## **DRDO on Twitter**



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On 28 May, Dr Samir V Kamat (Chair, @DRDO\_India), inaugurated the DRDO Industry Academia - Raman Centre of Excellence (DIA-RCoE), in the presence of Prof G Rangarajan, Director of IISc, and other dignitaries.



## **Defence News**

Defence Strategic: National/International

# THE ECONOMIC TIMES

Tue, 30 May 2023

### India Set to Complete EEZ Survey in Andamans, Extended Continental Shelf Next Step

India is set to complete an exhaustive survey of its Exclusive Economic Zone (EEZ) months after the central government aligned all stakeholders, including defence and space agencies, to release 99 percent of the areas prohibited for oil exploration and production due to security concerns.

It is learnt that the first proper survey of the Andamans offshore area, considered to be a petroliferous basin with prospects for oil and gas resources, is nearing completion with data being acquired for 23,055-line kilometres (LKM). Similarly, survey works for 38,711 LKM in the Western sector and 8,235 LKM in the Eastern Sector are nearing completion. The next step is likely to be a survey to cover the limits of the Indian Extended Continental Shelf (ECS).

The survey was started in November last year after a joint effort by stakeholders like the Directorate General of Hydrocarbons, ministry of defence and the space department, who were aligned to release areas that had been prohibited earlier.

An empowered coordination committee oversaw the process and the National Maritime Security Coordinator, part of the National Security Council Secretariat, played a critical role in expediting security clearances. In the past, 42 percent of the Indian EEZ of 2.36 million square km was under a 'no go' zone.

After exhaustive consultations with the Indian Navy, Coast Guard and Defence Research and Development Organisation (DRDO), the 'no go' zone was brought down to 24832 sq km. Safeguards were also put in place to indemnify government departments and the forces from any damage suffered in oil exploration and production.

The survey is expected to yield discovery of significant oil and gas resources in the Indian EEZ. As per broad estimates, the Indian EEZ should have 17-billion-ton oil equivalent (BTOE) of oil and gas, of which 7.4 BTOE had been discovered prior to the survey. The current EEZ survey is being conducted by Shearwater Geoservices Limited on the Eastern and Western offshore and Seabird Exploration in the Andaman region.

India, which is the third largest energy consumer in the world, is looking to cut down its dependencies on imports. At the current pace, the Indian requirement for oil and gas is expected to grow threefold by 2050. Steps to explore for oil and gas in the EEZ are being taken to close the gap.

https://economictimes.indiatimes.com/news/india/india-set-to-complete-eez-survey-in-andamansextended-continental-shelf-next-step/articleshow/100602599.cms



#### Indian Army Celebrates 75th International Day of UN Peacekeepers

The Indian Army on Monday commemorated the 75th International Day of UN Peacekeepers, by paying homage to the fallen comrades by laying a wreath at the National War Memorial in the national capital, stated an official release from Ministry of Defence.

The wreath was laid by Chief of the Army Staff Gen Manoj Pande, Vice Chief of Army Staff Lieutenant General MV Suchindra Kumar and representatives from the Navy and Air Force, Ministry of External Affairs and the United Nations.

"This is the day when in 1948 the first UN peacekeeping mission, UN Truce Supervision Organisation (UNTSO) began operations in Palestine," read an official release.

Each year on this Day, the UN and countries across the globe pay tributes to the professionalism, dedication and courage of all men and women who have served or are serving in UN Peacekeeping Missions and honour the memory of those who have laid down their lives in the cause of peace.

This year marks the 75th Anniversary of the UN Peacekeepers Day.

"India has a rich legacy of contribution to UN Peacekeeping operations and is one of the largest contributors of troops. It has contributed approximately 2,75,000 troops to peacekeeping missions so far, with around 5,900 troops currently deployed in 12 UN Missions. Indian Army personnel have operated under difficult conditions in challenging terrains and have displayed exemplary professionalism, humane approach, courage and valour, to the extent of making the supreme sacrifice to defend the UN mandates," it read.

According to an official release, 159 Indian Army soldiers have made the supreme sacrifice to ensure peace across the globe. Apart from the current deployment, India has pledged one Infantry Battalion Group and Corvette with Helicopter, as hard power and an Engineer Company & Signal Company as Force enablers, to be deployed at the behest of the UN.

In keeping with the need for women peacekeepers in conflict areas under UN mandate, India has deployed Female Engagement Teams (FETs) in MONUSCO and UNISFA (the second largest women contingent after Liberia). India has also deployed Women Military Police in UNDOF and women staff officers and military observers in various missions.

The Indian Army has established a Centre for UN Peacekeeping (CUNPK) in New Delhi to impart niche training in peacekeeping operations. The Centre trains more than 12,000 troops every year.

"CUNPK undertakes a multitude of activities from contingent training to national and international courses for potential peacekeepers and trainers. It also hosts foreign delegations as part of sharing best practices. The Centre regularly dispatches Mobile Training Teams to Friendly Foreign Countries as part of capacity building in the field of UN peacekeeping training. The institute has evolved in the two decades as a Centre of Excellence and repository of experience and best practices," it read.

In order to ensure the operational efficiency and sustainability of Indian contingents in UN missions, the Indian Army has deployed state-of-the-art equipment and vehicles. These vehicles and equipment are manufactured in India and have successfully withstood the vagaries of difficult terrain, weather and operational conditions in the mission areas, stated an official release.

As per an official release, India has been at the forefront of capacity development for the UN, host nations and partner nations. It has always strived to support UN initiatives by providing agile and flexible units, peacekeeper training, logistic support, enhancing gender parity and contributing to technological enhancements.

"India continues to provide active support for host nation capacity development by providing training, infrastructure development and Civil-Military Co-operation (CIMIC) activities," it read.

https://www.aninews.in/news/national/general-news/indian-army-celebrates-75th-internationalday-of-un-peacekeepers20230529130633/



Mon, 29 May 2023

#### Army, Navy, Air Force to Come Together for 'Theatre Command System', Say Defense Officials

All three defense services, the Air Force, Navy and the Army, will come forward for all the military exercises in future, senior defence officials informed India Today. The initiative will be taken under the 'Theatre Command System', which aims to bring synergistic coordination between the three branches of the armed forces.

Further, the idea of theatre command aims to bring greater focus to allocating resources and help reduce redundancies.

This is a step towards creating new theatre commands and future military exercises will have components from all three services and not just individual services, the officials added. CDS Gen Anil Chauhan has been tasked by the government to hasten the setting up of these theatre commands.

Operation Vayu Shakti of the Indian Air Force (IAF), will be one such exercise that will have events for all three services. It will take place early next year.

CDS Chauhan has been moving very steadily towards creating joint force structures and has also hosted almost all of the 17 commands of the three forces. The new theatre command will have events from three services and would be headed by a driver from all three services.

Gen Chauhan, from his first official communication with the Army, Navy and Air Force, has been asking the forces to make a move towards creating new theatre commands for war fighting. Meetings took place between top defence brass to finalise the structure of theatre command.

The 'Theatre Command System' also aims to develop separate commands for the Army, Navy, and Air force under a unified command headed by a single commander. The integration process would lead to unified military assets under one operational head who would be responsible for directing and controlling their activities in a given situation.

Besides the operational synergies, the theatre command system would contribute to more streamlined costs and a leaner fighting force.

https://www.indiatoday.in/amp/india/story/army-navy-air-force-to-come-together-for-theatrecommand-system-2386134-2023-05-29

# The**Print**

Tue, 30 May 2023

## Rajnath Singh Wants Indian Military to Boost R&D. But Defence Finance is Complex Territory

#### By Lt General Prakash Menon

Last week, on two separate platforms, Defence Minister Rajnath Singh pointed out the dire need for India to metamorphose from being an 'imitator' in Research & Development to a 'leader' in developing futuristic technologies that could deal with pressing global security concerns.

One of the platforms was the Defence Research and Development Organisation (DRDO)'s Academia Conclave in Delhi, where Singh highlighted the need for deepened collaboration between DRDO and academia. If realised, the cross-movement of scientists between DRDO and other institutes could produce results greater than the sum of its parts. One of the means suggested was that the DRDO, which has an extensive R&D infrastructure with over 50 laboratories across the country, could make its labs available to academia for research purposes. Not only would this move benefit institutions financially, but it would also provide DRDO with skilled researchers from the academic space, he said.

At the annual session of the Confederation of Indian Industry (CII), where the theme was 'Future Frontiers: Competitiveness, Technology, Sustainability and Internationalization', the defence minister reiterated the 'imitator' issue and also stated that R&D could help create technologies that improve the utilisation of available resources and act as a force multiplier. He sought greater participation by the private sector in defence R&D and urged it to make inroads into new and hitherto untouched sectors/products/goods and services.

He listed robust R&D infrastructure and substantial financial and human capital as the key requirements for making India a technology leader. Singh also said that the government had taken several appropriate steps to achieve this goal – covering banking policy, regulatory policy, provision of funds, labour policy, as well as education and health policy. Such initiatives would provide a playfield for the country's youth and the industry to work collaboratively and take R&D to greater heights.

This article looks at one critical aspect of defence R&D – financing.

#### India's R&D budget

India was ranked 40th among 132 countries in the Global Innovation Index (GII) 2022 by the World Intellectual Property Organization (WIPO), a specialised agency of the United Nations. The index was released in January 2023 and provides a yardstick for measuring an economy's innovation performance. The index uses various measures to rank countries, such as institutions, human capital, research, infrastructure, market sophistication, knowledge and technology outputs. India was ranked 40th last year and 81st in 2015, which means it has certainly made progress in R&D at the national level.

In defence, R&D capital outlay is approximately Rs 12,850 crore for 2023-24, in contrast to the Budget Estimate (BE) in 2022-23 of Rs 11,982 crore, which amounted to an increase of 7.2 per cent. However, revenue allocation has increased by 11.4 per cent. It has witnessed a Compound Annual Growth Rate (CAGR) of 6.07 per cent over the last decade while the capital budget has seen a CAGR of 5.5 per cent.

Undoubtedly, several steps like the Innovations For Defence Excellence (IDEX) scheme have been initiated. But such programmes cannot be expected to develop state-of-the-art technology. It is a different ballgame altogether and would require a synergised national effort on a scale that certainly cannot be met by the total amount India spends on its R&D. According to GII 2022, this amount is 0.7 per cent of the country's GDP and an area where globally, India ranks 53rd.

It is obvious that the national and defence R&D budget will require much more allotment if the defence minister's call for becoming a leader from an imitator is to get anywhere near its realisation. With allocation challenges intact, any major increase in the defence budget seems unlikely in the near future. Therefore, Singh's call to industry leaders to spend more on R&D is understandable, but whether the industry will rise to the occasion is a moot point.

#### **Corporates are profit-driven entities**

A CII Report, entitled, 'Harnessing Private Sector Investment in R&D, admitted that so far, it is mostly the government that has been investing in R&D, and there was a need for the private sector to step up and play a role in increasing India's R&D spend to 2 per cent of the GDP. The recommendations included promoting and strengthening Public Private Partnership (PPP) Models; increasing R&D with other countries; strengthening the funding ecosystem; increasing investments in education; promoting expenditure on R&D as investments; developing incubators on the PPP model; and private sector shifting to India- centric R&D.

The corporate sector is understandably a profit-driven entity. It will put in the money only if, in its estimation, a reasonable return on investment is assessed.

Certainly, such opportunities exist in the defence sector, especially as security demands rise. But to expect that the corporate sector will pursue the development of cutting-edge technologies for deployment in the defence sector may be unrealistic. The process of R&D is, in essence, a journey into the unknown. It is a risk that business moguls will be reluctant to take, especially when opportunities exist along other routes. At best, the private sector can be expected to keep to the path of investment in R&D, which would produce items that are in demand nationally and globally.

#### **R&D** financing an uphill task for govt

For the development of advanced technologies in the defence sector, the Indian government will have to rely mostly on its own finances while leveraging its R&D infrastructure and human capital that reside in large measure outside the government. It should also seek international cooperation, which it is attempting, like through the India-US 'Initiative on Emerging Technology' launched by the US president and the Indian prime minister on the sidelines of the Quad (Quadrilateral Security Dialogue) summit in May 2022. This aims to elevate and expand the countries' strategic technology partnership as also the defence industrial cooperation between their governments, businesses, and academic institutions. But to expect the US corporate sector to part with the knowledge that resides at the core of its critical technologies would be an unfeasible ask. The impact is that the US or any other country would retain its ability to keep India strategically dependent.

For India's strategic planners, it is better to identify those critical technologies derived from its strategic vision based on a long-term view of its political and security destination. Developing an engine for fighter aircraft is a prime example that must be pursued with the idea of 'whatever it takes'. With its limited resources, India's priority should be deploying R&D to capitalise on identifying accessible capabilities that must be shaped by national military strategy and doctrine. Armed/suicide and surveillance drones are yet another example. The focus must be derived from the types of war India must be prepared for.

Though the Russia-Ukraine war has triggered calls to gear up for the 'big wars', its applicability in the Indian context is questionable. Also, we must resist the proclivity to pursue military technology through R&D that is disconnected from strategic requirements. No mention of the presence of the military as users, in media reports covering the defence minister's twin address is perhaps pregnant with the indication of this existing malaise.

https://theprint.in/opinion/rajnath-singh-wants-indian-military-to-boost-rd-but-defence-finance-iscomplex-territory/1601340/



Mon, 29 May 2023

## India's Defence Sector is Embracing Self-Reliance in Manufacturing and Technology

By Dr Santanu Mandal

From high-tech weaponry to advanced weapon systems, the last two decades have seen India's defence forces increasingly equip themselves with modern technologies, and rapidly advance their technological capabilities. India has the largest defence budget, behind only the USA and China. However, it is also the largest defence importer in the world, which impacts its current account deficits. To overcome this, the Govt. of India, through its Defence Production Policy of 2018 (DPrP-2018) set the goal to become one of the top five global producers of Aerospace and Defence Manufacturing.

Like other sectors, defence has also embraced the role of technology from materials science and sourcing to high-tech applications and systems. The iDEX (Innovations for Defence Excellence) programme launched in April 2018, creates an ecosystem that fosters innovation and technology development by engaging across large and small industries, research and academic institutes and start-ups to adopt technology and advance the defence capabilities.

Another initiative, Aatmanirbhar Bharat, was started to encourage home-grown technology development to build a self-reliant India, and has become a national movement today. The resulting drive towards self-reliance as a nation has created opportunity across the industry. The Defence Acquisition Procedure (DAP) accordingly prioritises the indigenisation of sourcing, manufacture, research and development, as well as software and other high-tech applications.

Industry is responding to the call of Aatmanirbhar Bharat to offer solutions to various defence organisations and build a self-reliant India. While various Defence R&D units and Public Sector Units played a pivotal role in developing indigenous technologies and launching products as per the market requirements, the private sector as well has realigned their business models to tap into this sector as a business opportunity and help the country achieve these strategic goals.

#### Making India self-reliant in materials and manufacturing

India has been significantly relying on imports for military materials, the critical metal and nonmetal raw materials and specialised compounds used in armour, ammunition, aerospace, and naval applications. India imports approximately \$2 billion annually, relying on countries such as China, Democratic Republic of Congo (DRC), Russia, Brazil, Australia and the U.S. With the supply chain disruptions caused by the Covid-19 pandemic and the ever-present threat of geo-political unrest, looking to become self-reliant is critical. A self-reliant defence system is not only crucial for the economy of a country but also important from a strategic national security point of view.

Indian companies like CUMI have been contributing to the aerospace and defence industry value chain by producing and supplying revolutionary new materials for indigenous manufacturing with a competitive advantage. Providing end-to-end solutions right from mining to research and manufacturing, these companies also make products and components used in various purposes in defence.

Since the components used in the defence manufacturing sector must accomplish specific temperatures, resistance and loads, a great deal of importance is given to material science research and development. At CUMI, our expertise in materials also extends to several defence purposes through indigenous and fully integrated operations across the value chain including mining, power generation, fusion, manufacturing, marketing and distribution. Our lightweight ceramic, engineered with alumina and silicon carbide is used to provide ballistics protection in bullet-proof gear for armed forces, and in armoured vehicles. Ceramics are also used in green energy, sensors for Light Combat Aircraft (LCA), and even in missiles. CUMI recently signed a Licensing Agreement for Transfer of Technology (LAToT) with DRDO's Research Centre Imarat (RCI) Laboratory for technology to manufacture "Ceramic Radomes (GELCAST Process) Technology" used in missile systems. Since missiles undergo extremely high surface temperatures while traveling through the atmosphere, ceramic is considered as the optimal radome material.

Lightweight composites like carbon fibre reinforced polymers (CFRP) have high tensile strength making them ideal for unmanned aerial vehicles (UAVs). With over five decades of experience in design, manufacturing and testing of composites, CUMI's Composites Manufacturing Division has brought cutting-edge technology across the board from payload holders to landing gear, with solutions that include CFRP tubes, sheets and customised composite structural parts for UAVs.

CUMI's research team has also helped develop various grades of graphene – the strongest, thinnest material known to man, known as the 'Wonder Material', at just one atom thick – to create graphene-integrated innovative solutions.

#### Impact of Aatmanirbhar Bharat on defence exports

With several Government policy initiatives and reforms in the last five years to encourage indigenous design, development and manufacturing, the defence manufacturing sector has contributed immensely to improve the current account deficits and developing indigenous technologies. According to the Press Information Bureau, India's defence exports grew by 334% in the past five years, exporting to 75 nations due to collaborative efforts. In 2022, India signed a \$375 Million worth deal with the Philippines to export its indigenous BrahMos missile system. This was a major boost to India's defence exports plan. And it also brought focus on the development of missile technology in India, which is a niche technology especially if one talks about the super-sonic (>Mach 1) and hypersonic (>Mach 5) technologies that would require light-weight engineering materials for structural & functional application.

In 2021-22, India's defence exports stood at an impressive \$1.5 Billion, with a target to become a \$5 Billion worth industry by 2024-25. With this huge push by the Indian Government for indigenisation and procurement of defence products from domestic resources, the expenditure on defence procurement from foreign sources has reduced from 46% to 36% in the last 5 years.

#### Self-reliance – a must for national security and development

The Ministry of Defence (MoD) in their 2022 year-end review emphasized that Atmanirbharat i.e. self-reliance in defence is a must for development and national security – from this it is evident that the focus is on building a youthful and tech-savvy military to meet the future challenges. This is a

shot in the arm for Indian tech start-ups, manufacturing companies and materials suppliers, who have a critical role to play in positioning India as a global player in defence manufacturing.

https://www.financialexpress.com/business/defence/indias-defence-sector-is-embracing-self-reliance-in-manufacturing-and-technology/3106717/



*Tue, 30 May 2023* 

## Defence Minister Rajnath Singh Attends Swearing-in Ceremony of Nigerian President

Defence Minister Rajnath Singh on Monday represented India at the swearing-in ceremony of Nigerian President Bola Ahmed Tinubu.

Tinubu, 71, was sworn in as Nigeria's president in Abuja, the capital city, in the presence of thousands of Nigerians and several heads of government. He succeeded Muhammadu Buhari.

Tinubu, a former governor of the country's commercial capital, Lagos, was declared the winner of the February 25 presidential election on March 1.

India was among the select non-African nations that were represented in the 'swearing-in ceremony' at the Ministerial level, reflecting the high priority and strength of our bilateral relations with Nigeria, the Defence Ministry in New Delhi said in a statement.

Singh arrived here on Sunday on a three-day visit, marking the first-ever visit of an Indian defence minister to the African country.

In addition to senior officials of the Ministry of Defence, Singh's delegation to Nigeria included top executives of Hindustan Aeronautics Limited (HAL) and Goa Shipyard Limited (GSL).

These executives held a series of meetings with the Nigerian military and government representatives for identifying their requirements which can be fulfilled by the Indian Defence companies. Business-to-Business meetings were held with Nigerian companies for enhancing cooperation, the statement said.

Singh also had a brief meeting with the Minister for Local Government, Rural Development and Cooperative of Bangladesh Md Tazul Islam, who was also in Abuja to attend the swearing-in ceremony.

"Wonderful interaction with the Minister for Local Government, Rural Development and Cooperative of Bangladesh, Mr Md Tazul Islam in Abuja," Singh tweeted after the meeting.

The meeting was a testimony of the bonhomie between India and Bangladesh. The two leaders expressed the commitment of their respective governments towards further expanding and strengthening the bilateral ties, the statement said.

During the visit, Singh will also address an estimated 50,000-strong Indian diaspora in Nigeria, strengthening the shared cultural ties between the two countries.

https://theprint.in/world/defence-minister-rajnath-singh-attends-swearing-in-ceremony-of-nigerian-president/1601349/



#### CBI Books Rolls Royce, BAE Systems for Alleged Corruption in Hawk Aircraft Deal

The Central Bureau of Investigation has registered a case against arms dealer Sudhir Choudhrie and British defence firms Rolls Royce Plc and British Aerospace Systems in connection with alleged irregularities in the purchase of 24 Hawk 115 advance jet trainer aircrafts for the Indian air force and navy between 2003 and 2012, people familiar with the development said.

Kickbacks were allegedly paid to middlemen although agreements, an integrity pact, and associated documents and orders related to the deal prohibited such payments, officials added. (File photo for representation)

Kickbacks were allegedly paid to middlemen although agreements, an integrity pact, and associated documents and orders related to the deal prohibited such payments, they added, requesting anonymity.

Rolls-Royce Plc office in London issued a statement saying the firm is assisting Indian authorities. HT reached out to British Aerospace Systems but there was no comment till evening.

Choudhrie, a British citizen, is a known arms dealer. He earlier faced probes by CBI and the Enforcement Directorate in defence deals, including alleged bribery in securing a contract for an upgrade of artillery guns for an Israel-based defence firm in 2004 and in the Barak missile scandal of 2006-07. Both cases were closed due to lack of evidence.

Rolls-Royce was investigated in 2018-19 in a separate case related to dubious payments in the form of commissions in return for contracts from three state-run Indian companies. It allegedly made payments to a Singapore based middleman between 2007 and 2011 in bank accounts in Singapore and Hong Kong.

The latest case, registered on May 23 based on a preliminary enquiry, names Rolls Royce India's director Tim Jones, Choudhrie's son Bhanu Choudhrie and unidentified public servants.

"Enquiry revealed that unknown officers of ministry of defence, during the period 2003 to 2012, entered into a criminal conspiracy with Tim Jones, director of Rolls Royce India Pvt Ltd, Sudhir Choudhrie, Bhanu Choudhrie, M/s Rolls Royce Plc, British Aerospace Systems UK, and other unknown public servants and private persons with the object to cheat the government of India in the matter of procurement of Hawk aircraft from Rolls Royce Plc, UK, and its associate group companies, including Rolls Royce Turbomeca Limited, and in pursuance of the criminal conspiracy, the unknown public servants abused their official position and approved and procured a total number of 24 Hawk 115 advance jet trainer (AJT) aircrafts for British Pounds 734.21 million (around ₹7,400 crore according to Monday's exchange rate)," CBI's first information report said. HT has seen a copy. "Rolls-Royce Plc is continuing to assist the Indian authorities. The allegations being investigated by CBI were disclosed in the Deferred Prosecution Agreement agreed with the UK's Serious Fraud office in 2017. Rolls-Royce today is a fundamentally different business. We will not tolerate business misconduct of any sort and are committed to maintaining high ethical standards. India remains an important market for Rolls-Royce and we have a valued ecosystem of skilled people and partners in the country," the company said in its statement.

The Cabinet Committee on Security (CCS) had approved the procurement of 66 Hawk 115 AJTs on September 3, 2003, under which 24 BAE Hawk 115Y AJTs in flyaway condition with all the

accoutrement along with material for 42 aircraft to be manufactured by HAL were cleared for British Pounds 734.21 million, equivalent to ₹5653.44 crore (calculated at ₹77 per British Pound), was sanctioned.

Procurement of 42 aircraft, to be licence manufactured by HAL at an additional cost of 308.247 million British Pounds, equivalent to ₹1944 crore, and a payment of 7.5 million British Pounds to Rolls Royce as a Manufacturer's licence fee was also cleared.

Subsequent contracts signed with Rolls Royce/BAE had an integrity clause that barred the engagement of any middlemen or payment of a commission. In case of violation, the company could have been debarred for any Government of India work for the next five years besides penalty.

HAL delivered 42 aircraft to the Indian Air Force between August 2008 and May 2012.

Hawk aircraft is used as a trainer as well as for aerobatics and ground attack operations.

The FIR says the accused persons permitted "licence manufacturing of 42 additional aircraft by HAL against materials supplied by the said manufacturer (Rolls-Royce) for an additional amount of \$308.247 million (around ₹2,545 crore at today's rates) and \$7.5 million (around ₹62 crore) towards manufacturer's licence fee, in lieu of huge bribes, commissions and kickbacks paid by manufacturer and its officers to intermediaries, despite the fact that agreements, integrity pact and associated documents/orders pertaining to the said deal prohibited payments to intermediaries and middlemen."

The preliminary enquiry revealed that the income-tax department recovered documents related to the deal during a survey at Rolls-Royce's office in 2006-07. But the accused persons allegedly caused the disappearance of these vital documents, CBI said.

In 2012, media reports alleging corruption in Rolls Royce operations surfaced, resulting in an investigation by the British Serious Fraud Office based in London. Rolls-Royce allegedly paid 1.85 million pounds (around ₹19 crore) to an intermediary, CBI said.

According to CBI, 100 million British pounds were deposited by Russian arm companies into a Swiss bank account in the name of Portsmouth, a company associated with Choudhrie with regard to defence deals with Russia for purchase of MIG fighter aircraft.

"Out of this amount, the companies in the name of Choudhrie's family, namely Belinea Services Ltd, Cottage Consultants Ltd and Carter Consultants Inc. received GBP 39.2 million, GBP 32.8 million and GBP 23 million respectively between October 2007 and October 2008," the FIR alleged, without elaborating on the link between this and the Hawk jet aircraft deal.

https://www.hindustantimes.com/india-news/cbi-registers-case-against-arms-dealer-sudhirchoudhrie-rolls-royce-and-british-aerospace-systems-over-alleged-irregularities-in-hawk-jet-deal-101685387508962-amp.html

# THE TIMES OF INDIA

Tue, 30 May 2023

#### China Declines US Request for a Meeting Between Defence Chiefs

China has declined a request by the US for a meeting between their defence chiefs at an annual security forum in Singapore this weekend, media reported on Monday, a new sign of strain between the powers.

"Overnight, the PRC informed the US that they have declined our early May invitation for Secretary Austin to meet with PRC Minister of National Defense Li Shangfu in Singapore," the Pentagon said in a statement to the Wall Street Journal, referring to China by the initials of its official name, the People's Republic of China.

The Pentagon said it believed in open communication "to ensure that competition does not veer into conflict."

Last week, White House spokesman John Kirby said there were discussions by the Defense Department to get talks going between Lloyd Austin and his Chinese counterpart, who was named defence minister in March.

The prospect of a meeting between them was being closely watched given regional security tensions and trade disputes that have derailed plans for re-engagement by the world's two largest economies.

Last week, USCommerce Secretary Gina Raimondo and Chinese Commerce Minister Wang Wentao traded barbs on trade, investment and export policies in a meeting in Washington that marked the first U.S.-China cabinet-level exchange in months.

Singapore-based security analyst Ian Storey said China's decision to shun Austin did not bode well.

"At a time of rising US-China tensions, General Li's refusal to meet his American counterpart will fray regional nerves even further," Storey said.

Austin and Li will be in Singapore to attend the annual Shangri-la Dialogue that opens on Friday, an informal gathering of defence officials and analysts that also plays host to a string of side meetings.

Both are expected to hold bilateral meetings with counterparts from around the region.

Chinese officials have yet to explain Li's snub but some security analysts said Beijing's annoyance at US sanctions against him was a possible reason.

Li, who security scholars say is a veteran of the People's Liberation Army modernisation effort, has been under USsanctions since 2018 over the purchase of combat aircraft and equipment from Russia's main arms exporter, Rosoboronexport.

Li is a member of the Central Military Commission, China's top defence body that is commanded by President Xi Jinping.

https://timesofindia.indiatimes.com/world/china/china-declines-us-request-for-a-meeting-betweendefence-chiefs/articleshow/100609642.cms

## THE TIMES OF INDIA

Tue, 30 May 2023

#### North Korea Says it will Launch its First Military Spy Satellite in June

North Korea will launch its first military reconnaissance satellite in June for monitoring US military activities, state media KCNA reported on Tuesday. In a statement carried by the KCNA news agency, Ri Pyong Chol, vice-chairman of the Central Military Commission of the ruling Workers' Party, denounced joint military exercises by the United States and South Korea as openly showing their "reckless ambition for aggression."

US and South Korean forces have carried out various training exercises in recent months, including what they said were the biggest joint live-fire exercises last week, after many drills were scaled back amid Covid-19 restrictions and hopes for diplomatic efforts with North Korea.

North Korea's Ri said the drills required Pyongyang to have the "means capable of gathering information about the military acts of the enemy in real time."

"We will comprehensively consider the present and future threats and put into more thoroughgoing practice the activities for strengthening all-inclusive and practical war deterrents," Ri said in the statement.

Nuclear-armed North Korea has said it has completed development of its first military spy satellite, and leader Kim Jong Un has approved final preparations for the launch.

The statement did not specify the exact launch date, but North Korea has notified Japan of the planned launch between May 31 and June 11, prompting Tokyo to put its ballistic missile defences on alert.

Japan has said it would shoot down any projectile that threatens its territory.

"(North Korea's) satellite launches incorporate technology that is almost identical and compatible with those used for ballistic missiles, and regardless of the designation used by North Korea, we believe that the one planned for this time also uses ballistic missile technology," Japan's Chief Cabinet Secretary Hirokazu Matsuno said on Tuesday.

A US State Department spokesperson said on Monday any North Korean launch that uses ballistic missile technology, including those used to put a satellite in orbit, would violate multiple United Nations resolutions.

The launch would be the North's latest in a series of missile launches and weapons tests, including one of a new, solid-fuel intercontinental ballistic missile last month.

Analysts say the satellite will improve North Korea's surveillance capability, enabling it to strike targets more accurately in the event of war.

https://timesofindia.indiatimes.com/world/rest-of-world/north-korea-says-it-will-launch-its-firstmilitary-spy-satellite-in-june/articleshow/100608435.cms



Mon, 29 May 2023

#### Israeli Navy Successfully Tests C-Dome Defense System

A naval version of Israel's Iron Dome passed a series of tests, taking the C-Dome system one step closer to becoming operational, Israel's Defense Ministry announced on Monday.

Installed on the Israeli Navy's Saar 6 "Magen" corvettes, the system correctly identified and successfully intercepted rockets, cruise missiles and aerial drones, all representing potential threats to Israel's offshore natural gas fields.

"The C-Dome system constitutes a significant leap forward in our defense capabilities, and ensures the Israeli defense establishment's superiority and operational capabilities in the face of growing threats in the maritime arena," said Defense Minister Yoav Gallant. "The system's naval adaptation is part of our advanced multi-tier air and missile defence system. I would like to express my great appreciation to the Directorate for Defense R&D, the IDF, and Rafael, for turning a tech vision into reality - developing operational capabilities in the field," he added.

Israel's multi-tier air and missile defence array consists of four operational defence tiers: Iron Dome, David's Sling, Arrow 2, and Arrow 3. The development of these systems is spearheaded by the Defense Research and Development Directorate (DDR&D), with the Haifa-based Rafael Advanced Defense Systems serving as the primary contractor and developer.

"The campaign's success further strengthens our confidence in the defence systems and their ability to protect extensive areas as well as the State of Israel's strategic assets on land and at sea," said Brig. Gen. (res.) Dr Daniel Gold, who heads the DDR&D.

Hezbollah has threatened to attack Israeli gas fields and has even developed a naval unit with Iranian assistance.

During the 2006 war in Lebanon, Hezbollah fired a Chinese-made C-701 anti-ship missile at the Hanit, an Israeli Navy corvette, damaging the ship.

Since then, Hezbollah is believed to have acquired more advanced Russian and Chinese anti-ship missiles with Iranian assistance.

In June 2022, Israel intercepted unarmed Hezbollah drones on their way to Israel's Karish gas field. The move was regarded as a signal by Hezbollah against Israeli drilling there.

https://www.aninews.in/news/world/asia/israeli-navy-successfully-tests-c-dome-defensesystem20230529213411/

**ARMY** TECHNOLOGY

Mon, 29 May 2023

#### US DoD to Maximise Cyber Capabilities through 2023 Cyber Strategy

The US Department of Defense (DoD) has announced the new classified 2023 DoD Cyber Strategy to further advance the defence priorities of the nation.

The DoD transmitted this strategy to the US government last week.

The department will also launch an unclassified summary of this strategy in the upcoming months.

The new strategy supports 2023 National Cybersecurity Strategy and is a part of the 2022 National Security Strategy (NSS) and the 2022 National Defense Strategy (NDS).

It aims to operationalise the concepts and defence objectives for cyberspace specified under the 2022 NDS.

Besides, this strategy builds on the 2018 DoD Cyber Strategy and draws learnings from the years of real-world instances, such as the Russia's invasion of Ukraine last year.

All such real-world experiences will help the DoD to understand the significance of boosting cyber capabilities to counter large-scale, conventional conflicts.

Under the 2023 Cyber Strategy, the DoD has decided to maximise cyber capabilities to support integrated deterrence and to campaign in/through cyberspace "below the level of armed conflicts".

The department will further identify the US' international allies and partners network to register its foundational advantage in the cyber domain.

The strategy includes four main line of efforts for the US DoD to meet the existing and future requirements of the cyber adversaries.

The first effort is 'Defend the Nation' campaign that will help in creating insights about 'malicious cyber actors' to further deter and degrade their capabilities and ecosystem.

In the next move, the DoD will 'Prepare to Fight and Win the Nation's Wars' by maintaining the cyber resilience of the Joint Forces

The third effort, 'Protect the Cyber Domain with Allies and Partners', will allow DoD to assist US allied and partner countries in developing their cyber capabilities to expand the possibility of establishing cyber cooperation in future.

The last initiative 'Build Enduring Advantages in Cyberspace' will help the US DoD in organising, training and equipping the country's Cyber Operations Forces and Service-retained cyber forces.

https://www.army-technology.com/news/us-dod-2023-cyber-strategy/

# THE ECONOMIC TIMES

Tue, 30 May 2023

### US Patriot Anti-Missile Systems Ensure 100% Interception: Ukraine's Zelenskyy

Ukrainian President Volodymyr Zelenskyy said on Monday that using U.S.-provided Patriot antimissile systems ensured a 100% interception rate and would play a role in pushing forward against Russia's invasion.

"When Patriots in the hands of Ukrainians ensure a 100% interception rate of any Russian missile, terror will be defeated," Zelenskyy said in his nightly video address.

The president said that with military successes "and with our Patriots, we have to continue responding to Russia and all its manifestations of evil".

Zelenskyy made his remarks after overnight and daytime attacks on Kyiv and other targets by Russian missiles and drones.

The general staff of Ukraine's armed forces said in its evening report that all 11 missiles used in the daytime attacks had been destroyed. But it made no mention of the Patriot systems.

Yuriy Ihnat, a spokesperson for Ukraine's air force, suggested the Patriot was behind the latest results against incoming Iskander ballistic missiles.

"I think you can guess," Ihnat told Ukrainian television. "If Iskander-M missiles are intercepted, you can draw conclusions about the means that specifically targeted the objectives -- ballistic targets."

https://economictimes.indiatimes.com/news/defence/us-patriot-anti-missile-systems-ensure-100interception-ukraines-zelenskyy/articleshow/100607194.cms



Mon, 29 May 2023

## Inside South Korea's Race to Become One of the World's Biggest Arms Dealers

South Korea is using a \$13.7 billion arms deal with Poland - Seoul's biggest ever - to lay the groundwork for a military-industrial juggernaut that the two nations' defence companies hope will feed Europe's hunger for weapons far into the future.

South Korea's arms sales jumped to more than \$17 billion in 2022 from \$7.25 billion the year before, according to its defence ministry, as Western countries scrambled to arm Ukraine and tensions rose in other hot spots such as North Korea and the South China Sea.

The arms deal with Poland, a key NATO member, last year included hundreds of Chunmoo rocket launchers, K2 tanks, K9 self-propelled howitzers, and FA-50 fighter aircraft. The deal's value and the number of weapons involved made it stand out even among the world's biggest defence players.

South Korean and Polish officials say their partnership will help them conquer the European arms market even beyond the Ukraine war, with Seoul providing high-quality weapons faster than other countries and Poland offering manufacturing capacity and a sales pipeline into Europe.

Reuters spoke to 13 company executives and government officials, including those directly involved in the deal, who said the arrangement provides a blueprint for using international public-private partnerships and consortiums to extend Seoul's reach and achieve its ambition to be one of the world's biggest weapons suppliers.

"The Czech Republic, Romania, Slovakia, Finland, Estonia, Latvia, Lithuania, and others were thinking of buying defence products only in Europe, but now it is more well known that you can buy at a low price and have it delivered quickly from Korean companies," said Oh Kyeahwan, a director at Hanwha Aerospace who was involved in the Poland deal.

South Korean companies do not disclose the unit prices for their weapons, which are often sold with support vehicles and spare parts.

Hanwha Aerospace already had a 55% share of the global howitzer market - a number that will rise to an estimated 68% with the Poland deal, according to research by NH Research & Securities.

The deal established consortiums of South Korean and Polish companies that will build the weapons, maintain the fighter jets and provide the framework to eventually supply other European states, said Lukasz Komorek, director of the Export Projects Office at the state-owned Polish Armaments Group (PGZ).

That will include building South Korean arms on license in Poland, officials in Seoul and Warsaw said. Plans call for 500 of 820 tanks and 300 of 672 howitzers to be built in Polish factories starting in 2026.

"We don't want to just play the role of subcontractor, technological transfer provider and the purchaser," Komorek said. "We can both create the synergy and use our experiences to conquer the European markets." Sash Tusa, a defence and aerospace analyst at Britain-based Agency Partners, said that although both countries have well-established defence industries, the long-term plans will face hurdles. Political winds could shift, he said, reducing demand for weapons such as howitzers and tanks.

Even if production and demand hold up, European countries might want deals of their own with South Korea along the lines of what Poland has - co-production agreements that could create jobs and stimulate industry, Tusa said.

"It may work for some countries at very, very low volume," he added of Polish-brokered South Korean weapons sales, discussing challenges the joint operation might face.

#### **SPEEDY DELIVERY**

At a Hanwha Aerospace factory on South Korea's southern coast, six huge automated robots and more than 150 production workers are churning out 47-ton K9s destined for Poland.

The self-propelled guns use NATO-standard 155mm ammunition, have computerised fire-control systems, are designed to easily integrate into command and control networks, and offer performance comparable to more expensive Western options. Major powers such as Australia and India operate them.

To meet demand, the company expects to add about 50 more workers and more production lines, production manager Cha Yong-su said during a recent tour. The robots handle about 70% of the welding work on a K9 and are key to expanding capacity, he said. They operate an average of eight hours per day but can work around the clock if needed.

"Basically, we can meet any amount of order you want," Cha said.

South Korea's offer to provide weapons faster than almost anyone was a key consideration, Polish officials say. The first shipment of 10 K2s and 24 K9s arrived in Poland in December, just months after the deals were signed, and at least five more tanks and 12 additional howitzers have been delivered since.

By contrast, Germany, another major arms manufacturer, has yet to deliver any of the 44 new Leopard tanks Hungary ordered in 2018, said Oskar Pietrewicz, senior analyst at the Polish Institute of International Affairs.

"Countries' interest in South Korea's offer may only grow considering the limited production capacity of Germany's defence industry, which is a major arms supplier in the region," he said.

Executives in South Korea's arms industry say that will be a selling point for future clients.

A close relationship between South Korea's military and its arms industry allows them to rearrange domestic orders to make room for export production and expand production in the country's highly industrialized manufacturing base, officials said.

"They put things together in weeks or months that would take us years," a European defence industry executive said, speaking on condition of anonymity because of the sensitivity of the matter.

Constant tensions with North Korea mean the South's military production lines are running and its weapons have been developed, tested, and upgraded in high-pressure situations, said Cho Woorae, global business and strategy vice president at Korea Aerospace Industries.

South Korea had promoted its weapons to Poland before the war, but the invasion of Ukraine - which Russia calls a "special operation" - increased Poland's interest, said Kim Hyoung Cheol, deputy director at the Defense Acquisition Program Administration (DAPA).

After the Polish defence minister's visit in May 2022 to observe South Korean weapons, and Yoon Suk Yeol met with Polish President Andrzej Duda on the sidelines of the NATO summit in June that year, the stage was set for the huge deal that was finalised a month later, Kim said.

South Korea's weapons are designed to be compatible with U.S. and NATO systems - another selling point. The country is the third-largest supplier of weapons to NATO and its member states,

accounting for 4.9% of arms purchases, according to the Stockholm International Peace Research Institute (SIPRI).

That is far behind the United States, which accounts for 65%, and France at 8.6%.

#### JOINT PRODUCTION

Officials in Seoul told Reuters that they pitched Poland on producing South Korean weapons there to make it easier to deliver to European customers.

"The Korean government is promoting military diplomacy and defence cooperation so that the relationship with the purchasing country can develop into various partnerships beyond just a sellerbuyer relationship," South Korea's Defense Ministry said in a statement.

Poland's Ministry of National Defence did not respond to a written request for comment.

Oh said Hanwha Aerospace operates successful technology-sharing arrangements in India, Egypt, and Turkey.

"Because of that, I don't think there's much to worry about regarding capacity," he said.

The 2022 arms deal began with South Korean companies signing a framework agreement with the Polish government. Those companies formed consortiums with PGZ and its subsidiaries, which signed the final deal with the Polish government, he said.

"We have the one entity only, one big consortium that is representing the whole project from the perspective of the industry," Komorek said, noting that the deal encompassed many projects.

#### 'AGENDA FOR A DECADE'

In the past year, South Korea has launched its first home-grown space rocket, saw the maiden flight of its domestically designed KFX fighter, and announced billions of dollars in deals.

"For most other countries, that would be an agenda for a decade," one executive at a European defence firm told Reuters, speaking anonymously because of the sensitivity of the matter. "We've underestimated Korea for a long time."

Yoon told Reuters last month that South Korea might extend its support for Kyiv beyond humanitarian and economic aid if Ukraine comes under a large-scale civilian attack.

Seoul has since approved at least some South Korean weapons components for use in Ukraine.

The country's sales in Asia - which accounted for 63% of its defence exports from 2018-2022, according to SIPRI - come amid regional arms build-ups driven by security concerns and the U.S.-China rivalry.

South Korea is developing its KFX fighter jet with Indonesia, and Polish leaders have signalled interest in that project. Malaysia this year bought nearly \$1 billion in FA-50s, and Seoul is in the running to win a \$12 billion deal to supply Australia's next infantry fighting vehicle.

"Asian countries see us as a very attractive partner for defence deals as we all seek to hedge against the rising tensions," a diplomat in Seoul said. "We're a U.S. ally, but not the U.S."

https://www.reuters.com/business/aerospace-defense/inside-south-koreas-race-become-one-worldsbiggest-arms-dealers-2023-05-29/

## Science & Technology News

## THE TIMES OF INDIA

Tue, 30 May 2023

### **ISRO Successfully Launches 2nd-Gen Navigation Sat**

The Indian Space Research Organisation (Isro) on Monday placed NVS-01, the first of the five second-generation navigation satellite series, into a geosynchronous transfer orbit. The satellite, which will continue the services of the NavIC constellation, was placed by a geosynchronous satellite launch vehicle (GSLV-MkII), in its 15th flight.

Around 19 minutes after the rocket lifted off from the second launch pad at the Satish Dhawan Space Centre, Sriharikota, the 51.7m-tall, 420 tonnes three-stage GSLV-F12 placed the 2,232kg satellite at a 251km altitude. In the coming days, Isro scientists will perform manoeuvres by firing the onboard propellant to place the satellite in its final orbit.

Isro chairman S Somanath said the rocket achieved an orbit better than expected, which would give the satellite more life as this would save onboard fuel. The NVS-01 satellite had additional capabilities including providing new service in L1 band for civilians and carries a space-qualified rubidium atomic clock developed by Space Applications Centre, Ahmedabad.

"Earlier, we had only L5 and S-band and we were not given authorisations to use L1 and L2 band, which are being used in GPS for civilian services. We made a lot of effort to use L5 and S-band. But it is not a civilian frequency, so they had to put in additional chipsets. There were a lot of difficulties in adopting NavIC in the civilian sector. We have got the L1 band now. Once the remaining satellites are launched and L1 becomes fully operational, naturally all your mobile phones can be made compatible without any additional investment or cost to the manufacturer," Somanath said.

On other upcoming missions, Somanath said they would be testing the crew escape systems of the Gaganyaan project rocket in July. After that, an unmanned Gaganyaan mission is planned for early next year. "We are getting ready for the test vehicle mission. We have to get the crew module and crew escape system. By July, we will integrate the systems with the rocket," he said.

Somanath said the space agency is working on upgrading the payload capability of GSLV-MkIII or LVM3 rocket from 4 tonnes to 5.5 tonnes and is designing the next-generation launch vehicle (NGLV), which will be recoverable and expendable, for carrying much higher payloads.

https://timesofindia.indiatimes.com/india/isro-successfully-launches-2nd-gen-navigation-sat/ articleshow/100603976.cms



Mon, 29 May 2023

## 'Chandrayaan-3 to be Launched in July': ISRO Chief

Indian Space Research Organisation (ISRO) chairman S Somanath on Monday said that Chandrayaan-3 will be launched in July this year. He made these remarks after the successful

launch of the second generation navigation satellite NSV-01 from Satish Dhawan's Space Centre, Sriharikota, Andhra Pradesh.

"Chandrayaan-3 will be launched in July this year," he told news agency ANI.

Chandrayaan-3 is a follow-on mission to Chandrayaan-2 to demonstrate end-to-end capability in safe landing and roving on the moon. It consists of Lander and Rover configuration. It would launched by LVM3 from Satish Dhawan Space Centre in Sriharikota.

It consists of an indigenous lander module, a propulsion module and a rover. The lander and the rover will have scientific payloads to carry out experiments on the lunar surface.

The mission aims to develop and demonstrate new technologies required for interplanetary missions. The lander will have 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 Indian lunar exploration programme, is an ongoing series of outer space missions by ISRO.

Chandrayaan-2 was successfully launched and inserted into lunar orbit in 2019, but its lander "crash-landed" on the moon's surface when it deviated from its trajectory while attempting to land on September 6, 2019, due to a software glitch.

https://www.hindustantimes.com/india-news/chandrayaan3-isro-isro-chief-s-somanathchandrayaan-3-launch-101685344754023.html



Mon, 29 May 2023

#### ISRO Looking at Testing Gaganyaan Crew Module Mission by July, Says Chairman Somanath

The Indian Space Research Organisation is gearing up for a host of activities at the spaceport here, including testing of the crew module in July for its ambitious Gaganyaan mission, Chairman S Somanath said here on May 29.

The Secretary of the Department of Space said the space agency was also working for the launch of the synthetic aperture radar mission in association with National Aeronautics Space Agency (NASA).

The NISAR (NASA-ISRO Synthetic Aperture Radar Mission) is a joint earth-observing mission between NASA and ISRO with the goal of making global measurements of the causes and consequences of land surface changes using advanced radar imaging.

Talking about future launches, Mr. Somanath said the next launch would be a climate and weather observation satellite called "INSAT-3Ds", which would be launched using a GSLV rocket.

"The same rocket [GSLV] is bound to take the NISAR as well. In the coming months we are going to have launches of PSLVs as well as GSLV MkIII " he said.

"The SHAR [Satish Dhawan Space Centre, Sriharikota] will be abuzz with activities towards all of this.", he said.

Scientists are working on conducting various tests for the ambitious Gaganyaan mission and the agency is coordinating with the Navy and others in this connection, he said.

"We will be launching a test vehicle mission now. Target is to conduct it by July. The vehicle for conducting the test is already here in Satish Dhawan Space Centre here." he said.

This launch would demonstrate how the crew escapes in case of any accident during the Gaganyaan mission, he said. "The vehicle will be taken to an altitude of 14 km and from there we would create a problem or try to destroy it and see how the crew module escapes. That we have to demonstrate. We are talking to various stakeholders like the Navy." he said.

This mission has to be repeated again and after that there would be an unmanned mission probably next year in which the whole crew module would be taken to orbit and return, he said.

On setting up a launch pad in Kulasekarapattinam in Tamil Nadu about 600 km from Chennai, he said ISRO was almost in the final stages of acquiring 2,000 acres of land.

"We will be building a launch pad for a small launch vehicle in Kulasekarapattinam and possible rocket launches for private players in future. Land acquisition process is almost completed and some more land is yet to be acquired" he said.

Mr. Somanath said the space agency was under discussion about the launch of the next-generation launch vehicle (NGLV).

"Now is not the right time to discuss it. It is a rocket which we want to be a recoverable stage, and basically [we are] working on liquid and semi-cryogenic technology," he said.

"We would like to make it much heavier than the current launchers, and the cost can also be substantially lower. We are working on various architecture across centres and are talking with industries to take part along with us," he said.

To a query about the launch of a navigation satellite on-board a GSLV rocket on May 29, unlike a PSLV used for IRNSS-1 navigation satellite missions, he said navigation satellites are heavier and cannot be launched using a PSLV and they would be launched using GSLV rockets.

On whether the services enabled by the navigation satellite launched on May 29 would be available to civilian users, he said ISRO was not given the authorisation for L1 and S bands for civilian services (earlier).

"When the remaining satellites are launched [after Monday's mission], I am sure all of your mobile phones can be compatible [for usage of the satnav facility]", he said.

Following today's successful GSLV-F12 mission, ISRO has planned to launch more navigation satellites in the near future.

https://www.thehindu.com/sci-tech/science/isro-looking-at-testing-gaganyaan-crew-modulemission-by-july-says-chairman-somanath/article66907883.ece

# THE MORE HINDU

Mon, 29 May 2023

#### China to Send First Civilian into Space on Tuesday

China will send its first civilian astronaut into space as part of a crewed mission to the Tiangong space station on Tuesday, its Manned Space Agency announced, as Beijing pushes ahead with its extra-terrestrial ambitions. The world's second-largest economy has invested billions of dollars into its military-run space programme, trying to catch up with the United States and Russia after years of belatedly matching their milestones.

Until now, all Chinese astronauts sent into space have been part of the People's Liberation Army.

"Payload expert Gui Haichao is a professor at Beijing University of Aeronautics and Astronautics," China Manned Space Agency Spokesperson Lin Xiqiang told reporters Monday.

Gui will be "mainly responsible for the on-orbit operation of space science experimental payloads", Lin said.

The commander is Jing Haipeng -- on his fourth mission into space, according to state media -- and the third crew member is engineer Zhu Yangzhu.

They are set to take off from the Jiuquan Satellite Launch Centre in northwest China on Tuesday at 9:31 am (0131 GMT), the Manned Space Agency said.

Gui's university, known as Beihang University in English, said he hailed from an "ordinary family" in western Yunnan province.

He "first felt the attraction of aerospace" listening to the news of China's first man in space, Yang Liwei, on campus radio in 2003, the university said in a post on social media.

Space Dream

Under President Xi Jinping, plans for China's "space dream" have been put into overdrive.

China is planning to build a base on the Moon and the country's National Space Administration said it aims to launch a crewed lunar mission by 2029.

The final module of the T-shaped Tiangong -- whose name means "heavenly palace" -- successfully docked with the core structure last year.

The station carries a number of pieces of cutting-edge science equipment, state news agency Xinhua reported, including "the world's first space-based cold atomic clock system".

Once finished, Tiangong is expected to remain in low Earth orbit at between 400 and 450 kilometres (250 and 280 miles) above the planet for at least 10 years -- realising an ambition to maintain a long-term human presence in space.

It will be constantly crewed by rotating teams of three astronauts, who will conduct scientific experiments and help test new technologies.

While China does not plan to use Tiangong for global cooperation on the scale of the International Space Station, Beijing said it is open to foreign collaboration.

It is not yet clear how extensive that cooperation will be.

China has been effectively excluded from the International Space Station since 2011, when the United States banned NASA from engaging with the country.

https://www.thehindu.com/sci-tech/science/china-to-send-first-civilian-into-space-on-tuesday/ article66907603.ece

# The Indian EXPRESS

Mon, 29 May 2023

#### China to Send Astronauts to Moon by 2030 as Space Race Intensifies

China on Monday announced plans to send a manned mission to the moon by 2030 for lunar scientific exploration, amid its deepening space race with the West.

The announcement was made by Lin Xiqiang, Deputy Director of the China Manned Space Agency (CMSA), as China is preparing to send a third set of astronauts to its space station on Tuesday.

Li told the media at the Jiuquan Satellite Launch Centre in Inner Mongolia ahead of the launch of the spacecraft that takes the three astronauts to the space station called Tiangong that China has recently initiated under the lunar landing phase of its manned lunar exploration programme.

The overall goal is to achieve China's first manned landing on the moon by 2030 and carry out lunar scientific exploration and related technological experiments, he was quoted as saying by the state-run Xinhua news agency.

China's manned lunar mission came as the US space agency NASA aims to send a second manned mission to the moon by 2025 to explore the south pole for frozen water.

For its part, the Indian Space Research Organisation (ISRO) has announced plans to launch its ambitious Chandrayaan-3 mission aimed at demonstrating critical technologies to land the spacecraft on the south pole.

Chandrayaan-3 mission carries scientific instruments to study the thermo-physical properties of the lunar regolith, lunar seismicity, lunar surface plasma environment and elemental composition in the vicinity of the landing site.

China in the past successfully launched uncrewed missions to the moon which included a rover. China has also sent a rover to Mars.

According to Lin, the goal of China's moon mission also includes mastering the key technologies such as earth-moon manned roundtrip, lunar surface short-term stay, human-robot joint exploration, accomplishing multiple tasks of landing, roving, sampling, researching, returning, and forming an independent capability of manned lunar exploration.

In 2021, China and Russia announced plans to set up an International Lunar Research Station.

Russian space agency Roscosmos said in March 2021 that it has signed an agreement with China's National Space Administration to develop research facilities on the surface of the moon, in orbit or both.

Lin said China's manned lunar landing will promote the leapfrog development of manned space technology from near-Earth to deep space, deepen human understanding of the origin and evolution of the moon and the solar system, and contribute Chinese wisdom to the development of lunar science, he said.

The aim of space powers, such as the US, Russia and China, is to set up bases on the Moon for astronauts to live in, Dr McDowell, an astronomer at the Harvard-Smithsonian Centre for Astrophysics in the US told BBC earlier.

"The Moon is being used as a stepping stone to places like Mars," he says. "It's a great place to test out deep space technologies." It also takes less fuel to launch a spacecraft from the Moon than from Earth to travel into deep space, according to Dr Lucinda King, space project manager at the University of Portsmouth.

Meanwhile, the three astronauts Jing Haipeng, Zhu Yangzhu, and Gui Haichao who were selected to travel by the Shenzhou-16 spaceflight mission to join the orbiting space station on Tuesday also interacted with the media.

Jing will become the country's first astronaut to go into space for a fourth time. He was involved in the Shenzhou-7 mission in 2008 and commanded the Shenzhou-9 and Shenzhou-11 crews in 2012 and 2016, respectively.

Zhu and Gui are going to make their first trip to space.

Zhu will serve as a spaceflight engineer in the Shenzhou-16 mission.

Gui is a professor from Beijing-based Beihang University, and he will work as a payload expert responsible for the in-orbit operations of science experiment payloads in the country's Tiangong space station. The Shenzhou-16 will be the first crew mission after China's space station program entered the stage of application and development, Lin said.

The trio will stay in orbit for about five months, he said.

Once ready, China will be the only country to own a space station as the International Space Station (ISS) of Russia is a collaborative project of several countries. The ISS station is also set to be decommissioned by 2030.

The significant feature of China's space station is its two robotic arms, especially the long one which can grab objects including satellites from space.

https://indianexpress.com/article/technology/science/china-send-astronauts-to-moon-by-2030-8635085/

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