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

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Fri, 04 Feb 2022

TN small industries to take advantage of more self-reliance in defence

Chennai: The small industries in Tamil Nadu will be taking advantage of more self-reliance in defence production announced by Union Finance Minister Nirmala Sitharaman during the 2022 budget speech.

Sitharaman, while presenting the budget on February 1 had said 68 per cent of capital procurement will be earmarked for the defence industry in the 2022-23 Budget which is 10 per cent higher than the 2021-22 Budget.

She said: "Defence Research and Industry will be opened up for industry, startups, and academia with 25 per cent of defence R&D Budget earmarked for it. Private industries will be encouraged to take up design and development of military platforms and equipment in collaboration with Defence Research and Development Organisation (DRDO) and other organisations through Special Purpose Vehicles (SPV) models."

Several companies in Coimbatore, Hosur, and Tiruchi are already in the defence production and research sector in Tamil Nadu and are in association with the DRDO. The proposed defence corridor is also expected to create an ecosystem where industries will be encouraged to take up more defence projects.

Tamil Nadu has over 120 aerospace manufacturing companies and 700 suppliers to various Defence Public Sector Undertakings (PSUs) already and with the new announcement in budget all these companies will get sizeable work for supplying components to major productions in the defence sector.

G. Satheesh Reddy, Chairman DRDO and secretary department of defence (R&D) in a statement, said: "The DRDO is planning an R&D centre in Tamil Nadu defence corridor where industries will be groomed by our scientists. An SPV will be formed soon which will lead to industries partnering DRDO in all stages of the supply chain from design, development, testing, production, marketing, and exports."

The DRDO chief also said that this was the apt time for the Indian industries to take advantage of the latest policies of the government and join hands with DRDO to deliver defence systems and technologies to the Indian defence forces.

Other than small industries in Tamil Nadu spread across the industrial hubs of Coimbatore, Tiruchi, Hosur, big companies in the state like L&T and Ashok Leyland are already production partners of the DRDO.

The DRDO, according to insiders, will soon be grooming and developing several Tamil Nadu companies, both small and big, to advance design and development capabilities.

The main battle tank Arjun Mk-1A was developed by Combat Vehicles Research and Development Establishment in Chennai in collaboration with other DRDO labs.

<https://www.daijiworld.com/news/newsDisplay?newsID=922625>

Philippines set for another BrahMos deal with India, to procure the Supersonic Cruise Missiles for its Army: Report

After signing a \$375 million deal with India for procurement of BrahMos missile for its Navy, Philippines is reportedly planning to buy the supersonic cruise missile for the Philippine Army (PA).

The acquisition will be done under the third horizon of the Revised Armed Forces of the Philippines Modernization Program (RAFPMP).

"PA's acquisition of BrahMos is programmed under the 3rd Horizon (Year 2023-2027) of the RAFPMP. Hence, the PA is yet to acquire said units since we are still on the 2nd Horizon (2018-2022) wherein some of the programmed acquisitions are still (in) process," Philippine Army spokesperson Colonel Xerxes Trinidad was quoted as saying by Philippine News Agency (PNA) in a report.



India's BrahMos Supersonic Cruise Missile (Pic Via Twitter)

He added that the Army is set to get two BrahMos batteries which will be used for coastal defense missions.

"The acquisition of two batteries will serve as the general support artillery unit in coastal defense that will (complement) the joint force in territorial defense," Trinidad was quoted as saying.

He also said the BrahMos answers the Philippine Army's requirement of Ground-Based Anti-Ship Missile (GBASM) and the mission of the field artillery to destroy, neutralise and suppress the enemy through cannon, rocket fires.

Earlier on 28 January, Philippines signed a deal worth \$375 million with India's BrahMos Aerospace Private Limited for the supply of BrahMos supersonic cruise missiles to equip its shore-based anti-ship missile system.

With the signing of the contract earlier today (28 January), the Philippines has become the first international customer of the cruise missile.

The acquisition of the missile will significantly boost the Philippine's capabilities to deal with the threat from China's People's Liberation Army Navy. China lays claim to almost all of the South China Sea, including the parts claimed by the Philippines, based on the "nine-dash line".

The dispute in the South China Sea, to which Vietnam, Malaysia, Brunei and Taiwan are also a party, is driven by overlapping claims to land features in the South China Sea and the maritime entitlements around them. Over the years, China has built artificial islands in the region, militarised them to solidify its claims, and bullied other claimants, including the Philippines.

In 2016, the International Tribunal in The Hague dismissed China's claims in the South China Sea as part of a ruling in a case brought by the Philippines in 2013. China had refused to participate in the proceedings at the tribunal in the Hague and rejected its ruling in the case.

In recent years, tensions between China and the Philippines over the long-simmering territorial dispute have increased. In November 2021, Chinese coastguard ships blocked and fired water cannons on Philippines supply boats within the country's 200-nautical-mile exclusive economic zone (EEZ). Earlier, the Philippines had reported an incursion into its EEZ by around 285 maritime militia vessels from China.

In the event of a conflict, the Philippines could use its shore-based anti-ship missile system to target Chinese vessels in parts of the South China Sea.

The BrahMos is a supersonic cruise missile developed by BrahMos Aerospace which is an Indo-Russian joint venture between India's DRDO and Russia's NPO Mashinostroyeniya.

The BrahMos supersonic cruise missiles can be launched from submarines, ships, aircraft, or land platforms.

The missile flies at a speed of 2.8 Mach or almost three times the speed of sound. The variant to be exported is likely to have a range of around 290 kilometres.

<https://swarajyamag.com/defence/philippines-set-for-another-brahmos-deal-with-india-to-procure-the-supersonic-cruise-missiles-for-its-army-report>



Fri, 04 Feb 2022

Explained: Indo-Philippines defence deal for BrahMos Missiles

By Hamaad Habibullah

Highlights

- *The missiles are capable of traveling three times faster than the speed of sound and hold much potential to enhance the naval strength of the Philippines.*
- *The BrahMos is one of the fastest medium-range supersonic cruise missiles in the World which can be launched from Land, Sea, and Air.*
- *The deal, hence, can be seen as a way of The Philippines upscaling its marine effectiveness to counter China.*

In its first-of-a-kind deal, The Philippines has signed a pact with the BrahMos Aerospace Private Limited (BAPL) to acquire a shore-based anti-ship ramjet supersonic missile system for a total of 374.96 million U.S. Dollars.

A contract signing ceremony was held on 28th January wherein the deal was sealed by the Philippines' Defense Secretary of the Department of National Defense, Delfin N. Lorenzana, and the Director-General of BrahMos Aerospace Private Limited, Atul Dinkar Rane.



At the onset of the year, a proposal had been sent to the Philippines government by the BrahMos Aerospace; after much deliberations, a notice of award was issued by the Philippines' Department of National defence, detailing the acceptance of the offer.

What is the deal

The deal seeks to supply three batteries of the BrahMos missile system, which has a range of 290 Kilometers and an integrated logistics support (ILS) package along with training for maintainers and operators. The missiles are capable of traveling three times faster than the speed of sound and hold much potential to enhance the naval strength of the Philippines.

BrahMos Aerospace Private Limited is an Indo-Russian multinational aerospace and defence corporation with a focus on cruise missiles. It was founded as a joint venture between India's Defence Research and Development Organisation and Russia's NPO Mashinostroyeniya and is headquartered in New Delhi, India. The company primarily manufactures BrahMos Missiles.

According to the official website of BrahMos Aerospace, “after the Gulf War of 1990s, it was felt increasingly necessary to equip the country with a cruise missile system.

It was at that time when India’s decades-old bonhomie with Russia, without disturbing the unique balance in the Non-alignment policy, came to the forefront in developing the new missile system”.

The BrahMos is one of the fastest medium-range supersonic cruise missiles in the World which can be launched from Land, Sea, and Air. Named after the river Brahmaputra of India and river Moskva of Russia, the BrahMos is a joint venture between India’s Defence Research and Development Organization (DRDO) and the Russian Federation’s NPO Mahinostroyeniya, who have come together to form the Brahmos Aerospace Private Limited.

The BrahMos is a two-stage missile whose range varies from 290 kilometers to 400 kilometers and can reach a maximum speed of Mach 3. The first stage is a solid propellant booster while the other is a liquid ramjet. It weights 3t and intercepts surface targets at an altitude of 10m up to 14,000m.

The Philippines’ Secretary of Defence, Delfin Lorenzana stated, “As the world’s fastest supersonic cruise missiles, the Brahmos missiles will provide deterrence against any attempt to undermine our sovereignty and sovereign rights, especially in the West Philippine Sea”.

The remark is indicative of the long-standing dispute in the South China Sea region. China’s claims of sovereignty over the waters and its hydrocarbon riches have time and again been a matter of conflict with The Philippines. The deal, hence, can be seen as a way of The Philippines upscaling its marine effectiveness to counter China.

Attributing to this, many other countries in the Southeast Asian region like Vietnam, Thailand, and Indonesia have shown their interest in supersonic missiles. It is speculated that discussions with Thailand are in their early developing stage and hence still being contemplated. Indonesia’s naval team has been frequenting visits to India to determine the suitability of the missiles concerning their warships. As per the sources, it is also being stated that deliberations with Vietnam are proceeding positively.

<https://www.indiatimes.com/explainers/news/philippines-to-buy-indian-brahmos-missiles-561078.html>



Fri, 04 Feb 2022

Analysing the Defence expenditure in the Budget

New Delhi: At a time when India's presence in the world atmosphere is more profound than ever, the Ministry of Finance of the Central government during the Budget 2022 presentation in Parliament announced a plan to boost the Defence sector. Minister of Finance Nirmala Sitharaman stressed the implementation of Aatmanirbhar Bharat in the arena of armed forces. "Government is committed to reducing imports and promoting Aatmanirbharta in the armed forces.

FM's announcements for Defence Sector

- 68% of the capital procurement budget will be earmarked for domestic industries for 2022-23, up from 58% in 2021-22, (up 10 percentage points from FY22)
- It's set aside 25% of its budget in defence research and development (R&D) for collaborating with the private industry.
- FM announced that 5 % of Universal Service Obligation (USO) Fund would be provided for R&D and technology upgradation.
- A new "independent, umbrella" body will be set up for private players to test new technology and get certified.
- Private industry will be encouraged to take up the design and development of military platforms and equipment in collaboration with DRDO and other organizations through the SPB model
- Allocated Rs 2.39 lakh crore against the Rs 2.33 lakh crores allocated last year to the Defence Ministry.
- Meanwhile, the pension budget is Rs 1.19 lakh crore.
- According to Budget documents, the capital expenditure outlay for the defence sector has increased significantly, by 13%, in FY23 to Rs 1.52 trillion from Rs 1.35 trillion in FY22 while revenue and pension expenditure have remained stable.
- In total, the budgetary allocation to the Ministry of Defence has risen 9% year-on-year to Rs 5.25 trillion in FY23 from Rs 4.7 trillion in FY22.

The defence sector has been a key area of the Modi government since it came to power at the Centre.

Last year, it had increased the capital outlay for the armed forces by nearly 19 per cent to modernise them. It also allocated Rs 1.35 lakh crore to the Defence Ministry for purchase of new weapons.

The Modi government also aims to increase the exports in the defence sector. Earlier, Rajnath had said that India has exported defence items worth more than Rs 38,000 crore in the past seven years and the country hopes to become an overall net exporter soon.

"We have an estimated Rs 85,000 crore industry of aerospace and defence. The contribution of the private sector in this has increased to Rs 18,000 crore".

Rajnath Singh said, " It is a Budget which would give a fillip to 'Make in India', boost demand and build capacities for a stronger, prosperous and confident India.

"The 68 per cent of the defence capital procurement budget has been allocated towards local procurement. It is in line with the 'Vocal for Local' push and it will certainly boost the domestic defence industries," Rjanth Singh further wrote.

The Budget outlines the Government's focus on Atmanirbharata and Prime Minister Shri Narendra Modi's vision for development and pro-people reforms. It is a growth-oriented Budget focused on harnessing the energies of New India."

Defence Minister hailed substantial amounts being allocated towards Research and Development in several sectors including Defence. He hailed the proposal to reserve 25 per cent of the R&D Budget for Startups and Private entities is an excellent move.

Defence expert Anil Gaur said, "This is a very welcome step. Being Aatmanirbhar in defence will make us independent. If we keep importing defence equipment, we will never become Aatmanirbhar."

<https://www.oneindia.com/india/analysing-the-defence-expenditure-in-the-budget-3366774.html>

The Tribune

Fri, 04 Feb 2022

Tech to change future warfare: Services Chiefs

New Delhi: The Chiefs of the three armed forces today highlighted how technology would change the way wars will be fought in the future and warned that a full-scale conflict could not be ruled out.

They were speaking at a conclave, "Contours of Future Wars and Counter-measures", organised by the Centre for Land Warfare Studies (CLAWS), an Army think-tank. Indian Air Force Chief Air Chief Marshal VR Chaudhari said, "We stand at the threshold of a technological explosion that will have a disruptive effect on the way future wars are fought."



Air Marshal Vivek Ram Chaudhari

Technologies could be non-lethal, meaning these would be spread across the cyber, information and space continuums, he said. "Future conflicts are likely to be hybrid in nature," the IAF Chief said. "The present conflicts are transcending conventional understanding of what military action is. It will be needed to maximise speed and range," he said.

The contours of recent attacks showed that military strategy of today could not be based on erstwhile theories of "mass manoeuvre" and "holding ground" and there was need to continuously evolve to stay contemporary, he said.

Navy Chief Admiral R Hari Kumar said the impact of technology on warfare was evident. "It may be possible to fight and win in entirely new ways. Given our security situation, the probability of a full-blown conflict can never be ruled out," the Navy Chief said.

Modern warfare would require overcoming existing silos and developing cross-organisational linkages at all levels as the future would always remain unpredictable and exemplified by disorder, he added.

Army Chief General MM Naravane, without naming China, referred to the neighbour and its activities in the South China Sea. "We have also observed that some nations are challenging the globally accepted norms and the rules-based order," he said.

This challenge of not accepting global norms had manifested in various forms of creeping aggression and opportunist actions to alter the status quo, he said. On various types of wars, he said, there were ongoing hostilities between states in the cyber, information, sub-conventional and hybrid domains.

<https://www.tribuneindia.com/news/nation/tech-to-change-future-warfare-services-chiefs-366807>

India witnessing ‘trailers’ of future conflicts: Army Chief

New Delhi: India is witnessing “trailers” of future conflicts and its adversaries like China and Pakistan will continue efforts to achieve their strategic aims by use of “grey zone” tactics instead of a full-fledged war, Army chief General M M Naravane said on Thursday.

“We have observed some nations are challenging globally accepted norms and the rules-based order. This challenge has manifested in various forms of creeping aggression and opportunist actions to alter the status-quo, keeping the threshold below all-out war,” said Gen Naravane, addressing a seminar here.

“Our adversaries shall continue with their efforts to achieve their strategic aims, short of conflict, by use of grey zone activities in the political, military and economic domains, and do so in a collusive manner,” he added.

The Army chief said the developments in 2020 — the People’s Liberation Army made multiple intrusions into eastern Ladakh in May that year — were testimony to the diversity of security threats being faced in all domains by India.

Noting that the ceasefire on the Line of Control with Pakistan continues to hold because India had negotiated from a position of strength, Gen Naravane said the developments on the northern borders with China have underscored the requirement of “ready and capable forces”, with an optimal component of “boots on ground” backed by modern technology, to preserve the country’s sovereignty and integrity.

Trailers of future conflicts are being enacted on the information battlefield, in the networks and cyberspace, on a daily basis. “They are also being played along our yet unsettled and active borders,” he said.

“If you look around, you will realise that the ‘sci-fi’ of yesterday is the ‘reality’ of today. We too have to leap-frog to the future, skipping many stages, to an entirely new configuration,” he added.

IAF chief Air Chief Marshal V R Chaudhari and Navy chief Admiral R Hari Kumar, speaking at the seminar, also called for a “whole of nation approach” in developing multi-domain military capabilities to prepare for wars of the future in a synergised manner.

“The traditional domains of land, sea and air have further expanded to include cyber and space domains which will be the battlegrounds of the future. China’s doctrine of “Winning Informatized Local Wars” enshrines the centrality of information as an instrument of prosecuting and winning contemporary wars,” ACM Chaudhari said.

Admiral Kumar said future wars were bound to be technology-intensive. “Therefore, there is a requirement to innovate and evolve mechanisms that foster development and incorporation of niche technologies at a rapid pace. Anyone who lags behind in this aspect, may face difficulties,” he said.

<https://timesofindia.indiatimes.com/india/india-witnessing-trailers-of-future-conflicts-army-chief/articleshow/89332077.cms>



How is China planning to use Artificial Intelligence in Warfare?

By Aishwarya Banik

China has prioritised Artificial Intelligence in its quest to become a powerful superpower under Xi Jinping. Beijing's interest in AI development and use stems from the fact that technology may be used for both civil and military objectives. As a result, while AI advances can benefit China's economy and healthcare, they can also help the People's Liberation Army (PLA) engage in "intelligent warfare", which PLA strategists define as "the implementation of artificial intelligence and its related technologies, such as cloud technology, data analytics, quantum information, and autonomous systems for military uses."

AI and related technologies such as computer vision, human-machine teaming, neural connectivity, and autonomous systems also known as "intelligentized weapons", have been identified as critical to gaining an advantage in the next creation of warfare by China's military leaders and strategists. At the same time, they are concerned that other nations, particularly the United States, may surpass them in this area and develop the potential to overwhelm China's air defences and assault its command-and-control systems. As a result, China's central and provincial governments, the Chinese Communist Party (CCP), all PLA branches, and the country's state- and privately-owned industries are all working together. As a result, China's central and provincial governments, the Chinese Communist Party (CCP), and all branches of the party are taking part in a whole-of-society strategy.

The Chinese military is working hard to investigate, develop, and operationalize AI for military reasons, as part of Xi Jinping's mandate to become "completely modernised" by 2035 and on par with the US military by 2050. Laws and efforts, such as the National Security Law (2015), National Intelligence Law (2017), the New Generation Artificial Intelligence Development Plan, and Civil-Military Fusion, have been introduced to guarantee perfect compliance and synchronisation amongst all Chinese agencies.



In a separate programme, China began naming Chinese IT businesses as "AI Champions" in 2017 and assigned each one a specific AI sector to pioneer. Alibaba, Baidu, Tencent, Xiaomi, and Huawei are among the companies on the list. The PLA will almost certainly have access to the products of their AI investments.

China is working hard to harness AI's military potential and is attempting to outperform the United States. However, as Chinese experts point out, it lags behind the ruling superpower by at least a few years. More crucially, many of Beijing's problems, such as a scarcity of talent and technological know-how, insufficient infrastructure, and reliance on foreign suppliers for essential components like transistors, have been exacerbated by the continuous US-China conflict. Time will tell who wins and if China's reckless behaviour is punished or rewarded.

In recent years, the PRC has made significant attempts to incorporate artificial intelligence (AI) into its military assets, at least in the People's Liberation Army (PLA) and other service branches' weapons systems and cyber networks. The nation has put a lot of money into these initiatives. However, the function of AI in command architecture has remained vague and ambiguous thus far; in fact, there has been contradicting data.

China may wish to explore artificial intelligence-based weapons that decrease human participation to a level that many countries, including the United States, are unlikely to do. India's efforts are also minimal, if not plain insignificant, in comparison to China's. To integrate AI

applications into its military systems, India will need to be strategic. This necessitates first determining which armaments ought to be the target of AI spending, as well as which missions AI may be useful in. The acquisition of AI-enabled technologies that assist in military performance is one area where India should strive to follow China.

In addition to selectivity and efficacy, there is a case to be made for expanding collaboration with an AI-capable state like Japan. India wants good information at home, not only in terms of gathering and processing it with humanitarian aid but also in terms of developing human capacity for Big Data analytics. After all, in the design of potential technologies like AI, human intelligence is equally as important as machine intelligence.

While governments often conceal data on defence R&D, the Indian government should at the very least be transparent about the data it collects, as well as the expenditures it makes in fundamental civilian AI research. This will aid not just in maintaining a civilian AI research audit, but also in monitoring progress, determining priorities, and finding new efforts.

<https://www.analyticsinsight.net/how-is-china-planning-to-use-artificial-intelligence-in-warfare/>



Fri, 04 Feb 2022

Jagran Explainer: India starts sea trials of 5th Scorpene-class submarine | How it will boost Navy's capabilities

INS Vagir is the fifth submarine of Project 75, Yard 11879. It will be delivered to the Indian Navy later this year after completion of the trials

New Delhi: As India continues to make its defence sector 'Atmanirbhar', the fifth Scorpene-class submarine 'Vagir' commenced her first sea sortie on February 1 to undergo trials before its final delivery, the Indian Navy said on Tuesday.

INS Vagir is the fifth submarine of Project 75, Yard 11879. Launched on November 20202 from the Kanhoji Angre Wet Basin of Mazagon Dock Shipbuilders Limited (MDL), it will be delivered to the Indian Navy later this year after completion of the trials.

"Despite the COVID pandemic, MDL has 'Delivered' two submarines of the Project – 75 in the year 2021 and the commencement of sea trials of the fifth submarine is a significant milestone," the Defence Ministry said in a release.

"The submarine will now undergo intense trials of all its systems at sea, including propulsion systems, weapons and sensors. The submarine is scheduled for delivery to the Indian Navy in the year 2022 after completion of these trials."

How the Scorpene-class submarine will boost the Indian Naval capabilities?

The Scorpene-class submarines are extremely potent platforms with their stealth features. Equipped with long-range guided torpedoes and anti-ship missiles, these submarines also have state of the art SONAR and sensor suites permitting outstanding operational capabilities.

They also have an advanced Permanent Magnetic Synchronous motor (PERMASYN) as their propulsion motor. The new Vela carries forward the legacy of her namesake, the erstwhile INS Vela which was commissioned on August 31, 1973, as the lead boat of Vela class submarines.

Apart from being a training ground for many submariners, she had several noteworthy operational achievements during her long and illustrious career. The submarine rendered yeoman



Image shared by PIB

service to the nation for 37 years and was the longest operational submarine at the time of decommissioning on January 25, 2010.

<https://english.jagran.com/india/jagran-explainer-india-starts-sea-trials-of-5th-scorpene-class-submarine-how-it-will-boost-navy-s-capabilities-10038891>

दैनिक भास्कर

Fri, 04 Feb 2022

पाकिस्तान बॉर्डर पर गरजेंगे राफेल: 5 मार्च को एयरफोर्स का वायुशक्ति युद्धाभ्यास, 140 से ज्यादा लड़ाकू विमान लेंगे हिस्सा

जैसलमेर: जैसलमेर में एयरफोर्स का सबसे बड़ा युद्धाभ्यास वायुशक्ति-2022 अब पांच मार्च को होगा। पहले यह अभ्यास 10 फरवरी को होने वाला था। भारतीय वायु सेना एशिया की सबसे बड़ी फील्ड फायरिंग रेंज पोकरण में अब तक का सबसे बड़ा युद्धाभ्यास करने जा रही है। वायुशक्ति नामक इस युद्धाभ्यास में करीब 140 विमानों की हिस्सेदारी होगी, जिसमें करीब 100 फाइटर प्लेन हिस्सा लेंगे।



फायरिंग रेंज में बनाए गए दुश्मन के ठिकानों को तबाह करने के अभ्यास में कई तरह की मिसाइलों और फाइटरों का इस्तेमाल होगा। सूत्रों के अनुसार रफाल की अत्याधुनिक मिका मिसाइल इसका विशेष आकर्षण होगी। सुखोई-30 एमकेआई, मिग-29, एलसीए तेजस, मिराज 2000, मिग-21 बाइसन, हॉक और जगुआर विमान भी इसमें शामिल होंगे। अपाचे हेलिकॉप्टर और चिनूक के साथ भारत के ध्रुव हेलिकॉप्टर भी नाइट ऑपरेशन में हिस्सा लेंगे। रात के आपरेशन में लड़ाकू हेलीकाप्टर से टारगेट्स पर राकेटों की बौछार दिखेगी।

जैसलमेर में वायुशक्ति-2022 में 36 राफेल हिस्सा ले सकते हैं।

36 राफेल ले सकते हैं हिस्सा

सूत्रों के अनुसार रफाल के सभी 36 विमानों की आपूर्ति फरवरी के पहले सप्ताह में पूरी हो रही है। वायु शक्ति के 5 मार्च के अभ्यास में इन सभी की एक्टिव हिस्सेदारी होने की पूरी संभावना है। तीन साल में एक बार होने वाले वायु शक्ति अभ्यास में देशभर में वायु सेना की यूनिटें सक्रिय हिस्सेदारी कर रही हैं। इस दौरान कई तरह के ऑपरेशन इस युद्धाभ्यास में होने हैं जिसमें डिफेंसिव काउंटर एयर, ऑफेंसिव काउंटर एयर, काउंटर एयर स्ट्राइक, सप्रेस एनिमी एयर डिफेंस और टारगेट ऑफ अपॉर्चुनिटी शामिल होंगे।

पहली बार महिला पायलट लेंगी हिस्सा

वायुशक्ति युद्धाभ्यास में महिला पायलट भी हिस्सा ले रही हैं। मिग-21 बाइसन लड़ाकू विमान की उड़ान के साथ पहली बार वायु शक्ति युद्धाभ्यास में महिला पायलट शौर्य दिखाएंगी। भारतीय वायु सेना में अब तक 10 महिला पायलट लड़ाकू भूमिका में शामिल हो चुकी हैं। इनमें से कम से कम तीन पायलट इस बार के बड़े अभ्यास में शामिल हो सकती हैं।

वायुशक्ति के आयोजन और तैयारी को लेकर एयरफोर्स स्टेशन जैसलमेर के स्टेशन कमाण्डर गुप कैप्टन अमरदीप सिंह पन्नू और जिला कलेक्टर डॉ प्रतिभा सिंह ने मीटिंग ली। मीटिंग में जिला प्रशासन जैसलमेर द्वारा दिए जाने वाले सहयोग और कामों को लेकर चर्चा की।

<https://www.bhaskar.com/local/rajasthan/barmer/jaisalmer/news/vayushakti-of-indian-air-force-on-march-5-more-than-140-fighter-aircraft-and-women-pilots-will-take-part-129366200.html>

Chandrayaan-3 targeted this year; corrections in progress, hardware realisation almost done

By Chethan Kumar

Bengaluru: The Indian Space Research Organisation (ISRO), which has a packed year ahead of it, has made considerable progress on its third moon mission — Chandrayaan-3. With many related hardware and their special tests having been successfully completed, the team is moving closer to integrated testing.

ISRO Chairman S Somanath told TOI: “Chandrayaan-3 has been going through a series of reviews, improvements, and strengthening. Some of these are based on the issues we’ve seen earlier. But the issues we’ve learnt so far may not be the only ones. The questions are many and we need to foresee a lot of them, which may further require corrections. The hardware is under realisation too.”

While Somanath is expected to conduct a formal review of the project later this month, minister of state, department of space, Jitendra Singh, has said that based on the learnings from Chandrayaan-2 and suggestions made by the national-level experts, the realisation of Chandrayaan-3 is in progress. “The launch is scheduled for August 2022,” he added.

According to more than one scientist associated with the project, testing and fabrication of the lander and other systems that will be part of Chandrayaan-3 is ongoing at various Isro centres while design changes have been nearly finalised.

Isro conceived Chandrayaan-3 after it failed to soft-land Vikram (lander) on the lunar surface while it still has a fully operational orbiter of Chandrayaan-2 going around Moon. While the mission was initially planned for late 2020 or 2021, the department of space (DoS), owing to Covid-19, had said earlier this year that the launch is being targeted for 2022.

“...Because we need a specific launch window, we need to work towards a deadline, failing which it will have to move to next year. But the top management is very clear that all steps in the process will be complete before we actually launch the mission,” a source said.

In his New Year message on January 3, then Isro chairman K Sivan had said: “Chandrayaan-3 design changes incorporating and testing has seen huge progress. The mission could be launched by the middle of the year.”

As reported first by TOI, Chandrayaan-3 will see major design changes compared to the previous mission, key among which is the decision to drop the fifth engine, which was added last minute on Vikram (Chandrayaan-2’s lander).

The lander for this mission will have only four engines, while the overseeing committee has also suggested a minor modification on the legs on the lander, inclusion of the laser doppler velocimeter (LDV) for better measurement of speed during landing, among other things.

The modifications being proposed on Chandrayaan-3 — which were indicators of shortcomings in Chandrayaan-2 — also include changes in software and algorithms, strengthening of the legs and better power and communication systems.

That the Union Budget 2022-23 among other things has listed one mission of GSLV-Mk3 is also seen as reasons for optimism so far as Chandrayaan-3 is concerned.

<https://timesofindia.indiatimes.com/india/chandrayaan-3-targeted-this-year-corrections-in-progress-hardware-realisation-almost-done/articleshow/89322779.cms>

