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समाचार पत्रों से चयित अंश
Newspapers Clippings

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

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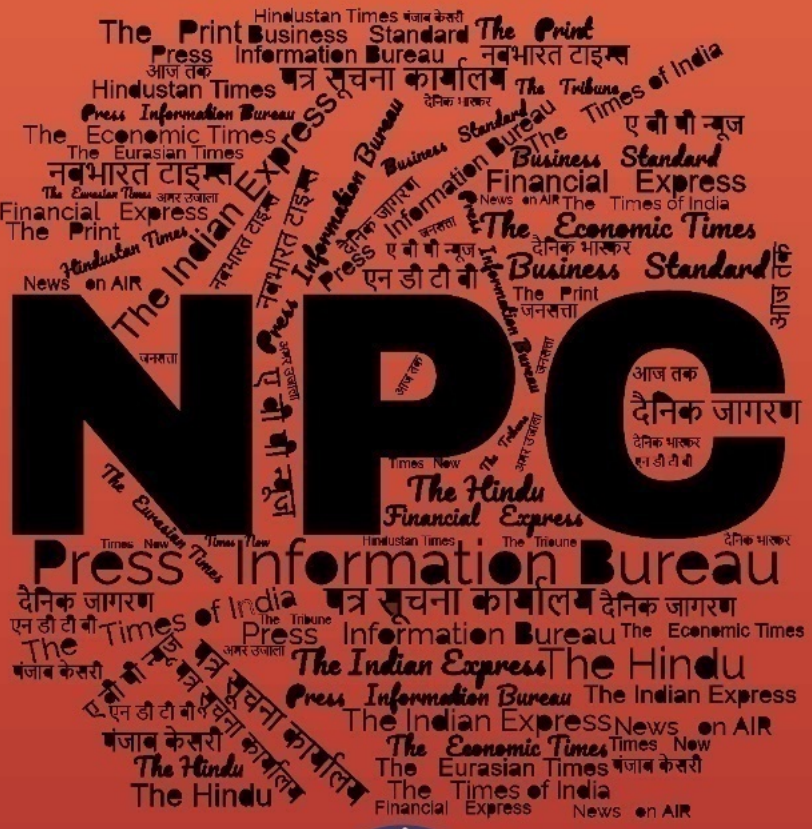

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Thu, 30 May 2024

Armed Forces Medical Services & IIT Hyderabad ink MoU for Collaborative Research and Training

The Armed Forces Medical Services (AFMS) have signed a Memorandum of Understanding (MoU) with the Indian Institute of Technology (IIT) Hyderabad to collaborate on research and training. The MoU was signed by Director General of Armed Forces Medical Services Lt Gen Daljit Singh, and Director of IIT Hyderabad Prof B S Murty.

The MoU aims to foster innovation and research in developing novel medical devices and addressing health issues specific to soldiers serving in varied terrains. IIT Hyderabad, with its departments of Biotechnology, Biomedical Engineering, and Bioinformatics, will provide the necessary technical expertise to tackle the diverse medical challenges faced by the Armed Forces.

Key areas of collaboration discussed include drone-based patient transport, telemedicine innovations, the application of Artificial Intelligence in the medical field, and advancements in nanotechnology. Additionally, the MoU will facilitate student exchange programs, short-term courses for undergraduates, and faculty exchange initiatives.

Lt Gen Daljit Singh emphasized the AFMS's commitment to delivering comprehensive medical care to soldiers, both in peripheral and tertiary care settings. He highlighted that partnering with an institute like IIT Hyderabad, known for its cutting-edge technology, represents a significant step towards enhancing research and training, ultimately improving the quality of life for soldiers and their families.

Prof B S Murty expressed IIT Hyderabad's dedication to addressing the problem statements presented by the Armed Forces, ensuring prompt and effective solutions to the challenges they face.

This collaboration marks a significant milestone in leveraging advanced technology and research to enhance the health and well-being of military personnel.

https://pib.gov.in/PressReleasePage.aspx?PRID=2022200

ThePrint

Thu, 30 May 2024

India sends largest chunk for UN peacekeeping ops in 2023, global deployment fell by 13%

India sent the highest number of troops to the UN peacekeeping operations last year, keeping up its tradition of being among the largest contributors to the force.

In its report 'Multilateral Peace Operations in 2023: Developments and trends', released this week, the Stockholm International Peace Research Institute (SIPRI) states that India sent 5,901 troops on various peacekeeping missions across the globe. Nepal comes a close second at 5,878 troops.

Among India's South Asian neighbours, Bangladesh and Pakistan were among the top 10 contributors. While Bangladesh stood in fourth place with 5,393 troops, Pakistan, in seventh place, sent 4,299.

The report states that three overall trends that were identified in 2022 "continued and intensified in multilateral peace operations in 2023". These included the increasing effects of geopolitical rivalries, the growing tensions in relations between peace operations and their host countries, and the increasing regionalisation of peace operations.

A total of 63 multilateral peace operations were active in 37 countries or territories around the world — one less than in 2022. With Sub-Saharan Africa engulfed in violence, the region recorded 24 UN peacekeeping operations — the highest number in the world.

Further, 19 operations are ongoing in Europe, 14 in the Middle East and North Africa, and three each in Asia and the Americas.

A total of 100,568 international personnel were deployed to multilateral peace operations — 13 percent less than last year. Of these, 76,372 personnel were deployed in sub-Saharan Africa alone, an 18 percent drop from the year before.

The report also showed that the peacekeeping force had begun new operations in countries like Armenia, Moldova, and the Democratic Republic of the Congo (DRC).

The EU Partnership Mission in the Republic of Moldova (EUPM Moldova) was established on 24 April last year at the request of the Moldovan government on the back of Russia's ongoing aggression in Ukraine.

The country has suffered security issues such as an influx of refugees, an energy crisis, and violations of its airspace by Russian missiles, the report said.

The mission of the Southern African Development Community (SADC) in the Democratic Republic of Congo (SAMIDRC) was established on 8 May, 2023, to support the Congolese army in fighting armed groups in eastern DRC.

The European Union Mission in Armenia (EUMA), established on 23 January last year, succeeded the 2022 EU Monitoring Capacity to Armenia (EUMCAP). The aim of this mission is to "observe

and report on the security situation along the Armenian side of the international border with Azerbaijan".

Meanwhile, peacekeeping operations were terminated in countries such as Mali, Sudan, and Central African Republic (CAR).

https://theprint.in/defence/india-sends-largest-chunk-for-un-peacekeeping-ops-in-2023-global-deployment-fell-by-13/2107829/

THE ECONOMIC TIMES

Thu, 30 May 2024

Satellite images show China's J-20 stealth fighters near Indian border in Sikkim

Satellite images taken on May 27 reveal that China has stationed its advanced J-20 stealth fighter jets less than 150 kilometers from India's boundary in Sikkim. The images, provided by All Source Analysis, show six J-20 fighters at a dual-use military and civilian airport in Shigatse, Tibet. This airport, at an altitude of 12,408 feet, is among the world's highest. Also visible in the images is a KJ-500 Airborne Early Warning and Control Aircraft.

IAF Response and Strategic Implications

The Indian Air Force (IAF) is aware of the J-20 deployment but has chosen not to comment. "The J-20 stealth fighter is China's most advanced operational fighter aircraft to date," said a VP for Technology and Analysis at All Source Analysis in an NDTV report. The deployment at Shigatse is notable as these aircraft are typically based in China's eastern provinces.

India's Countermeasures

India counters the J-20 with its fleet of 36 French-built Rafale fighters. Currently, eight Rafales are participating in advanced air combat exercises with the US Air Force in Alaska. Shigatse, where the Chinese J-20s are stationed, is less than 290 kilometers from Hasimara in West Bengal, where India bases its second squadron of 16 Rafales.

Previous Deployments and Aircraft Capabilities

This is not the first time the J-20 has been observed in Tibet. The jets were seen in Xinjiang's Hotan prefecture between 2020 and 2023. However, this latest sighting represents the largest deployment of J-20s captured by commercial satellite imagery. Introduced in 2017, the Chengdu J-20, or Mighty Dragon, is equipped with advanced sensors and China's most sophisticated air-to-air missiles, such as the PL-15, capable of striking targets up to 300 km away.

China and India's Military Build-Up

"China has steadily built up its air power capacity in Tibet and other areas near India over the past five years," says Sim Tack. This build-up includes new air bases and upgraded infrastructure. China

has also deployed aircraft like the J-20 and H-6 nuclear-capable bombers to these regions on a temporary basis.

India has responded by significantly upgrading its airbases, including adding hardened shelters and deploying the Russian-built S-400 long-range surfaceto-air missile system. The S-400, capable of tracking stealth platforms, aims to deter Chinese fighter sweeps along the Line of Actual Control (LAC).

https://economictimes.indiatimes.com/news/defence/satellite-images-show-chinas-j-20-stealth-fighters-near-indian-border-in-sikkim/articleshow/110569521.cms

अमर उजाला

Thu, 30 May 2024

IISS Report: क्षेत्रीय सुरक्षा के लिए सजग हुआ भारत, पसंदीदा सुरक्षा साझेदारी की चाहत चीन से तनाव बढ़ा सकती है

भारत ने क्षेत्रीय रक्षा कूटनीति, सहभागिता और मुद्दा आधारित भागीदारी पर काफी अधिक ध्यान दिया है। लंदन स्थित इंटरनेशनल इंस्टीट्यूट फॉर स्ट्रैटेजिक स्टडीज (आईआईएसएस) ने अपनी रिपोर्ट में यह बात कही है। रिपोर्ट में कहा गया कि भारत की बढ़ती रक्षा भूमिका और भागीदारी का भारत–चीन संबंधों पर भी असर दिखेगा। बता दें, आईआईएसएस रिपोर्ट सिंगापुर में आयोजित शांगरी–ला वार्ता की शुरुआत में जारी हुई है। यह एशिया–प्रशांत क्षेत्र के लिए एक सुरक्षा वार्ता है।

क्षेत्रीय मनमुटाव बढ़ सकता है

शुक्रवार को जारी रिपोर्ट में आगे कहा गया कि अगर भारत–चीन संबंध और बिगड़ते हैं तो यह क्षेत्र दो शक्तियों के बीच बंट सकता है। इससे रक्षा संबंध और बिगड़ सकते हैं। एशिया–प्रशांत क्षेत्रीय सुरक्षा आकलन (एपीआरएसए) की एक रिपोर्ट में कहा गया है कि पसंदीदा सुरक्षा भागीदारी के कारण क्षेत्रीय मनमुटाव बढ़ सकता है। पसंदीदा सुरक्षा द्विपक्षीय रिश्ते विशिष्ट लाभों के साथ–साथ जोखिम और चुनौतियां भी लेकर आती हैं। आईआईएसएस की रिपोर्ट के अनुसार, भारत इन सब के बावजूद एशिया–प्रशांत क्षेत्र में तेजी से आगे बढ़ना पसंद करेगा।

भारतीय सेना तेजी से बढ़ा रही है संयुक्त सैन्य अभ्यास

रिपोर्ट के अनुसार, भारत क्षेत्रीय भागीदारों के साथ संयुक्त सैन्य अभ्यास को न केवल सुधार के रूप में देखता है बल्कि नई दिल्ली के साथ उनके सहजता स्तर को भी बढ़ाता है। भारत सैन्य संयुक्त अभ्यास को बढ़ा रहा है, जिसमें वायुसेना, थलसेना और नौसेना अभ्यास तीनों अभ्यास शामिल है।

भारतीय नौसेना के बंदरगाहों पर भी सैन्य अभ्यास आयोजित किए जाते हैं। भारतीय सेना एशिया–प्रशांत सेनाओं के साथ त्रिपक्षीय, द्विपक्षीय और बहुपक्षीय अभ्यासों में तेजी से भाग ले रही है। रिपोर्ट में कहा गया है कि भारतीय सेना ने 2023 में कुल 75 संयुक्त सैन्य अभ्यास किए हैं। जिसमें 55 द्विपक्षीय, 16 बहुपक्षीय अभ्यास शामिल है। साल–दर–साल भारतीय सेना ने सैन्य अभ्यासों को बढ़ाया है।

2022 में 45 अभ्यास, 2021 में 39, 2019 में 29 और 2018 में 40 सैन्य अभ्यास आयोजित किया गया था। भारत अपनी क्षेत्रीय उपस्थिति को बढ़ाना चाहता है। इसका लक्ष्य भागीदार देशों की संख्या को बढ़ाना है।

संयुक्त अभ्यास के लिए भारतीय नौसेना भी सबसे आगे

संयुक्त अभ्यास में भारतीय नौसेना भी काफी आगे है। भारतीय नौसेना ने रॉयल थाई नौसेना, आसियान और यूरोपीय संघ के सदस्य देशों की नौसेनाओं के साथ भी अभ्यास कर चुकी है। इसके अलावा, भारतीय नौसेना भारत–इंडोनेशिया–ऑस्ट्रेलिया और भारत–फ्रांस–यूएई त्रिपक्षीय अभ्यास में भी शामिल हो चुकी है।

भारतीय नौसेना हिंद महासागर और दक्षिण पूर्व एशिया में संयुक्त अभ्यासों से रक्षा संबंधों को मजबूत करने के लिए प्रतिबद्ध है। 2023 में भारतीय नौसेना ने ऑस्ट्रेलिया, मालदीव, अमेरिका और वियतनाम सहित कई देशों के साथ सैन्य अभ्यास किए हैं।

अभ्यासों के साथ–साथ भारतीय नौसेना बंदरगाहों की यात्रा को लेकर भी काफी सक्रीय है। 2023 में नौसेना ने 51 बंदरगाहों पर यात्राएं कीं। वहीं, 2022 में 39, 2021 में 24 और 2019 में 25 बंदरगाहों पर यात्राएं कीं। अगस्त 2023 में ऑस्ट्रेलिया में भारतीय पनडुब्बी की पहली तैनाती हुई। फरवरी 2023 में इंडोनेशिया में भारतीय पनडुब्बी ने पहली यात्रा की। सितंबर 2023 में भारतीय पनडुब्बी ने सिंगापुर का भी दौरा किया। भारत ने ऑस्ट्रेलिया और फ्रांस के साथ संयुक्त गश्ती भी की है।

https://www.amarujala.com/world/iiss-report-india-increased-focus-on-regional-defence-diplomacy-india-china-relations-2024-05-31

नवभारत टाइम्स

Thu, 30 May 2024

अमेरिका में गरजेंगे भारत के राफेल जेट, इन दो देशों में उतरकर अलास्का तक भरी उड़ान

भारतीय वायु सेना की टुकड़ी बहुराष्ट्रीय अभ्यास 'रेड फ्लैग 24' में भाग लेने के लिए गुरुवार को अलास्का में अमेरिकी वायु सेना के ईल्सन वायु सेना बेस पर पहुंची। रेड फ्लैग अभ्यास दो सप्ताह का अडवांस एरियल कॉम्बेट ट्रेनिंग एक्सरसाइज है। भारतीय वायु सेना ने एक्स पर एक पोस्ट में लिखा, "आगे और ऊपर। भारतीय वायु सेना की एक टुकड़ी बहुराष्ट्रीय अभ्यास रेड फ्लैग 24 के आगामी संस्करण में भाग लेने के लिए आज अमेरिका के अलास्का में अमेरिकी वायु सेना के ईल्सन वायु सेना बेस पर पहुंची।"

ग्रीस और पुर्तगाल में उतरे भारतीय राफेल

अलास्का जाते समय, भारतीय वायु सेना के राफेल लड़ाकू विमानों ने ग्रीस और पुर्तगाल में रुकते हुए एक ट्रांसअटलांटिक उड़ान भरी। भारतीय वायुसेना ने कहा, "आईएल–78 एयर–टू–एयर रिफ्यूलर और सी–17 ट्रांसपोर्ट एसी द्वारा सक्षम रूप से समर्थित, भारतीय वायुसेना के राफेल लड़ाकू विमानों ने ग्रीस और पुर्तगाल में पड़ाव डालते हुए एक ट्रान्साटलांटिक उड़ान भरी।" इसमें कहा गया, "बहुराष्ट्रीय वातावरण में एयरक्रू को एकीकृत करने के उद्देश्य से, एक्स–रेड फ्लैग दो सप्ताह का उन्नत हवाई युद्ध प्रशिक्षण अभ्यास है।"

भारत और अमेरिका बढ़ा रहे रक्षा सहयोग

इससे पहले, रक्षा तकनीक और व्यापार पहल (डीटीटीआई) के तहत काम करने वाले भारत–अमेरिका संयुक्त कार्य समूह ने दोनों देशों के बीच रक्षा सहयोग को मजबूत करने के लिए मई के शुरुआती हफ्तों में नई दिल्ली में एक महत्वपूर्ण दो दिवसीय बैठक के लिए बैठक की। भारतीय वायुसेना के अनुसार, बैठक का नेतृत्व भारतीय वायुसेना के उप प्रमुख एयर मार्शल आशुतोष दीक्षित और समूह के सह–अध्यक्ष अमेरिकी ब्रिगेडियर जनरल जोएल डब्ल्यू सफ्रानेक ने किया, जिसमें चर्चा रक्षा सहयोग और सह–उत्पादन को बढ़ाने के लिए दोनों साझेदार देशों की संबंधित शक्तियों का लाभ उठाने पर केंद्रित थी।

वायु सेनाओं के बीच मजबूत हो रहे संबंध

गहन सत्रों के दौरान ब्रिगेडियर जनरल जोएल डब्ल्यू सफ्रानेक और एयर वाइस मार्शल जॉर्ज थॉमस, सहायक वायु सेना प्रमुख (योजना) सहित प्रमुख अधिकारियों ने द्विपक्षीय रक्षा संबंधों को गहरा करने के उद्देश्य से रणनीतिक योजनाओं पर गहन चर्चा की। इस सत्र का मुख्य उद्देश्य 2012 में स्थापित डीटीटीआई तंत्र द्वारा निर्धारित उद्देश्यों के अनुरूप साझेदारी और सहकारी अनुसंधान के माध्यम से चुनौतियों पर काबू पाना था।

https://navbharattimes.indiatimes.com/world/america/indian-air-force-rafale-jets-to-join-us-air-force-in-alaska-for-multinational-exercise-red-flag/articleshow/110568566.cms

The Tribune

Thu, 30 May 2024

IAF Rafales join in US for 4-nation exercise

An Indian Air Force contingent of eight Rafale fighter jets will take part in a two-week (May 30 – June 14) advanced aerial combat training exercise ‘Red Flag’ at Alaska, US.

They will join the 3100 personal from four countries who are to fly, maintain and support more than 100 aircraft at the exercise.

The IAF on Thursday said its team had reached the Eielson air force base of the US for the upcoming edition of the multi-national exercise Red Flag 24. A, C-17 heavy lift plane and an IL-78 mid-air refueller is part of the IAF contingent.

Enroute the jets were refuelled mid-air by the IL-78 air-to-air refuellers. The Rafale jets took a transatlantic flight with staging halts at Greece and Portugal.

The exercise is to be hosted by the Pacific Air Forces of the US and primary flight operations would be over the Joint Pacific Alaska Range Complex.

“It is designed to provide realistic training in a simulated combat environment,” a US statement said.

This was expected to enable joint combined forces to exchange tactics, techniques and procedures while improving interoperability.

Red Flag-Alaska training spans from individual skills to complex, large-scale joint engagements. The exercises can be adapted to integrate various forces into a realistic threat environment using the more than 77,000 square miles of airspace in the Joint Pacific Alaska Range Complex, which is the largest combat training range in the world.

https://www.tribuneindia.com/news/india/iaf-rafales-join-in-us-for-4-nation-exercise-626279

THE TIMES OF INDIA

Fri, 31 May 2024

Pentagon says military partnership with India is growing

The military partnership between India and the United States is growing and deepening, the Pentagon said on Thursday. "You've seen a deepening of cooperation and ties between our militaries. The secretary has hosted delegations from India here in the Pentagon and, of course, travelled overseas to meet with his counterparts. So, you've certainly seen a growing and deepening partnership and our militaries engaged in exercises," Pentagon's Deputy Press Secretary Sabrina Singh told reporters at a news conference.

that we made during the Secretary's trip. But one of the things that he announced there was a production facility in India. So you're seeing our military partnership grow and deepen, and that's something that we're extremely proud of," Singh said. Last month, US defense secretary Lloyd Austin told lawmakers that by bolstering the Indian military's capabilities the two nations can work together to uphold a more stable balance of power across the wider IndoPacific region.

He said the militaries of the US and India were accelerating operational activities to boost maritime security in the Indian Ocean. In 2023, the US and India launched INDUS-X and completed a roadmap for US-India Defence Industrial Cooperation to enhance bilateral defence industrial cooperation and innovation. The proposed deal between GE Aerospace and Hindustan Aeronautics Limited for domestic Indian production of the F-414 jet engines exemplifies this approach.

https://timesofindia.indiatimes.com/india/pentagon-says-military-partnership-with-india-is-growing/articleshow/110578177.cms

ThePrint

Thu, 30 May 2024

'Day not far when China coerces India with use of missiles,' says Lt General PR Shankar (Retd)

The use of rockets and missiles has risen as a geopolitical tool of coercion for state and non-state actors with countries like China and North Korea relying heavily on their rocket forces to threaten

others, said Lt General P.R. Shankar (Retd) at a lecture for Centre for Land Warfare Studies (CLAWS).

He said while North Korea has been trying to pressure Japan, South Korea and the US, China has been browbeating Taiwan. The day is not far when it will start coercing India too, said Lt General Shankar. “The day is not far when they will start coercing us (India). Their way of coercing is firing,” he said.

He also kept Iran ahead of China when it came to the projection of force and power by the use of missiles.

According to the Lt General, “China does economic power projection, not military power projection. But Iran doesn’t have an air force and it is offsetting its air force by use of missiles.”

He added this tactic was being used by China against the US – China had gone for long-range rockets because it doesn’t have the number of bases that the US has.

“Against us (India) in the Himalayas, (since) they can’t deploy their air power, they are using their missile power. It is the cheaper air force,” he said.

On how Russia had made use of missiles, Lt General Shankar said the country had postured with nuclear warheads and fired conventional warheads to achieve deterrence in its ongoing aggression against Ukraine. “It has used air, hypersonic/cruise/guided missiles, rockets, and guns to deter NATO from getting directly involved.”

Ukraine, on the other hand, used rockets and cruise missiles “imaginatively to deliver crucial blows to Russia”, which helped sink a large part of the Russian Navy, Lt Gen Shankar said.

Rockets were “a choice of tools of power, coercion and terror” for the state as well as non-state actors, he said, adding that “enhanced ranges outpace conventionally artillery or aircraft”.

He also suggested combining missiles or rockets with drones in order to make them more effective. “When combined with drones, they expand and threaten every corner of the battlefield.” He added that it presents a new vista of non-contact warfare with positive escalatory controls.

Missiles were also cheaper and far less complicated for air forces to acquire and maintain, flexible in employment and light on training and infra requirements, he added.

He also said that while India did not require a rocket force, it certainly needed “integrated thinking and jointness”. According to Lt General Shankar, “We sorely lack that at every level.”

Lt General Shankar pointed out that while India has the technology and wherewithal to produce any kind of rocket or missile and even has a reasonable inventory and adequate capability to accelerate production, the country lacked the “vision to put it all together”.

Pointing out certain areas where there was a need to put in more work, he said a major part of the inability was the lack of recce-strike-integration capability. He added that integration of surveillance and long-range firepower through a dedicated command and control system was “sorely” lacking.

He further said that India lacked a national security strategy, pointing out that ISRO and DRDO didn’t exactly “see eye to eye”.

Coming to where the services stand on getting along, the retired Armyman said, “Each service has its own philosophy at variance with the other.”

He pointed out that the Army had reduced the number of rocket regiments in its long-term plans and as the range of engagement had increased, “the Indian Artillery has been stripped of integral deep surveillance and targeting capability”.

“While the rest of the world is integrating firepower, surveillance and observation through repurposed apps in battle, we have systematically disintegrated our structure,” he said.

https://theprint.in/defence/day-not-far-when-china-coerces-india-with-use-of-missiles-says-lt-general-pr-shankar-retd/2108754/

THE ECONOMIC TIMES

Thu, 30 May 2024

The China challenge: The nuts and bolts of Rs 50,000 cr fighter jet deal

India has been gearing up to meet the challenges posed by China's People's Liberation Army (PLA) Navy in the Indo-Pacific region. Two years ago, Indian Navy inducted indigenously built aircraft carrier INS Vikrant. Now to add teeth to Vikrant, it is buying marine fighter jets. India will soon begin final contract and price negotiations with France to buy 26 Rafale Marine fighter jets manufactured by French company Dassault.

Estimated at nearly Rs 50,000 crore, the government-to-government deal is expected to be inked within the financial year. While a formal offer was presented by the French side in December, the current round of negotiations will finalise the price, weapons package, maintenance terms and delivery timelines for the aircraft. The acquisition of Rafale Marine fighter jets was cleared by the Defence Procurement Board in July last year, days ahead of the visit of Prime Minister Narendra Modi to Paris.

The jets will be manufactured to India-specific standards and will have several indigenous systems as well, including weapons and communication. The Indian Navy will get 22 single-seated Rafale Marine aircraft along with four trainer aircraft. 36 Rafale jets are already in service with the Indian Air Force. Rafale-M has superior air power as compared to the present MIG-29K deployed on the aircraft carrier. A team of officials from the French government, fighter-manufacturer Dassault and weapon systems integrator Thales, among others, is arriving here on May 30 for the talks with the contract negotiation committee (CNC) constituted by the Indian defence ministry.

The French side has stated that if required, it can increase the rate of production to 30 aircraft per year from the existing 18 per year. The French received multiple orders from different countries after India first selected it for its requirement multirole combat aircraft deal where all participants were made to go through a rigorous trial procedure.

The defence and strategic ties between India and France have been on an upswing in the last few years, and the Rafale-M deal will further strengthen these ties.

How French Rafale-M defeated American F/A-18 Super Hornet

After the Indian Navy commissioned its second aircraft carrier INS Vikrant, the question was which fighter jets will pair with it. Experts thought any delay in resolving the shortage of enough fighter jets will make Vikrant toothless and the Navy will not be able to tap the true potential of its new moving airbase without a strong air fleet.

Both Rafale (M) and US-made F/A-18 Super Hornets had successfully completed operational demonstration tests and the Navy was looking at buying either of these aircraft. Rafale M emerged as the frontrunner over the American F/A-18 Super Hornet.

Rafale-M was found to be “more suitable in meeting the operational requirements and criteria” of the Navy compared to the Boeing-manufactured F/A-18. Both the fighters underwent operational demonstration trials to assess their suitability and capability at the shore-based test facility (SBTF) at INS Hansa in Goa, which has a ski-jump to resemble an aircraft carrier’s deck in 2022. The French fighter, in any case, had a head start on logistical and other grounds given that the IAF has already inducted 36 Rafales under the Rs 59,000 crore deal inked with France in September 2016.

The China challenge

The Navy only has 40 of the 45 MiG-29K jets, inducted from Russia at a cost of $2 billion from 2009 onwards, to operate from the decks of its two over 40,000-tonne aircraft carriers, the older Russian-origin INS Vikramaditya and the new indigenous INS Vikrant. The MiG-29Ks have also been dogged by poor serviceability and other problems over the years. With the indigenous twin-engine deck-based fighter (TEDBF) likely to take time to be developed, the Navy had pushed for the 26 Rafale-M jets as a stopgap measure.

Then Navy chief Admiral R Hari Kumar had said in 2022 that the 26 fighters were an "interim solution" till the indigenous TEDBF being manufactured by Hindustan Aeronautics Limited is ready. It will take the TEDBF at least a decade to become fully operational.

China is now conducting trials of its third aircraft carrier, the over 80,000- tonne Fujian, after earlier inducting the 60,000-tonne Liaoning and the 66,000-tonne Shandong, and building more such warships.

The Indian government, in contrast, is yet to even give the preliminary nod for the longpending case for a third 45,000-tonne aircraft carrier, let alone a more potent 65,000-tonne one, which will take at least a decade to build. Significantly, the Fujian -- like the newest American carrier USS Gerald R Ford -- has an electromagnetic catapult system to also launch much heavier aircraft for surveillance, early-warning and electronic warfare. While the 10 US Nimitz-class carriers have steam-powered catapults, INS Vikramaditya and INS Vikrant as well as Liaoning and Shandong,

China's other two aircraft carriers, have only angled ski-jumps that allow fighters to take off under their own power. While its spy vessels frequently sail close to India, China has not yet sailed an aircraft carrier into the Indian Ocean but is expected to do so within the next few years.

It already has other vessels operating regularly in the region and has established its first overseas base in the Horn of Africa country of Djibouti, which gives it easy access to the Indian Ocean.

"New Delhi sees Beijing as encroaching into its traditional sphere of influence, especially in the Indian Ocean region," Ridzwan Rahmat, a Singapore-based analyst with the defense intelligence company Janes, had told AP last year.

"While a potential war with China will likely be fought inland, China's presence in the Indian Ocean region can severely disrupt India's sea lines of communication, which will be essential in sustaining the war effort. The Indian navy's recent modernization track is to ensure that scenarios like these will not take root," Rahmat said.

https://economictimes.indiatimes.com/news/defence/the-china-challenge-the-nuts-and-bolts-of-rs-50000-cr-jet-fighter-deal/articleshow/110561430.cms

The EurAsian Times

Thu, 30 May 2024

Pakistan's JF-17 'Beats' Indian LCA Tejas In Exports; Can It Outflank MK 1A Fighters In Real Aerial Combat?

The Indian Air Force (IAF) is set to receive the upgraded version of the indigenous supersonic fighter aircraft, the Tejas Mk1A, by July. Meanwhile, in December 2023, the Pakistan Air Force (PAF) marked a significant milestone by officially incorporating the latest version of the JF-17 Thunder – Block III.

India's LCA Tejas and Pakistan's JF-17 compete fiercely not only for regional air superiority but also for global market share. Each represents a cost-effective option for military missions.

Production:

The Tejas is a homegrown marvel forged through the collaborative efforts of India's Aeronautical Development Agency (ADA) and Hindustan Aeronautics Limited (HAL). Across the border, the JF-17 is the product of a Sino-Pakistani partnership between the Pakistan Aeronautical Complex (PAC) and China's Chengdu Aircraft Industry Complex (CAC).

Advanced Aircraft Evolution:

The MK1A is an advanced version of its predecessor, the MK 1, and is classified as a 4.5-generation aircraft. In contrast, the JF-17 Block III is described by PAF officials as a "fourth-generation plus" fighter jet, offering several enhanced capabilities over the earlier Block II version.

Budget-Friendly Powerhouses:

Both fighters are designed for similar military missions and requirements, positioning them to compete in the global market for budget-friendly combat aircraft. Both India's LCA Tejas and Pakistan's JF-17 Block III are single-engine, lightweight, multirole fighters designed to be cost-effective.

Replacing Aging Fleets: Conceived as 4.5th-generation jets, the Tejas and JF-17 Block III were tasked with replacing their nations' aging third-generation fighter fleets—the venerable MiG-21 for India and a motley crew of Chinese and French jets for Pakistan.

First Flight:

Flight tests have shown promising results for both aircraft. The LCA Tejas MK 1A successfully conducted its first test flight on March 28, 2024. On the other hand, the JF-17 Block III —a single-seat variant—completed its inaugural flight in Chengdu, China, on December 15, 2019. The PAF has acquired an impressive fleet of 50 JF-17 Block III aircraft, with the first one joining the ranks on December 4, 2023. Mass production began at PAC Kamra on December 30, 2020.

Specifications and Features:

HAL has modernized the aircraft by incorporating advanced technology and making slight design adjustments, resulting in nearly a 50% increase in indigenous content compared to its predecessor – MK 1. The MK 1A demonstrates versatility, fulfilling various roles such as ground attack, interception, air-to-air combat, and air defense. Despite its external resemblance to the MK 1, the MK 1A features new electronics, processors, display systems, and fly-by-wire hardware.

The updated version offers improved situational awareness, with a slightly larger canopy and aerodynamic changes enhancing maneuverability. It boasts approximately nine hard points on its underbelly, capable of carrying a variety of weaponry, including Beyond Visual Range (BVR) missiles, Air-to-Air/Ground missiles, and Advanced Short Range Air-to-Air missiles (ASRAAM). External self-protection jammer pods enable the aircraft to engage in electronic warfare. Additionally, an indigenously developed digital fly-by-wire flight control computer has been integrated into the Tejas jet, replacing mechanical flight controls with an electronic interface.

On the other hand, according to the PAF, the JF-17 Block III aircraft offers superior maneuverability, extended range, and enhanced combat capabilities. It features a single-seat variant and incorporates advanced technological developments, including the NRIET/CETC KLJ-7A AESA radar. This radar, developed by the Nanjing Research Institute of Electronics Technology (NRIET), can track 15 targets simultaneously and engage four targets at once.

It has a three-axis digital fly-by-wire flight control system and an Infrared Search and Track (IRST) system. Additionally, it is equipped with a Helmet-mounted Display and Sight (HMD/S) system jointly developed by Pakistan and China.

Moreover, the enhancements in the Block III variant extend to engine upgrades. Initially powered by the Klimov RD-93MA after-burning turbofan, plans are underway to upgrade to the Guizhou WS-13 engine, which aims to increase thrust and optimize the thrust-to-weight ratio.

Cost:

Since 2016, the Indian Air Force (IAF) has been developing an upgraded version of the Tejas Mk 1A with a reported budget of US$5.9 billion. In contrast, the project cost for the JF-17 Block III remains undisclosed. However, Iraq recently expressed interest in purchasing 12 JF-17 Block IIIs for $664 million, translating to approximately $55 million per unit.

Initially, JF-17 airframes were produced solely in China after its first flight in 2003. Presently, Pakistan manufactures 58% of the aircraft, with the remaining 42% produced in China.

Exports:

Besides Pakistan, Nigeria and Myanmar have already acquired the JF-17 Thunders, and Azerbaijan has finalized the deal to buy them. There are reports that Iraq could also buy these Sino-Pak jets. For LCA Tejas, the Indian Air Force remains its primary & biggest customer. Despite serious negotiations with Malaysia and Argentina, no export orders have been received yet.

Crash History:

On March 12, 2024, an Indian Air Force LCA Tejas crashed for the first time since its debut in 2001. The crash occurred near Jaisalmer while returning from the 'Bharat Shakti' exercise in Pokhran, Rajasthan. The pilot ejected safely, and there were no casualties despite the aircraft damaging a hostel. In contrast, since its first flight in 2003, the JF-17 has crashed four times, resulting in at least one death. According to the Flight Safety Foundation's Aviation Safety Network, JF-17 crashes occurred in November 2011, September 2016, September 2020, and August 2021.

Future Horizons:

As these aerial titans take to the skies, their nations are already looking ahead. As ET previously reported, the Pakistan Air Force (PAF) has unveiled plans for the JF-17 PFX (Pakistan Fighter Experimental), indicating that the Block-III variant is not the final iteration in the JF-17 series. The development of the JF-17 PFX aligns with PAF's long-term modernization strategy.

On the other hand, India is focused on accelerating the delivery of the Mk1A to facilitate the introduction of the LCA Mk2. The primary objective is to promptly fulfill all Mk1A orders, thereby freeing up production capacity for the subsequent model, the LCA Mk2.

This version will feature more capable engines—the GE 414—and will be locally manufactured in India under a technology transfer agreement. The initial LCA Mk2 is slated for serial production readiness by 2027, with ongoing efforts to prepare the prototype. Compared to its predecessors, the MK2 is projected to have extended flight duration and significantly increased weapons payload capacity. According to reports, in terms of deployment, the IAF plans to establish the first squadron of Tejas Mk 1A at the Nal air base in Rajasthan's Bikaner district, replacing one of the existing MiG-21 squadrons stationed there.

Amidst escalating regional tensions and burgeoning global aspirations, the skies over the Indian subcontinent are poised for an electrifying aerial showdown as these 4.5th generation fighters vie for dominance. Keep an eye out for the unfolding chapters of this high-flying saga.

Which Is Better?

"Tejas is a more capable, maneuverable, agile, and reliable aircraft than the JF-17. The Chinese JF-17 was initially powered by a Russian RD-93 engine. Beijing found the JF-17 unsuitable for induction," an Indian (HAL) official associated with the development of the aircraft told the EurAsian Times.

"The Chinese then offered their local 'unproven' WS-13 engine to JF-17 operators, which Pakistan refused for their Block-3 JF-17 fighter jets," the official said. Unlike the GE-404 engine, which powers many military aircraft globally with an unblemished record, the unproven WS-13 engine of China is riddled with reliability issues. "Without a reliable engine, the JF-17 is very dangerous for

pilot's safety. Chances of mission success are abysmal on JF-17 equipped with WS-13 engine," the official added. The JF-17 was jointly developed by the Pakistan Aeronautical Complex and China's Chengdu Aircraft Industry Corp. It has a Chinese airframe, Western avionics, and a Russian engine.

Since its induction in PAF in 2007, it has seen many crashes. The aircraft has been grounded several times due to cracks in guide vanes, exhaust nozzles, and flame stabilizers. The LCA scores over JF-17 when it comes to serviceability. In the IAF squadron, the LCA has a serviceability of over 75 percent. "Out of 100 aircraft delivered to date, at least 40 JF-17 aircraft are known to be unserviceable. The number of accidents on this aircraft in Pakistan shows a very dismal record. Another parameter that sets LCA one notch up the JF-17 is the fly-by-wire system. The JF-17 has a triplex redundant fly-by-wire system, and the LCA has a quadruplex redundant architecture.

Myanmar, the first country besides Pakistan to buy JF-17, was forced to ground its fleet due to technical malfunctions. Reports suggest the reason behind the grounding in Myanmar was that the airframe of JF-17 reported "vibration issues'. The Irrawaddy Times notes: "The airframe is vulnerable to damage, especially in its wingtips and hardpoints, when the aircraft encounters strong gravitational forces, according to a former pilot of the Myanmar Air Force."

The critical part of the JF-17 avionics is the China-made KLJ-7 Al radar, which has poor accuracy and maintenance problems, analysts say. The aircraft does not even have an effective beyond-visual-range (BVR) missile or airborne interception radar. According to reports: "Malfunction of the Weapon Mission Management Computer has caused launch zones of BVR air-to-air missiles to shrink during combat exercises." For LCA Tejas, the entire software, including the flight control laws, mission computer algorithm, and weapon release solutions, are designed indigenously. There are unique features in the flight control laws that allow "carefree handling and recovering from unseen situations."

The LCA's Turn-Around Servicing (TRS) is less than 30 minutes. TRS is the time the aircraft takes to get airborne again after landing, as the plane undergoes servicing after each landing. This is because the LCA Tejas has all its services on Hydraulics. The Chinese-Pakistan JF-17 uses a pneumatic system to operate some utility services in main and emergency modes. This requires regular pneumatic charging, increasing Turn-Around Servicing (TRS) time.

https://www.eurasiantimes.com/pakistans-jf-17-beats-indian-lca-tejas-in-exports-can/

THE ECONOMIC TIMES

Thu, 30 May 2024

Pakistan does not adhere to 'no first use' of nuclear weapons policy: ex-Army official

Pakistan does not follow the "no first use" policy on nuclear weapons and the country's deterrence capabilities can respond to all threats from the enemy, a former senior military officer has said, as he clarified Islamabad's stance on the use of atomic weapons. Lt Gen (retd) Khalid Ahmed Kidwai, Adviser to the National Command Authority, was speaking at a seminar held at the Centre for

International Strategic Studies (CISS) on Wednesday to commemorate Youm-e-Takbeer, the 26th anniversary of Pakistan's nuclear tests in 1998.

The Dawn newspaper reported that Kidwai, who has served as the director general of the Strategic Plans Division (SPD), said: "Pakistan does not have a No First Use policy, and I'll repeat that for emphasis. Pakistan does not have a No First Use policy." The NFU refers to a country's stance and is regarded as an assurance that its nuclear arsenal is meant for deterrence, not fighting a nuclear war.

Islamabad has traditionally maintained ambiguity regarding its NFU policy. "The Indian gung-ho leadership may like to think about it there should never ever be a doubt in anyone's mind, friend or foe, that Pakistan's operationally ready nuclear capability enables every Pakistani leader the liberty, the dignity and the courage to look straight into the Indian eye and never blink," Kidwai said.

Kidwai said the full spectrum deterrence capabilities available to the Pakistani military were the combination of the conventional and most modern technology-based weapons capable of responding to all threats from the enemy, state-run Associated Press of Pakistan (APP) news agency reported.

He added that the full spectrum deterrence helped in restoring the strategic balance of power that enforced peace in the region. "In the past few decades, the robust nuclear capability of Pakistan has enforced peace in the region," APP quoted Kidwai as saying. Pakistan conducted six nuclear tests on May 28, 1998, inside a deeply dug tunnel in the remote Chaghi mountain of Balochistan province, as a tit-for-tat response to India's nuclear tests in the same month at the Indian Army's Pokhran Test Range. Gen Kidwai also hinted at using emerging technologies to strengthen the country's nuclear programme. "Advancements in technology including what is referred to as emerging technologies will continue to make their way appropriately in Pakistan's National Security calculus, and the nuclear programme will be stronger by benefiting from these," he said.

He noted that Pakistan's Full Spectrum Deterrence (FSD) capability, while generally remaining within the larger philosophy of Credible Minimum Deterrence (CMD), comprises horizontally of a robust tri-services inventory of a variety of nuclear weapons. He said that the nuclear weapons were held on land with the Army Strategic Force Command (ASFC), at sea with the Naval Strategic Force Command (NSFC), and in the air with the Air Force Strategic Force Command (AFSC).

Vertically, the nuclear spectrum encapsulates progressively increasing destructive weapon yields, and range coverage at three: strategic, operational, and tactical to 2,750 km to cover India's vast Eastern and Southern geographical dimensions, including its outlying territories.

Lt Gen Kidwai further stated that India's Dynamic Response Strategy (DRS) is a clear reflection of the limits and constraints imposed by Pakistan's robust nuclear capability on India's strategic and operational options, and therefore, Pakistan's strategic weapons, especially the Tactical Nuclear Weapons (TNWs), are "weapons of peace". Director General of the Arms Control and Disarmament Affairs (ACDA) branch of the SPD, retired Brig Zahir Kazmi, highlighted some of the emerging threats and enduring threats to Pakistan's nuclear programme.

https://economictimes.indiatimes.com/news/defence/pakistan-does-not-adhere-to-no-first-use-of-nuclear-weapons-policy-ex-army-official/articleshow/110563204.cms

THE ECONOMIC TIMES

Thu, 30 May 2024

Russia says it may take extra nuclear deterrence steps if US puts missiles in Europe/Asia

Russia may take extra steps in the area of nuclear deterrence if the United States deploys intermediate and shortrange missiles in Europe and Asia, Russian Foreign Minister Sergei Lavrov told the state RIA news agency in an interview. RIA referred to U.S. plans, announced in April, to deploy missiles in the Indo-Pacific region in response to what Washington sees as growing Chinese militarisation. Such deployments would have previously been outlawed under the landmark 1987 Intermediate-range Nuclear Forces (INF) Treaty with Russia which the United States formally withdrew from in 2019 after saying that Moscow was violating the accord, an accusation the Kremlin denied.

Moscow has long warned it would scrap a moratorium it proposed after the treaty lapsed on the deployment of short and medium range missiles if Washington went ahead with plans to deploy such missiles in Asia and Europe. Lavrov told RIA that Russia might have to take other steps too. "We do not rule out additional steps in the sphere of nuclear deterrence, because our command centres and the locations of our nuclear forces will be in range of American forward-based missiles," said Lavrov.

https://economictimes.indiatimes.com/news/defence/russia-says-it-may-take-extra-nuclear-deterrence-steps-if-us-puts-missiles-in-europe/asia/articleshow/110558697.cms

THE ECONOMIC TIMES

Thu, 30 May 2024

North Korea fires missile barrage toward eastern waters days after failed satellite launch

North Korea on Thursday fired a barrage of suspected ballistic missiles toward its eastern sea, according to South Korea's military, days after its attempt to launch a military reconnaissance satellite ended in failure but still drew strong condemnation from its rivals. South Korea's Joint Chiefs of Staff said it detected the North firing around 10 projectiles that appeared to be short-range ballistic missiles from an area near its capital, Pyongyang.

It said the suspected missiles flew around 350 kilometers (217 miles) before landing in waters off the North's eastern coast. It said the South Korean military has increased surveillance and vigilance and is closely sharing information with the United States and Japan. Japan's coast guard issued a maritime safety advisory over the North Korean launches and urged ships to exercise caution if they find any fallen objects. Japan's Prime Minister Fumio Kishida told reporters that the suspected

missiles were believed to have landed in waters outside of Japan's exclusive economic zone and there were no immediate reports of damages. He said Tokyo "strongly condemns" the launches, which are in violation of U.N. Security Council resolutions against the North.

Tensions on the Korean Peninsula have increased in recent months as the pace of both North Korea's weapons testing and South Korea's combined military exercises with the United States and Japan have intensified in a cycle of tit-for-tat. Thursday's launches came after North Korea flew hundreds of trash-carrying balloons toward the South since Tuesday night in retaliation against South Korean activists flying anti-North Korean propaganda leaflets across the border. North Korean leader Kim Jong Un had warned of unspecified "overwhelming actions" against South Korea after it staged an aerial exercise involving 20 fighter jets near the inter-Korean border hours before North Korea attempted to launch its second military reconnaissance satellite.

The rocket exploded shortly after liftoff, but Kim has urged his military scientists to overcome the failure and continue developing space-based reconnaissance capabilities, which he described as crucial for monitoring U.S. and South Korean military activities and enhancing the threat of his nuclearcapable missiles. Also on Thursday, North Korea hit back at international condemnation of its failed satellite launch, which drew strong rebukes from the United Nations and other countries as it involves technologies used for developing intercontinental range ballistic missiles. The North had successfully launched its first military spy satellite in November, but Monday's failure posed a possible setback to Kim's plans to launch three more military spy satellites in 2024.

"We will never tolerate any moves of the hostile forces to violate the inviolable sphere under the exercise of sovereignty nor step back from having access to the space reconnaissance capability which should be done surely no matter what others may say," North Korean Vice Foreign Minister Kim Son Gyong said in a statement published on state media. Kim Son Gyong's statement came as response to U.N. Secretary-General Antonio Guterres' condemnation of Monday's launch, which he called a violation of Security Council resolutions that prohibit the North from conducting any launches involving ballistic missile technology.

Thursday's launches were the latest in a series of weapons tests by North Korea. On May 17, South Korea's military said that North Korea fired suspected shortrange ballistic missiles off its east coast. North Korea later said it tested a tactical ballistic missile with a new autonomous navigation system. The North this year tested various cruise missiles and artillery systems and flight-tested what it described as a solid-fuel intermediate range missile with hypersonic warhead capabilities. Experts say it is designed to reach remote U.S. targets in the Pacific, including the military hub of Guam.

https://economictimes.indiatimes.com/news/defence/north-korea-fires-missile-barrage-toward-eastern-waters-days-after-failed-satellite-launch/articleshow/110551203.cms

Press Information Bureau
Government of India

Ministry of Science & Technology

Thu, 30 May 2024

Technology Development Board (TDB) - Department of Science and Technology (DST) approves support for M/s Midwest Advanced Materials Private Limited, Hyderabad for Sustainable Magnet Production

The program aimed at increasing the production of Neodymium magnets to enable sustainable future

The Technology Development Board (TDB) under the Department of Science and Technology (DST) has sanctioned funding for M/s Midwest Advanced Materials Private Limited (MAM), Hyderabad with the aim of boosting the domestic production of essential materials and technologies, today at the TDB Centre in New Delhi.

The strategic project focuses on advancing the commercial manufacturing of Neodymium materials and Rare Earth Permanent Magnets, integral components for e-mobility applications. Aligned with national priorities, the funded project aims to establish an integrated production module for Rare Earth (RE) magnets, starting with oxides.

Utilizing a modified Metal Extraction method employing Molten Salt Electrolysis (MSE) technology, which incorporates an environmentally sustainable electrolysis process with proprietary cell designs, this initiative represents a critical stride towards sustainable technological advancement.

Neodymium (NdFeB) permanent magnets are vital for propulsion systems in electric vehicles and generators in renewable energy infrastructure, are forecast to witness substantial market expansion, thereby underlining the significance of indigenous production capabilities. This program aligns with international efforts to mitigate climate change and promote renewable energy sources, including solar and wind power.

The transfer of advanced technology from The Nonferrous Materials Technology Development Centre (NFTDC), an esteemed R&D institution under the aegis of the Ministry of Mines, Government of India, to Midwest Advanced Materials ltd. has paved the way for the commercial production of Neodymium materials and Rare Earth Permanent Magnets. NFTDC's proficiency in advanced materials, particularly Rare Earths, alongside expertise in process development and

equipment design, coupled with MAM's strengths in mining, powder metallurgy, e-mobility, and project financing, constitutes the bedrock of this TRL-9 demonstration plant. With an initial production target of 500 tons per year (TPY) of magnets, with a subsequent scaling up to 5000 TPA by 2030, this initiative underscores a transformative stride towards achieving self-reliance in critical technological domains.

During his speech, Dr. K. Bala Subramanian, the Director of NFDTC, emphasized the project's importance as a trailblazing initiative in India. He envisaged an annual production of 500 tons of magnets from 150–170 tons of oxide, which would be a significant milestone for the country.

This all-encompassing scientific breakthrough, which spans the entire range from motors and finished magnets to rare earth oxide, is expected to have a significant impact on a number of high-tech industries, including smartphones, wind turbines, medical imaging devices, and electronic mobility. For this project, five specialized pieces of equipment have been carefully built to provide optimal operational effectiveness and efficiency.

The project benefits from much lower capital investment (CapEx) due to local plant and machinery design. As India Rare Earth Engineers Limited (IREL) will supply the raw materials, the project will be more financially feasible in terms of operating expenses. In the future, MAM wants to reach a production target of 5,000 TPA annually by 2030.

This is a calculated step that will improve the project's long-term profitability and value proposition. NFTDC will support MAM's efforts in rare earths and other vital materials as a knowledge and technological partner.

Sh. Rajesh Kumar Pathak, Secretary, TDB, highlighted the project's importance. This initiative signifies India's advancement to domestically manufacture high-performance magnets, addressing national imperatives and contributing to the global transition towards sustainable technologies in critical materials for e-mobility and clean energy.

https://pib.gov.in/PressReleasePage.aspx?PRID=2022185

ThePrint

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Why launch of India's 1st semi-cryogenic rocket Agnibaan by Chennai startup is a 'major milestone'

Chennai-based space startup AgniKul Cosmos Thursday successfully test-launched India's first semi-cryogenic rocket — Agnibaan SOrTeD (Sub Orbital Technology Demonstrator) — after four of its previous attempts had failed.

"Humbled to announce the successful completion of our first flight — Mission 01 of Agnibaan SOrTeD — from our own and India's first and only private launchpad within SDSC-SHAR (Satish Dhawan Space Centre, Sriharikota Range) at Sriharikota," the company later said in a statement.

“All the vehicle was completely designed in-house and powered by the world’s first single piece 3D-printed engine and also happens to be India’s first flight with a semi-cryo engine,” it added.

The government space agency, Indian Space Research Organisation (ISRO), has not yet launched a semi-cryogenic rocket, making AgniKul Cosmos the first in India to venture into this sphere, albeit with ISRO’s technical support. After the launch Thursday, ISRO congratulated Agnikul Cosmos for achieving “a major milestone”.

AgniKul Cosmos is an Indian Institute of Technology-Madras incubated venture founded in 2017 by Srinath Ravichandran, Moin S.P.M., and S.R. Chakravarthy. It was the first Indian company to sign an agreement with ISRO in 2020 and is one of the heaviest-funded space startups in the country.

‘Historic milestone’

Agnibaan is a single-stage launch rocket powered by an Agnilet semi-cryogenic engine, i.e., an engine fuelled by a combination of liquid and gaseous propellants. A semi-cryogenic engine remains at temperatures higher than cryogenic but colder than traditional liquid rocket engines.

A semi-cryogenic engine also can provide more thrust to rockets, helping carry higher payloads than cryogenic engines running on only gaseous propellants. So, Agnibaan paves the way for heavy-lift capability rockets, marking a significant development in India’s space sector. Moreover, semi-cryogenic rockets are environment-friendly and cost-effective.

ISRO is now developing a 2,000 kN thrust semi-cryogenic engine, with its latest trial conducted 2 May this year.

Agnibaan has other features that make it a key achievement. A plug-and-play engine configuration would allow the precise tailoring of the rocket to meet mission objectives and adjustments to fit commercial requirements. This feature makes Agnibaan, which would be available for commercial use, versatile, with a potential for various applications.

Agnikul Cosmos has also pointed out that Agnibaan, unlike conventional rockets launched from guide rails, will lift off vertically and follow a predetermined trajectory while performing a precisely orchestrated set of manoeuvres during flight.

A.K. Bhatt, director general of the Indian Space Association (ISpA), said the successful test launch was “nothing short of a historic milestone since India launched its maiden rocket in 1963 from the Thumba launch station (in Kerala’s Thiruvananthapuram)”.

“This is a huge boost and a proud moment for India’s thriving private space industry and just a glimpse into what the future holds for us,” he said.

“This significant launch, coupled with the recently introduced guidelines for implementing the Indian Space Policy 2023 by IN-SPACe and the new FDI (foreign direct investment) regulations, will bolster global confidence in India’s private space industry and growing capabilities,” he added.

Semi-cryogenic engines as future of space travel

ISRO is also making strides in developing its first semi-cryogenic engine to ensure more efficient future launches. Early this month, the space agency conducted the first ignition trial for its SCE-200 (semi-cryogenic engine-200) at the Semi-cryo Integrated Engine Test (SIET) facility at the

ISRO Propulsion Complex (IPRC) in Mahendragiri, Tamil Nadu. The test demonstrated smooth and sustained ignition of the pre-burner, a vital step in starting the semi-cryogenic engine. The SCE-200 is a 2MN thrust class liquid rocket engine developed by ISRO's Liquid Propulsion Systems Centre (LPSC).

This next-generation rocket engine, designed to enhance the payload capability of ISRO's Launch Vehicle Mark-III launcher and future launch vehicles, operates on an oxidiser-rich staged combustion cycle using liquid oxygen (LOX) and RP-1 (rocket propellent-1) kerosene.

Speaking to ThePrint, senior ISRO scientists said the SCE-200 will likely replace the currently used L110 stage, also known as the core stage of the LVM-3. It promises to power future launch vehicles, such as the upcoming next-generation launch vehicles and reusable launch vehicles.

Four failed attempts before success

This is not the first time that AgniKul Cosmos has attempted the launch. There have been four previous tries at liftoff since March this year. The last was an attempt two days ago.

On 28 May, the launch was scheduled for 5.45 am but got delayed due to an undisclosed technical glitch during the countdown, with the liftoff rescheduled for 9.25 am. However, with just five seconds to launch, the AgniKul Cosmos team put the mission temporarily on hold to assess igniter performance. The company, however, did not clarify the exact reason behind the rescheduling.

Earlier on 7 April, a communication issue arose between two of the launcher's onboard hardware.

"Had to call off today's launch attempt of Agnibaan SOrTeD just a second into Automated Launch Sequence (ALS) initiation (at T-129 seconds) because of a communication issue between two of our onboard hardware. Although it is frustrating to see a hold this close to lift off, we are glad our ALS did its job. We'll get to the root cause and come back for the launch after fixing the cause," Agnikul Cosmos, at the time, said.

Senior officials from ISRO, which has been providing technical support to the private company, told ThePrint that such delays are normal, especially when attempting tests for a novel technology.

https://theprint.in/science/why-launch-of-indias-1st-semi-cryogenic-rocket-agnibaan-by-chennai-startup-is-a-major-milestone/2108779/

REUTERS

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South Korea plans Mars landing in 2045 as it launches first space agency

South Korea plans to make a Mars landing by 2045 and spend 100 trillion won ($72.6 billion) until then on space exploration, President Yoon Suk Yeol said on Thursday at the launch of the country's first space agency.

The Korea Aerospace Administration (KASA) will lead the country's "space economy," with hundreds of businesses and enterprises working to catapult South Korea into the ranks of the world's top five space powers, Yoon said.

"KASA will usher in a new space era by cultivating experts while intensively supporting the aerospace industry ecosystem and fostering challenging and innovative R&D," Yoon said. The country's first lunar lander is planned for 2032.

South Korea became the seventh country to own an indigenous space launch vehicle and satellite development technology with the launch of the Nuri rocket in May last year that put a commercial grade satellite in orbit.

The agency is aimed at streamlining policy and development functions shared among different government ministries and will bring under its structure the aerospace research institute that developed the Nuri and its precursor space launch vehicles.

South Korea plans at least three more space launches by 2027 and has plans to launch military satellites.

Yoon's announcement highlights the increasing efforts Asian nations are putting into space programs for practical reasons, such as honing rocket technology, and to bolster national pride.

On Monday, North Korea launched a rocket but failed to put its second military spy satellite in orbit, which it blamed on a new type of engine failing. But one expert noted the attempt as a "huge leap" in the heavily sanctioned country's race for space.

South Korea, Japan and the United States condemned the North's launch as violating U.N. Security Council resolutions banning it from developing ballistic missile technology.

China's space program has developed heavy-lift rockets such as the Long March 5, the Tiangong space station, unmanned moon probes and the rover Zhurong that reached Mars in 2021.

In January, Japan became the fifth country to place a lander on the moon. Last year, India became the fourth nation to land on the moon, after Russia failed in an attempt the same month.

Japan also plans a rover mission to Mars.

https://www.reuters.com/science/south-korea-plans-mars-landing-2045-it-launches-first-space-agency-2024-05-30/