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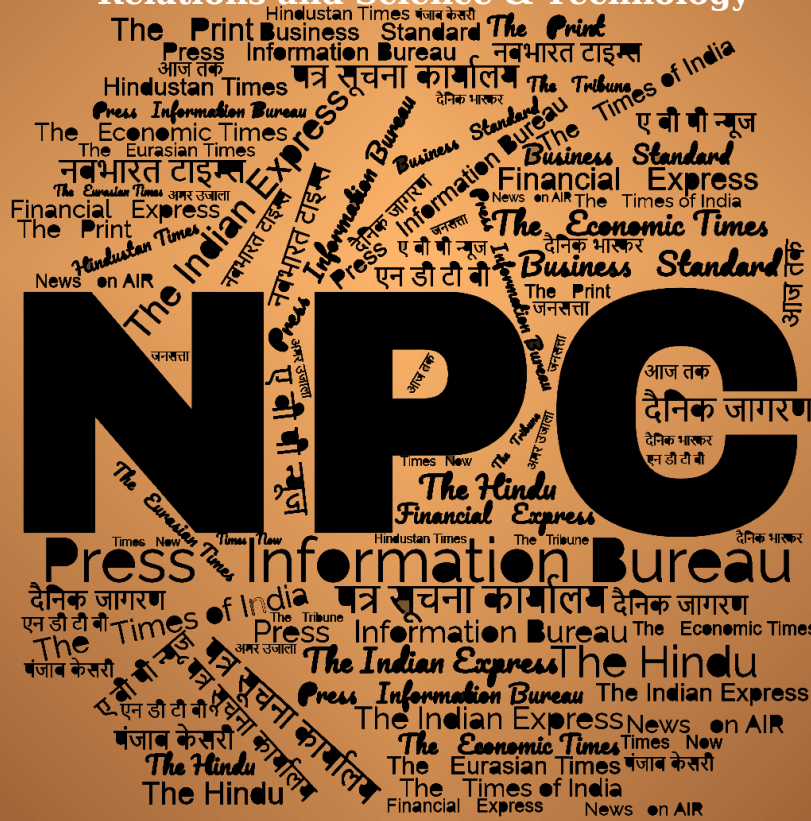
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समाचार पत्रों से चयित अंश Newspapers Clippings

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

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दुनिया में बढ़ी भारतीय हथियारों की मांग, पिछले साल 16 हजार करोड़ का हुआ डिफेंस एक्सपोर्ट

भारत के डिफेंस एक्सपोर्ट (Defense Export) ने जबरदस्त उछाल मारी है। पिछले एक दशक में भारत ने अभी सबसे ज्यादा एक्सपोर्ट किया। फाइनेंशियल ईयर 2022-23 (FY 2022-23) में भारत का डिफेंस एक्सपोर्ट लगभग 16 हजार करोड़ रुपए रहा है, जोकि अब तक का सबसे उच्च एक्सपोर्ट रहा है। वहीं फाइनेंशियल ईयर 2013-14 में भारत का डिफेंस एक्सपोर्ट 686 करोड़ रुपए था। मोदी सरकार ने पिछले एक दशक में डिफेंस एक्सपोर्ट को बढ़ावा देने पर जोर दिया है। इसे लेकर सरकार लगातार काम भी कर रही है।

प्रधानमंत्री नरेंद्र मोदी ने पिछले साल डिफेंस एक्सपोर्ट को 2025 तक 5 बिलियन डॉलर तक करने का लक्ष्य रखा था। इसके लिए सरकार ने डिफेंस पब्लिक सेक्टर अंडरटेकिंग (DPSUs), ऑर्डिनेंस फैक्ट्री बोर्ड्स (OFBs) और प्राइवेट सेक्टर के 100 से अधिक फर्मों ने दुनियाभर में अपने प्रोडक्ट का एक्सपोर्ट किया है।

इन कंपनियों ने भारतीय डिफेंस इंडस्ट्री के डिजाइनिंग और डेवलपमेंट क्षमताओं का प्रदर्शन किया है। इन्होंने स्टैंडर्ड एक्सपोर्ट प्रोसेस को आसान बना दिया है। इसके साथ ही end-to-end ऑनलाइन एक्सपोर्ट अथॉरिटी के साथ, टाइम को कम करने और बिजनेस करने में आसानी के साथ कई सुधारों को इंडस्ट्री के अनुकूल बनाया है।

क्या है भारत की पहल?

आत्मनिर्भर भारत पहल ने भारतीय-IDDM (स्वदेशी रूप से डिजाइन, विकसित और निर्मित) जैसे उपायों की शुरुआत की है, इस प्रकार देश के अंदर स्वदेशी डिजाइन, विकास और डिफेंस इक्विपमेंट के निर्माण को प्रोत्साहित किया जाता है। इन पहलों ने आयात पर भारत की निर्भरता को कम किया है और लंबे समय में भारत की विनिर्माण क्षमता को मजबूत करेगा। अप्रैल में, राजनाथ सिंह ने ट्वीट किया था, "वित्त वर्ष 2022-2023 में भारत का रक्षा निर्यात 15,920 करोड़ रुपये के सर्वकालिक उच्च स्तर पर पहुंच गया है।"

भारत सरकार का लक्ष्य 2025 तक रक्षा निर्यात में 35,000 करोड़ रुपये हासिल करना है और विदेशी डिफेंस एक्सपोर्ट पर बैन सहित कई कड़े कदम उठाए हैं। PIB की प्रेस रिलीज के अनुसार, विदेशी स्रोतों से रक्षा खरीद पर कुल व्यय 2018-19 में कुल व्यय के 46% से घटकर दिसंबर 2022 में 36.7% हो गया है।

भारत में बन रहे हैं हथियार

प्राइमरी डिफेंस एक्सपोर्ट के रूप में भारत की धारणा बदल रही है। भारत अब डोर्नियर-228 जैसे विमान, आर्टिलरी गन, ब्रह्मोस मिसाइल, पिनाका रॉकेट और लॉन्चर, रडार, सिमुलेटर और बख्तरबंद वाहनों सहित कई तरह के रक्षा प्लेटफॉर्म का निर्यात करता है।

<https://bharat.republicworld.com/india-news/general-news/demand-for-indian-weapons-increased-in-world-defense-export-reached-16-thousand-crores>

Military Exports Grew 23 Times in 9 yrs, Says Govt

Military exports have risen sharply and imports have declined on the back of policy initiatives and reforms during the past nine years, the Union government said on Tuesday.

Exports grew 23 times between 2013-14 and 2022-23 financial years while the spending on sourcing weapons and systems from foreign countries dropped from 46% of the total expenditure in 2018-19 to 36.7% in December 2022, it said in a statement. The defence report card came at a time when the central government is showcasing its achievements in different areas on its ninth anniversary.

“India’s defence exports have reached an all-time high, surging from ₹686 crore in FY 2013-14 to nearly ₹16,000 crore in FY 2022-23. This remarkable 23-fold increase reflects India’s progress in the global defence manufacturing sector,” the statement said.

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

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

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

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

The country’s focus is not only on cutting dependence on imports, but also on boosting exports.

India is exporting military hardware to around 85 countries, with around 100 firms involved in outbound shipments. It includes missiles, artillery guns, rockets, armoured vehicles, offshore patrol vessels, personal protective gear, a variety of radars, surveillance systems and ammunition.

India has set a defence export target of ₹35,000 crore by 2024-25.

“To give a push to defence exports, the government has taken a number of policy initiatives and brought reforms over the last nine years. Export procedures have been simplified and made industry-friendly, with end-to-end online export authorisation curtailing delays and bringing ease of doing business,” the statement said.

<https://www.hindustantimes.com/india-news/indias-defence-exports-surge-23-fold-imports-drop-as-government-reforms-spur-growth-in-manufacturing-sector-101685471575231.html>

अभी इन अफसरों के कामकाज को ग्रेड से नहीं आंका जाता

तीनों सेनाओं में श्री स्टार अफसर की भी हो सकती है ग्रेडिंग, इसी से तय होगी जिम्मेदारी

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■ नई दिल्ली: भारत की तीनों सेनाओं में अब श्री स्टार अफसरों की भी ग्रेडिंग हो सकती है। सूत्रों के मुताबिक, इससे जुड़ा प्रस्ताव इंटीग्रेटेड डिफेंस स्टाफ (IDS) ने तैयार किया है। इसमें कहा गया है कि आर्मी, नेवी और एयरफोर्स में अब श्री स्टार अफसरों की भी उनके काम के हिसाब से ग्रेडिंग हो और फिर इसी ग्रेडिंग के हिसाब से उनकी नई पोस्टिंग या काम की जिम्मेदारी तय होगी। इंटीग्रेटेड डिफेंस स्टाफ के पास ही तीनों सेनाओं में तालमेल बढ़ाने और प्राथमिकताएं तय करने की जिम्मेदारी है।

सूत्रों के मुताबिक, प्रस्ताव की फाइल सैन्य मामलों के विभाग (DMA) को भेजी गई है। इसे अंतिम रूप से देने से पहले रक्षा मंत्री के पास भी भेजा जाएगा। सभी जरूरी मंजूरी के बाद ही यह लागू हो पाएगा। अभी यह प्रपोजल है और मुमकिन है कि अलग-अलग चरणों में इसमें कुछ बदलाव भी हों। अभी तक सेना में मेजर जनरल से लेफ्टिनेंट



सेना में श्री स्टार रैंक के अफसर लेफ्टिनेंट जनरल होते हैं



नेवी में इस रैंक में वाइस एडमिरल आते हैं



एयरफोर्स में इस रैंक के अफसर एयर मार्शल होते हैं

जानें, कौन होते हैं श्री स्टार अफसर: सेना में कर्नल रैंक से प्रमोशन के बाद जब अधिकारी ब्रिगेडियर बनते हैं तो उन्हें वन स्टार अफसर कहा जाता है। ब्रिगेडियर से ऊपर होते हैं मेजर जनरल, जो टू स्टार होते हैं। इसके बाद लेफ्टिनेंट जनरल बनते हैं, जो श्री स्टार होते हैं।

जनरल और नेवी और एयरफोर्स में इसकी बराबरी के रैंक में पहुंचने तक ही अफसरों की ग्रेडिंग होती है। ग्रेडिंग में हर चीज के अलग-अलग मार्क्स होते हैं। जैसे अफसर का सर्विस रेकॉर्ड कैसा है, उन्होंने कहा-कहां काम किया है, उनका काम कैसा रहा और क्या उन्हें बहादुरी का कोई मेडल या अवॉर्ड मिला है। ग्रेडिंग में इन सब बातों का ध्यान रखा जाता है। प्रमोशन के वक्त इस ग्रेडिंग की सबसे ज्यादा अहमियत होती है। उसमें मिले मार्क्स के हिसाब से प्रमोशन तय होता है। लेकिन एक बार कोई लेफ्टिनेंट जनरल

या इसके बराबर के पद पर पहुंच जाए तो फिर उनकी ग्रेडिंग नहीं होती। सीनियर उनके बारे में कुछ लाइंस ही लिखते हैं।

सूत्रों के मुताबिक, ग्रेडिंग सिस्टम होने से आगे की जिम्मेदारी देने के लिए सही कैडिडेट चुनने में मदद मिलेगी। जैसे आर्मी में लेफ्टिनेंट जनरल रैंक के अफसर ही कोर कमांडर हो सकते हैं और आर्मी कमांडर भी लेफ्टिनेंट जनरल ही होते हैं। ग्रेडिंग सिस्टम होने से यह तय करने में मदद मिलेगी कि कौन-से कोर कमांडर आर्मी कमांडर बन सकते हैं। आर्मी में कोर कमांडर आर्मी कमांडर के तहत आते हैं।

THE ECONOMIC TIMES

Tue, 30 May 2023

Major Army Training Exercise Along Western Borders

The Indian Army carried out a major training exercise in Punjab this month by various units and formations of Ambala-based Kharga Corps, a statement said on Tuesday.

Validation of latest operational concepts like employment of attack helicopters in support of ground forces, operations deep across adversary's obstacle systems, the use of hi-tech drones as force multipliers, fighting in obstacle ridden terrain, sustained operations deep inside enemy territory by forces and heli-borne operations were conducted successfully, the Defence Wing said.

The exercise from May 11 to 27 also incorporated aspects of joint training with the Indian Air Force for operations in the enemy territory across Western borders, special forces drops behind enemy lines and simulated battlefield air strikes. The exercise was successful in validating many

important operational aspects and brought out valuable lessons as also reinforced a high degree of operational preparedness for the forces on Western Front.

The exercise was witnessed by the Army Commander, Western Command, and other senior dignitaries, who complimented all ranks on professional readiness.

<https://economictimes.indiatimes.com/news/defence/major-army-training-exercise-along-western-borders/articleshow/100622870.cms>



Tue, 30 May 2023

ALH Dhruv being Cleared for Urgent Ops; No Routine Sorties

The military has started clearing the advanced light helicopter Dhruv (ALH) for urgent flying missions in batches after comprehensive safety checks to keep itself operationally ready, but routine sorties are still no-go after the indigenous multi-mission chopper was grounded following three incidents in less than two months earlier this year, officials aware of the matter said on Tuesday. Most ALHs operated by the armed forces were grounded for checks after the recent incidents -- including the crash-landing of an army helicopter in Jammu & Kashmir's Kishtwar on May 4 in which a soldier was killed, and two pilots were injured -- raised serious safety concerns. The pilots reported a technical fault to the air traffic control before the incident.

The directorate general of military operations on May 22 wrote to different command headquarters about the restoration of flying of the ALH Dhruv, Rudra (the armed version of ALH) and the light combat helicopter (LCH). The Indian Air Force's latest LCHs were also grounded earlier as they inherit several features of the ALH.

"ALH and LCH hepters are op endorsed to be cleared for op emer flg (operational emergency flying)," the letter stated. "Op endorsed" here refers to helicopters that have been cleared in servicing and certified fit to fly, one of the officials cited above explained, asking not to be named. To be sure, it is not uncommon for an aircraft fleet to be grounded for inspection after an unexplained crash or incident.

The DGMO letter accessed by Hindustan Times lays down two pre-conditions for restoring emergency flying. It says such resumption of flights will follow the prescribed "satisfactory conduct of independent maintenance flight safety audit" of critical items and systems, and compliance with safety-related "special technical instructions and alert notices" issued by the technical authorities. The two directives were issued after the May 4 crash, said a second official, who also asked not to be named.

The DGMO instructions only talk about the resumption of critical operational missions. "This operational flying includes air maintenance (cargo transport to forward areas), casualty evacuation and other missions to support forward deployments. Training sorties are, currently, not on," one official said, asking not to be named.

HT reported on May 10 that a design review of a "safety-critical system" on the ALH may be in order, according to a top government regulatory body responsible for the certification of the airworthiness of military aircraft. The Bengaluru-based Centre for Military Airworthiness and Certification (CEMILAC) wrote to the three services and the coast guard about this on April 23. It has ordered the design review of the booster control rods to improve the ALH's airworthiness.

The call for the design review follows the ALH's troubling safety record. In the past five years, it has been involved in 12 accidents.

The design review is critical as the Indian armed forces operate more than 330 twin-engine ALHs, designed and developed by state-run aircraft maker Hindustan Aeronautics Limited. HAL began delivering these helicopters in the early 2000s.

CEMILAC, which functions under the Defence Research and Development Organisation (DRDO), reached the conclusion that the design review of the booster control rods is mandatory after an expert committee, formed in the backdrop of a navy ALH ditching (emergency landing in water) into the Arabian Sea on March 8, explored the possible failures that led to the incident. These rods allow pilots to control the helicopter's motion, and any failure can severely affect power input to the rotor blades and cause accidents.

The committee, constituted by the CEMILAC chief executive (airworthiness), found that the most probable cause of the navy ALH incident on March 8 was a technical failure -- an error in the assembly of serrated washers in the booster control rods. It recommended short and long-term measures to enhance the safety of the ALH.

The design, development and qualification of the steel booster control rods that are tolerant to assembly errors shall be expedited, and the compliance of the new design shall be aimed for implementation in six months to one year, CEMILAC wrote in the letter dated April 23 to Hindustan Aeronautics Limited (HAL), the three services, and the coast guard.

"Though the helicopters are matured from the design point of view, having been exploited for more than 3 lakh hours, still there is scope to review the design/lifting aspects of the safety-critical system by an expert committee as a long-term measure," said the letter, written by CEMILAC director (helicopters and missiles) DM Isack.

CEMILAC prescribed measures for the resumption of ALH and LCH operations.

Clearance for both platforms, limited to 100 flight hours each, will be given after mandatory inspections, it said. Further clearance for up to 500 flight hours or one year, whichever is earlier, will be based on the successful completion of two critical tests by HAL, it added. These tests involve the flight testing of two helicopters with instrumented control rod assembly for verifying the multi-axis loads on the control rods, and the fatigue testing of the rods with correctly assembled serrated washers to confirm their original capability.

"It is critical to fix the flaws on the ALH as there are flight safety implications. It plays an important operational role and India operates a large number of ALHs. Also, there are many potential foreign customers who are watching the helicopter closely," Air Marshal Anil Chopra (retd), director general, Centre for Air Power Studies, said while commenting on the CEMILAC findings.

<https://www.hindustantimes.com/india-news/indian-military-clears-alh-dhruv-for-emergency-flying-missions-after-safety-checks-but-routine-sorties-still-not-allowed-101685471335855.html>



Wed, 31 May 2023

MiG-21s Begin Flying Again After Rajasthan Crash

The Indian Air Force's MiG-21 fighter jets have begun flying again after they were grounded for safety checks three weeks ago following a crash in Rajasthan on May 8 that proved fatal for three civilians on the ground, officials familiar with the matter said on Tuesday.

The air force operates more than 50 MiG-21 Bison aircraft, the latest and last variant of the MiG-21. The crash in Hanumangarh in which three women were killed put the spotlight on the troubling safety record of India's longest-serving fighter plane once again and forced the air force to ground the entire fleet. It is not uncommon for an aircraft fleet to be grounded for inspection after an unexplained crash or incident. The air force operates three squadrons of the MiG-21 Bison. The squadrons have resumed flying, with the fighter jets being cleared for operations in batches, said one of the officials, who asked not to be named.

The IAF is set to retire these squadrons by 2025. The MiG-21 Bis (an upgraded MiG-21 variant flown for the first time in 1976) was further upgraded to MiG-21 Bison in India in 2000.

"I am happy that the government has decided to phase out the MiG-21s by 2025 and I hope this deadline doesn't change," Air Marshal Anil Chopra (retd), director general, Centre for Air Power Studies, said after the May 8 crash.

The MiG-21 Bisons were grounded at a time when most of the military's advanced light helicopters (ALHs) were also grounded for checks after a string of incidents including the crash landing in Jammu and Kashmir's Kishtwar on May 4 in which a soldier was killed, and two pilots injured.

The military has begun clearing the ALH Dhruv for urgent flying missions in batches after safety checks to keep itself operationally ready, but routine sorties are still no-go after the indigenous multi-mission chopper was grounded following three incidents in less than two months earlier this year. The IAF got its first single-engine MiG-21 in 1963 and progressively inducted 874 jets (different variants of the Soviet-origin supersonic fighter) to bolster its combat potential. More than 400 MiG-21s have been involved in accidents that have claimed the lives of 200 pilots in the past six decades.

Of the 874 MiG-21s inducted, more than 60% were licence-produced in India. More MiG-21s have crashed than any other fighter because they formed the bulk of the fighter aircraft in the IAF for a long time. The IAF has had to keep its MiG-21 fleet flying longer than it would have liked because of the delay in the induction of new fighter jets. The IAF retired MiG-21 Bisons at the Srinagar-based 51 squadron, also known as Sword Arms, last September. Wing Commander (now Group Captain) Abhinandan Varthaman, who was awarded Vir Chakra for shooting down a Pakistani F-16 during a dogfight over the Line of Control on February 27, 2019, was with the 51 squadron then.

The dogfight took place a day after the IAF bombed a terror facility in Pakistan's Balakot.

IAF's Mirage-2000s struck targets in Balakot on February 26, 2019, in response to the Pakistan-backed Pulwama suicide attack in Kashmir in which 40 Central Reserve Police Force personnel were killed 12 days earlier.

<https://www.hindustantimes.com/india-news/indian-air-force-s-mig-21-fighter-jets-resume-flying-after-safety-checks-following-fatal-crash-in-rajasthan-101685471455602.html>



Tue, 30 May 2023

Defence Minister Interacts with Indian Diaspora in Nigeria, Stresses on 'Atmanirbharta' in Defence

Defence Minister Rajnath Singh interacted with the Indian diaspora in Nigeria, at an event organised by the Indian High Commission in Abuja on 29th May 2023. The event witnessed presence of Indian community not just from Abuja, but also from other cities of Nigeria like Lagos.

The minister spoke about India's rising stature at world stage owing to its fast-expanding economy and progressive government actions. There was an outpouring of jubilation within the community members as the defence minister highlighted the growing stature of the Indian diaspora abroad. He commended the valuable contributions made by the Indian community in Nigeria and expressed confidence that they will continue to keep the Indian flag flying high.

The minister also spoke on length about the New India's focus on 'Aatmanirbharta' and the significant progress that has been made in the field of defence and defence exports in recent years towards achieving the goal of 'Make in India, Make for the World'. He also commended the capabilities and efforts of the Armed Forces in effectively countering any threat or challenge from adversaries. The Raksha Mantri also held discussions with esteemed Nigerian officials, including the Chief Justice and the Acting Minister of Defence, during a dinner organized by the Indian High Commissioner. Rajnath Singh's visit to Abuja also coincided with the inauguration of Mr Bola Tinubu as the President of Nigeria.

Notably, Nigeria accommodates a vibrant Indian community of over 50,000 individuals. Furthermore, Indian-owned and operated enterprises stand as prominent employers within Nigeria, making significant contributions to its workforce.

India and Nigeria share a robust and multifaceted relationship that spans across various domains. Diplomatic ties between the two countries have steadily strengthened over the years, paving way for mutual cooperation and collaboration. India has also emerged as one of Nigeria's top trading partners, particularly in sectors like oil and gas, agriculture, pharmaceuticals, and information technology. Cultural exchanges and people-to-people contacts further deepen the relations between the two nations, as Nigeria is home to a good chunk of Indian diaspora. Moreover, India has been actively involved in developmental projects in Nigeria, providing assistance in areas such as infrastructure, healthcare, education, and capacity building. As strategic partners, India and Nigeria continue to work together towards fostering greater regional stability and prosperity in Africa too.

<https://newsonair.com/2023/05/30/defence-minister-interacts-with-indian-diaspora-in-nigeria-stresses-on-atmanirbharta-in-defence/>



Tue, 30 May 2023

National Defence Academy Cadets Embrace Spirit of Jointness, will be Catalyst for Reforms: CDS

Chief of Defence Staff (CDS) General Anil Chauhan, while addressing the cadets of the 144th course at the National Defence Academy (NDA), emphasised the importance of jointness and its role in expediting reforms for tri-services integration and the establishment of theaterised commands. General Chauhan reviewed the passing out parade of the 144th course held at the Khetrapal Ground in Pune's Khadakwasla. The course, which commenced in June 2020, witnessed the ceremonial parade of 356 cadets after completing three years of rigorous military training.

The parade included 1175 cadets, with 356 passing out cadets who will now undergo one more year of pre-commissioning training at their respective Armed Forces academies—the Indian Naval Academy in Ezhimala, the Indian Military Academy in Dehradun, and the Air Force Academy in Dundigal. The passing out cadets comprised 214 Army cadets, 36 Naval cadets, and 106 Air Force cadets, including 19 cadets from friendly foreign countries—Bhutan, Tajikistan, Maldives, Afghanistan, Sri Lanka, Myanmar, and Bangladesh. They will join their respective Pre-Commissioning Training Academies.

Speaking to the passing out cadets, General Chauhan stated, “Armed forces of India are on the path of a major transformation. Jointness, integration, and creation of theaterised commands are on the anvil. The spirit of jointness, imbibed by you at the NDA, I am sure will act as a catalyst to speed up these reforms. I want you to further the spirit of jointness as you grow in your respective services.”

During a media interaction, General Chauhan addressed the topic of theaterisation and highlighted the significance of jointness and integration as stepping stones toward establishing theater commands. “While the end state of this process of creation of theatre commands, it begins with jointness. The jointness is in the cognitive domain and is a spirit that created a bonhomie among the forces to work together. Integration is a physical process where we integrate things like communication, operational planning or say HR issues. Now for the first time we will have officers from one service getting posted to the other, this is all part of the integration. So jointness will lead to integration and integration is a stepping stone towards theatre commands. Where we have reached, is not for me to say. It is for the government of India to tell you whenever we are ready. But we are right on the track for it,” he said.

The Department of Military Affairs, led by the CDS, focuses on promoting jointness in procurement, training, and staffing for the services, facilitating military command restructuring, and encouraging the use of indigenous equipment. The passing out parade also recognized the achievements of the cadets, with Battalion Cadet Captain Afrid Afroz, Academy Cadet Captain Anshu Kumar, and Battalion Cadet Adjutant Praveen Singh receiving top honors. Romeo Squadron bagged the prestigious ‘Chiefs of Staff Banner’.

Increase in number of women Naval cadets proposed

General Chauhan acknowledged the participation of women cadets in various roles during the parade and commended their dedication to defending national interests. “I also noticed a few women cadets as part of the parade. I congratulate them for breaking into this male bastion. I am glad you have chosen to shoulder equal responsibilities as your male brothers to defend national interests,” he said.

In June last year, the NDA admitted its first batch of girl cadets with a strength of 19 — 10 for Army, six for Air Force, and three for the Navy. This batch, part of the 148th course, is slated to pass out from the academy in May 2025. The second batch also has the same strength. When asked about increasing the number of women cadets, the CDS said, “The Navy wants to increase the capacity from three to 12. So you will see a larger participation of women cadets. It depends on the requirements of the forces.”

<https://indianexpress.com/article/cities/pune/national-defence-academy-cadets-embrace-spirit-of-jointness-will-be-catalyst-for-reforms-cds-8637399/>

ThePrint

Wed, 31 May 2023

India & US Close to Mega Defence Deal: Pact for Fighter Jet Engines 1st, Ship Engines Likely Next

After a wait of over a decade, India and the US are on the verge of signing a mega defence deal to facilitate state-run Hindustan Aeronautics Limited’s (HAL) partnership with American firm General Electric (GE) for jointly manufacturing indigenous jet engines of fighter aircraft.

While the partnership initially will be for aviation engines, it will eventually extend to those powering Indian military ships, ThePrint has learnt.

Sources described the proposed deal, which is likely to be announced during Prime Minister Narendra Modi's state visit to the US next month, as one of the most definitive defence collaborations to take place between the two countries.

Chalking out the broad contours of the deal will be one of the key focus areas for US Secretary of Defense Llyod James Austin during his visit to New Delhi next week.

Sources said a memorandum of understanding (MoU) needs to be finalised between GE and HAL and both sides are "pretty close" to doing it. The second step is that US government needs to notify the Congress, which is a 30 day period. Sources said that they don't expect any issues at the Congress. As reported by ThePrint, Transfer of Technology (ToT) for jet engines was the main thrust of National Security Advisor (NSA) Ajit Doval's talks with his American counterpart Jack Sullivan in February when they also operationalised the US-India Initiative on Critical and Emerging Technologies (iCET).

US President Joe Biden and PM Modi had announced the iCET in May 2022 to elevate and expand bilateral strategic technology partnership and defence industrial cooperation between the governments, businesses, and academic institutions of the two countries.

The US is keen on inking the deal as it takes the bilateral relations to a new high, and will help it beat the European competition from the French engine maker Safran and the British firm Rolls-Royce to the finish line.

Giving details of the proposed defence deal, sources in the defence establishment said the plan is to manufacture the GE F414 engine, which was shortlisted by India in 2010 to power the Mark II version of the indigenous Light Combat Aircraft Tejas, which currently comes with GE F404 engine. Once its production starts in India, the GE F414 will power all future fighter jets including the Tejas Mk II, Advanced Medium Combat Aircraft (AMCA) as well as the indigenous Twin Engine Deck Based Fighter (TEDBF) for the Indian Navy.

The F414 is an afterburning turbofan engine in the 22,000 pound (98 KN) thrust class of engines. The Boeing Super Hornets and the Gripen fighter jets are among those aircraft that run on this engine. While those fitted on board the AMCA is likely to be a newer version of a higher thrust class, the 100 per cent Transfer of Technology (ToT) to India has the potential to pave the way for future joint design, development, and manufacture of more powerful engines.

As per the schedule plan, the process will involve first making components for the engines in phases before actually moving to the full step up which will take at least a decade, the sources said.

The work on the F414 will be undertaken by the Engines Division of the Bengaluru-based HAL.

When the engine was shortlisted in 2010, John Flannery, the then President & CEO, GE India had said GE Aviation will supply the initial batch of F414-GE-INS6 engines and the rest will be manufactured in India under transfer of technology arrangement.

However, the plans for the ToT ran into rough weather because of a tough US government stance on export of critical technology and later was relaxed only in 2019.

Pursuit of jet engine technology

India has been pursuing the jet engine technology for decades, and the quest was shaped by the problems faced by the country's first indigenous fighter HF-24 Marut. Originally meant to be powered by the Bristol Orpheus 12 engine, the Marut was fitted with the less-powerful Bristol Orpheus 703 after the North Atlantic Treaty Organisation (NATO) project to develop the engine collapsed.

The Gas Turbine Research Establishment (GTRE) in Bengaluru eventually produced a more powerful version of Orpheus 703 with afterburners, significantly enhancing the engine's power. The engine, though, proved unsuitable for the Marut's airframe — the aircraft became obsolete before its time even though many regarded it as a good aircraft.

In 1983, the government sanctioned work on the LCA project following which feasibility studies in India and abroad revealed that while there was no entirely suitable engine available worldwide, the Rolls-Royce RB-1989 and GE F404-F2J, by and large, met the requirement.

The GTRE, since 1982, had been working on the indigenous GTX-37 engine, and pushed for its adoption on the LCA. In December 1986, it proposed the development of the indigenous Kaveri engine. The government then sanctioned a Rs 382.86 crore project in March 1989.

While the GTRE developed nine prototypes of Kaveri engines, as well as four core engines that undertook 3,217 hours of engine testing, including in Russia, they failed to meet the required parameters to power a fighter.

Instead of a so-called 'wet thrust' of 81 kN — the thrust the engine can deliver when a fighter needs maximum power — the Kaveri generated only 70.4 kN.

"GTRE has been unable to deliver an engine that could power the LCA despite a cost overrun of 642 per cent and a delay of about 13 years," the Comptroller and Auditor General (CAG) noted in a sharply-worded report released in 2011.

<https://theprint.in/defence/india-us-close-to-mega-defence-deal-pact-for-fighter-jet-engines-1st-ship-engines-likely-next/1602974/>

THE ECONOMIC TIMES

Tue, 30 May 2023

Modi is Eyeing a Jet Engine to Propel India-US Ties to New Sphere

Though Prime Minister Narendra Modi has visited the US more than half a dozen times since he became the PM, he will be on his first state visit on June 22. A state visit to the US is different from official or working visits, since a country can have just one state visit during a US president's four-year term. A state visit involves a lot of pomp and show, including a 21-gun salute at the White House.

Modi's visit is being seen as a landmark in India-America ties because the last state visit to the US by an Indian PM was in November 2009 when President Obama hosted Dr Manmohan Singh. President Biden has had just one state visit so far, when he hosted French President Emanuel Macron in December 2022.

The centrepiece of Modi's visit is a jet engine, which can propel India-America relations to a new sphere altogether. India has been striving to become Atmanirbhar in defence production, especially after the Russia-Ukraine war which exposed its utter dependence on Russia for weapons. Achieving self-reliance in defence and reducing import dependency for military hardware is important for India to maintain its strategic autonomy.

In the last few years, India has been trying to indigenise its military supplies at a maddening pace. The government released a few days ago a fresh list of 928 components and subsystems that will only be procured from domestic firms once import bans on them kick in, over a period of five-and-

a-half years. India's ambition to become a defence production hub can get a big boost if Modi is able to bag a jet engine deal in the US.

What's the jet engine deal?

Sharing of advanced defense technology has emerged as a new factor in India-America ties. The US has so far been cautious of sharing defence technology even with its partner countries. The Ukraine-Russia war and China-US tensions have made India an important bet for America. India wants critical defence and computing technology from the US for deeper ties. A major interest for India is domestic production of jet engines of America's General Electric Aviation.

GE Aviation is open to the transfer of technology to India for the indigenous manufacture of engines for India's Tejas-MK2 Light Combat Aircraft as it does not want to lose a big market to Europe. The Biden administration has approved GE Aviation's application to co-produce GE-F414 jet engines in India complete with technology transfer. The next step is Congressional review and approval under the Arms Export Control Act, which governs the transfer of all high-end defence technology. The US designated India a major defence partner in 2016 but it still did not equate India with other partners like Australia and Japan in the Arms Export Control Act. This means every single deal for transfer of military technology for co-production must undergo rigorous multi-stage scrutiny.

Some members of Congress are wary of the industry push to sell sensitive technology even to allies, forget partners, according to Seema Sirohi, a commentator on foreign policy. In India's case, expect questions about New Delhi's stand on the Ukraine war and friendship with Russia, which administration officials will (hopefully) answer to satisfaction, Sirohi has written in ET.

America's National Security Advisor Jake Sullivan has acknowledged that the partnership with India isn't without its risks, given the weapons trade between India and Russia, but he stressed that the initiative wasn't sparked by the war in Ukraine or efforts to drive a wedge between New Delhi and Moscow, Bloomberg has reported.

GE Aviation already has a significant presence in India's aerospace sector due to availability of quality talent in software, simulation and electronics. It started a back office operation here more than decade ago to develop new products. Its India team had worked on the GENx engine, the fastest-selling, high-thrust jet engine in GE Aviation history. Most of GE Aviation products have a contribution of 20-40% from the India team.

Why the deal is so important for India

If India is able to bag the GE jet engine deal, it will enter a super-exclusive club of countries that produce jet engines indigenously — the US, Britain, France and Russia. Significantly, China does not manufacture jet engines of its own, which will give India a critical tech edge over its rival.

Clearance for co-production of GE engines in India would be a step toward lessening the country's historic reliance on Russia for military hardware — a boost for American diplomacy in the effort to isolate Moscow over its invasion of Ukraine, according to Bloomberg. India now flies a mix of Russian, European and locally produced jets in its fighter fleet, a reflection of its position outside the superpowers' orbits. The deal will follow Sullivan and India's NSA Ajit Doval launching US-India initiative on Critical and Emerging Technologies (iCET) a few months ago. The iCET will involve a range of technology transfers, exchanges, and cooperation, including bilateral space cooperation. Both are supposed to propel India-US ties to a new sphere from lingering mutual distrust between the two countries.

Modi's June 22 visit to the US could be path-breaking for India. The GE Aviation jet engine deal can herald a new age in India-US defence industrial partnership which can extend to co-production of other major American weapon systems in India. This will bolster Modi's Make in

India and Atmanirbhar Bharat projects in a major way as well as empowering India's defence vis à vis China.

<https://economictimes.indiatimes.com/news/defence/modi-is-eyeing-a-jet-engine-to-propel-india-us-ties-to-new-sphere/articleshow/100619649.cms>



Tue, 30 May 2023

How IAF is Driving Military Startups?

By Manish Kumar Jha

The IAF has, over the years, transformed into a modern aerospace power that is capable of controlling and exploiting air and space environments in order to achieve India's national and security objectives.

The nature of warfare, however, evolves due to considerable technological advances and environmental changes.

The air force is the technological powerhouse, driving key technologies which also impact industrial growth. The IAF remains committed to such fundamentals with applications based on artificial intelligence (AI), machine learning (ML), Quantum Key Distribution (QKD) in Space Tech, Space ISR (Hyperspectral Scanning, anomaly detection) and Anti-Satellite Capability among other advanced military technologies.

Another key aspect is the civil-military fusion of technologies especially in the space domain.

Under its modernization plan, the IAF has marked projects which are under the various provision of the 'Make' category of capital acquisition in the Defence Procurement Procedure for fostering indigenous capabilities through the design & development of required defence equipment, systems and sub-systems.

As the Deputy Chief of the Indian Air Force, Air Marshal Ashutosh Dixit, during an interaction with the author, outlines projects of such importance which open immense opportunities for Indian domestic players and defence startups.

Indigenous technology for IAF

Air Marshal Ashutosh Dixit has been leading key projects under the IAF's strategic planning; the majority of such plan is based on the effort towards indigenization.

"All efforts by the industry towards capability development and enhancement are welcome. These would be encouraged and supported," remarks Air Marshal Dixit.

He also emphasized that the success of such efforts is to culminate in the induction of these indigenously developed capabilities in the armed forces.

Projects under the 'Make-I' sub-category involve government funding of 90%, released in a phased manner and based on the progress of the scheme, as per terms agreed between MoD and the vendor. While the projects under the 'Make-II' category will involve prototype development of equipment, system and platform or their upgrades, primarily for either import substitution or innovative solutions, for which no government funding will be provided for prototype development purposes. For example, 'under the Make-II' IAF has called for the development of a computer defence system for Cyber Situational Awareness to Secure its own satellites from cyber-attacks.

The IAF also invites private defence entities and startups for the development of a Network Management Port (NMP) for efficient SATCOM Bandwidth Management using multiple satellites.

The space domain remains the key priority area for the IAF where the military finds critical solutions, leveraging civil space programs.

One of the key initiatives, the IAF has accorded approval for the Ultra High-Resolution Optical payloads with Edge Computing for VLEO Bus for the industry.

However, it is pertinent to note that military-grade projects require a high degree of innovation and technological advancement for a successful prototype which can withstand the rigour and standards of military needs. The startups need to take account of such standards and work around the solutions, as Air Marshal Dixit further explained: “Once the broad capability development has been identified, along with the technological development efforts, thought should also be put to select the appropriate avenue or the method to be followed towards its acquisition for subsequent induction.”

“This will allow commitment from both sides and allocation of necessary resources,” he clarified.

Such is the case of Wearable Robotic Equipment for Aircraft Maintenance which is launched by the IAF for the Indian entities. The domestic vendor must validate the technological capability and ability to develop the system.

Similarly, drones, UCAVs and Counter Unmanned Aerial Systems have made the battlespaces a dense environment. The startups must evaluate the various avenues which are widely publicized under various schemes like the ‘Make’ category and Innovations for Defence Excellence (iDEX) challenge. For example, the defence space project — Micropropulsion system for cubesats—was initiated under the iDEX which made quite a breakthrough by Indian space startup, Inspecity. Inspecity is developing a gas-based system for this purpose. This technology, once developed, can be integrated with other satellites, including the cubesat swarm for imagery/Intelligence Surveillance, Reconnaissance and communication purposes.

<https://www.financialexpress.com/business/defence-how-iaf-is-driving-military-startups-3107845/>



Wed, 31 May 2023

North Korea Fires Possible Ballistic Missile: Japanese Defence Ministry

A day after it unveiled its plan for satellite launch, North Korea fired a "possible ballistic missile" on Wednesday, reported Kyodo News quoting the Japanese Defence Ministry.

According to the official Korean Central News Agency (KCNA), North Korean leader Kim Jong Un directed his country's space agency to finalise preparations for the launch of Pyongyang's first military reconnaissance satellite.

Pyongyang has alerted the Japan Coast Guard of three maritime hazard zones where objects may fall beginning Wednesday, two to the west of the Korean Peninsula and one to the east of the Philippines. All of these areas are not within Japan's exclusive economic zone, according to Kyodo News.

Kyodo News is a Japan-based news agency with an emphasis on Japanese and Asian viewpoints.

Vice Chairman of the Central Military Commission of the Workers' Party of Korea, Ri Pyong Chol, on Monday, said, "The North's military reconnaissance satellite is indispensable to tracking, monitoring, discriminating, controlling and coping with in advance in real time the dangerous military acts of the US and its vassal forces."

Ri noted "the reckless military acts" by the US and South Korea, telling KCNA, "We steadily feel the need to expand reconnaissance and information means and improve various defensive and offensive weapons", according to Kyodo News.

Japanese PM Fumio Kishida, while emphasising that Japan considers the launching of a rocket carrying a satellite equivalent to a ballistic missile test on the basis of historical precedent, warned that following through on the plan would be in violation of the UN Security Council resolutions.

Sanctions have been imposed on North Korea for its weapons-related actions in accordance with United Nations resolutions.

Pyeongyang, which launched missiles a record 37 times last year, has continued to launch ballistic missiles this year, raising suspicions that North Korea is planning its eighth nuclear test in the near future, Kyodo News reported.

<https://www.aninews.in/news/world/asia/north-korea-fires-possible-ballistic-missile-japanese-defence-ministry20230531040031/>



Tue, 30 May 2023

New DoD Cyber Strategy Tags Russia, China as Top Threats

Potential cyber attacks by China and Russia against the United States and its allies continue to be one of the pre-eminent threat facing the US Department of Defense (DoD), according to the Pentagon's latest cyber strategy.

The classified version of the 2023 DoD Cyber Strategy was sent to US congressional lawmakers on 26 May, according to an unclassified fact sheet on the key aspects of the strategy issued by the Pentagon on the same day.

The new strategy supersedes the earlier version issued by the DoD in 2018, and many of the tenets within the new cyber strategy fall in line with the 2023 National Cybersecurity Strategy issued by the White House in March 2023. The Pentagon is expected to release an unclassified version of the strategy in the coming weeks, DoD officials wrote in the fact sheet.

"Since 2018, the [US] Department [of Defense] has conducted a number of significant cyberspace operations through its policy of defending forward, actively disrupting malicious cyber activity before it can affect the US homeland," according to the fact sheet. The biggest influence in the new cyber strategy has been lessons learned from Russia's invasion and occupation of Ukraine, beginning in February 2022. DoD analysis of Russian-led cyber-warfare operations during the Ukraine war "has demonstrated how cyber capabilities may be used in large-scale conventional conflict [and] these experiences have shaped the department's approach to the cyber domain", DoD officials wrote. "Russia poses an acute threat in cyberspace, evidenced by its malign influence efforts against the United States and repeated cyber attacks against Ukrainian civilian critical infrastructure," they added.

<https://www.janes.com/defence-news/news-detail/new-dod-cyber-strategy-tags-russia-china-as-top-threats>

How NavIC Aims to Become a Global Navigation Tool

The Indian Space Research Organisation (Isro) on Monday launched NVS-01, the first second-generation navigation satellite series, NavIC or NAVigation with the Indian Constellation — ostensibly India's answer to Global Positioning System (GPS).

While NavIC is an independent stand-alone navigation satellite system, currently operating on a regional scale, the Indian government has clarified its stand on developing it as a global satellite navigation system, on par with the US's GPS, Russia's GLONASS, Europe's Galileo and China's BeiDou, in coming years. In its present status, NavIC is competing with QZSS from Japan, which also targets only the Japanese and neighbouring regions.

South Korea, which currently uses GPS, is also working to construct a satellite-based augmentation system (SBAS), which could help in accelerating the development of self-driving technology such as autonomous vehicles and drones in that country. Because of its strict security policies of mapping data and its strained political relations with its neighbouring country, North Korea, South Korea has not allowed Google to store its locational data on a foreign server, thus restricting the use of Google Maps in the country. Even though South Korea has local mapping services including Naver, Kakao, and T Map for regional navigation, these are often not very tourist friendly since they are primarily in Korean language. But South Korea aims to establish its own navigation service by 2035, further reducing positioning errors to the centimetre level.

What is NavIC?

To meet positioning, navigation and timing requirements of India, Isro established a regional navigation satellite system called NavIC, earlier known as the Indian Regional Navigation Satellite System (IRNSS).

NavIC is designed with a constellation of eight satellites and a network of ground stations operating 24X7. Three of these satellites are located in the geostationary orbit at approximately 22,000 miles above the earth's surface and five in the geosynchronous orbit. In the case of a global navigation satellite system, the satellites have to be constantly moving across the globe.

NavIC has a ground network consisting of a control centre, precise timing facility, range and integrity monitoring stations, and two-way ranging stations. It is signalled using dual frequency in the L5 (at 1,176.45 MHz) and S (at 2,492.028 MHz) bands of the microwave spectrum. GPS, however, uses a single frequency band. NavIC, therefore, provides better positioning accuracy of nearly 10 metres throughout the Indian landmass, as compared to the GPS's accuracy of 20 metres.

NavIC, which was originally cleared in 2006 with a budget of \$174 million, was made operational in 2018 after a delay of nearly seven years.

Since 2018, NavIC has been in operation.

Why NavIC over global competitors?

A senior Isro official explained that GPS and GLONASS, which are both global navigation systems being used in the world, are operated by the defence agencies of the US and Russia, respectively.

Thus, there is a possibility that the civilian service can be degraded or denied at any given time. For instance, during the 1999 Kargil War, the Indian government requested the US to provide enemy locations, but this request was denied. If India had its own navigation system back then, there would have been no need to depend on another country for such information.

“NavIC is an independent regional system over the Indian region and does not depend on other systems for providing a position service within the service region. It is fully under the control of the Government of India,” the official said.

The official said that a new civilian signal has also been introduced in the L1 band (1,575.42 MHz), which will make it compatible for civilian navigation services. The NavIC L1 signal is also interoperable with the other GNSS (global navigation satellite system) signals. All forthcoming — from 2023 — NavIC satellites will broadcast SPS signals in the L1, L5 and S bands. This will help improve its application in the fields of transportation (land, water and air), location-based services, personal mobility, resource monitoring, surveying and geodesy, scientific research and safety-of-life alert dissemination. To expand reach, the government has directed all mobile phone manufacturers to make their new devices compatible with NavIC from January 2023.

Though this is not a strict deadline, mobile manufacturers such as Apple, Samsung, Xiaomi, etc. will have to redesign hardware and software of their phones to comply with and accommodate Indian and other global positioning systems. The official, however, added that realistically, they expect manufacturers to make devices compatible by 2025.

Qualcomm has already launched three chipsets (Snapdragon 720G, 662, and 460) that support NavIC. “In the years to come, we are hoping that most areas where navigation services are used, including food delivery apps, courier services, gaming services and insurance services, will all use our indigenous navigation service, instead of relying on services from other countries,” the Isro official said. Rohan Verma, CEO and executive director of MapmyIndia, an Indian technology company that builds digital map data, telematics services, location-based SaaS and GIS AI technologies, said that Isro’s move to develop India’s very own navigation system is a big step towards its “Aatmanirbhar Bharat” goals (the government’s self-reliant India campaign).

“India’s indigenous and Aatmanirbhar location positioning (PNT) signal satellite system will get stronger by Monday’s NVS-01 launch. We are proud at MapmyIndia to support NavIC-based IoT devices and also build NavIC-based applications,” Verma said.

Future plans for NavIC

Isro chairman S Somanath said the agency’s ultimate aim with NavIC is to make it a global navigation system. However, to achieve that goal, the space agency will have to place more satellites in an orbit closer than the current constellation.

“Currently, NavIC’s reach is only 1,500km beyond Indian territory. But for our ships and airplanes travelling beyond that we will need satellites in medium earth orbit (MEO). So, to make this a global system, we can keep adding MEO satellites. This is the goal,” he said.

Currently, NavIC satellites orbit the earth in a geostationary or geosynchronous (GEO) orbit, or about 36,000km from the earth. MEO orbits occupy a space between GEO and low-earth orbit (LEO), or about 250-2,000km from the earth.

Monday’s launch, which placed the new NVS-01 satellite into orbit, and all its later versions will also ensure that even the less sophisticated, consumer-grade gadgets such as smartwatches can pick up the L1 signal, to increase civilian use.

<https://www.hindustantimes.com/india-news/india-launches-navic-second-generation-navigation-satellite-series-to-compete-with-global-positioning-systems-101685471578277.html>

पहली बार स्पेस में चीन का आम इंसान

■ पेइचिंग यूनिवर्सिटी के
प्रोफेसर गुई ने रचा इतिहास

■ इससे पहले चीन की सेना
से जुड़े लोग जाते थे स्पेस

■ पीटीआई, पेइचिंग

चीन ने पहली बार एक आम इंसान को अंतरिक्ष में भेजकर इतिहास रचा। मंगलवार को शेनझोउ-16 मिशन के जरिए चीन ने अंतरिक्ष में यह बड़ा कदम रखा। इस अंतरिक्षयान में तीन लोगों को भेजा गया। इसमें पेइचिंग यूनिवर्सिटी के एयरोनॉटिक्स और एस्ट्रोनॉटिक्स के प्रोफेसर गुई हाइचाओ वह पहले सिविलियन हैं, जिन्हें चीन की स्पेस एजेंसी CMSA ने इस दिन के लिए चुना। चीन की सेना में शामिल जिंग हाइपेंग मिशन कमांडर के रूप में गए हैं। उन्होंने रेकॉर्ड चौथी बार अंतरिक्ष में जाने वाले चीन के पहले अंतरिक्ष यात्री हैं। साथ में पेलोड इंजिनियर झू यांगझू भी हैं। चीन ने स्पेस स्टेशन में अपने क्रू को बदलने के लिए यह अंतरिक्ष यान भेजा। कुछ घंटों के अंदर यह मिशन क्रू को लेकर 400 किलोमीटर ऊपर अंतरिक्ष स्टेशन के कोर मॉड्यूल Tianhe में पहुंच गया। इसके बाद शेनझोऊ-16 पर सवार तीनों अंतरिक्ष यात्रियों ने तियान्हे मॉड्यूल में पहले के तीन अंतरिक्ष यात्रियों से मुलाकात की। ये तीनों अंतरिक्ष यात्री जल्द वापसी के लिए तैयार हैं।



गुई हाइचाओ
एयरोनॉटिक्स
और
एस्ट्रोनॉटिक्स
के प्रोफेसर हैं



स्पेश मिशन को नाम दिया गया शेनझोउ-16



9:31 am पर 'लॉन्ग मार्च-2F कैरियर रॉकेट' से शेनझोउ-16 मिशन रवाना हुआ।



10 मिनट बाद रॉकेट से शेनझोउ-16 अलग हो गया और तय ऑर्बिट में प्रवेश कर गया।



400 किमी. दूर स्पेस स्टेशन के कोर मॉड्यूल Tianhe में पहुंचे तीनों अंतरिक्षयात्री।



क्रू मेंबर वहां पहले से मौजूद तीनों यात्रियों से मिले। ये तीनों पुराने यात्री जल्द लौटेंगे।



तीनों अंतरिक्षयात्री स्पेस स्टेशन के कोर मॉड्यूल Tianhe में पहले से मौजूद तीन यात्रियों से मिले।

2030 तक चांद की तैयारी

चीन 2030 तक चांद पर पहुंचने की तैयारी कर रहा है। इसके लिए चीनी सेना के स्पेस प्रोग्राम पर कई अरब खर्च किए जा चुके हैं। चीन स्पेस की इस रेस में अमेरिका और रूस की बराबरी करना चाहता है। चीन ने पिछले साल ही अपना तीसरा स्थायी स्पेस स्टेशन 'तियानगोंग' बनाने का काम पूरा किया है। अमेरिका ने 2011 में चीन की स्पेस एजेंसी के साथ काम करने से इनकार कर दिया था। तब से चीन इंटरनैशनल स्पेस स्टेशन से बाहर है।

अंतरिक्ष पर कब्जा करना चाहता है चीन?

इसकी आशंका कई बड़े वैज्ञानिक जता चुके हैं। पिछले दिनों नासा के अधिकारी बिल

नेल्सन ने कहा था कि चीन चांद के एक हिस्से पर साइंटिफिक रिसर्च

फैसिलिटी बना रहा है। आशंका इस बात की है कि चीन बाद में इस इलाके पर कब्जा कर सकता है। ऐसी आशंका इसलिए भी है कि अंतरिक्ष के नियम पहले आओ, पहले पाओ की तरह काम करते हैं।



मुट्टी में कर लेंगे चांद

लॉन्चिंग
GSLV MK-III से होगी चंद्रयान-3 की लॉन्चिंग।

सब कुछ ठीक रहा तो एक से डेढ़ महीने (जुलाई) में भारत का चंद्रयान-3 चंद्रमा के लिए उड़ जाएगा। भारत ने पिछली गलतियों से सबक लिया है और इस बार वह अंतरिक्ष इतिहास में एक बड़ी लकीर खींचने के लिए तैयार है। देखते हैं क्या है चंद्रयान-3, और किन-किन देशों ने चांद पर जाने की योजना बनाई है।

इंजन टेस्टिंग

- 24 फरवरी को तमिलनाडु के महेंद्रगिरि में हुआ टेस्ट।
- 25 सेकंड के लिए हुआ फ्लाइंग एक्सेप्टेस हीट टेस्ट।
- सही काम कर रहे हैं हार्डवेयर।

बाकी देश

आज तक ये 11 देश और संगठन चांद पर अंतरिक्ष यान भेजने में कामयाब रहे हैं, चाहे वह लैंडर, ऑर्बिटर, इम्पैक्टर हो या सिर्फ फ्लाइबाई हों: सोवियत संघ, संयुक्त राज्य अमेरिका, जापान, चीन, भारत, इजराइल, इटली, लक्जमबर्ग, दक्षिण कोरिया, संयुक्त अरब अमीरात, यूरोपीय संघ



क्या चांद के लिए लड़ने वाले हैं चीन-अमेरिका? इस पर लेख पढ़ने के लिए यहां स्केन करें और navbharatgold.com पर जाएं



रोवर

- चांद पर घूमने और जानकारी जुटाने वाला हिस्सा।
- ऊर्जा के लिए इसमें सोलर पैनल लगे हैं।
- एक्सरे और लेजर तकनीक से लैस है रोवर।

कीमत



₹9,023 करोड़
लगभग

लैंडर टेस्टिंग

31 जनवरी से 3 फरवरी के बीच हुआ टेस्ट। इलेक्ट्रोमैग्नेटिक इंटरफेरेंस और कंपैटिबिलिटी टेस्ट पास किया। सॉफ्ट लैंडिंग का भी टेस्ट किया पास।

ऑर्बिटर

चंद्रयान-2 का ऑर्बिटर पहले से ही चंद्रमा के चक्कर काट रहा है, चंद्रयान-3 उसी का इस्तेमाल करेगा।

प्रोपल्शन

- यह चंद्रयान को उड़ाने वाला हिस्सा है।
- इसमें CE-20 क्रायोजेनिक इंजन लगा है।
- यह 100 किमी चंद्र कक्षा तक लैंडर और रोवर लेकर जाएगा।

मकसद

- चांद की सतह पर सुरक्षित और सॉफ्ट लैंडिंग
- रोवर का चंद्रमा पर घूमना और सूचनाएं जुटाना
- साइंटिफिक एक्सपेरिमेंट और उसके परिणाम
- चांद की सतह का करेगा रासायनिक विश्लेषण।



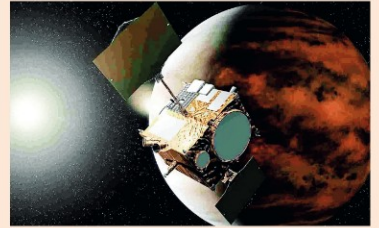
चंद्रयान-2

आखिरी वक्त में सॉफ्टवेयर में आई खराबी के चलते चंद्रयान-2 मिशन फेल हो गया था। तब विक्रम लैंडर के मार्गदर्शक सॉफ्टवेयर में खराबी आई थी जिससे यह चंद्रमा की सतह पर दुर्घटनाग्रस्त हो गया था।

अंतरिक्ष में भारत

- 1963 थुंबा से पहला रॉकेट छोड़ा।
- 1975 पहला भारतीय उपग्रह आर्यभट्ट छोड़ा।
- 1992 स्वदेशी तकनीक से बना उपग्रह इन्स्पैट-2A छोड़ा।
- 2008 22 अक्टूबर को चंद्रयान-1 छोड़ा।
- 2013 5 नवंबर को मंगलयान छोड़ा।
- 2019 जुलाई में चंद्रयान-2 छोड़ा।

आने वाले मिशन

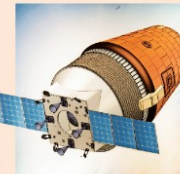


वीनस मिशन

इसरो के मुताबिक भारत दिसंबर 2024 तक शुक्रयान को स्पेस में भेजेगा। शुक्र यहां मौजूद सल्फ्यूरिक एसिड के बादलों का अध्ययन करेगा।

आदित्य L1 मिशन

सूर्य के अनुसंधान के लिए आदित्य L1 मिशन की तैयारी है। यह सूर्य के लिए भारत का पहला मिशन होगा।



गगनयान

अंतरिक्ष में भारत का पहला मानव मिशन 'गगनयान' 2024 में लॉन्च होने की संभावना है। बिना चालक दल के 'जी1' मिशन को 2023 की अंतिम तिमाही में लॉन्च करने का लक्ष्य है।

