जुलाई
July
2025

खंड/Vol. : 50 अंक/Issue : 135

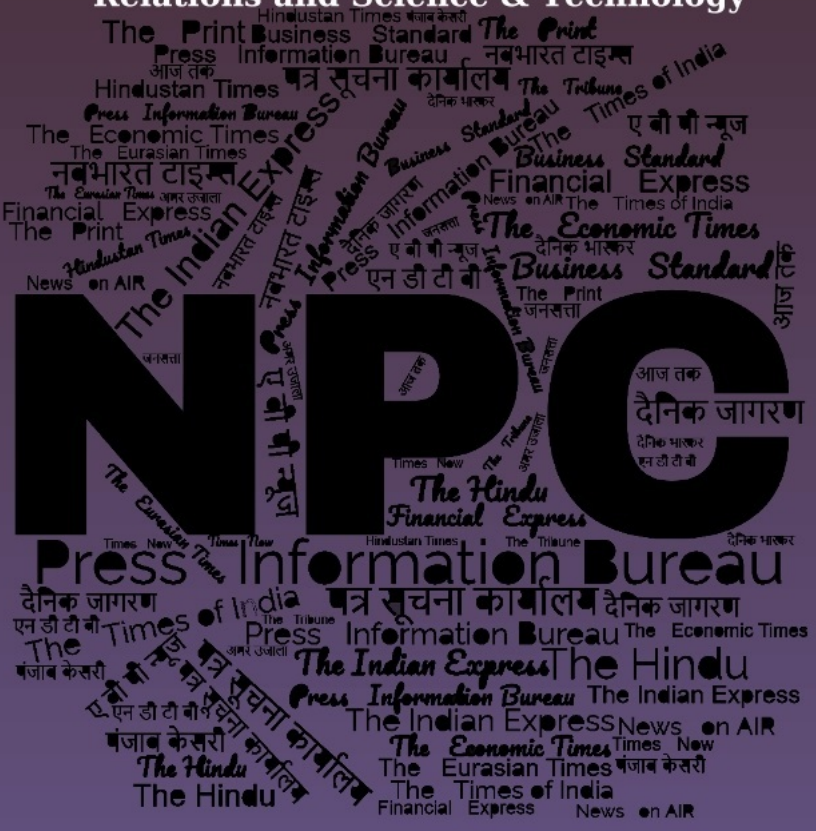
22/07/2025

समाचार पत्रों से चयनित अंश

Newspapers Clippings

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

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



रक्षा विज्ञान पुस्तकालय
Defence Science Library
रक्षा वैज्ञानिक सूचना एवं प्रलेखन केंद्र
Defence Scientific Information & Documentation Centre
मेटकॉफ हाउस, दिल्ली - 110 054
Metcalfe House, Delhi - 110 054

CONTENTS

Defence News

India, Pak continue shadow boxing with Notams along borders for air exercises

Source: The Times of India, Dt. 22 Jul 2025

The shadow boxing between India and Pakistan continues after cessation of the May 7-10 cross-border hostilities, with both countries issuing Notams (notice to airmen) to reserve their respective airspaces along the borders for exercises.

The South Western Air Command of the IAF is slated to undertake an air combat exercise in the Rajasthan-Gujarat region close to the international border from July 23 to July 25. Pakistan, in turn, has issued a Notam for its central region till July 23 and southern part on July 22-23.

Both nations had conducted multiple air force & naval drills in the run-up to the four-day intense hostilities that began after India launched deep precision strikes against four terror hubs in Pakistan and five in POK on May 7 under Operation Sindoor.

Though India made it clear that the aim was to hit only terror infrastructure, Pakistan chose to escalate the situation by launching waves of drones and missiles to target Indian airbases, military assets and civilian areas.

IAF had then struck at least nine Pakistani airbases & three radar sites, a few of them close to nuclear facilities as well as command & control structures, with Su-30MKI, Rafale & Mirage-2000 fighters using BrahMos, Crystal Maze-2, Rampage and Scalp missiles, among other precision munitions, for calibrated pinpoint strikes, as was reported by TOI.

https://timesofindia.indiatimes.com/india/india-pak-continue-shadow-boxing-with-notams-along-borders-for-air-exercises/articleshow/122822279.cms

*

Faster induction of fighters, refuellers in top panel's recommendations for IAF

Source: Hindustan Times, Dt. 22 Jul 2025

Quicker induction of fighter jets, mid-air refuellers and airborne early warning and control (AEW&C) systems tops the recommendations made by an empowered committee for capability enhancement of the Indian Air Force, people aware of the matter said on Monday, adding that the government is in the final stages of awarding a ₹67,000-crore contract to Hindustan Aeronautics Limited for 97 more light combat aircraft Mk-1As.

"The panel reviewed every element of capability development and suggested measures to boost the IAF's operational readiness in a time-bound manner. New fighters, refuellers and AEW&C systems are among the top priorities. These platforms are in different stages of the procurement cycle," said one of persons cited above, asking not to be named.

The government is in the final stages of awarding a ₹ 67,000-crore contract to HAL for 97 LCA Mk-1As.

Defence secretary Rajesh Kumar Singh, who chaired the committee submitted the report classified as “secret” to defence minister Rajnath Singh in March, days after chief of the air staff Air Chief Marshal AP Singh admitted that the air force was “very badly off in numbers”, adding that it must induct 40 fighter jets every year to stay combat-ready.

The committee’s members included the vice chief of air staff, secretary (defence production), DRDO chief, and director general acquisition, with the deputy chief of the air staff being its member secretary.

The panel recommended a raft of short and long-term measures to boost the capabilities of the IAF, which is grappling with a shortage of fighter squadrons, pointing out that it was critical to enhance self-reliance in the aerospace sector through increased participation of the private sector to fill critical gaps.

“The committee has recommended a larger role for the private sector. The public sector has its strengths and the first-mover advantage. But the country needs to build a larger defence base to meet the growing needs of the IAF,” said a second person, who also asked not to be named.

After the committee submitted its report, the defence ministry in May unveiled its long-awaited plan to fast-track the development of an indigenous fifth-generation stealth fighter, or the advanced medium combat aircraft (AMCA), announcing that the execution model will be competitive and provide equal opportunities to public and private sector firms to participate in one of the country’s most significant military projects.

The committee’s recommendations are being implemented at a critical moment as the IAF is scouting for 114 multi-role fighter aircraft to be made in India by a foreign original equipment manufacturer and a local partner.The recommendations are in the process of being implemented in the backdrop of Operation Sindoor, India’s strike on terror and military installations in Pakistan and Pakistan occupied Kashmir, carried out in response to the Pahalgam terror attack. The Indian Air Force played a central role in the operation.

“The IAF is planning to move the case for the 114 new fighters. The MRFA programme will be accelerated once the execution model is finalised. Also, the follow-on order of 97 LCA Mk-1As will

be placed soon," said the first person. The air force has around 30 fighter squadrons compared to an authorised 42.5.

The defence minister has ordered top officials to ensure timely implementation of the empowered committee's wide-ranging recommendations.

The techno-commercial bids for six more mid-air refuellers are expected to be opened shortly, the second official said, adding that European, Russian and Israeli defence contractors are vying for the order. The IAF operates a fleet of six Russian-origin Ilyushin-78 tankers that are plagued by maintenance problems and the force urgently needs at least six more refuellers.

In February, the defence acquisition council approved several key proposals worth ₹84,560 crore to strengthen the military's operational readiness, including the purchase of more mid-air refuellers.

The refueller procurement, which comes in the backdrop of previous failed attempts to buy new tankers, is being pursued at a time when a high-powered defence ministry committee --- steering a comprehensive review of India's arms-buying rules --- is looking at shortening actual acquisition timelines from the current seven-eight years to under two years for speedy modernisation of the armed forces.

The panel, headed by director general (acquisition), has identified three key areas that account for delays in the procurement of critical weapons and systems, including preparation of the request for proposal (RFP), field evaluation trials and contract negotiations.

Also, the Cabinet Committee on Security, chaired by Prime Narendra Modi, is expected to clear the construction of six AEW&C systems based on the Airbus 321 platform, as reported by HT on July 19.

Air Chief Marshal AP Singh has publicly flagged concerns about a worrying erosion of capabilities and called for urgent measures to address it.

https://www.hindustantimes.com/india-news/faster-induction-of-fighters-refuellers-in-top-panel-s-recommendations-for-iaf-101753123518128.html

*

Look who's making kamikaze drones for Army: Two 20-yr-old engineering students

Source: The Times of India, Dt. 22 Jul 2025

Bomb-dropping kamikaze drones - 300kmph, radar-proof. Assembled inside a hostel room of BITS Pilani's Hyderabad campus. The Army buys in.

Two 20-year-old engineering students of the institute have stunned India's defence circles by building and selling cutting-edge UAVs to Army units across Jammu, Haryana's Chandimandir, Bengal's Panagarh, and Arunachal Pradesh - all within two months of launching their start-up Apollyon Dynamics. Their mission: reduce India's dependency on imported drones.

Jayant Khatri, a mechanical engineering student from Rajasthan's Ajmer, and electrical engineering student Sourya Choudhury from Kolkata built their drones with off-the-shelf parts, customised the systems for Indian terrain, and pitched them to Army officers via cold messages on

LinkedIn."I just started shooting cold emails to whoever I could find... Luckily, a colonel responded and called us to Chandigarh for a demo," Khatri said Monday.

What followed was a whirlwind - a live demo of bomb-dropping and racing drones, followed by more demonstrations to military regiments. Orders began flowing in. The company was born.

Their standout product: a kamikaze drone that hits speeds over 300kmph, five times faster than standard commercial UAVs, and delivers 1kg payloads with pinpoint accuracy.

"Our drones are not just fast - they can't be detected on radar," said Choudhury.

The duo insists every UAV is built in-house with a focus on "ruggedness, reliability and adaptability". "Our shared love of robotics brought us together. We started with a defence-tech club on campus. Then came the orders - that's when we knew we had to go big," Choudhury said.

The team now includes six second-year students and is working on next-generation VTOL & fixed-wing platforms to boost mission flexibility. They also offer hands-on training to military personnel - even those with no prior flight experience.

"It's heartening to see what they've achieved," said professor Sanket Goel of BITS Pilani.

In "3 Idiots", Joy Lobo's passion for machines died in silence - no support, no takers. In real life, two students built war-ready drones in a hostel room. The Army called back.

https://timesofindia.indiatimes.com/india/look-whos-making-kamikaze-drones-for-army-two-20-yr-old-engineering-students/articleshow/122823195.cms

*

The real drone war is yet to come

-by Lt Gen DS Hooda (Retd)

Source: The Tribune, Dt. 22 Jul 2025

IT’s now over two months since Operation Sindoor, and with the media frenzy having subsided, a dispassionate assessment can be made of some of the key military issues surrounding the operation. One of these issues is the description of the conflict as South Asia’s first drone war. Senior Indian military officers have spoken about the revolutionary employment of drones during the operation and the effectiveness of India’s counter-drone systems.

Drones have undoubtedly become central to modern conflict, and India’s successful defence against Pakistani intrusions has been justifiably praised. Yet a closer analysis of drone employment during the operation shows that drone warfare in both countries is still at a nascent stage. This is borne out by how the two countries utilised drones during the operation.

On the night of May 7-8, a day after India launched strikes on nine terrorist camps, Pakistan retaliated with drone activity, targeting Indian military bases at 15 locations across Punjab, Jammu and Kashmir, Gujarat, and Rajasthan. The following night saw further intrusions at 36 locations, stretching from Leh to Sir Creek, with an estimated 300 to 400 drones. According to official briefings, the aim of these incursions was likely to test Indian air defence systems and gather intelligence.

On the night of May 9-10, drone activity was reported at 26 locations, spanning from Srinagar to Naliya. Most of these drones were successfully neutralised, though limited damage was sustained at Udhampur, Pathankot, Adampur and Bhuj.

According to media reports, most of the drones employed by Pakistan were unarmed. A few specialised military drones, such as Turkey's Asisguard Songar and the Yiha-III loitering munition, were used. The Songar has a range of about 10 km and can be equipped with a light armament, such as a gun or grenade launcher. The Yiha-III is designed for precision strikes against high-value targets, but it remains a low-end capability compared to more sophisticated systems.

Indian drone strikes, though fewer in number, were more targeted and precise. These employed loitering munitions such as the Harpy and Harop. The Harpy is an anti-radiation drone designed to destroy enemy radar systems, while the Harop has electro-optical sensors and can engage a broader range of targets. Polish Warmate and the indigenously developed Nagastra-1 loitering munitions were also employed.

It is likely that some of the Indian strikes on terrorist camps on May 7 were carried out by drones, though this has not been officially confirmed. What has been revealed through press briefings is that on May 8, Indian drones targeted air defence radars and systems at multiple locations inside Pakistan, destroying one radar in Lahore. On May 9, four more air defence sites were targeted, with at least one additional radar destroyed.

On May 10, the Indian Air Force launched devastating airstrikes on Pakistani airbases, command centres and military infrastructure using long-range standoff weapons such as the BrahMos and SCALP cruise missiles, and air-to-ground munitions like the Crystal Maze and Rampage. These strikes were preceded by decoy drones and Harops designed to degrade Pakistani air defence systems.

On the counter-drone front, Pakistan claimed to have downed at least 48 Indian drones. The Indian counter-drone effort was commendable as it neutralised almost all Pakistani drone attacks. At the forefront were air defence guns like the L-70, ZU-23 and Shilka. India also has an indigenous Drone Detection and Interdiction System that would have played an important part in neutralising hostile drones.

India did come out on top in the brief drone war, but there are some important lessons. The reason drones are having such a significant impact on the battlefield is due to their affordability and ubiquity. Thousands of $500 drones in the hands of soldiers make aerial surveillance, precision strikes and real-time intelligence accessible to even small infantry units. Low-cost drones also permit strategic reach, as seen in Ukraine’s deep strikes into Russia.

It is not the technology, but the scale of drone warfare that is redefining warfighting. Both Ukraine and Russia are estimated to have between one and two million drones in their military inventory. It is the mass usage that is the fundamental characteristic of drone warfare, and this has sparked innovation in tactics and battlefield adaptation.

One might argue that a four-day conflict between India and Pakistan cannot be compared to the Ukraine war. There is merit in this argument, but then we should also not conclude that the Sindoor experience offers a reliable blueprint for future conflicts involving drones. In fact, it highlights several areas that must be addressed.

Indian drone strikes were precise but primarily carried out by specialised drones. Such drones are highly expensive; each Harop drone costs approximately $700,000. What is required is a massive

infusion of low-cost drones, particularly in the Army. Units at the tactical level must then devise practical doctrines and battlefield tactics for their effective employment.

India must also indigenously develop medium and long-range strike drones. Ukraine has developed a series of drones with ranges of up to 1,000 km, which transitioned from concept to combat use in around six months. While this wartime mobilisation is not replicable in India, drone development timelines must be drastically shortened through mission-mode programmes and agile public-private partnerships.

The military must also not rest on its laurels of having countered Pakistani drones. With few exceptions, the drones were mostly unarmed and posed little direct threat. An effective counter-drone system must address both tactical and operational levels. Frontline troops must be equipped with portable jammers and rifle-mounted AI-assisted sights. At the operational level, the most effective architectures integrate long-range detection by radar and other sensors, mid-range disruption through jamming or spoofing, and close-in destruction by kinetic means. We may also need to examine new organisational structures that integrate radars, guns and Electronic Warfare resources.

Preparing for the future means thinking beyond the victories of Operation Sindoor. It requires scaling up the employment of drones, rewriting doctrine and integrating drone defences into every level of the battlefield. The real drone war is yet to come.

https://www.tribuneindia.com/news/comment/the-real-drone-war-is-yet-to-come/

*

13th High-Level Meeting Between Indian Coast Guard and Korea Coast Guard Held in New Delhi

Source: Press Information Bureau, Dt. 21 Jul 2025

The 13th High-Level Meeting (HLM) between the Indian Coast Guard (ICG) and the Korea Coast Guard (KCG) was held in New Delhi on July 21, 2025. Both sides engaged in discussions to boost cooperation in Maritime Search and Rescue (SAR), Pollution Response (PR), and Maritime Law

Enforcement (MLE), while reaffirming their commitment to share best practices and enhance interoperability under the 2006 MoU.

The meeting was co-chaired by Director General ICG S Paramesh and Commissioner General KIM Yong Jin, Commissioner General, KCG, who is currently leading a five-member delegation on an official visit to India from July 20-24, 2025. As part of the visit, the KCG delegation will travel to Mumbai from July 23-24 for an industrial visit to Mazagon Dock Shipbuilders Limited (MDL) and to an ICG patrol vessel, aimed at strengthening maritime industrial and operational linkages.

https://www.pib.gov.in/PressReleasePage.aspx?PRID=2146622

*

Launch of Yard 3034 (Ajay), Last Ship of ASW SWC (GRSE) Project

Source: Press Information Bureau, Dt. 21 Jul 2025

Yard 3034 (Ajay), the eighth and last ship of Anti-Submarine Warfare Shallow Water Craft (ASW SWC), indigenously designed and built by Garden Reach Shipbuilders and Engineers (GRSE) has been launched on 21 Jul 2025 at GRSE, Kolkata in the presence of VAdm Kiran Deshmukh, Chief of Materiel (COM). In keeping with the naval tradition, Mrs Priya Deshmukh, launched the ship. Senior officials from the Indian Navy and GRSE were present for the event.

The first Ship of the class Arnala was commissioned on 18 Jun 2025 and delivery of the second ship is planned in Aug 2025. The warship will augment Indian Navy's underwater domain awareness, Anti-Submarine Warfare and mine laying capabilities. The ship is equipped with role defining sensors such as a Hull Mounted Sonar and Low Frequency Variable Depth Sonar (LFVDS), and firepower provided by state-of-the-art Torpedoes, Anti-Submarine Rockets, NSG-30 Gun and 12.7 mm SRCG. The ship is powered by diesel engines and propelled by Waterjets.

Launch of Ajay is a significant milestone in Indian Navy's continued quest for self-reliance in shipbuilding, weapons, sensors and advanced communication and electronic warfare systems. With an indigenous content of over 80%, the ship exemplifies the Government of India's initiative

of Aatmanirbhar Bharat and Make in India and will provide significant capabilities to secure our national maritime interests in the Indian Ocean Region.

https://www.pib.gov.in/PressReleasePage.aspx?PRID=2146420

*

Science & Technology News

पिघलते ग्रीनलैंड के भारत पर असर की रिसर्च

Source: Navbharat Times, Dt. 22 Jul 2025

आर्कटिक में रिसर्च के लिए NCPOR ने ग्रीनलैंड में भेजी एक रिसर्च टीम

Newton.Sequeira
@timesofindia.com

■ **पणजी:** आर्कटिक इलाके में अपनी रिसर्च को आगे बढ़ाने के लिए भारत के नेशनल सेंटर फॉर पोलर एंड ओशन रिसर्च (NCPOR) ने ग्रीनलैंड में एक रिसर्च टीम भेजी है। यह अभियान इस इलाके में तेजी से बढ़ रही गर्मी की वजह से शुरू किया गया है। यहां बढ़ता तापमान भारत के मॉनसून पैटर्न और समुद्री जलस्तर में बदलाव से देश की आर्थिक सुरक्षा पर बड़ा असर डाल सकता है। भारत के समुद्री साइंटिस्टों की टीम आइसलैंड की राजधानी रेकजाविक पहुंचेगी और वहां से स्वीडन की गोथेनबर्ग यूनिवर्सिटी के 49 मीटर लंबे रिसर्च जहाज 'RV स्केगेरक' पर सवार होकर स्टडी के लिए निकलेगी। यह रिसर्च ट्रैवल 21 जुलाई से शुरू होकर 7 अगस्त तक चलेगी। NCPOR के डायरेक्टर थम्बन मेलोथ ने बताया कि अब तक संस्थान ने आर्कटिक में केवल जमीन और फजॉर्ड्स (झील जैसी संरचनाएं) पर रिसर्च की है, लेकिन अब पहली बार समुद्र की गहराई से स्टडी की जाएगी। उन्होंने बताया कि आर्कटिक इलाके में तापमान ग्लोबल एवरेज से तीन गुना अधिक तेजी से बढ़ रहा है। इससे समुद्री बर्फ पिघल रही है और प्रमुख समुद्री धाराओं में बदलाव की आशंका है।

21 जुलाई से 7 अगस्त तक चलेगी रिसर्च

भारत और आर्कटिक इलाके के बीच संबंध 1920 में शुरू हुए थे। भारत ने इस समय पेरिस में स्वालबार्ड संधि पर हस्ताक्षर किए थे। NCPOR की टीम आर्कटिक ग्लेशियरों के मास बैलेंस (बर्फ की मात्रा में बदलाव) की स्टडी कर रही है, ताकि उनकी तुलना हिमालय के ग्लेशियरों से की जा सके। भारत की आर्कटिक से भागीदारी उसके पोलर प्रोग्राम का हिस्सा है। इसमें आर्कटिक, अंटार्कटिक और हिमालयी इलाकों में साइंटिफिक रिसर्च करना शामिल है।

*

NASA-ISRO joint satellite NISAR set for July 30 launch

Source: The Indian Express, Dt. 22 Jul 2025

The much-awaited launch of NISAR — an earth observation satellite jointly developed by NASA and ISRO — is set to take place on July 30 at 5:40 pm from the country's only spaceport in Sriharikota, Andhra Pradesh. The satellite will be launched on the GSLV-F16 and be put in a 734 km sun synchronous orbit — an orbit in which the satellite reaches over a place at the same time each day.

The satellite will scan the entire globe every 12 days, proving a series of very detailed images of the Earth's surface.

NISAR, which stands for NASA-ISRO Synthetic Aperture Radar, will provide an unprecedented view of the planet. Weighing 2,392 kg it will be the first satellite ever to observe the Earth in two frequencies — NASA's L-band and ISRO's S-band. "Each system's signal is sensitive to different sizes of features on Earth's surface, and each specializes in measuring different attributes, such as moisture content, surface roughness, and motion," according to NASA.

Putting two radar systems on a single satellite is a unique engineering feat because the two systems require different sets of hardware, and yet have to function in a complementary fashion without interfering with one another.

This would mean that the satellite would be able to provide very high-resolution data, in all types of weather conditions, and both during the day and the night. The satellite is powerful enough to capture changes as small as one centimetre in size during its repeated observations over the same terrain.

It will therefore be able to study the dynamic processes happening on Earth's surface, like retreat of glaciers, movement of sea ice, the path of a storm, changes in vegetation and forest cover, and even the movements during earthquakes and volcanoes. Scientists expect this satellite to provide new insights into our understandings of processes like climate change or natural hazards and better prepare for them.

It can also help with practical applications such as tracking the changes in soil moisture or mapping surface water levels.

Costing around USD 1.5 billion, it is the most expensive earth observation satellite in the world, with ISRO contributing Rs 469.4 crores for the satellite. The Indian space agency will also incur costs in launching the satellite. "The NISAR launch is the result of strong technical cooperation between ISRO & NASA/JPL technical teams for more than a decade," the space agency said.

There have been several delays in the launch of the satellite, with the scheduled launch last year being pushed after technical issues. There was a need to fix the one of the key components of the satellite — a 12-metre unfurlable antennae. The satellite was shipped back to the United States.

https://indianexpress.com/article/india/nisar-to-be-launched-on-july-30-10140842/

*

The Tribune
The Statesman
पंजाब केसरी जनसत्ता
The Hindu
The Economic Times
Press Information Bureau
The Indian Express
The Times of India
Hindustan Times
नवभारत टाइम्स
दैनिक जागरण
The Asian Age
The Pioneer