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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

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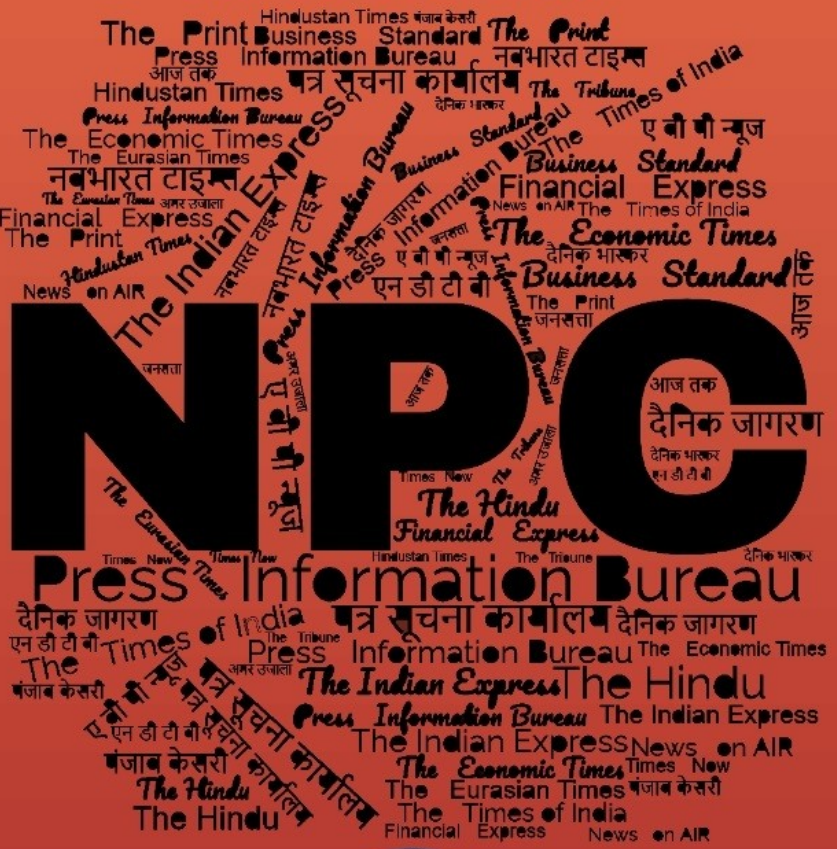

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OPERATION SINDOOR : Indian Armed Forces Carried Out Precision Strike At Terrorist Camps

Source: Press Information Bureau, Dt. 07 May 2025,
URL: https://pib.gov.in/PressReleasePage.aspx?PRID=2127370

A little while ago, the Indian Armed Forces launched 'OPERATION SINDOOR', hitting terrorist infrastructure in Pakistan and Pakistan-occupied Jammu and Kashmir from where terrorist attacks against India have been planned and directed.

Altogether, nine (9) sites have been targeted.

Our actions have been focused, measured and non-escalatory in nature. No Pakistani military facilities have been targeted. India has demonstrated considerable restraint in selection of targets and method of execution.

These steps come in the wake of the barbaric Pahalgam terrorist attack in which 25 Indians and one Nepali citizen were murdered. We are living up to the commitment that those responsible for this attack will be held accountable.

There will be detailed briefing on 'OPERATION SINDOOR', later today.

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From HAMMER bombs to SCALP missiles, all you need to know about weapons used in 'Operation Sindoor'

Source: The Week, Dt. 07 May 2025,
URL: https://www.theweek.in/news/defence/2025/05/07/from-hammer-bombs-to-scalp-missiles-all-you-need-to-know-about-weapons-used-in-operation-sindoor.html

Precision strike weapon systems, including the loitering munitions, of India's three armed forces—the Indian Army, Navy and Air Force—were used in 'Operation Sindoor' to target nine terrorist hideouts located in Pakistan and Pakistan-occupied-Kashmir.

According to news agency ANI, the coordinates for the attacks on terrorist camps inside Pakistan and PoK were provided by the intelligence agencies.

The attacks were carried out from Indian soil only. India used a variety of weapons to target the terror outfits.

These include the SCALP (Storm Shadow) missiles, which are long-range, air-launched cruise missiles capable of deep strikes with high accuracy.

Media reports suggest that the French-origin precision-guided, air-to-surface bomb system HAMMER (Highly Agile Modular Munition Extended Range) too was used by the Indian security forces. These bombs are known for their flexibility, accuracy, and stand-off capability.

Loitering munitions, also known as "suicide drones" or "kamikaze drones" that can hover over a target area and strike at the optimal moment, either autonomously or under human control, also were reportedly used to target the militant outfits.

The operation featured beyond-visual-range and stand-off weapons to ensure that the Indian forces did not cross over to the Pakistani side while targetting the terror camps. These weapons were picked because of their precision capabilities and ability to minimise collateral damage, limiting the impact exclusively on terror camps.

Sources told news agency ANI that it was a joint operation by the Indian Army and Air Force. Among the targets hit in a precise operation were Markaz Subhan Allah at Bahawalpur, Sarjal at Tehra Kalan, Markaz Abbas in Kotli and Syedna Bilal camp in Muzaffarabad.

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Defence Minister Rajnath Singh speaks to Army, Air Force and Navy chiefs following Operation Sindoor

Source: The Economic Times, Dt. 07 May 2025,
URL: https://economictimes.indiatimes.com/news/defence/defence-minister-rajnath-singh-speaks-to-army-air-force-and-navy-chiefs-following-operation-sindoor/articleshow/120947875.cms

Union Defence Minister Rajnath Singh spoke to chiefs of the Indian Army, Indian Air Force and Indian Navy, according to sources.

The conversation happened in the aftermath of the Operation Sindoor conducted by the Indian Armed Forces where they destroyed terrorist hideouts on Wednesday night.

Meanwhile. The Ministry of Defence (MoD) has announced that a press briefing on Operation Sindoor will be held on Wednesday at 10:00 AM. Further details regarding the operation are expected to be shared during the briefing.

Earlier, India carried out its deepest strikes inside Pakistan's undisputed territory since 1971, according to CNN, successfully targeting terror camps in Pakistan and Pakistan-occupied Kashmir. This marks New Delhi's most significant military action within Pakistterritory in over five decades.

The strikes were carried out to avenge the victims of the Pahalgam terror attack and to eliminate Jaish-e-Mohammed (JeM) and Lashkar-e-Taiba (LeT) leaders involved in planning and executing terrorist attacks in India.

The Ministry of Defence, in its statement, said, "A little while ago, the Indian Armed Forces launched 'OPERATION SINDOOR', hitting terrorist infrastructure in Pakistan and Pakistan-

occupied Jammu and Kashmir from where terrorist attacks against India have been planned and directed."

"Our actions have been focused, measured and non-escalatory in nature. No Pakistani military facilities have been targeted. India has demonstrated considerable restraint in selection of targets and method of execution," the statement added.

Indian Armed Forces successfully struck nine terror targets, four in Pakistan, including Bahawalpur, Muridke, and Sialkot, and five in Pakistan-occupied Kashmir, using special precision munitions in a coordinated operation, sources told ANI. The operation was jointly carried out by the Indian Army, Navy, and Air Force, with the mobilisation of assets and troops.

Prime Minister Narendra Modi was constantly monitoring Operation Sindoor throughout the night, sources confirmed to ANI. The strikes on all nine targets were successful, sources further revealed. The Indian forces selected the locations to target top Jaish-e-Mohammed (JeM) and Lashkar-e-Taiba (LeT) leaders involved in sponsoring terrorist activities in India.

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Operation Sindoor: All air defence units activated along India-Pakistan border

Source: The Economic Times, Dt. 07 May 2025,
URL: https://economictimes.indiatimes.com/news/defence/operation-sindoor-all-air-defence-units-activated-along-india-pakistan-border/articleshow/120943195.cms

Indian defence officials have said that all air defence units have been activated all along the India-Pakistan border to tackle any eventuality following Indian strikes at nine locations in Pakistan and PoK, reported ANI.

The Indian armed forces launched ‘Operation Sindoor’ in the early hours of Wednesday, hitting terrorist infrastructure in Pakistan and Pakistan-occupied Jammu and Kashmir in response to the Pahalgam terror attack that killed 26 tourists.

"Justice is Served. Jai Hind!', the Indian Army said in a post on X.

"A little while ago, the Indian Armed Forces launched 'OPERATION SINDOOR', hitting terrorist infrastructure in Pakistan and Pakistan-occupied Jammu and Kashmir from where terrorist attacks against India have been planned and directed," ministry of defence said in a statement.

"Our actions have been focused, measured and non-escalatory in nature. No Pakistani military facilities have been targeted. India has demonstrated considerable restraint in selection of targets and method of execution," said it added.

The ministry said that there will be a detailed briefing regarding the operation later in the day.

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2-day IAF combat drills in western sector begin today as tensions with Pakistan peak

Source: Hindustan Times, Dt. 06 May 2025,
URL: https://www.hindustantimes.com/india-news/iaf-to-kick-off-2-day-combat-drills-in-western-sector-as-tensions-with-pak-peak-101746548540160.html

The Indian Air Force (IAF) will on Wednesday begin a two-day combat exercise in the country's western sector, with the aerial drills involving fighter planes, transport aircraft, airborne warning and control system (AWACS) aircraft, midair refuellers, helicopters and unmanned aerial vehicles, officials aware of the matter said on Tuesday.

The exercise will involve assets from airbases spread across Rajasthan, Gujarat, Haryana and Uttar Pradesh, the officials said, asking not to be named. India has issued a NOTAM (notice to airmen) regarding airspace restrictions in the exercise area in Rajasthan that extends towards the Pakistan border, they added. An IAF spokesperson said it was "a pre-planned, routine training exercise".

The drills are taking place against the backdrop of simmering tensions between India and Pakistan that are threatening to reach a flashpoint in the aftermath of the April 22 Pahalgam terror strike that killed 26 people. The exercise also comes at a time when Pakistan continues to ratchet up tensions along the Line of Control (LoC) in Jammu and Kashmir.

"The exercise seeks to test the IAF's combat readiness," said one of the officials cited above. To be sure, the Indian and Pakistani militaries have carried out a series of drills, including missile launches, after the Pahalgam strike that sparked the worst crisis between the nuclear-armed neighbours since the 2019 Pulwama terror attack.

On Tuesday, the Pakistan Army escalated tensions along the LoC by firing at Indian posts in several sectors, including Kupwara, Baramulla, Poonch, Rajouri, Mendhar, Naushera, Sunderbani and Akhnoor, marking the 12 straight day of ceasefire violations, said another official.

The Indian Army's counter-fire was measured but effective, he added. The neighbouring army had opened fire in these eight sectors on Sunday and Monday too, the maximum number of areas it targeted on a single day after the Pahalgam terror attack that was reminiscent of the heyday of terrorism in the 1990s and 2000s and the worst strike on civilians in India since the 2008 Mumbai terror strikes.

The extensive ceasefire violations are being seen as a deliberate attempt by Pakistan to escalate tensions along the de facto border where it has rushed reinforcements to bolster its posture. The repeated targeting of Indian posts has sparked the most extensive cross-border exchange since the 2021 ceasefire. During the last four days, Prime Minister Narendra Modi has been given a series of briefings by top officials on the operational readiness of the armed forces and the security dynamics in the region after the strike.

Modi has granted the military a free hand to respond forcefully to the Pahalgam terror attack and underlined that the armed forces have complete operational freedom to choose "the mode, targets, and timing of the response."

On Wednesday, India will also conduct civil defence preparedness drills, including testing air raid warning sirens, training on civil defence protocols and crash blackout measures, as the government firms up its response to Pakistan in the aftermath of the attack.

The drills were ordered on Monday across the 244 civil defence districts. Drills on this scale have not been conducted in the country since 1971, when India defeated Pakistan in a war that led to the creation of Bangladesh.

Since the April 22 Pahalgam attack, India has unveiled several punitive measures, banning the import of goods originating in Pakistan, prohibiting Pakistan-flagged vessels from docking at Indian ports, shutting its airspace to aircraft registered in or operated by that country, suspending the 1960 Indus Waters Treaty, downgrading bilateral ties, expelling most Pakistani citizens in India, and shutting down the only operational land border crossing at Attari.

Pakistan has also unveiled tit-for-tat reactions to punitive measures announced by India but neither side has thus far indicated its intent to abandon the ceasefire. It has closed its airspace to Indian airlines, suspended all trade with India, and has threatened to suspend bilateral pacts such as the Simla Agreement.

India has significantly multiplied its offensive capabilities since the 2019 Balakot airstrikes in Pakistan, and during the border standoff with China, and the new weapons and systems it has modernised its arsenal with bring more options on the table as New Delhi weighs military action to punish Pakistan for being behind the Pahalgam terror attack.

The military hardware inducted to power the war machine includes Rafale fighter jets, S-400 air defence missile systems, Barak 8 air defence system, the indigenous aircraft carrier INS Vikrant, a raft of warships and submarines including the nuclear-powered ballistic missile submarine INS Arighaat, the Prachand light combat helicopters, the C-295 tactical transport aircraft, artillery guns and a new range of assault rifles.

The capability boost, which coincided with the military standoff with China in eastern Ladakh, covers a variety of unmanned systems, smart air-to-ground weapons, missiles, rockets, precision munitions, tank ammunition, high-tech surveillance systems and specialist vehicles.

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Pakistan tries to up ante but UNSC seeks accountability for Pahalgam attack

Source: The Times of India, Dt. 06 May 2025,
URL: https://timesofindia.indiatimes.com/india/pakistan-tries-to-up-ante-but-unsc-seeks-accountability-for-pahalgam-attack/articleshow/120938997.cms

The UN Security Council (UNSC) closed-door meeting on rising India-Pakistan tensions expectedly failed to yield any substantive outcome for Pakistan.

According to Indian government sources, Pakistan's efforts to internationalise the issue made little headway with the Council as it advised Islamabad to resolve issues bilaterally with India and

sought accountability for the Pahalgam terrorist attack, while expressing concerns over Pakistan's nuclear rhetoric and missile tests.

While views were expressed individually by some after the consultations, the Council didn't collectively make any statement. The least Pakistan would have hoped for is an oral statement by the Council president. Not taken in by what the Indian side saw as diplomatic grandstanding by Pakistan, which is a non-permanent Council member currently, the member-states are learnt to have condemned the Pahalgam attack in the 90-minute meeting and posed "tough questions" about the likely involvement of UN-proscribed Pakistan based terror group Lashkar-e-Taiba.

Former Indian permanent representative to UN Syed Akbaruddin said Pakistan's quest to resurrect an agenda item which has not been deliberated upon formally since 1965 by the Council expectedly did not take off.

"The lack of a response by the Council to Pakistan's briefing is a vindication of the Indian stance," said Akbaruddin, who was India's ambassador to the UN when Pakistan last sought closed-door consultations through China in 2019. That was after India revoked the special status of J&K in August 2019.

The 2019 meeting too had ended without any outcome or formal statement even though China had strongly pushed for it. Closed-door meetings comprise informal discussions that are held not in the Council room but in an adjacent chamber with limited number of delegates.

For Pakistan, like in 2019, the latest meeting too was more an exercise in managing public perception than advancing any meaningful discussions, even though the consultations were held under the India-Pakistan Question that relates to J&K and not under, as it was meant to be initially, the generic "Threats to International Peace and Security" agenda item.

In the meeting, according to sources here who spoke on condition of anonymity, members disapproved of the false flag narrative initially propounded by Pakistan and asked "tough questions" about the likely involvement of UN proscribed terror group Lashkar-e-Taiba in the attack. There were questions also about the targeting of tourists based on their religious identity.

"There was broad condemnation of the terrorist attack and recognition of the need for accountability. Some members specifically brought up the targeting of tourists on the basis of their religious faith,'' said a source, adding many members expressed concern that Pakistan's missile tests and nuclear rhetoric were escalatory factors.

Some Council members before the meeting were reported to have backed the idea of an independent international investigation into the attack. According to the Security Council Report, China and Greece appeared to have already indicated - before the meeting - their support for such an investigation. Such a probe though will need the consent of both India and Pakistan.

Pakistan issued a statement after the meeting in which it said that Council members expressed "deep concern" about the risk of escalation and urged restraint. It also claimed several members underscored that the J&K dispute remained the root cause of regional instability.

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States all set to conduct mock drills; to submit report to Centre

Source: The Hindu, Dt. 07 May 2025,
URL: https://www.thehindu.com/news/national/union-home-secretary-govind-mohan-civil-defence-mock-drills-may-6-2025/article69543883.ece

States across the country prepared to conduct mock drills on Wednesday (May 7, 2025) following the directions of the Ministry of Home Affairs (MHA). The drill comes in the aftermath of the April 22 Pahalgam terror attack where 26 people were killed.

Meanwhile, the Pakistan Army continued to violate the ceasefire for the 12th consecutive night by resorting to unprovoked small arms firing along the Line of Control in Kupwara, Baramulla, Poonch, Rajouri, Mendhar, Naushera, Sunderbani and Akhnoor districts of Jammu and Kashmir. The Indian Army responded in a proportionate manner, a statement said.

Pakistan Defence minister warns India could carry military strike any moment along LoCUnion Home Secretary Govind Mohan on Tuesday reviewed the preparations done by States to test civil defence preparedness in the wake of a “hostile” situation.

States have been asked to submit a report to the MHA after the drills are completed and the identified security gaps will be plugged accordingly, a senior government official said.Blackout Action Plan is crucial component of civil defense preparedness. Staying calm & prepared during emergencies or hostile situations is key to ensuring national security. Regular drills & awareness of such plans can help citizens respond effectively in critical situations.

While the Directorate General, Civil Defence has identified 244 districts in categories I, II and III for the conduct of drills up to the village level based on an assessment done in 2005 and 2010, States have been asked to add to the “vulnerable areas” list based on their own assessment. An area is designated as civil defence district if there are vital installations such as refinery or a nuclear plant or a cantonment in its geographical limits.

The drill will test the efficacy of the operationalisation of air-raid warning signs, crash blackout measures, camouflaging vital installations, evacuation plans, establishing hotline with the Indian Air Force, activating control rooms, firefighting and warden services and undertake cleaning of bunkers and trenches among others.

“We are not micro-managing the drill. States have been given directions and a format to conduct the drill based on the availability of resources and mapping of vulnerable areas. The district magistrates may decide the venue and time,” the official said.

The Anantnag police in South Kashmir issued a public advisory that a mock drill will be conducted at 4 p.m. on Wednesday by the State Disaster Response Force (SDRF). “As part of the drill, sirens will be activated at various locations in Kashmir. This is a practice exercise to test our emergency response systems,” the police said.

In Delhi, the mock exercise will be conducted at 55 locations from 4-6 p.m. The locations include residential buildings, government offices, markets and colleges. The Delhi Police beefed up

security in the national Capital ahead of the scheduled mock drills with increased number of officials being deployed at tourist spots such as Connaught Place, India Gate, Janpath, Gole Market, Jama Masjid, Red Fort. Further, the police headquarters has now been equipped with the Long Range Acoustic Device (LRAD) to transmit clear messages beyond a kilometre in case of an emergency, an official told The Hindu.

The South Central Railway said volunteers, instructors and associated personnel would "simulate a hostile attack scenario to evaluate emergency preparedness and inter-agency coordination" at Kacheguda (Hyderabad division), Raichur (Guntakal Division) and Aurangabad (Nanded Division) on May 7.

In Maharashtra, the drill will be conducted at more than a dozen locations, including Mumbai at 4 p.m. The drill will be initiated through an 'air-raid' warning that will be passed on through the civil defence channels by the Air Force followed by a mock exercise through simulation of fire incident in a building.

Director of Maharashtra Civil Defence, Prabhat Kumar, said on Tuesday, "Till 2010, the main objective of the civil defence was to recruit volunteers during wartime, but after 2010, disaster management was also included. Tomorrow, we will do mock drills in the coastal areas."

Uttar Pradesh Director General of Police (DGP) Prashant Kumar said that as per the MHA's list, 19 districts in the State have been identified in the "multi hazard-prone districts," but the mock exercise will be done in all the 75 districts.

"All the verticals such as fire department, civil defence will be roped in. The timing will be decided by the local authorities," Mr. Kumar said. Bihar DGP Vinay Kumar said the Civil Defence Rules were passed in 1962 and the response of various arms including civil defence in emergency situations such as external aggression were codified in it.

"All the wings will be activated from State to village level. We will see to it that the agencies and equipment are in order and assess the response time... in all the identified districts, 350-400 civil volunteers will be deployed in schools, colleges and vital installations and people will be instructed on how to protect themselves in an emergency situation," the Bihar DGP said.

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Amid riding tensions with Pak, Pinaka range to be doubled from existing 90 km

Source: The Tribune, Dt. 07 May 2025,
URL: https://www.tribuneindia.com/news/india/amid-riding-tensions-with-pak-pinaka-range-to-be-doubled-from-existing-90-km/

Amid the ongoing tensions between India and Pakistan, the Indian Army will be keenly watching the expected trials to double the range of rockets fired from the Pinaka systems.

India's indigenous Pinaka Multi-Barrel Rocket Launcher (MBRL) system so far can fire at targets 90 km away. The plan is to increase the range gradually by testing the rockets to fire for 120, 150 and 200 km, respectively. The tests are slated this summer.

Pinaka, which is truck-mounted and provides mobility, can launch a salvo of 72 rockets in just 44 seconds, delivering up to seven tonnes of explosives across enemy targets up to 60 km away. The extended-range variant, Pinaka Mk-II ER, reaches distances up to 90 km.

Sources said the advanced iterations under development were from 120 km, 150 km, and even 200 km ranges. A set of integrated GPS and inertial navigation systems ensure precision targeting.

Designed and developed by the DRDO and produced through a consortium of Indian defence companies, Pinaka combines firepower, precision, mobility, and scalability – qualities essential for both deterrence and decisive military operations.

With a capacity to produce over 5,000 rockets annually, India possesses the capacity to sustain long-term operations without external dependence. Indian defence manufacturers such as Tata Advanced Systems and Larsen & Toubro play a role in the system's serial production.

Designed for a digitally-enabled battlefield, Pinaka is integrated with state-of-the-art command and control systems that enable network-centric operations and real-time coordination with surveillance and reconnaissance assets. It complements existing artillery and drone systems, enhancing the Indian Army's layered firepower capabilities.

Pinaka's operational deployment underscores the Indian Army's readiness and capability to strike with precision and power. The name Pinaka is derived from after Lord Shiva's celestial bow.

IAF exercise along Raj border

A notice to airmen (NOTAM) has been issued for an Indian Air force exercise in south-western Rajasthan bordering Pakistan. The NOTAM, as per procedure, was issued by the airports authority of India. "The IAF is conducting a pre- planned routine training exercise," sources said.

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How can India 'Make for the World'? Unlocking its defence export potential

Source: The Economic Times, Dt. 07 May 2025,
URL: https://economictimes.indiatimes.com/news/defence/how-can-india-make-for-the-world-unlocking-its-defence-export-potential/articleshow/120938534.cms

India today stands at an inflection moment in its quest to become a global defence manufacturing powerhouse. The vision of transitioning from 'Make in India' to 'Make for the World' is bold, but the path is fraught with challenges that demand urgent attention. Are we ready to seize this opportunity? Though India has a right mix of competencies and competitiveness, the answer hinges on addressing five critical issues: aligning policy, industry, and diplomacy for export success; need to manufacture high-tech products, competitiveness and ensuring our industry meets global standards; increasing investments in strategic R&D; building trust and resilience: evolving from a mere manufacturer to a trusted, low-cost partner in global security and lastly, building confidence, sustainability, and growth of small players by ensuring long term supply arrangements with technical support, especially for the home-grown SMEs. With the right strategy, and road-map

in place, India can transform its defence sector into a ‘go to’ source for countries in need, but the clock is ticking.

India’s defence journey is one of remarkable progress. Decades ago, we were heavily reliant on imported platforms and weapons. Today, organisations like Defence Research and Development Organisation (DRDO), Hindustan Aeronautics Limited (HAL), Bharat Electronics Limited (BEL), and Bharat Forge have built a robust ecosystem for indigenous manufacturing. Last year, defence production soared to ?1.27 lakh crore, with exports accounting for nearly ?21,083 crore in FY 2023-24 which is a clear evidence of growing capability.

India’s non-aligned geopolitical stance is a unique asset, making us a palatable partner for many nations. This neutrality can be leveraged to promote our defence products, but only if we better align our policies to promote industries and get them market access through adroit commercial diplomacy. For instance, Indian companies are already supplying components to countries like United States, Armenia and France proving that quality can attract global buyers. However, scaling this requires a cohesive strategy: Despite continuous initiatives to strengthen its defence-industrial foundation, India still relied heavily on foreign suppliers accounting for 9.8% of global arms imports between 2019 and 2023 highlighting a persistent strategic dependency in its defence procurement. The government’s efforts to revise the Defence Acquisition Procedure and signing of Security of Supply Agreement (SOSA) or negotiating Reciprocal Defence Procurement Agreement with the U.S. are all steps in the right direction, but we must ensure that these policies and agreements translate into swift, tangible outcomes.

Moreover, our siloed approach in governance, cloaked in secrecy, limits collaboration with academia, startups, and industry. The higher authorities do not market or allow any information in the press or in public domain which limits the scope of good R&D.

The DRDO’s Prototype-Centric Project (PCP) model, which involves industry from project inception, is a positive step, but we must dismantle silos entirely. Without alignment of the ecosystem across policy, industry, and diplomacy to ensure long-term export success, our export ambitions risk remaining aspirational.

Another hurdle is whether India’s defence industry can deliver to global standards in quality, scale, timelines, and pricing. While we have shifted from importing to manufacturing, critical technologies like aero-engines, anti-missile systems, advanced UAVs and fighter jets of 5th generation and above still rely on foreign expertise. India exports small components to the U.S. and France, however exporting complete systems like multi-role light attack helicopters - Prachand and Akash missiles face hurdles in competitive markets due to the dominance of established exporters (US, Western Europe and Russia) and the need for proven reliability. Foreign buyers prioritise systems with established operational histories, a challenge for India’s relatively new indigenous platforms.

On the flip side collaborative models with foreign OEMs for co-design and co-development are gaining traction, the notion that “nobody will transfer us the technology” is only half-true. What went absolutely right here is the C-295 programme, a very tangible example of Government of India’s vision as it was the first ever programme given to Indian private aerospace industry to do what was never done before. The programme is a landmark collaboration between Airbus (Spain),

Tata Advanced Systems Limited (India), and Indian Defence Public Sector Undertaking (DPSUs). Similarly, success of BrahMos, supersonic cruise missile developed jointly by DRDO and Russia's NPO Mashinostroyeniya and even General Atomics' partnership with Bharat Forge to manufacture main landing gear components, subassemblies, and assemblies for remotely piloted aircraft.

It showcases how private industry and MSMEs can build a deep supply chain for aircraft production in India. Yet, the industry's evolution from 'build-to-print' to 'design-to-development' is slow. Lengthy acquisition cycles, often five to seven years, render technologies obsolete before they reach the market, undermining both industry and armed forces. Speed is thus paramount. Simplifying procurement, fostering urgency, and ensuring after-sales support are critical to earning global trust. Without these, India risks being outpaced by competitors who deliver faster and cheaper.

The third issue is the urgent need for strategic R&D. This is going to build internal capacity, increase patents leading to reduced dependency on global supply chains. Technologies like quantum communication, GPS-denied navigation, and long-life batteries are redefining defence landscapes. Yet, India's R&D spending of 3.9% of the defence budget lags far behind the 10-15% allocated by nations like the U.S. and China.

The promise to increase this to 10% over five years is encouraging, but funding alone isn't enough. A cultural shift is needed to embrace risk. As rightly put by Dr Samir V. Kamat, Chairman of the Defence Research and Development Organisation (DRDO), the fear of failure, reinforced by CAG audits that penalise unsuccessful projects, stifles innovation. R&D is inherently uncertain. Citing the America's Defense Advanced Research Projects Agency's (DARPA) willingness to invest in high-risk, low-reward R&D which proves that failure is part of progress. We must adopt similar flexibility, closing underperforming projects without fear of blame.

The fourth challenge is transitioning from a supply chain participant to a reliable, low-cost partner in global security. India's maritime heritage and strategic location in the Indian Ocean position us to offer naval capabilities to smaller nations through forums like QUAD and BIMSTEC. Yet, our shipbuilding industry contributing less than 1% to global tonnage, pales beside China's 51% dominance.

DPSUs, comfortable with Navy and Coast Guard orders, have little incentive to diversify into commercial vessels like bulk carriers or LNG tankers. Declaring shipbuilding an infrastructure sector could unlock investments, enabling public-private partnerships and foreign collaborations.

Lastly, a critical missing piece in achieving the ambitious target of ?50,000 crore in defence exports by 2029 lies in strengthening the capacities of SMEs and startups. This can be effectively addressed by placing consistent, long-term orders spanning five years and more through these enterprises. Such a commitment and assured purchase would provide the stability they need to invest in machinery, scale production, and grow sustainably, rather than risk closure within a year of operation.

The future beckons, but the path forward demands clarity, courage, and conviction.

We believe that India is poised to 'Make for the World,' but the window of opportunity is narrow. By aligning our ecosystem, meeting global standards, scaling our SMEs, investing in futuristic

technologies, and positioning ourselves as a trusted security partner, India will be able to transform from a buyer's nation to a builder's powerhouse.

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All about the P-8I Poseidon, India's 'Eye in the Sky' amid tensions over Pahalgam terror attack

Source: The Print, Dt. 06 May 2025,
URL: https://theprint.in/defence/pakistan-vigilantly-watching-indias-eye-in-the-sky-all-about-the-p-8i-poseidon/2617359/

Pakistan was "vigilantly watching" Indian Navy's maritime reconnaissance aircraft P-8I, the Pakistan Navy spokesperson said Monday in an apparent bid to showcase its surveillance capabilities in the backdrop of heightened tensions.

Irrespective of Pakistan's claim, the Indian Navy's aircraft was flying in international airspace and broadcasting its location on FlightRadar24, an open-source flight-tracking platform accessible to any party with an internet connection.

Sources in the Navy told thePrint that the presence of the P-8I in the Arabian Sea and the Indian Ocean Region is a regular occurrence. The aircraft has frequently been involved in anti-piracy missions, operating alongside Navy's Marine Commandos (MARCOS) and contributing to broader maritime domain awareness.

ThePrint looks at the P-8I long range maritime patrol aircraft, nicknamed India's Eye in the Sky', and its crucial role it essays for the Indian Navy.

A flying destroyer

The Boeing P-8I Poseidon, adapted from the Boeing 737 airframe, is the Indian Navy's most advanced long-range maritime patrol aircraft.

India inducted its first P-8I in 2013 after signing a $2.1 billion deal with the US in 2009 for eight aircraft. A follow-on order for four more was placed in 2016, with the final aircraft delivered in 2021. Furthermore, India is in talks to likely acquire 6 more aircraft.

Originally developed to replace the US Navy's ageing P-3 Orion fleet, the P-8I has been tailored to Indian operational requirements under a defence agreement with America.

The aircraft come with a combination of American systems and indigenous technologies developed by Indian defence public sector units and private manufacturers.

P-8I's capabilities are built around endurance, altitude and payload. It can fly up to 41,000 ft, remain airborne for over 10 hours, and cover over 1,200 nautical miles per mission—thereby, suitable for extended surveillance over both coastal and deep-sea theatres.

What makes it suitable for tracking submarines is the Magnetic Anomaly Detector (MAD) that can sense minor disturbances in the Earth's magnetic field caused by underwater metal objects like submarine hulls, while expendable sonobuoys acoustically track submarine activity below the surface.

Its arsenal includes AGM-84L Harpoon Block II anti-ship missiles, Mark 54 lightweight torpedoes, depth charges and free-fall bombs. These capabilities make it a formidable anti-submarine warfare (ASW) platform, a critical asset in tracking potentially hostile submarines in contested waters and earning it the moniker of "flying destroyer."

From seas to the Himalayas

Despite its primary maritime role, the P-8I has repeatedly proven useful in land-based operations as well.

The aircraft, according to sources in the defence, was used to monitor Chinese military deployments over the Himalayas during the 2017 Doklam standoff, a non-traditional environment for a naval aircraft.

Reports further indicate that a similar deployment followed the Pulwama terror attack in 2019, when the P-8I was reportedly used to monitor Pakistani military activity near the Line of Control (LoC).

Similarly, it was also engaged in post-Galwan operations in 2020, assisting in intelligence-gathering and data relay.

The sources indicated that the P-8I became a semi-permanent presence in the northern theatre due to a capability gap in the Indian Air Force's Intelligence, Surveillance, Target Acquisition, and Reconnaissance (ISTAR) assets. It helped bridge that gap with real-time imagery and data relay, directly aiding Army formations in contested zones along the Line of Actual Control (LAC).

P-8I has thus evolved into a strategic asset that serves beyond its original maritime mission, operating across land and sea in both conventional and grey-zone scenarios.

In addition, the aircraft's versatility extends to peacetime missions as well. It has supported search-and-rescue efforts, anti-piracy patrols in the Indian Ocean Region and environmental monitoring operations.

A notable episode took place in 2018, when a P-8I flying out of Mauritius helped locate the damaged sailing vessel S.V.Thuriya. The boat was carrying Indian naval officer Commander Abhilash Tomy (retired), who was injured in a storm and was stranded in a remote region of the Indian Ocean. The aircraft's long-range sensors played a critical role in narrowing down the search zone and ensuring his rescue.

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PL-15 Vs Meteor: Does The Chinese Missile Give Pakistan Air Force An Edge Over Indian Rafales?

Source: Swarajya, Dt. 06 May 2025,
URL: https://swarajyamag.com/defence/pl-15-vs-meteor-does-the-chinese-missile-give-pakistan-air-force-an-edge-over-indian-rafales

Some commentators on the Pakistani side claim that their PL-15 surpasses the performance of the Meteor missiles equipped on India's French Rafale fighters.

But does this advantage truly exist?

In February 2019, just over six years ago, the Indian Air Force (IAF) was involved in its first air battle in decades—a fierce skirmish with the Pakistan Air Force (PAF) that unfolded over the Line of Control. The outcome did little to bolster the IAF's image. The details of that chaotic day remain murky, obscured by a web of claims, counterclaims, disinformation, and outright propaganda from both sides, each eager to declare victory.

Yet, amid the haze, one undeniable truth emerged for the IAF: the PAF held a critical advantage in beyond visual range (BVR) combat.

Even Prime Minister Narendra Modi acknowledged the gap in capability, noting that if India had possessed the Rafale jets at the time, the outcome of the battle would have been very different. He remarked that none of India's fighter jets would have been lost, nor would any of Pakistan's attacking aircraft been spared, saying that the timely acquisition of Rafale would have made a difference.

His words weren't solely about the Rafale jet itself but rather a transformative capability it brought to the table—the Meteor missile. But more on the Meteor later.

Pakistan's BVR Edge

The roots of Pakistan's BVR superiority trace back to the post-9/11 era, when the United States, eager to bolster Pakistan as an ally in the war on terror, provided extensive military aid. The West, happy to oblige Pakistan for its support, equipped Pakistan with the weapons of Rawalpindi's choice. This support enabled the PAF to modernise its F-16 Falcon fleet, steadily eroding the IAF's numerical and technological edge.

By 2019, the PAF operated a diverse F-16 fleet, including 18 F-16C/D Block 52+ aircraft inducted in 2010, 13 F-16A/B ADF variants acquired from Jordan between 2014 and 2016, and 44 F-16A/B Block 15 models upgraded through Mid-Life Update (MLU) programs by Turkish Aerospace

Industries from 2010 to 2014 (Pakistan Air Force). The Block 52+ variants represents the pinnacle of Pakistan's air combat capabilities.

Over the years, the PAF has ensured that nearly all its F-16s, except the Jordanian ADFs, were fitted with the Northrop Grumman AN/APG-68(V)9 multi-mode radar, enhancing target detection and tracking (F-16 upgrades).

The most significant upgrade, however, has been the integration of the AIM-120 C-5 Advanced Medium-Range Air-to-Air Missile (AMRAAM), a beyond-visual-range missile with an active radar seeker and a range of approximately 100-120 km.

In 2006, Pakistan ordered 500 AMRAAMs as part of a $650 million deal, with deliveries beginning in 2010. This missile, widely used by NATO forces, gave the PAF a decisive edge in BVR engagements, a capability it lacked during the 1999 Kargil War. It was this edge in BVR engagements that blunted India's response to Swift Retort - Pakistan's response the IAF's surgical strike in Balakot following the Pulwama attack.

But as India has started tightening the screws on Pakistan following the April 22 Pahalgam attack, the conversation in Pakistani defence circles has shifted. It wasn't the AMRAAM that dominated discussions but the Chinese PL-15 missile, touted to outrange even the capabilities brought to bear by the IAF's Rafale fighters.

PL-15 Missile

Development of the Chinese PL-15 missile likely began around 2011, with its operational service with the People's Liberation Army Air Force starting in late 2016.

The missile, an advanced version of the PL-12 BVRAAM, can reach speeds of Mach 5. It boasts a maximum range of 200 to 300 km, with various sources reporting different figures. The missile is equipped with a two-way datalink that enables guidance updates between the missile and the launching aircraft.

The PAF is the first export customer for the PL-15. It has integrated the PL-15 with its Chengdu J-10C Firebird fighter ground-attack aircraft and is also equipping it on the Chengdu JF-17 Thunder Block III. The Block III variant features an AESA radar, replacing the mechanically scanned radar of earlier models to enhance targeting capabilities.

The PAF is believed to have the export version of the PL-15 missile, Fwhich is reported to have a significantly lower range of around 145 km.

However, there has been some speculation that Pakistan may possess the same PL-15 version used by the PLA, rather than the export model.

On April 29, the PAF released a video on its YouTube channel showcasing a JF-17 Block III armed with four PL-15 BVR missiles, marking the first official confirmation of the missile's integration with this platform. Pakistan received its initial batch of PL-15 missiles in 2021, and the Block III variant entered PAF service in 2023.

While other weapons shown in the video were identified as export versions, the PAF did not specify this for the PL-15, suggesting it might be using the same version as the PLA. If verified,

this would mark the first time a foreign military has been equipped with the full-range variant rather than the shorter-range export model.

The long-range strike capability offered by the PL-15 missile has been widely touted as a significant edge for the Pakistan Air Force (PAF). Some commentators on the Pakistani side even claim that it surpasses the performance of the Meteor missiles equipped on India's French Rafale fighters. But does this advantage truly exist?

Meteor Missile

As with most missile systems, the maximum range of the Meteor remains a closely guarded secret. Nevertheless, most authoritative sources estimate that it can engage aerial targets at distances of up to 130 miles (approximately 200 km) from the point of launch. Its true operational range likely falls somewhere between 120 and 200 km.

Like all air-to-air missiles, however, Meteor's range is not a fixed number—it is highly dependent on a host of variables, including the heading and manoeuvring of the target, as well as the altitude and speed of the launching aircraft.Regardless of the exact figures, Pakistan may be celebrating too soon.

What truly sets the Meteor apart is not its raw range figure, but its underlying propulsion system. The missile employs a solid-fuel, variable flow ducted rocket—commonly referred to as a ramjet —instead of a traditional single-stage solid rocket motor.

This design allows the Meteor to throttle its engine output across different phases of flight, unlike conventional rocket motors that discharge all of their energy in a single, continuous burn cycle.

When a standard missile is fired, it produces a fixed amount of thrust over a limited period, regardless of the tactical situation. If the target is relatively close and the missile reaches it while still powered—or shortly after motor burnout—it retains high energy during the terminal phase. This allows for aggressive manoeuvring, enabling the missile to stay on target even as the adversary attempts last-second evasive manoeuvres.

However, if the target is farther away, the missile typically climbs to altitude during the boost phase, then coasts through the remaining flight on momentum and altitude advantage, descending toward the target during its terminal phase.

If the target lies within range and the missile is still at a higher altitude, it may dive on the target during its final approach in order to preserve energy and increase manoeuvrability. But fundamentally, the farther the missile has to travel, the less energy it has remaining when it matters most—during its terminal attack phase. That lack of endgame energy can critically reduce the missile's ability to hit manoeuvring targets at long range.

This is precisely where the Meteor's ramjet propulsion delivers a decisive advantage. Because it can throttle its engine output, it is capable of cruising at moderate power to conserve fuel during the midcourse phase and then accelerating during the terminal phase.

As a result, even at extended ranges, the Meteor can enter its final attack at or near maximum energy, traveling at speeds up to Mach 4.5. This ensures that it retains maximum agility and kinetic advantage, regardless of the distance it had to cover.

Not only does this allow for more aggressive manoeuvring in the final seconds of flight, but it also dramatically increased the size of the missile's "no escape zone."

In operational terms, this means the Meteor can chase down and successfully intercept targets over a wider range of scenarios—including those that would normally fall outside the effective kill envelope of traditional missiles. It can continue to pursue fast-moving or evasive aircraft with a significantly higher probability of success at long distances.

Thus, Meteor's superiority lies not merely in its range, nor in advanced sensors or a larger motor, but in its fundamentally different—and more intelligent—propulsion approach.

No Edge For PL-15

For the PAF, the PL-15 does offer better capability, but it offers no edge over the Meteor.In a study for the Royal United Services Institute, researcher Justin Bronk concluded that the "PL-15 outranges the latest AIM-120D model" but isn't more capable that the Meteor.

According to Bronk, the PL-15 has "a comparable maximum range to the Meteor," but he further observes that "the European weapon will likely retain a significantly larger no-escape zone and a much higher probability of kill beyond 100 km due to its ramjet propulsion system."

These conclusions were drawn from his discussions with serving Royal Air Force and United States Air Force fast jet pilots, conducted in 2020.

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IAF Can't Wait For 2035; India Must Acquire 40 5th-Gen Fighters As Stopgap Solution: OPED

Source: The EurAsian Times, Dt. 07 May 2025,
URL: https://www.eurasiantimes.com/india-pakistan-war-iaf-cant-wait-for-2035-india/

As India launched Operation Sindoor targeting Pakistan's terrorist facilities, the IAF (Indian Air Force) must be well prepared for the future and a possible military clash with both Pakistan and China. In a major counter-terrorism operation during the night of May 6–7, the Indian Armed Forces conducted large-scale air strikes targeting nine locations across Pakistan and Pakistan-occupied Kashmir (PoK). The strikes focused on key infrastructure and hideouts linked to the terror outfits Jaish-e-Mohammed and Lashkar-e-Taiba (LeT).

Visual evidence confirms the destruction of multiple buildings, with reports indicating significant casualties. The Pakistani government has acknowledged air strikes at six locations, marking a rare and substantial escalation in the region.

India needs to be ready for the future!

With every sortie, our fighter pilots remain steadfast, guarding the nation. Their resolve is unwavering, their training world-class. While our air warriors train as they fight, we as a nation must ensure they don't outfly the future in legacy platforms. That should remain a last resort, if at all. As the world accelerates into an era defined by stealth, sensor fusion, and artificial intelligence, India must make a decisive leap. The acquisition and development of fifth-generation fighter aircraft is no longer aspirational—they are imperative.

While Skill Soars, Platforms Must Follow

Indian fighter pilots have long been the backbone of regional air dominance. From Red Flag in Nevada to Garuda in France to numerous multi-nation exercises hosted, they've outperformed global peers time and again. "The man behind the machine" has always been India's edge.

But warfare has changed. Stealth, first-look advantage, electronic warfare, and data fusion define air superiority. No matter how skilled, a pilot in a non-stealth fourth-generation jet is at a disadvantage when facing an adversary with stealth technology and superior situational awareness.

Geopolitics In Afterburner: The China Challenge

India's evolving threat matrix is no longer hypothetical. The 2020 Ladakh standoff, followed by PLAAF's rapid deployments, defines the urgency. China's high-altitude airbases in Tibet may face performance limitations, but they're rapidly being populated with J-20 Mighty Dragons—a fifth-generation stealth fighter. With more than 150 in service, the PLA is consolidating air dominance on India's northern front. Add to this a strategic entente between China and Pakistan. Beijing's assistance in developing the JF-17 and potentially transferring fifth-gen training packages to Islamabad poses a two-front challenge India can no longer ignore.

AMCA: India's Dream With A 5.5-Gen Vision

India's strategic project, the Advanced Medium Combat Aircraft (AMCA), is advancing rapidly. Being developed as a 5.5-generation fighter, AMCA blends fifth-generation stealth with sixth-generation technologies like:

- AI-enabled electronic co-pilot
- Modular open architecture avionics
- Internal weapons bays
- Diverter less Supersonic Intakes for low RCS

Why AMCA Is More Than a Fighter

The AMCA is not just a machine—it's a symbol of sovereign aerospace capability gained by the development of the in-service LCA and numerous past projects (India's fighter aircraft ecosystem has been growing over the years, initiated in the 1950s). With 75% Indigenous content planned, including radar, flight control, stealth materials, and avionics, AMCA marks a generational leap for Indian fighter aircraft development.

The transformation due to AMCA's development lies in the aerospace ecosystem it is nurturing across India. It's about creating an industrial and technological base to support future combat air programs, exports, and Indigenous sustainment.

Foundation Laid By The LCA Tejas

The Light Combat Aircraft (LCA) Tejas program, further built:

- Design and engineering expertise within ADA (Aeronautical Development Agency) and HAL.
- Flight control and fly-by-wire systems were developed in collaboration with Indian institutions.
- An ecosystem of over 200 suppliers, many in the private sector, delivering avionics, structures, and subsystems.
- A culture of iterative testing and validation is crucial for advanced fighter programs.

The lessons from the LCA—in modular avionics, composite airframes, digital design, and Indigenous radar—directly feed into AMCA. For example, the Uttam AESA radar, developed for Tejas Mk1A and Mk2, will evolve further for AMCA integration.

AMCA: The Next-Gen Leap

The AMCA demands even more complex capabilities:

- Stealth shaping and low-observable materials
- Internal weapons bays and advanced aerodynamics
- AI-based sensor fusion and electronic warfare suites

This requires a supply chain shift from parts to modules. ADA plans to assign entire segments (e.g., wings, fuselage) to private sector firms. This modularity builds:

- High-end precision manufacturing capacity
- Digital engineering platforms using CAD/CAM/PLM
- Certification and QA frameworks aligned with military aviation standards

Private Sector Integration and Capability Building

AMCA is pushing traditional boundaries by integrating:

- MSMEs with tier-2 and tier-3 capabilities into a tiered aerospace supply chain
- Firms like L&T, Tata Advanced Systems, Godrej Aerospace, and VEM are entering co-development roles
- Academic institutions and research labs, including IITs and DRDO labs, for materials, AI, propulsion systems, and flight software

Importantly, AMCA is being designed to evolve. Its open systems architecture will allow plug-and-play upgrades, ensuring relevance beyond 2050.

Plugging The Capability Gap: Interim Fifth-Gen Fighters Needed

While AMCA progresses, India must urgently address the current capability gap. With only 31 active squadrons (against the sanctioned strength of 42) and an ageing fleet of MiG-29s, Jaguars, and Mirage-2000s, India cannot afford to wait until 2035. What's needed is a stop-gap solution: acquiring a few squadrons (36–40 aircraft) of fifth-gen stealth fighters by 2028 (maybe on lease or other forms of procurement).

These aircraft will offer:

- Stealth: Radar-evading entry into contested airspace
- Supercruise: Supersonic flight without afterburners
- Sensor Fusion: 360° situational awareness
- Electronic Warfare: Ability to jam, spoof, and deceive
- Multi-role Flexibility: Strike and air superiority in one platform

Comparing The World's Fifth-Generation Fighters

Fighter Jet	Country	Role	Max Speed	Supercruise	Stealth	Internal Missile Load*	Service Entry
AMCA	India	Multirole	Mach 1.8	Planned	Low RCS	4-6 internal stations (planned)	2035 (planned)
Sukhoi Su-57 Felon	Russia	Multirole	Mach 2.0	Yes	Moderate Stealth	4-6 internal stations	2020 (limited)
F-22 Raptor	USA	Air Superiority	Mach 2.25	Yes (Mach 1.8)	Very Low RCS	6 + 2 internal (side bays)	2005
F-35 Lightning II	USA	Multirole	Mach 1.6	Yes	Very Low RCS	4 internal stations	2015
Chengdu J-20	China	Multirole	Mach 2.0	Likely	Moderate Stealth	6-8 internal stations	2017
KF-21 Boramae	South Korea	Multirole	Mach 1.8	Planned	Partial Stealth	0 (Block-1)	2026 (Block-1)
TF Kaan	Turkey	Multirole	Mach 1.8	Planned	Planned Stealth Features	Planned 4-6 internal stations	2030+ (expected)
J-35 / FC-31	China	Multirole	Mach 1.8	Unknown	Moderate Stealth	4-6 internal stations	Unknown

Obviously, most 5th-generation aircraft can also carry external weapons, but that depends on the mission requirements and impacts the aircraft's stealth capabilities.

Can A 4.5-Generation Take On A 5th-Generation Aircraft?

Yes, it's possible in some scenarios, but not consistently or across the full battlespace.

Pilot Skill: The "Man Behind the Machine"

In visual range (dogfight) scenarios, pilot training and situational awareness are crucial.

- A highly trained pilot in a 4.5-gen aircraft like the Rafale or upgraded Su-30MKI may outmanoeuvre a 5th-gen pilot with less experience.
- This has happened in exercises: e.g., IAF Su-30MKIs gave a tough time to F-22 Raptors in Red Flag 2008, though those were heavily scripted exercises.

Stealth & Sensor Fusion Tilt the Battlefield

- 5th gen jets (like Su-57, F-22, F-35, J-20) are designed to kill before being seen, not to engage in traditional dogfights.
- Their advantages include Stealth (Low RCS), Sensor fusion, Long-range engagement, and Electronic warfare dominance.

Upgrades Help, But Can't Eliminate Limitations

- Adding AESA radar, IRST, electronic warfare systems, and long-range missiles helps close the gap.
- Example: Rafale F4, Su-30 Super Sukhoi, and Tejas Mk2 will have highly upgraded capabilities.
- However, 4.5-gen platforms still have higher radar signatures, may lack supercruise or internal weapons bays, and are more vulnerable to networked data warfare.

The Human + Machine Combine

- In BVR (Beyond Visual Range) combat, 5th-generation aircraft usually dominate due to stealth and data fusion.
- In WVR (Within Visual Range), with HMS (Helmet Mounted Sights), off-boresight missiles like ASRAAM or R-73, and thrust-vectoring, a 4.5 gen jet could win.

Indian pilots are globally respected for their adaptability and training. With AMCA still years away, India is heavily upgrading Su-30MKI (Super Sukhoi) and relying on Rafales. However, to maintain deterrence against stealth-equipped adversaries like the J-20, India must acquire or deploy 5th-generation fighters alongside these upgrades.

From Theory To Tarmac: The Road Ahead

To secure its skies and strategic autonomy, India must do the following:

- Short Term: Procure 36–40 fifth-generation fighters for immediate deployment by 2028.
- Medium Term: Accelerate AMCA development, testing, and production timelines.
- Long Term: Invest in 6th-gen technologies (swarm drones, AI wingmen, quantum radar). Some work is already underway; this would accelerate further.
- Support Infrastructure: Upgrade forward bases in Ladakh, increase AEW&C and tanker assets, and invest in resilient ISR networks. The IAF is doing some of this currently.

Conclusion: A Fighter Is More Than Its Frame

India's pilots are world-class, and our manufacturers are rising to the occasion. The enemy is watching. In a world where dogfights happen through data and missiles find targets before radar sees them, India must match talent with technology.

A fighter jet is not just a weapon. It is a flying declaration of a nation's strength, resolve, and readiness. AMCA is India's long stride into the future. But bridging the present with a few squadrons of fifth-generation fighters will be the runway to strategic deterrence.

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China Unveils World's First Barrage-Style Anti-Drone "Bullet Curtain"; Will It Be A Game-Changer?

Source: The EurAsian Times, Dt. 06 May 2025,
URL: https://www.eurasiantimes.com/first-barrage-style-anti/

Revealed in the April issue of 'Modern Weaponry' – a Chinese defense magazine, the system is described as a novel approach to terminal defense, one that Chinese sources suggest may be the first of its kind globally. The system also signals China's growing focus on saturating firepower to counter the rising role of unmanned and high-speed precision weapons.

Speed Of "Metal Storm"

At the heart of this new system is a multi-barrel barrage weapon, informally referred to as "Metal Storm." The prototype features 16 tightly grouped 35mm barrels capable of firing "unique munitions" at an extraordinary combined rate of up to 400,000 rounds per minute. This level of firepower enables the system to produce an exceptionally dense "Bullet Curtain" of projectiles.

According to a report by the 'South China Morning Post', this density is sufficient to intercept incoming hypersonic missiles traveling at speeds beyond Mach 7—a capability that, if validated, would mark a notable advance in short-range naval air defense. The system reportedly outpaces the fire rate of China's current Type 1130 close-in weapon system (CIWS), and is designed to neutralize both fast-moving anti-ship missiles and complex threats like coordinated drone swarms. If fully integrated, it could significantly improve the defensive resilience of Chinese warships in increasingly contested maritime environments.

From Concept To Capability

The concept behind the so-called "Metal Storm" weapon traces back to the 1990s, when Australian inventor Mike O'Dwyer first proposed a radically new approach to rapid-fire weaponry. His company, Metal Storm Inc., developed a 36-barrel prototype capable of firing up to one million rounds per minute—a record-breaking rate that drew international attention. In 2006, O'Dwyer claimed that China's People's Liberation Army (PLA) had approached him with an offer reportedly worth US$100 million for access to the technology.

Meanwhile, the US Department of Defense also engaged O'Dwyer in exploring battlefield applications for the weapon. Despite early interest and promising tests, the project struggled with technical hurdles and ultimately stalled. Metal Storm Inc. filed for bankruptcy in 2012, marking

the end of the original Western effort to bring the concept into military service. While the Western project faded, China continued to invest in the idea.

The current system is being developed by Harbin First Machinery Group Co., Ltd., a subsidiary of the state-owned defense conglomerate North Industries Group Corporation (NORINCO). With state-backed research and development resources, Chinese engineers revisited the Metal Storm principles—preloaded munitions and electronically controlled ignition—and adapted them into a new generation of high-density firepower systems.

According to 'Modern Weaponry', China's version not only revives the original Metal Storm vision but significantly enhances it, both in firing rate and versatility. Some Chinese researchers now believe their design exceeds the performance of the early Australian prototype by a factor of ten, potentially opening the door to a range of naval and land-based military applications.

What Sets It Apart?

China's new barrage weapon system stands out not just for its immense firepower but for its adaptability. Designed as a vehicle-mounted defense platform, the system can be deployed on a wide range of platforms—from trucks and armored vehicles to naval warships—thanks to its modular design. This flexibility allows it to be rapidly integrated across different branches of the armed forces, tailoring defense to the demands of varied combat environments.

The "Wall of Bullets" Concept

At the heart of the system is a 16-barrel configuration, with each barrel capable of firing up to 12,000 rounds per minute. Controlled by a sophisticated electronic ignition system, the weapon unleashes a tightly choreographed sequence of fire that forms a dense "wall of bullets" or "Bullet Curtain" – a broad, high-speed curtain of projectiles designed to intercept incoming threats such as drone swarms or supersonic missiles.

Yu Bin, the system's chief designer, explains that the weapon uses a "plane-to-point" interception concept, in contrast to the traditional "point-to-point" method used by conventional air defense guns. While conventional systems focus on hitting specific targets, this design floods the projected path of incoming threats with firepower, increasing the probability of interception, especially against numerous or fast-moving targets.

Solving the Reload Problem: One of the biggest logistical challenges for such high-rate-of-fire systems has always been reloading. With millions of rounds potentially expended in minutes, conventional reload mechanisms fall short. Chinese engineers addressed this by developing a containerized magazine system: each container includes preloaded barrels filled with ammunition. After firing, the entire unit—barrels and all—is discarded and replaced, streamlining the reload process and keeping the system combat-ready with minimal downtime.

Versatile Naval Integration: In addition to its land-based applications, the system is designed for seamless integration into a variety of naval platforms, including destroyers and frigates. It provides close-range defense within a 3 to 5 km envelope, capable of engaging both supersonic and subsonic threats. This includes sea-skimming anti-ship missiles and fast, maneuvering drones—targets that are traditionally difficult to intercept with conventional systems.

Advanced Ammunition and Fire Control: The system supports multiple types of 35mm ammunition, most notably the AHEAD programmable airburst round, which detonates in proximity to the target to release a controlled burst of sub-projectiles. This feature enhances the system's precision lethality, especially against small, agile threats such as drones or incoming munitions. 'Modern Weaponry' emphasizes that the weapon's rapid firing cycle and broad-area coverage offer a form of multi-layered close-in defense, enabling warships to respond quickly to sudden, high-density attacks.

Cost-Effective and Combat-Ready: Additional reporting from Chinese media underscores several practical advantages: the system is relatively low-cost, designed for high survivability, and capable of sustained operation in prolonged engagements. In contrast to traditional missile-based air defenses, which can be quickly depleted in a heavy exchange, this gun-based barrage system offers a more durable solution for defending critical platforms under continuous threat.

Mass Production And Strategic Potential

According to Modern Weaponry, China's version of the "Metal Storm" has progressed beyond the prototype stage to become the only system of its kind in the world to enter mass production. This marks a significant milestone, positioning it as a potentially game-changing asset in countering saturation attacks, especially those involving volleys of cruise missiles or large-scale drone incursions. Its mass production status also signals China's readiness to field the system widely across its armed forces and opens the door for international export.

Chinese sources suggest that its operational versatility, high-volume lethality, and cost-efficiency make it an attractive option for countries looking to modernize their close-in air defense capabilities without becoming overly dependent on costly missile systems.

Drones, Deterrence, And The Taiwan Strait

The timing of this development is far from incidental. China's rapid advances in defensive technology, such as its new barrage weapon system, unfold against the backdrop of mounting strategic tension across the Taiwan Strait, where the cost of future conflict is measured not only in firepower but also in lives. The United States and Taiwan have already begun strengthening their drone capabilities. Long-range platforms like the MQ-4C Triton and MQ-9B Reaper are being deployed, while Taiwan's Ministry of National Defense has committed to producing 3,500 domestically made drones. A UAV testing and development hub is also planned for Chiayi County to fast-track innovation and supply chain readiness.

Unmanned aerial systems are now central to Taiwan's asymmetric defense strategy. Large drones will conduct surveillance and battlefield coordination, while smaller and mid-sized UAVs are being equipped for electronic warfare, jamming, and precision strikes, especially in the event of a beachhead assault. In this evolving tactical environment, China's barrage weapon seems engineered with a specific mission: to saturate the skies with firepower capable of neutralizing swarms of drones before they reach their targets.

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Science & Technology News

Gaganyaan mission moved to ‘first quarter of 2027’, says ISRO chief

Source: The Hindu, Dt. 06 May 2025,
URL: https://www.thehindu.com/news/national/gaganyaan-mission-slated-for-first-quarter-of-2027-isro-chief-narayanan/article69544954.ece

he Indian Space Research Organisation (ISRO) expects the Gaganyaan mission to launch Indian astronauts into space will only take place in the “first quarter of 2027”, V. Narayanan, Chairman, ISRO, said at a press conference on Tuesday.

While it will be preceded by three test launches — two uncrewed and one with a robot — this is the latest extension of the launch date, in this most anticipated of ISRO’s missions. The crewed mission was initially proposed for 2022 but kept being pushed to subsequent years, with early 2027 being the latest timeline.

Minister for Space Jitendra Singh and Mr. Narayanan said the delays had been caused by the COVID-19 pandemic; the tests required to train astronauts; extra test flights of the launch vehicle; and a revamped Gaganyaan programme under which eight missions, both crewed and uncrewed, would be executed till 2028.

“There are thousands of components and at least 10 lakh lines of code that need to be written for ensuring that the crew in the launch vehicle is safe, can escape in case of an emergency, [and] they can be brought back safely to Earth after the mission is completed,” Mr. Narayanan said, adding, “About 10,000 people working for four-five years have to be credited with the progress made so far.”

Mr. Narayanan also said the Axiom-4 private space mission to carry Indian astronaut Shubhanshu Shukla to the International Space Station was scheduled for the first week of June. Officially, this launch, according to Axiom, is scheduled for May 29. India has paid ₹550 crore to Axiom for taking the first Indian astronaut to space after Rakesh Sharma’s journey of 1984. “This mission will allow Mr. Shukla to conduct several missions as well as gain extremely valuable experience, which will be useful to us,” Mr. Narayanan said.

For the first uncrewed mission expected later this year, with a robot called Vyom-mitra on board, all propulsion systems for the human-rated launch vehicle are ready, and about 90% of the necessary infrastructure and tests are also ready.

Some of the tests from the Gaganyaan mission will also feed into the development of the Bharatiya Antariksh Station, expected in 2035. The recent success of the space docking experiment (Spadex), in early January, where two satellites moving at high speeds were ‘docked’ or conjoined autonomously, was critical to future missions, including the development of the five-module Bharatiya Antariksh Space Station.

In 2028, ISRO expects to employ docking technology as a ‘space docking’ experiment to the International Space Station. This will be followed by sending the first of the five modules by 2028. “Once it’s successful, we will go ahead with the rest of the modules,” Mr. Narayanan said.

The Spadex experiment met all its objectives with only half the fuel originally supplied, and therefore could be used for “several more experiments”.

“The recently conducted Spadex circumnavigation experiment was one such with a variety of uses such as satellite repair and strategic applications,” Mr. Narayanan said. Docking was also necessary for the Chandrayaan -4 mission, which hopes to bring back lunar material, as well as India’s planned manned mission to the moon in 2040.

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