Research Unit
Press Information Bureau
Government of India

Operation SINDOOR: The Rise of Aatmanirbhar Innovation in National Security

India's growing technological self-reliance

14th May, 2025

Introduction

Operation SINDOOR emerged as a calibrated military response to an evolving pattern of asymmetric warfare, one that increasingly targets unarmed civilians along with military personnel. The terrorist attack on tourists in Pahalgam in April 2025 served as grim reminder of this shift. India's response was deliberate, precise, and strategic. Without crossing the Line of Control or international boundary, Indian forces struck terrorist infrastructure and eliminated multiple threats. However, beyond tactical brilliance, what stood out was the seamless integration of indigenous hi-tech systems into national defence. Whether in drone warfare, layered air defence, or electronic warfare, Operation SINDOOR marks a milestone in India's journey towards technological self-reliance in military operations.

Air Defence Capabilities: Tech as the First Line of Protection

On the night of 07-08 May 2025, Pakistan attempted to engage a number of military targets in Northern and Western India including Awantipura, Srinagar, Jammu, Pathankot, Amritsar, Kapurthala, Jalandhar, Ludhiana, Adampur, Bhatinda, Chandigarh, Nal, Phalodi, Uttarlai, and Bhuj, using drones and missiles. These were neutralised by the Integrated Counter UAS (Unmanned Aerial Systems) Grid and Air Defence systems.

Air Defence systems detect, track, and neutralise threats using a network of radars, control centres, artillery, and both aircraft- and ground-based missiles.

On the morning of May 8, the Indian Armed Forces targeted Air Defence Radars and systems at a number of locations in Pakistan. An Air Defence system at Lahore was neutralised.[1]

[1] https://www.pib.gov.in/PressReleasePage.aspx?PRID=2127670

PERFORMANCE OF SYSTEMS

As part of Operation SINDOOR, the following were used:

- Battle-proven AD (Air Defence) systems like the Pechora, OSA-AK and LLAD guns (Low-level air defence guns).
- Indigenous systems such as the **Akash**, which demonstrated stellar performance

AKASH is a Short Range Surface to Air Missile system to protect vulnerable areas and vulnerable points from air attacks. The AKASH Weapon System can simultaneously engage Multiple Targets in Group Mode or Autonomous Mode. It has built in Electronic Counter-Counter Measures (ECCM) features. The entire weapon system has been configured on mobile platforms.[2]

India's Air Defence Systems, combining assets from the Army, Navy, and primarily the Air Force, performed with exceptional synergy. These systems created an impenetrable wall, foiling multiple attempts by Pakistan to retaliate.

The Integrated Air Command and Control System (IACCS) of the Indian Air Force brought all these elements together, providing the net-centric operational capability vital for modern warfare.

Offensive Actions with Pinpoint Accuracy

India's offensive strikes targeted key Pakistani airbases- Noor Khan and Rahimyar Khan with surgical precision. Loitering munitions were used to devastating effect, each finding and destroying high-value targets, including enemy radar and missile systems.

Loitering munitions also known as "suicide drones" or "kamikaze drones", are weapons systems that can hover or circle a target area, searching for a suitable target before attacking.

[2] https://www.drdo.gov.in/drdo/akash

All strikes were executed without loss of Indian assets, underscoring the effectiveness of our surveillance, planning, and delivery systems. The use of modern indigenous technology, from long-range drones to guided munitions, made these strikes highly effective and politically calibrated.

Indian Air Force **bypassed and jammed Pakistan's Chinese-supplied air defence systems**, completing the mission in just 23 minutes, demonstrating **India's technological edge**.

Evidence of Neutralized Threats

Operation SINDOOR also produced concrete evidence of hostile technologies neutralized by Indian systems:

- Pieces of **PL-15 missiles** (of Chinese origin)
- **Turkish-origin UAVs**, named "Yiha" or "YEEHAW"
- **Long-range rockets, quadcopters and commercial drones**

These were recovered and identified, showing that despite Pakistan's attempts to exploit advanced foreign-supplied weaponry, India's indigenous air defence and electronic warfare networks remained superior.

Performance of Systems: Air Defence Measures of the Indian Army

On May 12, *Lt Gen Rajiv Ghai, Director General Military Operations*, in the Operation SINDOOR press briefing highlighted the excellent performance of a mix of legacy and modern systems:

Preparedness and Coordination:

Since precise strikes on terrorists were conducted without crossing the Line of Control or International Boundary, it was anticipated Pakistan's response would come from across the border.

- A unique blend of Counter Unmanned Aerial Systems, Electronic Warfare assets, and Air Defence Weapons from both Army and Air Force
- Multiple defensive layers from the International Boundary inward:
    a) Counter Unmanned Aerial Systems
    b) Shoulder-Fired Weapons
    c) Legacy Air Defence Weapons
    d) Modern Air Defence Weapon Systems

This multi-tier defence prevented Pakistan Air Force attacks on our airfields and logistic installations during the night of May 9-10. These systems, built over the last decade with continuous government investment,

proved to be force multipliers during the operation. They played a crucial role in ensuring that both civilian and military infrastructure across India remained largely unaffected during enemy retaliation attempts.

ISRO's contribution: At an event on May 11, ISRO Chairman V Narayanan mentioned that At least 10 satellites are continuously working round-the-clock for the strategic purpose to ensure the safety and security of the citizens of the country. To ensure the safety of the country, the nation has to serve through its satellites. It has to monitor its 7,000 km seashore areas. It has to monitor the entire Northern part continuously. Without satellite and drone technology, the country can't achieve that.[3]

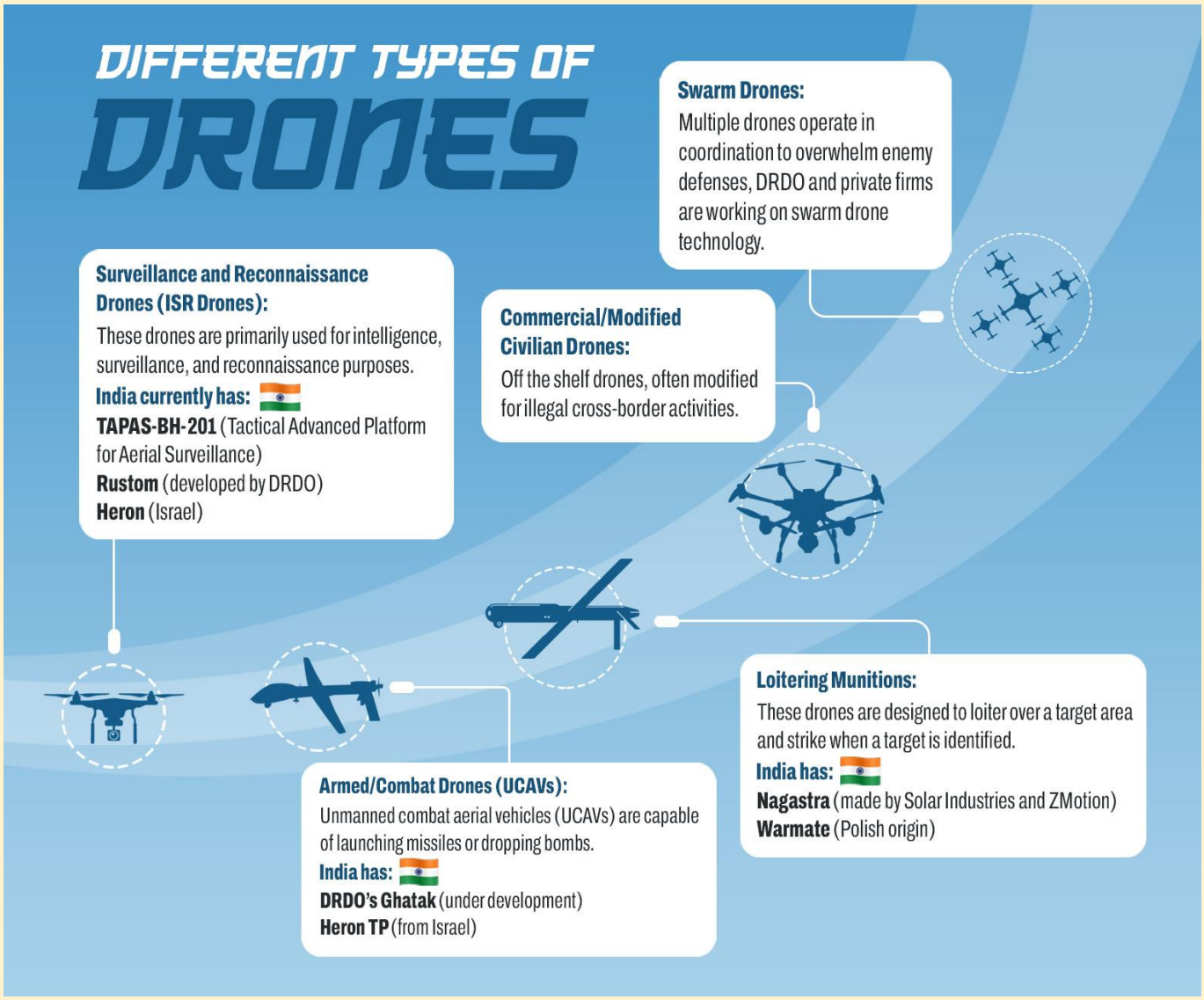
The Business of Drone Power: A Rising Indigenous Industry

The **Drone Federation India (DFI)**, is a premier industry body representing over **550 drone companies and 5500 drone pilots**[4]. DFI's vision is to make India a global drone hub by 2030, and it promotes the design, development, manufacturing, adoption and export of Indian drone and counter-drone technology worldwide. DFI enables ease of doing business, promotes the adoption of drone technology, and hosts several programs like Bharat Drone Mahotsav.[5] Some companies involved in the drone space are:

- Alpha Design Technologies (Bengaluru): Partnered with Israel's Elbit Systems to build SkyStriker.
- Tata Advanced Systems offers a full range of integrated solutions across Defence & Security and has served as a trusted partner to India's armed forces for over six decades[6]
- Paras Defence & Space Technologies operates within the Defence and Space segments, distinguished by Indigenously Designed Developed and Manufactured (IDDM) capabilities[7]
- IG Drones is a Drone Technology Company for manufacturing and R & D of Drones specialized in defence and other industry applications along with provider of drone related services like drone surveying, mapping & inspection by industry experts. The company has partnered with Indian Army, Government of India , multiple State Governments, among others.[8]

[3] https://www.youtube.com/watch?v=rvDkFE4mB1M
[4] https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2112555
[5] https://nidar.org.in/about/
[6] https://www.tataadvancedsystems.com/about
[7] https://parasdefence.com/
[8] https://igdrones.com/

The Indian drone market is projected to reach $11 billion by 2030, accounting for 12.2% of the global drone market.[9]



Drones at the Centre of Modern Warfare

The integration of drone warfare into India's military doctrine owes its success to years of domestic R&D and policy reform. Since 2021, the ban on imported drones and the launch of the PLI (Production Linked Incentive) scheme have catalyzed rapid innovation. The scheme of Production Linked Incentive for drones and drone components of Ministry of Civil Aviation was notified on 30th September, 2021 with a total incentive of Rs 120 crores spread over three Financial Years (FYs), FY 2021-22 to FY 2023-24.[10] The future lies in autonomous drones with AI-driven decision-making, and India is already laying the groundwork.

[9] https://www.igdtuw.ac.in/IGDTUW/uploads/798386185.pdf
[10] https://sansad.in/getFile/loksabhaquestions/annex/184/AU5448_8thzxt.pdf?source=pqals

Defence exports crossed the record figure of about **Rs 24,000 crore** in Financial Year 2024-25. The aim is to increase the figure to Rs 50,000 crore by 2029, and make India a developed nation and the world's largest defence exporter by 2047. [11]

Make in India continues to power the growth of the defence sector.

India has emerged as a major defence manufacturing hub, driven by the "Make in India" initiative and a strong push for self-reliance. In FY 2023–24, indigenous defence production reached a record ₹1.27 lakh crore, while exports soared to ₹23,622 crore in FY 2024–25, a 34-fold increase from 2013–14. Strategic reforms, private sector involvement, and robust R&D have led to the development of advanced military platforms like the Dhanush Artillery Gun System, Advanced Towed Artillery Gun System (ATAGS), Main Battle Tank (MBT) Arjun, Light Specialist Vehicles, High Mobility Vehicles, Light Combat Aircraft (LCA) Tejas, Advanced Light Helicopter (ALH), Light Utility Helicopter (LUH), Akash Missile System, Weapon Locating Radar, 3D Tactical Control Radar, and Software Defined Radio (SDR), as well as naval assets like destroyers, indigenous aircraft carriers, submarines, frigates, corvettes, fast patrol vessels, fast attack craft, and offshore patrol vessels.

The government has backed this growth with record procurement contracts, innovations under iDEX, drives like SRIJAN, and two Defence Industrial Corridors in Uttar Pradesh and Tamil Nadu. Key acquisitions such as LCH (Light Combat Helicopters) Prachand helicopters and the ATAGS (Approval for Advanced Towed Artillery Gun System**)** highlight the shift towards indigenous capability. With targets of ₹3 lakh crore in production and ₹50,000 crore in exports by 2029, India is firmly positioning itself as a self-reliant and globally competitive defence manufacturing power.

Conclusion:

Operation SINDOOR is not just a story of tactical success. It is a validation of India's defence indigenization policies. From air defence systems to drones, from counter-UAS capabilities to net-centric warfare platforms, indigenous technology has delivered when it mattered most. The fusion of private-sector innovation, public-sector execution, and military vision has enabled India to not only defend its people and territory but also assert its role as a hi-tech military power in the 21st century. In future conflicts, the battlefield will increasingly be shaped by technology. And India, as shown in Operation SINDOOR, is ready, armed with its own innovations, backed by a determined state, and powered by the ingenuity of its people.

References:

- Operation SINDOOR Press Briefing (May 12)

[11] https://www.pib.gov.in/PressReleasePage.aspx?PRID=2127735

- https://sansad.in/getFile/loksabhaquestions/annex/184/AU5448_8thzxt.pdf?source=pqals
- https://www.drdo.gov.in/drdo/akash
- https://www.pib.gov.in/PressReleasePage.aspx?PRID=2127670
- https://www.youtube.com/watch?v=rvDkFE4mB1M
- https://www.pib.gov.in/PressReleaseIframePage.aspx?PRID=2112555
- https://nidar.org.in/about/
- https://www.tataadvancedsystems.com/about
- https://parasdefence.com/
- https://igdrones.com/
- https://www.igdtuw.ac.in/IGDTUW/uploads/798386185.pdf
- https://sansad.in/getFile/loksabhaquestions/annex/184/AU5448_8thzxt.pdf?source=pqals
- https://www.pib.gov.in/PressReleasePage.aspx?PRID=2127735

Santosh Kumar/ Ritu Kataria/ Kritika Rane