

Autonomous Warfare in Operation Sindoor: India-Pakistan Drone Conflict

May 30, 2025 • vajiramandravi.com



Autonomous Warfare Latest News

- Launched in early May as retaliation for the April 22 Pahalgam terror attack, **Operation Sindoor** marked the first direct drone-led military conflict between nuclear-armed India and Pakistan.
- Over four days, both nations shifted to a new mode of engagement centered on **Unmanned Aerial Systems (UAS)**—including armed drones, loitering munitions, and electronic decoys—operating below the threshold of full-scale war.
- Prior to the operation, **Israeli Heron MK-II** and indigenous **TAPAS-BH-201 (Rustom-II)** UAVs conducted deep surveillance into Pakistani airspace.
- From May 7, India struck nine targets, and both sides deployed a wide range of drones for **real-time ISR (Intelligence, Surveillance, Reconnaissance)** and **precision strikes**.
- Tactics included the use of **decoy drones** to spoof enemy radars and drain interceptor stocks. The conflict de-escalated by **May 10** following a ceasefire, setting a precedent for **drone-centric warfare in South Asia**.

India's Use of Aerial Systems in Operation Sindoor

- India used a varied fleet of Unmanned Aerial Systems (UAS), including:
 - Indigenous loitering munitions like **Nagatra-1**
 - Israeli-origin **Harop drones** (capable of autonomous radar targeting)
 - **Swarm drones** developed by DRDO and private firms for radar saturation

Tactical Strategy: Sequenced Drone Strikes

- Initial waves included decoy drones and EW (electronic warfare) payloads to confuse radar and exhaust SAM (Surface-to-Air Missile) defences.
- Followed by **precision loitering munitions** and **armed UAVs** guided by Heron MK II and TAPAS-BH-201 drones.
- **Quadcopters and micro-UAVs** supplied real-time ISR feeds via the **Integrated Battle Management System (IBMS)** for dynamic target acquisition.

Notable Impacts and Strikes

- Reports claimed a **cricket match in Rawalpindi** was disrupted due to Indian drone strikes.
- A **Chinese-supplied HQ-9 SAM system near Lahore** was reportedly destroyed by an Indian Harop drone.

Strategic Implications

- The operation showcased India's **growing capability in autonomous warfare**, executing precise, risk-free cross-border strikes.
- Analysts highlighted this as a **new model of deterrence** in South Asia, signaling a **shift in regional aerial power dynamics** in India's favor.

India's Multi-Layered Air Defence System During Operation Sindoor

- Integrated Air Command and Control System (IACCS) is India's core air defence nerve centre.
- It fuses inputs from ground-based radars, AWACS, satellites, and other sensors.
- It also enables real-time tracking and interception of low-altitude threats like drones via integration with SAMs and fighter jets.
- It is designed with redundancy — damage to nodes doesn't disrupt overall operations due to alternate data links and mobile radars.

Pakistan's Attempted Disruption

- Pakistan tried to overload IACCS by varying drone altitude, timing, and routes to: Disrupt communication nodes; Confuse command loops; Find vulnerabilities for follow-up drone/missile strikes.
- All attacks were unsuccessful; any disruptions were swiftly mitigated.

Advanced Features and Failover Capabilities

- IACCS's 'mesh' architecture allows:
 - Seamless failover when nodes are hit.
 - Sustained situational awareness using satellite uplinks and mobile platforms.
- Directed Energy Weapons (DEWs): Employed high-powered lasers/microwaves to neutralise drones quickly.

Tactical Support: Akashteer System

- Akashteer developed by Bharat Electronics Limited (BEL) for Army Air Defence units.
- Digitised command layer ensures:
- Real-time coordination between sensors and weapons.
- Effective handling of low-level threats like UAVs, even under EW/communication stress.

Layered Architecture of the Air Defence Shield

- India used a multi-layer defence combining:
 - Retrofitted Cold War-era systems.
 - Modern missile platforms.
- **Low-Level Air Defence (LLAD) Network**
 - Composed of legacy systems upgraded with radar-directed fire and electro-optical sights.
 - Even Army and BSF snipers contributed by shooting down drones in frontline areas.
- **Modern Additions**
 - Israeli SPYDER missile system with Python-5 and Derby missiles: Used for point defence against UAVs, cruise missiles, and aircraft.

A New Kind of War - The Technological Evolution of Operation Sindoor

- **Advanced Missile Systems for Layered Defence**
 - **Akash & Akash-NG**: Provided medium-range air defence against aerial threats.
 - **Barak-8**: India-Israel joint development offering long-range protection of high-value strategic assets from aircraft, drones, and missiles.
 - **S-400 'Triumf' (Sudarshan Chakra)**: Russia-made cutting-edge long-range air defence system; India has received 3 out of 5 units ordered.
- **Centralised Integration through IACCS**
 - All missile systems were seamlessly integrated via the Integrated Air Command and Control System (IACCS).
 - Enabled coordinated, real-time responses to a full spectrum of aerial threats.
- **Dawn of Algorithmic, Autonomous Warfare**
 - Operation Sindoor marked a paradigm shift:
 - From conventional to autonomous, algorithm-driven warfare.
 - Deterrence mechanisms are now shaped by data, drones, and digital precision rather than brute force.
 - Future conflicts may begin not with human mobilization but with the silent launch of autonomous drones — a shift in both strategy and psychology of warfare.

Autonomous Warfare FAQs

Q1. What is Operation Sindoor?

Ans. A drone-led military conflict between India and Pakistan launched in May, marking the start of autonomous warfare in South Asia.

Q2. Which drones did India use?

Ans. India used Nagastra-1, Harop drones, and swarm drones for precision strikes and aerial dominance.

Q3. What is the IACCS?

Ans. India's Integrated Air Command and Control System ensures real-time tracking and neutralization of drone threats using multi-source data integration.

Q4. What role did Directed Energy Weapons play?

Ans. DEWs used high-powered lasers and microwaves to quickly detect and disable incoming enemy drones during combat.

Q5. How did India defend against Pakistani drones?

Ans. India employed a layered air defence system with LLAD platforms, Akash missiles, SPYDER systems, and upgraded Cold War-era weapons.

.Source: **TH**

Source: <https://vajiramandravi.com/current-affairs/autonomous-warfare-in-operation-sindoor-india-pakistan-drone-conflict/>

© Vajiram & Ravi. For personal use only.