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President's Note

Issue 1 | May 2026

It gives me great pleasure to welcome you to the inaugural issue of our monthly ***CASS Opinion Round-up,*** a curated compilation of the analytical perspectives shaping Pakistan's strategic discourse.

This publication was born from the idea that rigorous thought deserves wider reach. Each month, we will bring together opinion pieces authored by researchers and directors at CASS, alongside distinguished academics from partner institutes, offering readers a consolidated window into the ideas forwarded in our policy conversations.

For this inaugural issue, the timing is especially significant. The month of May marked the first anniversary of Operation Marka-e-Haq, commemorated across Pakistan as a defining moment in the short yet intense India-Pakistan conflict. The contributions in this edition revisit the conflict with candour, analytical rigour, and strategic foresight, examining its military, technological, and geopolitical implications. Particular attention has been devoted to Pakistan's operational success and the performance of the Pakistan Air Force, whose conduct established a new benchmark in beyond-visual-range air combat. The conflict demonstrated the decisive value of integrated command structures, superior situational awareness, and doctrinal preparedness in contemporary high-intensity warfare. We hope this round-up serves not merely as a record of opinion, but as a catalyst for informed debate within policy circles, academic institutions, and among an engaged citizenry.

I strongly urge our readers, whether seasoned scholars, emerging researchers, or thoughtful practitioners, to contribute their opinions and analyses to this compilation. This endeavour thrives only when the widest possible range of informed voices participates in shaping it. Your perspectives are not just welcome; they are essential to the integrity and vitality of this platform.

We look forward to your readership, your critique, and your active contribution.

Air Marshal Javaid Ahmed (Retd)
President CASS

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Aerospace

Analysing the Strategic Paralysis of the IAF: May 2025 Air War

Air Marshal Javaid Ahmed (Retd)

The May 2025 Air War between the PAF and the IAF will go down in history as the largest Beyond Visual Range (BVR) battle between two nuclear-armed neighbours. So too would the consequences of a 7-nil loss for the IAF, which resulted in a 'strategic paralysis' of the Indian political and military leadership. This consequential event can be analysed in light of leading air power application theories in conflicts to see how these have been affected by the advent of emerging technologies and concepts.

Historically, the concept of strategic paralysis has been forwarded by leading air power philosophers and put into practice in various air campaigns. However, the theory has revolved around forms of paralysis caused by factors such as territorial loss, industrial degradation, and leadership decapitation. Douhet, the Italian air power theorist, professed victory by directly targeting the enemy's will and vital centres, while Trenchard believed in offensive air action to undermine the enemy's morale and war-making capacity. In the early 70's, Boyd's disruption of the enemy's decision cycle, and in the 90's, Warden's 'the enemy as a system' strategy was practised. Deptula, the US Air Force general and a key player in the Gulf War, advocated parallel and effects-based operations and applied the concept to defeat Iraq.

In June 2025, the Israeli plans against Iran in 'Operation Rising Lion' combined most air power strategies, employing pre-emptive counterforce strikes, air superiority, and parallel system-wide targeting. These were integrated with covert and drone operations to induce rapid paralysis of Iran's military and nuclear architecture. Meeting limited success, the operation came to a halt after 12 days of war amidst serious Iranian retaliation.

In sharp contrast, Operation Epic Fury, the joint US-Israeli air campaign against Iran launched on 28 February 2026, reflected a doctrinal application of Warden's Five Ring Theory of strategic warfare. However, in this case, the negotiation drama was staged to target and decapitate the entire leadership of Iran, an event which is one of a kind in history. While modern warfare has seen increasingly effective strategic strikes, the simultaneous elimination of both top leadership and its immediate successor tier in a single air strike remains virtually unprecedented. Overall, the campaign adopted the 'inside-out' targeting approach. The objective was not merely military degradation but systemic collapse of the Iranian command authority and war-fighting capacity.

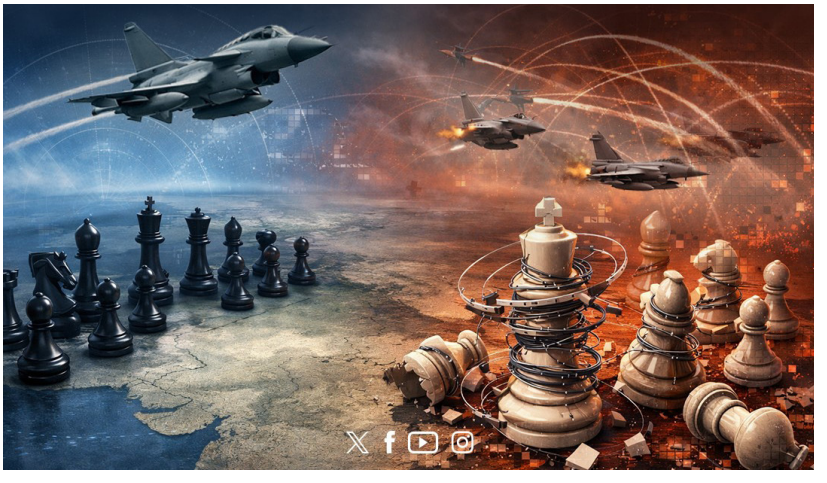
> ***"The fact that the Iranian political and governance system survived the most consequential strike in history is nothing short of a miracle and speaks volumes about the resilience of the Iranian forces and their Mosaic Command Structure."***

The IAF Vs PAF case of 2025 is nevertheless different, as the war involved two nuclear neighbours. Accordingly, limitations of thresholds and escalation, which remained directly proportional to the length of the conflict and destruction quotient had to be carefully considered. Both countries had also been there before, but back then the environment was not nuclearized and the conflicts spanned across days: 50 days in 1965 and 13 days in 1971 war. The five kills of Squadron Leader MM Alam is history, achieved

in an era without real time media or the internet to broadcast such events. By contrast, the capture of IAF pilot Wing Commander Abhinandan in 2019 was unprecedented in its immediacy; the news spread across the globe within minutes, rapidly intensifying the pressure, and affecting the embarrassment threshold of the Indian leadership.

Since then, both the IAF and the PAF had undergone significant transformation across technology, operational concepts, and employment techniques. These changes were driven by evolving threats, lessons from the 2019 crisis, and advances in warfare technologies such as the ones used in the Ukraine war and Israeli operations in Lebanon, Syria and Gaza. The IAF, with billions allocated in the budget, invested in high-end platforms led by the Rafale, integrated Air Defence through S-400 batteries, expansion of the IACCS (Integrated Air Command and Control System) for real-time battlespace awareness, Phalcon and Netra force multipliers and precision standoff weapons such as the SCALP and BrahMos. The PAF, on the other hand, invested in affordable modernisation by inducting the JF-17 Block III, the J-10 C with PL-15 missiles, HQ-9 air defence systems, EW platforms, and the Erieye AWACS, which was fully data-linked with the PAF fleet. A key factor in the PAF's modernisation plans was the active involvement of the Air Chief, who had envisioned not only the induction of new capabilities but also their operationalisation and seamless integration into a cohesive, multi-domain operations (MDO)-capable force.

The stage was thus set for the game-changing aerial encounter between the two airforces. Viewing the situation after the Pahalgam incident in April 2025, it was clear to the Pakistani leadership that India would opt for unnecessary military action. Blaming Pakistan and reacting in an offensive manner had gained political mileage for the Modi Government since 2019. As the much-touted rising power, anti-China bulwark and a regional hegemon, India also wanted to show off its military prowess to the world. Predictably, the strikes were to be spearheaded by the IAF, with the Rafales in the lead. The striking formations of the world's fourth-largest air force were very well equipped, projecting overwhelming airpower never seen before in the sub-continent. The Godi media had already been fed visions of grandeur, while the mass media briefings had been orchestrated in Bollywood style.



Visible to the IAF, the numerically smaller PAF took to the skies with its defensive formations. Having done its homework, it had correctly identified the IAF's centre of gravity (COG) as its Rafale fleet and its ability to generate and coordinate combat power. The 'scarlet thread' in this scheme was the information and connectivity backbone that fused these capabilities into a coherent, functioning system. The tables turned at the launch of weapons as the PAF shifted from a defensive posture to lightning-fast offensive counter-air operations. The IAF's connectivity, spanning EW, cyber, and satellite communications, was targeted at every node; the ensuing chaos was enough to seriously degrade IAF's situational awareness.


STRATEGIC PARALYSIS
MAY 2025 CONFLICT | A NEW PARADIGM IN AIR WARFARE
1
In the May 2025 conflict, a new paradigm for 'strategic paralysis' in the air had been established, 'a paralysis due to extraordinary unforeseen IAF losses.
2
The IAF suffered a devastating 7-aircraft loss, including four Rafales, which are an unprecedented psychological and operational shock.
3
The PAF established Air Superiority and IAF was forced to retreat to rear bases, ceding air superiority within a short span of time.
FRONTLINE AIRSPACE
4
Unlike traditional causes, this paralysis was driven by extraordinary and unforeseen battlefield losses, not territorial or industrial damage.
TRADITIONAL CAUSES
TERRITORIAL LOSS
INDUSTRIAL DAMAGE
≠
MAY 2025 PARALYSIS
EXTRAORDINARY & UNFORESEEN LOSSES
5
Degraded situational awareness and command response through electronic warfare, Cyber attacks & selective targeting.
ELECTRONIC WARFARE
CYBER PRESSURE
TARGETING CONNECTIVITY
6
Modern aerial engagements are rapid and lethal, leaving no time for regrouping once disruption sets in.
DETECT
ENGAGE
DESTROY
NO TIME TO REGROUP
SECONDS DECIDE. SURVIVAL IS NOT GUARANTEED.
7
The conflict redefined airpower dynamics, showing that shock and system disruption can achieve strategic outcomes without prolonged war.
SHOCK
SYSTEM DISRUPTION
STRATEGIC OUTCOME
WITHOUT PROLONGED WAR.
Analysis: Shaza Arif, Senior Research Associate, Centre for Aerospace & Security Studies, Islamabad
Sources: CASS Website | Design Curator: Hira Mumtaz

Aerial battles are quick, lethal surgical affairs affording no recovery to disoriented adversaries. In quick succession, the PAF shot down seven IAF aircraft, including four prized Rafales. As the news of the unprecedented losses reached the Indian command centre, a 'strategic paralysis' gripped the Indian leadership. In complete disarray, the IAF was ordered to retreat to rear bases, ceding air superiority to the PAF.

A new paradigm for 'strategic paralysis' in the air had been established, 'a paralysis due to extraordinary unforeseen losses.' Shocked and disoriented, the IAF could not regain balance for the remainder of the war. As the PAF consolidated its superiority, the aviation world and the military industry took note of the extraordinary air battle, analysing the weaponry, strategies, training, and grit of the PAF, a small but professional force.

"One year on, the world acknowledges PAF's historic feat; however, the Indians continue to forge their own narratives. Tales of 'Operation Sindoor on pause', extensive PAF aircraft losses, and destroyed infrastructure are being circulated to carve out a win to retain political support."

In parallel, the IAF has been showered with resources to strike expensive deals such as the purchase of 114 Rafales and replenishment of S-400 stocks. For Pakistan, the incredible win by the PAF has reshaped the contours of modern aerial warfare. The air war of 2025 has fundamentally altered the rules of aerial engagement worldwide, signalling a decisive shift in air combat dynamics. Accordingly, in the subcontinent, future conflicts in the skies will unfold under an entirely transformed paradigm.

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Aerospace

Misadventures into Pakistan's Airspace

Air Marshal Zahid Mehmood (Retd)

The Treaty of Westphalia is considered to be the foundation and a reference point for the conceptual establishment of the idea of a "Nation State". It solidified the notions of territorial sovereignty, state autonomy, and the structure of the international system. Signed in 1648, the treaty stabilised patterns of interstate conduct it reinforced. Since 1648, various other treaties, pacts and arrangements have been signed at international, regional, and bilateral levels. These were aimed at streamlining state-to-state relations and the movement of people and goods across geographical borders. Under "Schengen States" arrangement, for example, citizens of member states can cross over to other member states without visa or border checks. Today, the Schengen area covers over 4 million square kilometres with a population of over 450 million people and includes 29 countries. Even with this relaxed arrangement, state sovereignty and state laws are held inviolable and military activities are governed by international law, if not specifically covered in mutual or regional arrangements.

Another milestone was achieved with the establishment of the concept of "ADIZ" (Air Defence Identification Zone). It is defined as an area of airspace in which civil aircraft are required to identify themselves. These zones are established above the exclusive economic zone ('EEZ') or high seas adjacent to the coast, and over the territorial sea, internal waters, and land territory. Accordingly, an aircraft approaching national airspace can be required to identify itself while seaward thereof in international airspace as a condition of entry approval. While national airspace was defined by the territorial borders, the concept of ADIZ plugged the gap originating from the sea.

Overflight of civil and military aircraft is governed by specific laws and procedures. Violation of national airspace automatically grants a nation the right to defensive and subsequent legal action against the violator. A violation of airspace by a military aircraft thus assumes a more dangerous dimension, with stern reaction and graver consequences. Military aviation, therefore, pays special attention to peacetime aerial activities with a view to respecting the international and territorial airspace of other countries. When military aircraft violate the airspace of a sovereign nation having a potent Air Force, such as Pakistan, the event can at best be described as a "Misadventure".

The IAF (Indian Air Force) has been undertaking these misadventures for a very long time and meeting catastrophic results on every occasion. The first incident involved an IAF English Electric Canberra B(I)58, belonging to No. 106 Squadron. On April 10, 1959, which was the day of Eid-ul-Fitr, the aircraft entered Pakistani airspace on a high-altitude photo-reconnaissance mission. Two F-86F Sabres from PAF's No. 15 Squadron (the "Cobras") were scrambled from PAF Base Peshawar to intercept the intruder. The mission was led by Flight Lieutenant M. N. Butt, with Flight Lieutenant Muhammad Yunis as his wingman. While the Canberra was flying at over 50,000 feet—beyond the Sabre's normal operational ceiling—it lost altitude during a turn over Rawalpindi. Flight Lieutenant Yunis seized the opportunity and shot it down at 47,500 feet over Rawat. Both Indian crew members, Squadron Leader J.C. Sengupta and Flight Lieutenant S.N. Rampal, ejected safely and were captured. They

were repatriated to India a day later. Flight Lieutenant Yunis was awarded the Sitara-i-Jurat for his achievement.

Pakistan claimed that the Canberra's mission was to take aerial photographs of strategic installations between Lahore and Rawalpindi, and that the aircraft had been warned by hand signals and warning shots in front of the plane. The Foreign Office of Pakistan published a press note allegedly with a written statement of Sqn Ldr. J.C. Sengupta, which revealed the hostile nature of his mission to photograph certain military targets in Pakistan. The press note emphasized the fact that the incident took place on the Eid when the Indian Air Force expected that the Pakistani defence personnel, like the rest of the nation, would be celebrating Eid and it would consequently make their espionage mission less risky and more promising on that day.

The PAF was challenged by IAF during the wars of 1965 and 1971. Facing an enemy three times its size, the PAF came out of these wars with superior kill ratios. During periods of relative calm, PAF continued its vigil and remained steadfast in defending the airspace. PAF's unflinching resolve to defend the national airspace continued during the period when the erstwhile USSR had occupied Afghanistan. Between 1981/82 and 1988, the PAF intercepted and shot down 10 Soviet aircraft, without a single combat loss.

During the 2001-02 standoff, the IAF again violated Pakistani airspace and met the same fate. On June 7, 2002, the Pakistan Air Force (PAF) intercepted and shot down an Indian Unmanned Aerial Vehicle (UAV) that had violated Pakistani airspace. The UAV was identified as an Israeli-made Searcher-II drone operated by the Indian Air Force (IAF) on a reconnaissance mission. The drone was shot down near the Raiwind-Kasur Road, roughly 30 km inside Pakistani territory. A PAF F-16B aircraft, flown by Squadron Leader Zulfiqar Ayub and Squadron Leader Afzal Awan, engaged the drone at night using a heat-seeking missile (AIM-9L Sidewinder). The wreckage was recovered and displayed by Pakistani officials, who cited it as evidence of Indo-Israeli collaboration.

On June 19, 2017, the Pakistan Air Force (PAF) shot down an Iranian unmanned aerial vehicle (UAV) in the Panjgur area of Balochistan, near the Pakistan-Iran border. The drone was targeted after flying 3-4 kilometers inside Pakistani territory. Pakistani officials confirmed it was an unmanned aircraft operating in their airspace. The Pakistan Foreign Office confirmed the event and notified Iranian authorities, citing that it was an unmarked, unidentified drone. This incident occurred during a period of high tension between the two neighbors, following security concerns along the border.

In recent history, the IAF continued with its misadventures and met disastrous results. In 2019, the IAF attacked an alleged terrorist camp near Balakot. During the reciprocal action "Operation Swift Retort" the PAF attacked Indian targets on a quid-pro-quo basis. During the IAF defensive air operations, PAF shot down two IAF aircraft and one IAF helicopter was lost due to fratricide. Wing Com-

mander Abhinandan, who had violated Pakistani airspace, was shot down, captured and later handed over to India as a gesture of goodwill.

Failing to learn any lesson, the IAF attempted the same mistake on a much larger scale in 2025. During May 2025, the IAF attacked multiple targets inside Pakistan. The PAF responded aggressively, and during one hour, the IAF lost seven aircraft, including the highly publicized Rafales. This unprecedented and unexpected result shocked IAF into silence and it did not fly any aircraft for the next two days.

'Failure to learn from history remains the hallmark of IAF. "Insanity is doing the same thing over and over again and expecting different results." The statement is widely attributed to Albert Einstein, yet remains unknown to IAF planners.'

Air Marshal (Retd) Zahid Mehmood is a Senior Director at the Centre for Aerospace & Security Studies (CASS), Islamabad. The article was originally published in Defence Journal.

> ***"In recent history, the IAF continued with its misadventures and met disastrous results. In 2019, the IAF attacked an alleged terrorist camp near Balakot. During the reciprocal action "Operation Swift Retort" the PAF attacked Indian targets on a quid-pro-quo basis.***

IAF Chief's Flip-Flops May 2025 Air War

Initial Denial

The IAF initially avoided specifics, saying that all pilots were back home, even as Reuters admitted PAF claims of downed Indian aircraft and reports from Indian Kashmir of crashed IAF jets.

Reuters Revelation *(8 May 2025)*

Reuters reported on 8 May 2025, citing two US officials, that **Pakistan's J-10C had shot down IAF aircraft,** including at least one Rafale; IAF did not comment.

Partial Admission *(31 May 2025)*

India's CDS Gen Anil Chauhan publicly acknowledged initial air losses and alluded to how India changed tactics to avoid further losses.

Political Pressure

The BJP government could not defend IAF losses in the Indian Parliament's monsoon session.

Late Counter-Claim *(9 August 2025)*

Two months afterthe war the IAF Chief claimed IAF shot down five Pakistani fighter jets and one AWACS in May, with no proof presented.

Public Reaction

The claim was ridiculed in India and at the global level.

2019 Pattern Repeated

After Wing Commander Abhinandan Varthaman was captured, the IAF claimed it had shot down a Pakistani F-16.

Evidence Gap

Even though all 4 missiles of Abhinandan's aircraft are displayed in PAF museum. The US OEM debunked the claim.

Independent Verification

Reuters reported US officials counted Pakistan's F-16 fleet and found none missing.

Narrative Control

Reuters noted IAF officials said the timing and release of evidence from the Balakot strike was for political leaders to decide.

Messaging from the IAF Chiefs has repeatedly shifted between denial, partial admission, and counter-claims, while independent reporting has debunked Indian narrative.

Aerospace

PAF's Transformation: Operation Swift Retort to the 4-Day War of May 2025

Air Vice Marshal Khawar Hussain (Retd)

The Air Force is an inherently technology-sensitive force, and without adopting emerging technologies, concepts, and doctrines, it risks falling behind in effectiveness and relevance. Aware of this eventuality, the leadership of Pakistan Air Force (PAF) has always remained open to change and ready to embrace the evolving character of warfare. The PAF's success in the "4 Day War of May 25" lies in its transformation during the period from Operation Swift Retort in 2019 to the May 25 war.

Prior to 'Operation Swift Retort' in 2019, the air power balance between the PAF and the Indian Air Force (IAF) was defined by distinct yet comparable capabilities. The IAF operated a technologically diverse fleet that included SU-30 MKI, while the remaining fleet comprised older legacy fighters, such as Mirage-2000, MiG-29, MiG-21, and Jaguars. The PAF, meanwhile, had in its inventory the F-16 Fighting Falcon in the high-tech category, armed with AIM-120 AMRAAM BVR missile, one of the most advanced air-to-air missile in the world at that time. The induction of JF-17 enhanced PAF's capabilities in mid-tech category. Alongside this, PAF had spent years developing and refining its electronic warfare (EW) capabilities and integrating them into air operations. The stage was thus set for the first direct aerial encounter between the PAF and the IAF since the Indo-Pakistan War of 1971.

In the wake of the Pulwama incident, during the night of 26-27 February 2019, a package of 12 IAF Mirage-2000's carried out an airstrike against alleged terrorist camps in the vicinity of Balakot. However, the munitions fell aimlessly in open terrain, failing to hit any intended target. This outcome indicated a serious deficiency in both the weaponry and professionalism of the IAF pilots.

In response, the PAF executed a carefully planned and coordinated retaliatory operation, 'Operation Swift Retort,' on the morning of 27 February 2019. The strike package, comprising Mirages carrying stand-off glide bombs, was escorted by JF-17s, while the F-16s provided air cover and maintained forward Combat Air Patrol. The DA-20 EW aircraft equipped with an electronic countermeasures (ECM) suite supported the package by degrading communications. PAF Mirages successfully dropped bombs while remaining cis-frontier, against Indian military installations deep across the LOC.

All this while, F-16 fighters protected the strike package by engaging multiple IAF aircraft. During air-to-air combat, the F-16s employed AMRAAM BVR missiles and successfully shot down two of the IAF's aircraft, including a MiG-21 and a SU-30, demonstrating superior air combat skills, effective employment of advanced technology, and unwavering resolve. The PAF EW support was a significant factor in degrading communication between IAF ground air defence controllers and fighters, thus enabling the shooting down of IAF aircraft. The 'fog of war' created by PAF's EW operations further compounded the confusion on the Indian side, leading to an IAF air defence operator mistakenly locking and shooting down a friendly helicopter that had gotten airborne from Srinagar.

The MiG-21 wreckage fell inside Pakistani territory. The pilot, who had ejected and landed within Pakistan's border, was taken into custody. In a display of professionalism, goodwill, and adherence to the Geneva Conventions, Pakistan subse-

quently handed over the IAF pilot to the Indian authorities, further underscoring its commitment to responsible conduct even amid heightened tensions.

"In the aftermath of PAF's 'Operation Swift Retort,' the IAF recognized its deficiencies in the BVR domain and accelerated the induction of the Rafale fighter jets, armed with the METEOR BVR and SCALP air-to-surface missiles. Historically, the induction of Rafale by the IAF had been highly controversial and politically contentious because of corruption charges against PM Modi's government."

According to the original deal, India was to acquire 126 Rafales, along with the transfer of technology, enabling production of 108 aircraft by Hindustan Aeronautics Limited. In 2015, the plan was changed, and according to the new agreement, instead of 126 aircraft, only 36 Rafales were to be procured, all built by Dassault Aviation in France. The first batch of Rafales arrived in India in July 2020, and by late 2022, delivery of all 36 aircraft had been completed. The addition of the Rafale, coupled with the SU-30, gave IAF an edge over PAF in the BVR domain and shifted the airpower balance in IAF's favor, albeit temporarily.

Fully aware of the evolving threat environment, the PAF leadership swiftly moved to restore air power balance. In 2020, PAF ordered the cutting-edge PL-15 BVR and short-range PL-10 air-to-air missiles that were considered a credible counterbalance against the METEOR. In March 2022, PAF inducted the J-10C multirole fighters in the shortest possible time, i.e., eight months after signing the contract. It is noteworthy that pilots

with only three to four hours of experience on the type successfully ferried the aircraft from China to Pakistan.

For the new platform, comprehensive tactical doctrines and operational employment strategies were rapidly developed and refined through intensive training and exercises. PAF sought rapid integration of these platforms to counter the evolving Rafale threat. Resultantly, by early 2023, J-10 C equipped with the PL-15 missile were fully operational within nine months of their induction in PAF and took part in an international-level exercise 'Indus Shield' the same year.

The J-10 Cs, fitted with KLJ-10 Active Electronically Scanned Array (AESA) radar, offered greater detection and engagement ranges than the existing avionics suite of PAF's fighter fleet. Similarly, PL-15 had a 40 km greater range than its counterpart, the METEOR Missile. Thus, PAF regained its technological edge in the high-end air combat domain and established a credible 'First Shot' advantage, a critical factor in any BVR air combat engagements.

Simultaneously, the PAF began integrating multi-domain operation (MDO) concepts in its doctrine, combining air, space, EW, airborne warning and control system (AWACS), and cyber capabilities to create a syner-

gized air power structure. These elements were systematically networked to provide commanders and pilots with a comprehensive and real-time operational picture, thereby enhancing situational awareness of the pilots in the air, an indispensable factor for success in a complex and high-intensity air environment. This doctrinal evolution laid the operational foundation ensuring that the PAF was fully prepared to conduct integrated MDO by the time the May 2025 conflict unfolded.

In the backdrop of the Pahalgam incident, on the night of 7 May 2025, India launched unprovoked aggression on Pakistan, targeting nine locations across multiple Pakistani cities and LOC, thus plunging the whole region into crisis. The Indian strikes targeted mosques/madrassas, schools and homes, resulting in the killing of 26 civilians.

PAF would not let this unprovoked aggression by India go unpunished and when the moment arrived for the PAF to respond, the world witnessed an unprecedented aerial confrontation, the first and largest BVR air combat engagement between two nuclear-armed rivals. Within the first 52 minutes of the engagement, despite being numerically outnumbered, the battle space was reshaped entirely by the PAF pilots. Operating in darkness over the northern highlands, J-10Cs, JF-17s, and F-16s executed coordinated attacks supported by EW and cyber-enabled disruption. These enablers degraded hostile sensors, communication, and prevented the IAF from achieving missile employment. The result was unambiguous: seven IAF aircraft were shot down, including four Rafales. Despite carrying METEOR missiles, no Rafale aircraft managed to fire a single missile at PAF fighters.

Nothing could have been more demoralising for the IAF leadership than losing the most advanced weapon system in IAF inventory, the Rafale. The operational impact was immediate: the IAF withheld air operations for two days, acknowledged later by India's own military leadership. Yet, even at the height of its advantage, the PAF demonstrated restraint. Further kills were possible; however, escalation was deliberately avoided.

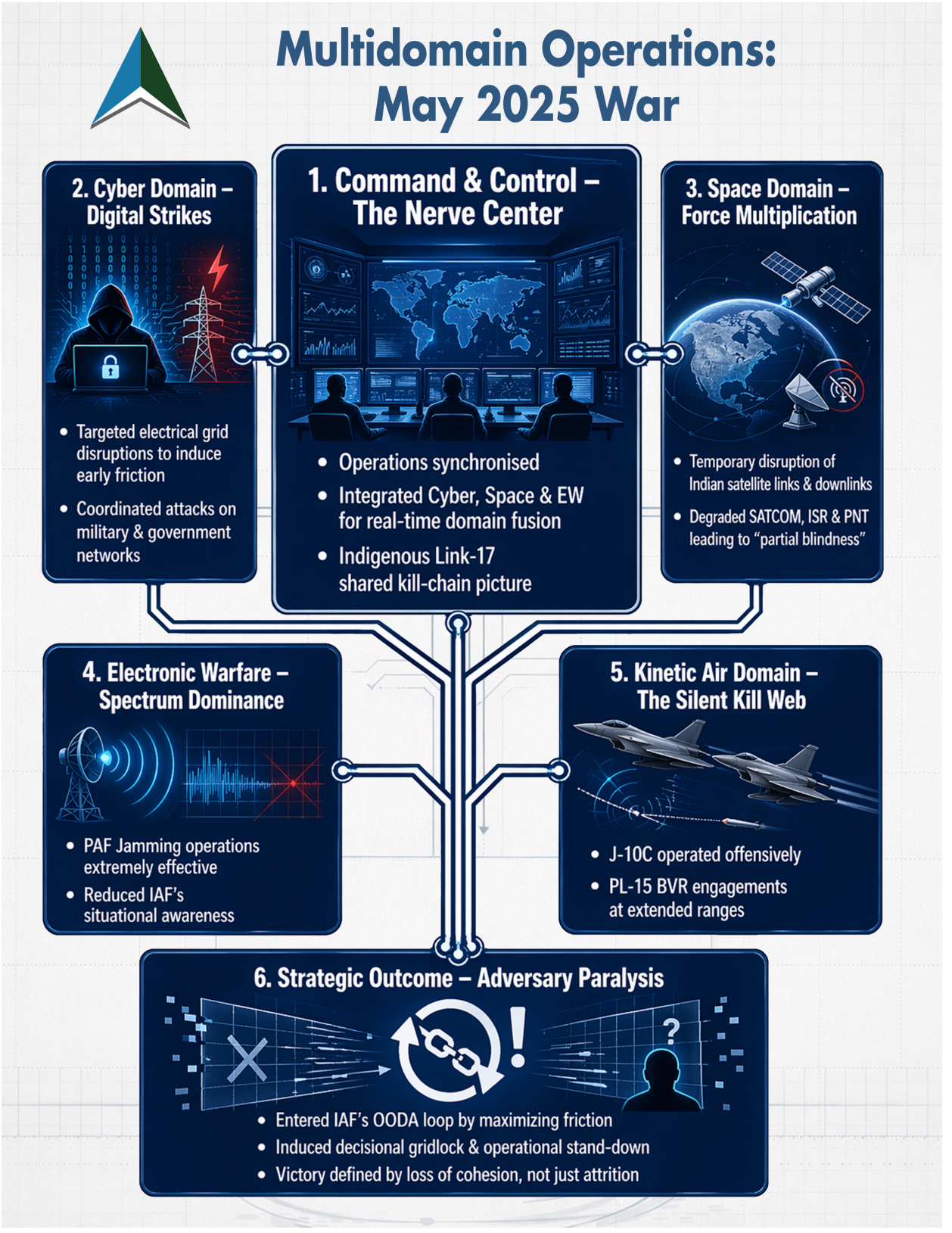
India attempted to regain lost pride through long-range strikes, launching SCALP, and BrahMos missiles from within its own territory. The trajectory of several incoming missiles was disrupted by Pakistani EW elements. In return, PAF launched long-range drones and precision stand-off missiles to demonstrate PAF's reach to the Indian airfields from North to South. The urban centres of Dehli, Gujarat and the Kandla energy sector were also attacked. However, PAF withheld its loitering munitions from striking sensitive or civilian sites, communicating capability without affecting escalation. Simultaneously, in a major PAF strike two Indian S-400 sites were destroyed by employing stand-off weapons launched by JF-17s.

The air combat of May 2025 proved that PAF's transition to MDOs was not a theoretical concept but an established reality.

Over four days of intense war, every layer of PAF's doctrine, i.e., leadership, training, and networked operations, was tested. Air superiority was achieved through BVR dominance while air defence networks remained resilient.

Intense EW shaped the fight, and cyber operations provided additional friction. And above all, the integration of all these effects produced the cognitive superiority that allowed Pakistan to restore deterrence rapidly and decisively. The results, achieved without triumphalism, confirmed that the PAF stands as the most potent contemporary air force in the region, ever ready to defend the aerial frontiers of its homeland, with discipline, courage, and absolute confidence in its human resource.

Air Vice Marshal (Retd) Khawar Hussain is a Director at the Centre for Aerospace & Security Studies (CASS), Islamabad. The article was originally published in Defence Journal.


Multidomain Operations:
May 2025 War
1. Command & Control – The Nerve Center
Operations synchronised
Integrated Cyber, Space & EW for real-time domain fusion
Indigenous Link-17 shared kill-chain picture
2. Cyber Domain – Digital Strikes
Targeted electrical grid disruptions to induce early friction
Coordinated attacks on military & government networks
3. Space Domain – Force Multiplication
Temporary disruption of Indian satellite links & downlinks
Degraded SATCOM, ISR & PNT leading to "partial blindness"
4. Electronic Warfare – Spectrum Dominance
PAF Jamming operations extremely effective
Reduced IAF's situational awareness
5. Kinetic Air Domain – The Silent Kill Web
J-10C operated offensively
PL-15 BVR engagements at extended ranges
6. Strategic Outcome – Adversary Paralysis
Entered IAF's OODA loop by maximizing friction
Induced decisional gridlock & operational stand-down
Victory defined by loss of cohesion, not just attrition

Aerospace

May 2025: Mosaic Warfare and the Myth of Centralised Air Power

Air Vice Marshal Nasser Wyne (Retd)

Visualise a modern-day Air Force commander sitting in the operations room, miles away from the combat zone, overseeing every friendly and enemy aircraft and all assets involved in the campaign. In a split second, he can task a fighter, reposition a drone, and authorise a strike. In today's promising technological era, he does not even need an operations room; a laptop on his desktop will suffice. The situation looks promising as it offers efficiency, precision, and control. The term used for such operational control is 'centralisation', which has been made possible with advanced networking, integrating space, cyber, surveillance, artificial intelligence, and seamless communication, enabling a single commander to manage an entire campaign from a single node. Centralised command and control, championed by the Western air forces and then adopted by many others, has thus been seen as a pinnacle of modern military power.

The concept of centralisation, enabled by state-of-the-art networking, may seem promising, but it is nothing more than a myth.

The myth first unravelled last year when the Pakistan Air Force (PAF) confronted the Indian Air Force (IAF) in a brief, but consequential conflict. Iran mirrored the PAF's performance in its war against the U.S. and Israel in 2026. Iran applied this strategy across domains and withstood the most sophisticated decapitation campaign. These two conflicts have changed the world's understanding of how air power must be employed.

Mosaic warfare (decentralised warfare or distributed resilience) captured global attention in 2026, but was amply demonstrated by the PAF in May 2025. For a smaller air force facing an adversary three times larger, decentralisation is not a luxury; it is a necessity.

IAF, in its modernisation drive, invested heavily in networking. Advanced IAF AWACS were integrated with sophisticated ground-based radars, and IAF's command philosophy was organised around centralised control, assuming that superior networking would translate into superior combat power. It was apparently a strong system, but its strength was also its weakness. The entire system rested on a few critical nodes, command centres, communication, and senior leadership, offering an ideal counterattack option to the PAF. Disrupt any of these, and the structure would not bend but would fracture. Centralisation creates a single point of failure, which in a high-tempo operational environment can be suicidal.

How PAF Conducted Mosaic Warfare in May 2025

When the conflict erupted in May 2025, many military observers were taken by surprise by PAF's formidable performance despite the force ratio of 1:3 in IAF's favour. What did PAF do differently? Firstly, understanding that it would not be able to match the IAF in numbers, PAF adopted a different philosophy by moving away from a rigid, centralised command structure. Significant autonomy was delegated to Squadron Commanders, air defence controllers and flight leaders. These mid-tier commanders are the backbone of PAF combat power, and they were given a clear understanding of the strategic objectives. In the Air Force's operational terminology, this is termed as 'commander's intent'. After receiving the intent, these commanders are trusted to carve out the best possible way to achieve objectives in dynamic situations.

Secondly, PAF operates from dispersed locations. Instead of concentrating assets at a few bases, making them tempting targets, it operated from a network of smaller airfields and forward operating bases. This provided adequate redundancy to PAF; even if one base was hit, the rest would continue to function.

Thirdly, PAF employed redundant, resilient and secure communication systems. A single, centralised network has risks of jamming or destruction. PAF thus built layers of communications, including links with low intercept probability, and where necessary, incorporated low-tech back-ups. The results were striking. IAF's centralised command nodes (AWACS, ground radars and command centres) were prioritised as high-value targets by the PAF, forcing IAF to employ them with extreme caution, negating their operational advantage. PAF, on the other hand, continued to operate without interruption, as its distributed structure meant that no single loss was catastrophic. IAF had to fight a coherent adversary that could not be decapitated. It was confronted with a constellation of highly capable, independently operating units that maintained cohesion through shared intent rather than real-time orders. The conflict culminated with an important lesson for air power analysts; a smaller air force, employing Mosaic principles, could effectively neutralise a numerically superior, more centralised adversary.

How does the PAF trust the independent decision-making of mid-tier leaders and even that of a flight or section leader in the air? How is the whole institution tuned to operate from the dispersed locations and communicate seamlessly in a decentralised manner? This does not happen overnight. The Air Force 'commander's intent' has to be followed in letter and spirit. But it is the commander himself who chalks out the plan, provides resources and trains his combat force to the highest standards so that each person understands and implements his intent even in an adverse communication environment. Such leadership was central to the PAF's effective conduct of operations against the IAF in May 2025.

PAF-IAF conflict of May 2025 and the ongoing U.S.-Israel-Iran conflict have exposed the fundamental flaw in the centralisation myth 'that technology alone cannot replace human judgment'. The centralisation myth assumed that superior networking would allow commanders to control more, but the fact is that networking tempts the commanders to overcontrol. Decentralisation is even more important when confronted with an adversary possessing highly advanced and superior jamming capabilities. PAF should not only be prepared against the Indian Air Force alone, but against any regional or extra-regional military threat, for which Mosaic is a must.

"It is emphasised that Mosaic warfare does not mean abandoning technology. While technology remains essential, it must be employed to enable decentralisation rather than reinforce centralisation."

This aspect requires a doctrinal shift. Mission command, the principle of giving subordinates clear intent and the authority to execute, must become a culture, not an exception.

To master this culture, a significant investment in personnel training is required, whether in the cockpit or an air defence command post; these airmen must thrive on autonomy, enabling them to make sound decisions under pressure, with incomplete information and in the absence of direct orders.

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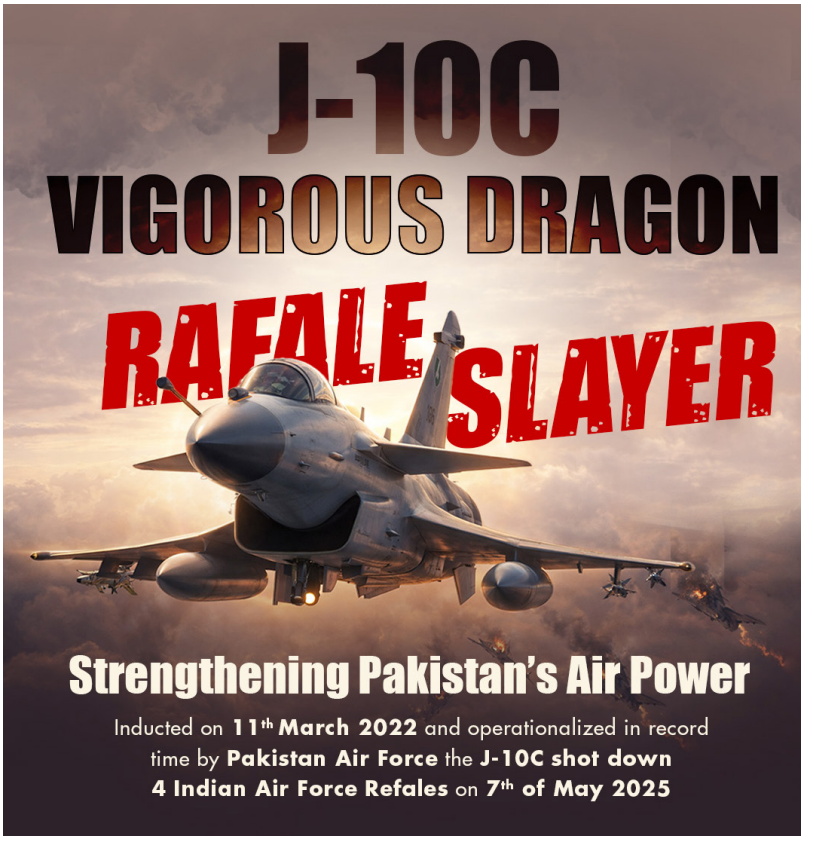
Security

Rafale Slayer The J-10C: What May 2025 Exposed

Muhammad Faizan Fakhar

The May 2025 conflict between India and Pakistan fundamentally altered the course of modern aerial warfare. From the very onset of the conflict, the superiority of PAF over its adversary became abundantly clear as it in quick succession it shot down seven Indian aircraft without suffering even a single loss. PAF employed J-10Cs fighter aircraft, and the score of 7-Nil became even more striking since four of the downed Indian aircraft were Rafales. These were the same Rafale fighters that were being presented as a hallmark of armed forces modernisation by Indian politicians, military leaders, and analysts. However, the combat loss of Rafale jets to J-10Cs not only shattered the assumptions about technological superiority in the battlefield but also solidified the critical role played by the, strategy, tactics and training in air combat. Yet this cannot be viewed as an isolated incident as it was a direct outcome of the contrasting training, procurement strategy and platform integration by both sides.

India's Rafale deal became highly politicised and controversial from the very beginning. The deal was first announced in 2012 when Dassault Rafale secured the Indian Medium Multi-Role Combat Aircraft (MMRCA) tender to supply 126 aircrafts to IAF including partial manufacturing in India by Hindustan Aeronautics Limited (HAL). Soon after the announcement, reports of disagreements between Indian authorities and Dassault started to emerge over cost of acquisition and warranty for the quality of aircrafts produced by HAL under this deal.



In 2016, under BJP, the original deal of 126 jets was replaced by an inter-governmental agreement (IGA) with France for buying 36 fully built jets. In 2017, allegations of corruption, kickbacks and favouritism in the Rafale contract started to surface against the Indian government. A major part of the allegations revolved around the replacement of state-owned HAL by a private entity Reliance Defence, which was owned by a business group close to PM Modi. However, the Indian Supreme Court dismissed all petitions seeking investigation into this matter.

India's push for acquiring Rafale intensified after the 2019 India-Pakistan conflict, fiasco when the PAF shot down two Indian aircraft and captured an Indian pilot. This debacle also exposed the operational limitations of IAF. In the following days, PM Modi publicly admitted these limitations. Speaking at an event in New Delhi PM Modi stated, "The results [of February 27 misadventure] would have been different if we had Rafale jets." By 2020, India finally started receiving Rafale jets after a wait of almost eight years. These aircrafts were then formally inducted in IAF. The delivery package of all 36 aircrafts was completed in 2022. Therefore, by May 2025 India-Pakistan conflict, IAF's Rafale jets were fully operationalised and combat ready.

In contrast, the induction of J-10C by PAF was seamless and swift, especially due to its long-standing collaboration with China since the 60's. In the following decades, Pakistan-China airpower cooperation further deepened with additional platform acquisitions. The year 1999 marked a turning point in this partnership as Pakistan and China signed a formal agreement to co-develop JF-17 thunder. Thus, PAF's relationship with China grew from platform acquisition to joint development and induction of platforms. Building on this foundation, Pakistan decided to acquire Chengdu J-10C and inducted them in PAF in March 2022. However, unlike IAF's acquisition of Rafale, PAF's transition to J-10Cs was backed by decades of familiarity, joint development and operational trust in Chinese platforms. Accordingly, the aircraft was made combat ready in record time.

Integration of PL-15 long-range Beyond Visual Range (BVR) missiles also proved to be a critical factor in the operationalization of J-10C as it equipped PAF with a decisive 'first-shot' capability in a combat scenario. Thus, a lethal operational ecosystem was adopted by the PAF coupled with the additional network-centric warfare systems. PAF operationalised J-10C within months of their induction. Thus, by May 2025 conflict with India, J-10C was not just operational but deeply embedded into PAF's doctrine and fully combat-ready.

On the night of 7th May 2025, India decided to launch its unprovoked aggression against Pakistan led by its Rafale jets. This move was made by India in hopes to gain air dominance and to fulfil the political promise made by PM Modi back in 2019. However, the events that followed dealt a decisive blow to Indian aspirations.

"Within minutes, PAF J-10C fighters, equipped with advance radar systems and PL-15 missiles, engaged and shot down Indian jets beyond visual range. The combat ended with a record 7-Nil scoreline with no losses suffered by the Pakistani side."

What made this victory even more astonishing was the fact that four of the downed Indian aircrafts were the Indian Rafale jets.

The global markets reacted sharply to the loss of IAF's Rafale jets. In the following days of the India-Pakistan aerial clash, the shares of Dassault Aviation plummeted by 10 percent while the shares of Chengdu Aircraft Corporation (CAC) surged by 20 percent. Moreover, the long-held assumptions about the superiority of Western platforms were also challenged. For many developing countries, this episode also raised questions on the worth of high-cost Western platforms in comparison to the cost-effective and integrated systems made by China.

The performance of J-10C was undoubtedly remarkable; however, it would be misleading to attribute the outcome solely to the platform. What truly played a decisive role in the fall of Indian Rafale at the hands of PAF's J-10C was the professionalism, combat training, skill, and doctrinal clarity of the PAF.

"One year on, the short and decisive air battle is viewed as a classic example of air power decisiveness in an intense nuclearized environment and is being taught in leading air powers' study institutes of the world."

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Aerospace

Debunking the S-400 Shield: Lessons from the India-Pakistan Conflict

Shaza Arif

Air defense has always been a central aspect of warfare. In South Asia, the phenomenon carries immense significance due to compressed reaction times. In this context, one of the most-hyped systems is the Russian-made S-400, touted by New Delhi as a one-stop solution to counter aerial threats from both Pakistan and China.

The 2025 conflict between India and Pakistan marked an important chapter in testing the S-400 technology. The conflict began on May 7, when India attacked what it alleged were terrorist targets in both Pakistani-held Kashmir and Pakistan proper, using drone and missile strikes. The conflict lasted for four days, culminating in a U.S-facilitated ceasefire. However, the brief conflict debunked a lot of the myths regarding the S-400 technology.

First, India claimed that the mobile S-400 would be able to control Pakistan's airspace. In contrast, Pakistani aircraft continued to operate freely, according to official briefings by the Pakistani military. Although the Pakistan Air Force (PAF) aircraft were in their own airspace, they were still within the air defense range.

Second, Pakistan's drones penetrated well inside Indian territory. According to the Pakistani military, the PAF was also able to disrupt the enemy's power and transport system, cripple its critical operational installations, shoot down India's most modern Rafale jets and destroy a state-of-the-art S-400 battery.

Such developments raise questions about whether the S-400 was even employed during the conflict or whether it simply failed.

Not a gamechanger

India perceived the system as a gamechanger that could protect its airspace without being vulnerable. In reality, Pakistan was able to target two batteries of the system deployed at Adampur and Poonch, damaging the radar components, according to Pakistani officials.

Pakistan carried out the attacks with a Chinese-made CM-400AKG air-to-surface missile launched from JF-17 aircraft. The episode marked the first time that the system came under attack.

Beyond the operational setback, the conflict exposed several technical limitations. The Indian manufacturers had repeatedly emphasized the 248.5-mile range. The advertised ranges do not guarantee battlefield success, as they are valid only under ideal conditions.

Operational environment can be unforgiving. The system's radars do not necessarily see everything within their range. In fact, they can be vulnerable to terrain masking, low-altitude penetration and electronic interference, which can put a cap on the detection range.

Even if the targets are detected, there is a probability of failing to engage the targets due to countermeasures or operational stress in the fog of war. In addition, while mobility is often an advantage, it also impacts performance vis-à-vis radar recalibration time, coverage gaps during movement and any required relinking of the network.

Major limitations exposed

The system operates in a networked manner, with ground radars, early-warning

Debunking the S-400 Shield:

Lessons from the May 2025 Air Battle

The Myth of a "Perfect Shield"

S-400 was projected as a game-changing system capable of fully securing airspace — but real conflict outcomes challenged this belief as 02 Systems were destroyed

Operational Reality vs Claims

Despite deployment, Pakistani aircraft and drones operated effectively, including drone penetration as far as New Delhi.

Failure to Deny Airspace

The system did not achieve its core objective of restricting adversary aerial operations, raising questions about effectiveness.

System Vulnerability Exposed

The system did not achieve its core objective of restrictingadversary aerial operations, raising questions about effectiveness. PAF drones struck 26 targets as

Radar = Critical Weak Point

Damage to radar systems can degrade performance even if missile units remain intact—making detection systems the

Technical Limitations in Real Combat

Terrain masking, low-altitude threats, electronic warfare, and countermeasures reduce detection and engagement capability.

Integration Challenges Matter

Lack of seamless coordination with diverse military systems limits effectiveness since air defence works as a network, not in isolation.

KEY STRATEGIC LESSON

No single system guarantees absolute security. Modern warfare requires integrated, adaptive, & multi-layered defence strategies.

S-400 Defensive Shield is a Myth

assets and the command network fully coordinated. Unless seamlessly integrated, the air defense system fails to perform optimally.

The synchronization of the system with the diverse weaponry in the Indian arsenal – American, Russian, Israeli, French and indigenous Indian – likely impacted its performance.

This mixed-origin architecture burdens the command-and-control system with different data links and varying communication protocols. If the system faced employment challenges in the conflict over these technical aspects, it raises fundamental questions about the acquisition of a multi-billion-dollar weapons system.

New Delhi has not yet lost faith in the platform, as reflected in its latest order of five additional S-400 batteries. It has sought to compensate for earlier vulnerabilities, thicken air defense and reduce coverage gaps.

However, the quantitative addition alone is less likely to deliver a meaningful impact. The system can be countered via saturation attacks, decoys, timings, false tracks, altitude mixing, multi-axis entry and electronic warfare tactics. Hence, the complex and evolving character of the battlefield certainly makes it imperative to adopt new and innovative technologies and tactics tailored to modern requirements and shift away from older air defense assumptions.

Challenges for Pakistan

For Pakistan, the systems pose challenges at various levels – strategic, operational and tactical, requiring solutions accordingly. In this context, long-range systems to counter the S-400, such as the Chinese HQ-9 system, are already in service.

"At the operational level, layered defense and extended ranges pose challenges that can be mitigated using standoff weapons, innovative flying and coordinated operations."

On the tactical level, due to the emission of radiation when employed, the system itself becomes a target – an aspect that can be exploited by both kinetic and non-kinetic measures.

Overall, the recent conflict didn't reveal the weakness of a single system on the Indian side. It reflected the limitations of the belief that a single platform can provide absolute security in a

contested battlefield. It is the seamless synchronization of leadership, doctrine, weaponry, tactics and training that resulted in a win for Pakistan.

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Security

Escalation & Restraint: Revisiting the May 2025 Conflict

Shaza Arif

The South Asian environment is shaped by an enduring rivalry between two nuclear-armed states, India and Pakistan. A stability-instability paradox exists in the region: the presence of nuclear weapons and nuclear deterrence dynamics upholds strategic stability at the highest level while limited crises continue to persist under the nuclear overhang. This paradox casts a constant shadow of nuclear escalation during conventional conflict. In the last six years alone, the two states have experienced intense escalation due to kinetic military attacks by India in Azad Kashmir and mainland Pakistan in 2019 and 2025, followed by Pakistan's response each time. In fact, a pattern appears to have emerged where sub-conventional attacks against Indian security forces or civilians are followed by an attack on mainland Pakistan under the pretext that Pakistan is responsible for these sub-conventional attacks.

The May India-Pakistan 2025 conflict will be remembered as a defining moment in South Asian politics, where both nuclear and conventional deterrence were vividly at play. The Indian Air Force (IAF) targeting mainland Pakistan on the night of 7 May showed that, despite the risk of nuclear escalation, India continues to believe that there is space for limited conventional conflict with Pakistan. From an Indian perspective, these actions were presented as a means to impose punitive costs on Pakistan.

By attacking mainland Pakistan across the international border as it had done in 2019, India had climbed a rung on the "escalation ladder". The attack was met with a swift response from the Pakistan Air Force (PAF), which executed a coordinated attack against incoming aircraft. However, there was always an element of restraint within the escalation. Pakistan did not escalate to the next rung of the escalation ladder (for example, cross-border targeting or conducting strikes inside Indian territory); instead, it only targeted the attacking Indian jets, which led to the downing of several Indian aircraft – including Rafale jets. While the Indian side later made an indirect and ambiguous acknowledgement that they had experienced some losses, the exact number remains undisclosed.

The PAF had the capability and opportunity to inflict more damage, which could have further enhanced its position and put more pressure on the adversary. However, such an approach was deliberately avoided to minimise any further escalation. The restraint was also visible in its decision to target Indian aircraft from its own airspace.

The subsequent grounding of the IAF led to the use of drones and, later, missiles from the Indian side, which introduced a new dynamic into the regional conflict. In response, Pakistan also used drones that penetrated deep inside Indian territory, as far as New Delhi. In the next cycle, India decided to further escalate with missiles. In particular, the use of the BrahMos cruise missile marked a critical step with direct implications for nuclear deterrence, further as-

cending the escalation ladder. While BrahMos's employment was in a conventional role, its dual capability poses the risk that its use in the context of a fast-moving crisis with compressed decision-making time could be mistakenly interpreted as crossing the nuclear threshold, posing serious challenges for escalation management. Following the loss of Indian aerial assets to PAF engagements, key air force bases in Pakistan were targeted. These missile attacks formed part of a broader effort to establish escalation dominance during the crisis by targeting the state's operational Centre of Gravity (CoG).

Despite the intensity of the attack, Pakistan gave a proportionate response, adhering to a quid pro quo (QPQ) strategy targeting critical military infrastructure. It targeted 26 Indian sites, including the S-400 batteries at Adampur and Bhuj. The neutralisation of more than 77 Indian drones in the conflict further augmented conventional deterrence. The Pakistani response countered Indian coercion without inviting uncontrolled escalation. The multi-domain operation combining kinetic activity, electronic warfare, and cyber-attacks proved notably effective. It denied India aerial reconnaissance and strike capabilities, reinforcing a credible deterrence posture. These developments arguably contributed to India's decision to terminate the conflict cycle and opt for a US-mediated ceasefire. Pakistan also opted not to climb to the next rung of the escalation ladder since it had already shown the credibility of its conventional deterrence. Hence, Pakistan also responded positively to the cessation of hostilities. As a result, the ceasefire prevented an all-out war between the two states.

It should be noted that both the Indian and Pakistani narratives present contradictory accounts of both the chronology of events and the ceasefire dynamics.

The brief yet intense conflict has offered many insights regarding how escalation dynamics have evolved in South Asia:

Perceptions of Nuclear Credibility

The episode revealed that conflict dynamics are shaped by contrasting perceptions of nuclear credibility. Aiming to garner political mileage, the Indian side, under Prime Minister Narendra Modi's leadership, has often referred to Pakistan's nuclear weapons programme as the "Nuclear Bluff" and "Nuclear Blackmail". This rhetoric suggests that Pakistan would never actually use nuclear weapons and can therefore be pushed conventionally. However, in reality, Pakistan's nuclear weapons continued to influence the freedom of kinetic activity undertaken by the Indian side, placing an operational cap on crisis escalation. Secondly, the nuclear element weighs heavily on the minds of the global actors. Hence, rapid escalation is expected to draw international intervention due to the fear of escalation between the two nuclear-armed states. Both aspects were witnessed during the May 2025 standoff. Overall, emphasising the "Nuclear Bluff" narrative is a dangerous practice that adversely impacts the region's stability. The recent conflict has highlighted how uncertain escalation becomes when a nuclear-armed state is attacked.

The Role of Airpower

On the conventional front, new escalation dynamics were witnessed. In response to Indian aggression, the PAF played a pivotal role in the conflict. In addition, Operation Bunyan-um-Marsoos manifested measured restraint and strategic precision, demonstrating effective use of conventional capabilities. Airspace denial capability, in particular, has redefined conflict dynamics in the India-Pakistan equation. It is evident that the role of airpower in South Asia will be pivotal in any future crisis. As per the new normal established in the region, the PAF showed its capability and credibility by denying India air superiority in contested airspace.

"The efficient employment of indigenous and Chinese weaponry, along with integrated multi-domain tactics, led to the grounding of the IAF for 48 hours during the peak of the conflict."

New technological procurements and the upgrade of existing weaponry are likely to further fortify the airpower component of conventional deterrence. The disruption of the enemy's kill chain (the sequential process of detecting, tracking, targeting and engaging hostile assets via effective air denial) helped synchronise Pakistan's political and military objectives. The battle-proven conventional deterrence role of the PAF is likely to play a leading role in the future given its agility and ability to create a pronounced impact. The episode manifested the doctrinal clarity, foresight of leadership, and rigorous training of the forces that ultimately led to the strategic paralysis of the adversary. In addition, reliance on indigenous and Chinese capabilities provided an edge to Pakistan, whereas reliance on diverse weaponry posed serious synchronisation and integration challenges across the border.

Interplay of Nuclear and Conventional Deterrence

While airpower was a central component during the war, it has to be viewed within the broader deterrence architecture of the region. Given the manner in which conventional and nuclear deterrence operate in South Asia, it is pertinent to analyse their interrelationship. In the larger picture, each reinforces the other. It is the nuclear overhang that reinforces conventional deterrence by enhancing confidence and assertiveness at the conventional level and influencing tactical and operational decision-making. It provides the required confidence, along with psychological and strategic assurance, that is required for conventional posturing. Hence, nuclear deterrence anchors conventional deterrence – an aspect that will influence any future crisis management strategy. In parallel, conventional deterrence reasserts the efficiency of nuclear deterrence when employed effectively, as seen in the recent conflict, signalling capacity and resolve. However, it is important to note that this reinforcement in the South Asian context has the potential to introduce risks and increase the likelihood of miscalculation, particularly by creating overconfidence in limited conventional operations under the assumption of controlled escalation.

Cross-domain Synchronisation

The manner in which nuclear and conventional deterrence have operationalised, along with the use of new capabilities, shows that any conflict between the two states will no longer be confined to a single domain. Pakistan has always relied on multi-domain synchronisation – leveraging multiple domains to counter Indian aggression. In the recent conflict, Pakistan demonstrated a cohesive integration of its conventional capabilities, electronic warfare, diplomacy, information domain, and media in the overall synchronisation of its operational strategy. For a conventionally smaller state, the use of such an approach augments its capability and enhances signalling without crossing thresholds that could trigger escalation. Pakistan exercised calibrated restraint and caution on all levels, which ultimately

contributed to the cessation of the standoff.

"The Risks of Limited War under the Nuclear Umbrella and New Arms Races"

While multi-domain operations enhance calibrated response, they also raise questions regarding escalation unpredictability under the nuclear umbrella. Ideally, such episodes should shrink the space for "limited war under the nuclear umbrella". On the contrary, historical patterns suggest that new insecurities will surface, followed by more investments in advanced weaponry, reinforcing an arms race. For example, India has recently signed a deal for 114 Rafale aircraft with France – its largest ever military deal. The development seems to be influenced by the May 2025 conflict. Such trends add a new layer of instability in the region.

The problem lies in the fact that the Indian leadership continues to seek space for conventional military actions under the nuclear shadow. This military adventure is being termed by many in New Delhi as the "New Normal". What is being dubbed the "New Normal" is an irrational approach leading to more instances of brinkmanship under the nuclear shadow. The Indian leadership should recognise that sustaining a new normal of heightened confrontation is inherently challenging against a nuclear-armed adversary with whom India shares a contiguous border spanning over a thousand kilometres. A clear-eyed assessment of the risks associated with cycles of aggression is essential for long-term stability.

The Next Conflict

The most significant implications lie in shaping any future conflict between the two states. The confrontations between the two states have terminated at a ceasefire so far. There is absolutely no guarantee that the next crisis will terminate along similar lines. It is quite possible that the next India-Pakistan conflict may operate at a rung higher than the May 2025 standoff. Furthermore, it is equally likely that the next conflict may be more intense or protracted. In addition, the next conflict could be triggered by events other than a terrorist attack, leading to a different cycle of escalation. Examples of such scenarios could include accidental airspace violations, cyber-attacks on critical national infrastructure, and misread military signalling. Further advancements and the use of emerging technologies (Artificial Intelligence, cyber, hypersonic, and space-based capabilities) are highly likely in any future conflict. If the escalatory cycle continues in such an environment, it will compress decision-making cycles and escalation control, adding more instability. Hence, the institutionalisation of this new normal and escalatory rhetoric, such as calls for Operation Sindoor 2.0, will be inherently detrimental for the region. It can lead to catastrophic situations where both states risk ceding control of the escalation ladder. Any such episode can lead to adversarial repercussions for the region and global security.

Conclusion

A key takeaway is that treating nuclear deterrence as a "nuclear bluff" is not a rational strategy. In a nuclearised environment, adversaries may be tempted to test thresholds that they consider manageable. Once such dynamics unfold, they can invite inadvertent escalation. This assertion underscores a more fundamental point that deterrence aims to prevent wars rather than normalise recurring cycles of coercion. The stability of the region depends upon viewing the regional dynamics through this lens. Ultimately, the stability of South Asia will depend not only on military capability but also on the responsible management of strategic narratives and signalling behaviour. Moving forward, policymakers on both sides must recognise that the pur-


AIR SUPERIORITY IN 30 MINUTES
Rapid Air Dominance:
PAF achieved air superiority within first 30 minutes of engagement. Such Swift response limited the IAF's operational space.
Shooting Down 7 Indian Jets:
7 Indian jets were shot down which reduced the IAF's ability to sustain aerial operations
Superior Tactical Execution:
Effective use of Beyond Visual Range (BVR) combat tactics and precision targeting before enemy aircraft could respond
Spectrum Dominance:
Integrated surveillance and command systems enabled real-time decision-making with faster coordination translated into battlefield advantage
Control of Air:
Early successes led the PAF to seize control of contested airspace, restricting the IAF's freedom to maneuver.

suit of short-term tactical advantage under the nuclear shadow risks undermining long-term regional stability. In an environment defined by uncertainty and rapid technological change, sustaining credible deterrence while preserving escalation control will remain the central challenge for crisis management in the years ahead.

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Security

May 2025 Air War: From Assumed Superiority to Operational Shock

Zahra Niazi

On the night of 6-7 May 2025, the Indian Air Force (IAF) faced an unprecedented setback. Pakistan Air Force (PAF)'s downing of seven Indian aircraft during a high-intensity aerial engagement that night, including four state-of-the-art Rafale fighters, regarded as the linchpin of India's air power modernisation, was a game-changing event.

The outcome represented the breakdown of an assumption that had shaped Indian strategic thought in the period following the 2019 India-Pakistan crisis, that is, the belief that advanced fighter aircraft platforms could decisively shape future battlefield outcomes in India's favour.

In 2019, PAF downed IAF's Sukhoi-30MKI and a MiG-21 Bison in a retaliatory air operation following the Indian Balakot strike, with the MiG-21 crashing in Azad Jammu and Kashmir (AJK), resulting in the capture of its pilot, Wing Commander Abhinandan Varthaman. While Abhinandan was released 60 hours after his capture as a 'peace gesture,' the episode marked the first major shock for the IAF, which had been outmanoeuvred by a rival force despite possessing advantages in terms of fleet size, budgetary resources, and force depth.

The lesson was thus unmistakable: conventional military superiority alone cannot guarantee battlefield success.

Rather than internalising this implication, the IAF, aligning with the government's position, underplayed the losses while perpetuating the narrative that the acquisition of more advanced platforms can shape future battlefield outcomes in India's favour. The then Chief of Air Staff, Air Chief Marshal BS Dhanoa, in April 2019 categorically stated that the results would have been skewed in India's favour had it inducted Rafale aircraft in time, and their induction would shift the technological balance in India's favour, mirroring Prime Minister Modi's earlier assertion that India would have achieved much more if the country had the Rafale aircraft.

While electoral dynamics and the need to boost the population's morale explain the timing of the messaging, there also appeared to be an actual sense of strategic overconfidence within decision-making circles. Messages along similar themes continued to be echoed in subsequent years, as New Delhi received the first batch of Rafale fighters in 2020, with deliveries completed by late 2022. Notably, following the arrival of the first batch of Rafale fighters, Indian Defence Minister Rajnath Singh famously stated, 'If it is anyone who should be worried about or critical about this new capability of the IAF, it should be those who want to threaten our territorial integrity.' Research has corroborated that leaders and decision-makers can easily succumb to mutually reinforced

positive illusions, especially if other domestic actors do not meaningfully challenge those assumptions.

Within the aviation community, the Dassault Rafale is rightly considered a platform of stature for its range, strength, agility, and highly potent weapons suite. But as Stephen Biddle, the author of the book Military Power, puts it, 'many nations failed to master complicated modern-system force employment, and variations in such behaviour have been more important than technology per se for observed outcomes.'

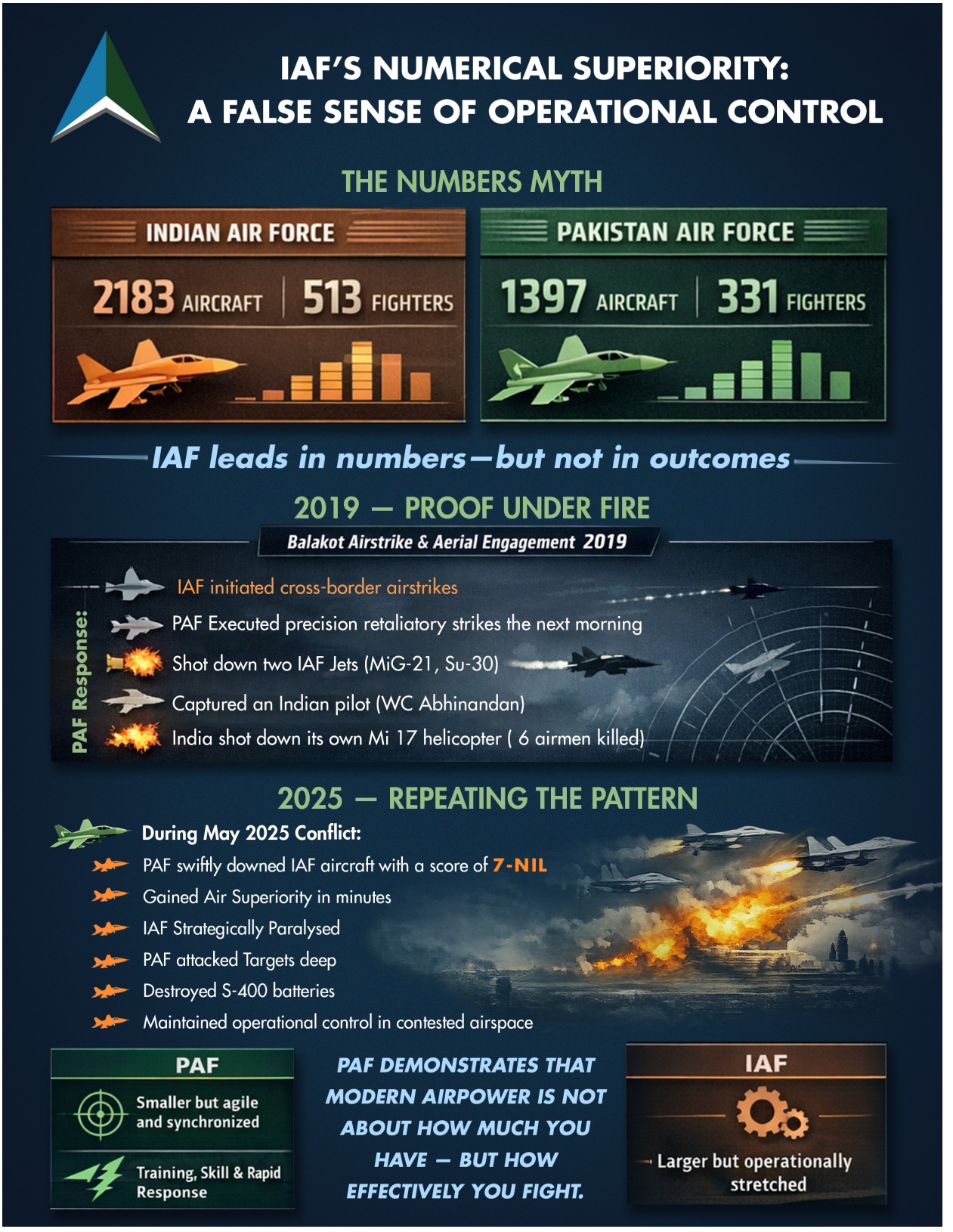
"The 2025 India-Pakistan air battle served as a practical demonstration of this dynamic. Indian strategists not only misjudged the engagement range of the PL-15 missile but also the resolve, professionalism, and strategic acumen of the PAF."

This allowed the PAF to achieve tactical surprise and a first-shot advantage. At the same time, the PAF used a networked 'kill chain,' by linking radars, airborne warning systems, and fighters through a data link, allowing the fighters to receive targeting data from airborne early warning and control aircraft and engage targets without using their own radar, while electronic warfare (EW) disrupted Indian sensors and communication, reducing the IAF's situational awareness. The challenges were further compounded by limitations in cross-platform data integration within the IAF, which constrained coordination during the engagement.

"The result was a seven-nil outcome. The claim was not random; Pakistan later disclosed the specific tail numbers of the four Rafale fighters, while statements from some members of the Indian military leadership also served as indirect acknowledgements of multiple jet losses."

Notably, in one of his interviews, the Indian Chief of Defence Staff (CDS), General Anil Chauhan, on being inquired about the jet losses, remarked that 'what is important is not the jets being downed but why the jets were downed,' and that the IAF rectified the tactical mistakes and implemented the improved strategy two days later. The latter suggested that the IAF likely withheld its air operations for two days to reassess its strategy–an indication of operational shock. To regain lost pride, it resorted to launching stand-off weapons from within its own territory against targets inside Pakistan–an implicit acknowledgement that it could not match PAF in the air.

The episode thus served as yet another sobering reminder that battlefield outcomes rarely unfold the way the initiating states may have anticipated. From the Vietnam War of 1955-1975 to the United States/Israel-Iran War of 2026, the war literature is replete with examples of conflicts that were started based on assumptions about the ability to achieve rapid military victory, which could not stand the test of time. For India, it is all the more important to in-


IAF'S NUMERICAL SUPERIORITY:
A FALSE SENSE OF OPERATIONAL CONTROL
THE NUMBERS MYTH
INDIAN AIR FORCE
2183 AIRCRAFT
513 FIGHTERS
PAKISTAN AIR FORCE
1397 AIRCRAFT
331 FIGHTERS
IAF leads in numbers—but not in outcomes
2019 — PROOF UNDER FIRE
Balakot Airstrike & Aerial Engagement 2019
PAF Response:
IAF initiated cross-border airstrikes
PAF Executed precision retaliatory strikes the next morning
Shot down two IAF Jets (MiG-21, Su-30)
Captured an Indian pilot (WC Abhinandan)
India shot down its own Mi 17 helicopter (6 airmen killed)
2025 — REPEATING THE PATTERN
During May 2025 Conflict:
PAF swiftly downed IAF aircraft with a score of 7-NIL
Gained Air Superiority in minutes
IAF Strategically Paralysed
PAF attacked Targets deep
Destroyed S-400 batteries
Maintained operational control in contested airspace
PAF
Smaller but agile and synchronized
Training, Skill & Rapid Response
PAF DEMONSTRATES THAT MODERN AIRPOWER IS NOT ABOUT HOW MUCH YOU HAVE — BUT HOW EFFECTIVELY YOU FIGHT.
IAF
Larger but operationally stretched

ternalise this lesson, as every successive crisis in nuclear South Asia has shown increasing intensity, and the region cannot afford such a trajectory.

Zahra Niazi is a Research Associate at the Centre for Aerospace & Security Studies (CASS), Islamabad. The article was originally published in Fair Observer.

Emerging Technology

The First Drone War in South Asia: May 2025

Shaheer Ahmad

The four-day India-Pakistan conflict saw the emergence of drone warfare as a new strategic reality in the South Asian theatre. Drawing inferences from the Russia-Ukraine war, both sides deployed drones for precision targeting, probing air defences, and performing intelligence, surveillance, and reconnaissance (ISR) tasks. The conflict marked a qualitative escalation where unmanned systems were used for coercive targeting besides their utility for tactical surveillance and reconnaissance.

The loss of 7 top-of-the-line fighter aircraft in the initial phase of battle swiftly ended the Indian Air Force (IAF) bid for air dominance, forcing it to retreat to the rear bases. The loss of control of air created a decision dilemma and operational pause for the Indian leadership, compounded by the absence of a coherent strategic direction.

When the IAF realised that it could not compete with PAF in the air, India shifted to an alternative axis of engagement: unmanned aerial vehicles (UAVs) and standoff weapons. With the IAF out of the operational equation, India launched a tri-phased UAV penetration employing coordinated swarming tactics against Pakistan's Integrated Air Defence System (IADS). In the initial two days, India launched 78 killer drones, including Israeli-made Harop and Polish-made Warmate-3, across multiple target locations in Punjab and Sindh. The intrusion was aimed at restoring tactical advantage, conducting cross-border ISR, gauging the response of Pakistan's IADS, and locating the camouflaged early warning radars and surface-to-air missile (SAM) sites.

In response, Pakistan intentionally refrained from engaging drones to conceal signatures and locations of its IADS. Instead, it adopted a mix of hard and soft kill measures to intercept or disable the loitering drones. These included the deployment of decoy radars, waiting for drone exhaustion, and subsequently shooting them down below 3000 feet with Oerlikon anti-aircraft guns operated by the PAF and Pakistan Army.

"On the soft kill side, it is widely believed that Pakistan deployed its indigenous Spider anti-drone system capable of disrupting flight paths and communication jamming."

India's failure to accomplish suppression of enemy air defence (SEAD) missions compelled it to amend employment tactics. During the early hours of 10 May, the IAF's Integrated Air Command and Control System (IACCS) and the Indian Army Air Defence Corps launched another wave of drones inside Pakistani territory. Besides performing SEAD missions, the drones were programmed and launched alongside surface-to-surface missiles (SSM) to hit Pakistani airbases and related military infrastructure.

However, none of the drones succeeded in reaching their designated targets. Pakistan's IADS

rendered the UAV incursions ineffective by jamming, spoofing, and mid-air interceptions. The successful interceptions demonstrated the efficacy of Pakistan's air defence grid, including its ability to detect low radar cross-section (RCS) targets with surgical precision. These operational failures created pressure in Indian decision-making cycles and exposed Indian operational vulnerabilities.

Pakistan also launched drones against numerous targets inside India in the early hours of 10 May. According to Indian sources, Pakistani drones loitered at 26 locations, along with reports of them being sighted at New Delhi and Gujarat for several hours. Primarily, Pakistan employed Yiha-III and Asisguard Songor drones, which mounted a proportionate and cost-effective response while maintaining the escalation threshold. These drones conducted precision strikes on the Indian airfields, logistics hubs, and related infrastructure.

"Besides the military utility, a significant aim of deploying UAVs was to inflict psychological damage on the public morale. Indian planners anticipated that loitering drones with hovering sounds would cause panic among the civilian populations. However, the drones became a source of public amusement and curiosity."

Graphics and visuals from digital media showcased civilians intercepting drones with rudimentary air guns along with security forces, and collecting the pieces of wreckage as war trophies. Contrary to the Indian expectations, the Pakistani public demonstrated a unified and resilient national character in times of crisis.

Overall, the drone incursions in the 2025 conflict demonstrated an alternative form of airpower. With less political and operational threshold of action, drones provided a cost-efficient way of precision targeting and ISR without risking the manned platforms. Despite India's numerical superiority, PAF's calibrated employment of drones turned out to be a comprehensive success for Pakistan at operational and tactical levels. This also points to the emergence of a new operational reality where drones would serve as a potential weapon of choice for both parties in the tense operational environment.

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PAF's Operations in Zarb-e-Karar May 2025

Established Air Superiority within the opening 30 minutes

- Rapid response
- Disciplined command-and-control
- Counter-air doctrine.

Achieved a score of 7-Nil , including

4 Rafales, altering the tactical and strategic balance

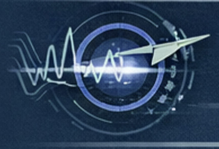
PAF Claims Reinforced

- Comprehensive post-conflict briefings
- Radar tracks, electronic signatures, and engagement timelines
- Transparency and confidence in its operational outcomes.

Maintaining an edge in Unmanned warfare

- Neutralising Indian UAV incursions
- Demonstrating reach through deep penetration of UAVs of Indian airspace

Degrading Air Defence Systems - PAF targeted high-value Indian air-defence systems, destroying 02 **S-400 radars,** thereby weakening India's layered air defence posture.



EW Operations - jamming, deceiving, and degrading Indian missile systems was successfully conducted.

Multi Domain Operations -

PAF cyber operations complemented kinetic and EW, with targeted cyber

IAF Limiting conventional airpower and shifting to large scale drone employment – suffering drone losses → gaps in operational integration and survivability planning.

Forcing IAF into a reactive posture - Limiting its operational flexibility - Reducing ability to sustain coordinated offensive momentum.

PAF operations in Zarb-e-Karar ushered in a new paradigm of multi-domain warfare in South Asia, **integrating airpower, drones, cyber, and electronic warfare into a unified operational framework that reshaped regional airpower dynamics.**

Aerospace

May 2025: The Largest BVR Engagement in South Asian Air Warfare

Mustafa Bilal

The tale of how the Pakistan Air Force (PAF) and the Indian Air Force (IAF) entered the era of Beyond Visual Range (BVR) air combat spanned decades before it came to its culmination on the night of 7 May 2025. For almost 50 years after partition, the PAF and IAF engaged each other in close-distance dogfights. Pilots would often recognize the tail markings on the fighter aircraft they were attempting to shoot down with their short-range guns and heat-seeking missiles. As such, all aerial engagements during the wars of 1965 and 1971 were conducted within visual range. The technological enablers for BVR engagements and corresponding doctrines did not develop in South Asia until the 2000s.

In BVR air combat, the first one to see, lock on, and fire their missiles wins the engagement. Initially, the IAF had the 'First Look, First Shot' advantage. PAF's fighter aircraft were capable but carried missiles with limited range, hindering effective long-range engagements. PAF did not remain oblivious to this asymmetry and trained its pilots for engagement geometries that could neutralise the IAF's standoff reach.

The tactical discipline ingrained in PAF pilots during years of hardware disadvantage was augmented when the range of their missiles caught up with and eventually surpassed those in the IAF's inventory. Subsequently, on 27 February 2019, PAF downed two IAF aircraft in the first BVR engagement with the IAF during Operation Swift Retort. The scale of the engagement was limited, and India sought to downplay the loss of an upgraded MiG-21. What Operation Swift Retort established, however, was that the PAF would no longer absorb standoff pressure without a credible and swift response.

On the night of 7 May 2025, 114 aircraft were simultaneously airborne for 52 minutes; 42 aircraft of the PAF were up against 72 aircraft of the IAF. According to reports, Indian aircraft were deployed at what their intelligence had assessed as a safe standoff distance. Consequently, Indian pilots assumed they were not at risk from long-range BVR missiles of the PAF. However, as it became apparent over the next hour, the missiles reached them before the threat was fully registered.While Indian employment strategy presented the opportunity, it was the PAF's operational discipline that exploited it. The outcome was determined more by years of sophisticated BVR training than by the performance of any single weapon. The Cobras from No. 15 Squadron spearheaded the engagement.The PAF pilots had extensively drilled emissions discipline, sensor fusion, and missile envelop coordination in complex multi-aircraft scenarios.

Their preparation converted a technological edge into an operational victory. The PAF downed seven IAF aircraft, including four Rafales that Indian officials had labelled as game-changing since 2020. This was the longest and largest BVR engagement in South Asian and military aviation history. It was also historically the largest aerial confrontation involving advanced 4th- and 4.5th-gen aircraft.

"The structural composition of the IAF fleet added to their challenges that night. The IAF operated Rafales, Su-30MKIs, and Mirage-2000s, a fleet built to different national specifications and not optimised for sharing sensor data across all platforms. The flaws in the IAF's fleet composition became a significant weakness under intensive jamming."

The PAF had no equivalent fragmentation. Its sensors and shooters were synchronized into a coherent kill chain, reflecting years of integrated training. The procurement reaction and spending surge by the Indian government that followed 7 May made the outcome hard to dispute. India accelerated its air-to-air missile programmes in a bid to restore stand-off-range parity.

Capital markets also reflected the prevailing consensus among international military aviation circles as Dassault Aviation's stocks fell whereas Chengdu Aircraft's rose. Moreover, Indonesia confirmed plans to acquire 42 J-10Cs even though it was expecting the first deliveries of Rafales after signing a $8.1 billion deal for them in 2022.

Reflecting on 7 May 2025, there is a tendency to merely reduce the engagement to the performance of a single weapon, whereas in reality, the ecosystem and pilots who fired those shots extended stand-off reach while minimizing their electromagnetic signature and executed their actions under pressure. BVR air warfare has no tolerance for fragmented systems and incoherent coordination between platforms and pilots. The PAF and IAF have spent decades acquiring what warfare demands. However, on 7 May 2025, it was the PAF that proved it was second to none in effectively executing those demands to win South Asia's longest and largest BVR engagement even before the first missile left its rail.

Mustafa Bilal is a research assistant at the Centre for Aerospace & Security Studies (CASS), Islamabad. The article was originally published in Stratheia.

Aerospace

Prepared to Prevail: PAF's Road to May 2025

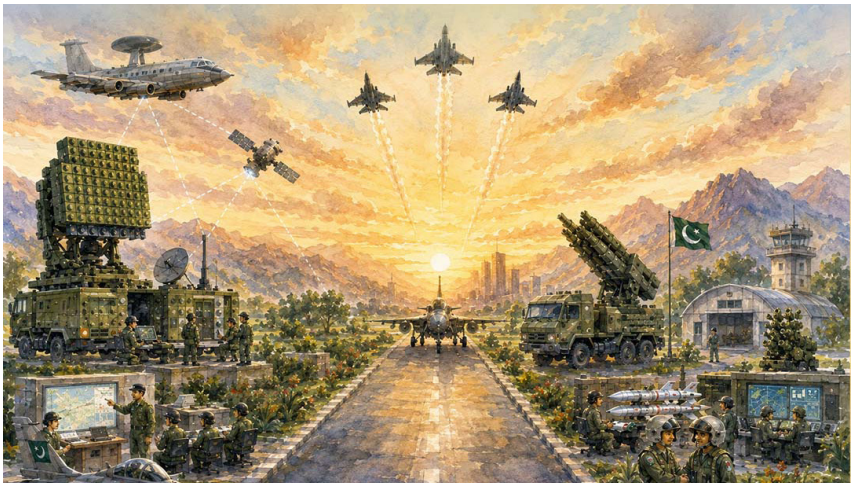
Saba Abbasi

Operation Bunyan-um-Marsoos was a watershed moment for the air forces of Pakistan and India. The silent years of Pakistan Air Force (PAF)'s preparation that led to the outstanding outcome of the May 2025 war continue to be of global interest. With international air forces studying PAF's kill chain model and arms markets prioritising Chinese platforms, because of how they were operated by Pakistani pilots, PAF carries the honour of being a formidable air force that has made the world rethink airpower and the future of air combat.

However, before May 2025, it was 2019's Operation Swift Retort that had set the tone for PAF's response to any future aggressive action by the adversary. Pakistan clearly anticipated that India would repeat its tactics and therefore remained prepared. It consolidated its capability and capacity in the face of the perpetual threat of India's misadventure. Post Balakot incident, PAF continued to crystallise its offensive defence doctrine, in which decisive air actions would

be executed to uphold deterrence without triggering uncontrollable escalation.

Starting in 2021, in the face of Indian leadership's boastful rhetoric and exaggerated claims about the induction of Rafales, PAF silently procured J-10 C. Although both air forces were recruiting the best platforms to upgrade their arsenals, one key difference that ended up setting PAF's inventory apart was the interoperability of its platforms. By contrast, Indian platforms operated in a disjointed and disintegrated manner, which greatly hindered their effectiveness in a high-tempo and interconnected air war theatre. For PAF, procuring state-of-the-art platforms and weapons was not the only goal; it was part of a broader strategy – a strategy in which every part of the air war connected and coordinated with each other to facilitate a network-centric kill chain, giving PAF an unprecedented beyond-visual-range (BVR)advantage.



However, the BVR capability is not entirely contingent on an inanimate object such as an aircraft. As PAF spokesperson had said in one of his press briefings during the May 2025 conflict, 'Rafales are a potent platform if employed well.' The statement clearly indicates that the defining factor in an air force's success is not merely a first-class aircraft, but rather the pilot and the entire ecosystem behind it. For this reason, PAF's pilots are selected under strict criteria and undergo rigorous training to be able to employ their platforms effectively. During the critical Dissimilar Air Combat Training, the PAF pilots are given complete freedom and responsibility to form and execute their own mission plans. Such training prepares the pilot to adapt to high-pressure, high-tempo situations where, at the tactical level, decisions have to be made within seconds, without any room for pause or paralysis. PAF pilots are trained on a psychological level to operate under stressful and at times uncertain situations, where their response to quickly changing combat situations influences the entire outcome of the war. Hence, autonomy in training and stress inoculation are major parts of a PAF pilot training program, which manifested remarkably during the May 2025 episode.

Another factor that distinguishes PAF from the IAF is its Pilot-to-Aircraft Ratio. The PAF trains more pilots, approximately 2.5 pilots per aircraft, which in turn allows it to generate more sorties per day during wartime. It allows for crew rotation and the ability to conduct continuous operations, especially in a swift and decisive conflict. It is beyond doubt that PAF's pilots were pivotal to the May 2025 aerial theatre. The downing of seven IAF aircraft in less than an hour highlighted that the real force behind the victory was not the machines but the humans that were operating those machines. Verily, without a highly skilled pilot in the cockpit, even the most advanced and sophisticated aircraft cannot be utilised to their full potential.

The May 2025 conflict was not solely a duel between J-10Cs and Rafales, but a real-world demonstration of how in the air war theatre, not just the brand of aircraft, but training, operational jointness, and

doctrinal clarity determine the outcome. IAF's appetite for testing its numerical advantage over PAF was perhaps diminished after the May 2025 conflict, which had kept its forces in a delusion due to the previous limited and localised nature of encounters. PAF's resounding victory has been a result of its silent and consistent preparation, where it meticulously worked on every aspect of the force, to live up to and translate the Quaid's founding directive for PAF — second to none — into reality.

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The article was originally published in The Friday Times.

Emerging Technology

Inside the PAF Kill Chain – May 2025 Air Operations Explained

Syed Ahmed Ali

Air combat has come a long way from traditional visual based kinetic manoeuvre warfare. Modern aerial combat relies heavily on technological sophistication which has given the birth to new concepts such as Beyond Visual Range (BVR) capability, multi domain operations, systems and network centric warfare. This complex web of intertwined capabilities, platforms and domains culminates into a single kill chain providing a firing solution. On 7 May 2025, Pakistan Air Force (PAF) demonstrated its superiority over its archival India by shooting down seven of its aircraft. The PAF achieved this feat by compressing its kill chain while simultaneously disrupting the adversary's targeting cycle.

The Air & Space Forces Magazine defines Kill Chain as a process used to put munitions on a specified target. This complex process is broken into five different parts, first is 'finding' which revolves around Intelligence, Surveillance and Reconnaissance (ISR) capabilities. This process is crucial as it helps map the battle space and identify the target. 'Fixing' helps locate the exact location of the target; 'tracking' guides the munitions to the target adjusting to the relative change in location and the last step is 'targeting' which engages the hostile. After the munitions have successfully hit the target, operators 'assess' the damage to the objective to determine if any additional strikes are necessary.

Amateur commentators often credit an air force capability to superior fighting jets: this represents an erroneous judgment and a lack of understanding of the complexities of air warfare. The composition of modern airpower is a product of its supply chain, superior pilot training, information architecture (data links), satellite network, Air Defence Ground Environment (ADGE), electronic warfare (EWs) and cyber capabilities. The integration of these systems represent the essential infrastructure for an air force to develop its kill solution. In modern air warfare the speed of the kill chain determines the winner, the combatant that develops its kill solution first, wins the engagement.

The basic foundation of a reliable kill chain is situational awareness, which encompasses the ability to perceive, analyse and anticipate the movement of an adversary. Without this capability, the command and pilots are likely to develop operational blind spots, which can be exploited by adversaries. Situational awareness includes Command and Control (C2) ar-

chitecture, ground based radars like the YLC-8E, Airborne Early Warning and Control (AEW&C) aircraft such as Saab 2000 Erieye, radars for Surface to Air Missiles (SAM) which includes HQ – 9BE and HQ-16FE. Collectively, these platforms detect, track and provide early warning capability, without which an air force would be operationally blind.

If Early Warning systems and radars are the eyes and ears of an air force, the data link systems are the nervous system that connects it to the shooters. The function of a data link is to connect sensors to shooters and provide a connectivity to different platforms. Based on NATO's Link-16, Pakistan has indigenously developed 'Link-17 system,' which comprises of several Tactical data links that are jam resistant and protected against electronic counter measures (ECMs). This communication architecture that allows PAF to engage in real time information network protected through layered encryption systems. This network connects all air to air and air to ground systems providing a near seamless battlefield situational awareness, communication and coordination.

On 7th May, PAF put all these concepts and capabilities into action and developed operational superiority over its arch nemesis the Indian Air Force (IAF). In an interview, Micheal Dahm, senior fellow at Mitchell Institute for Aerospace Studies stated that the kill chain may have been started by ground radar (or possibly an AEW&C such as Saab 2000). The radar system had the capability to detect the hostile platform at a longer distances, while Pakistani aircraft kept radar and radio silence to minimise electronic signature. The information from the radar was relayed to a J-10 C fighter which launched its missiles at the designated target, which could have been guided by an AEW&C through a midcourse data link to update its trajectory. With a seamless network Link 17 and advanced PL-15 BVR missiles, PAF had demonstrated technical and technological edge over its adversaries in both range and detection capabilities.

PAF's victory over IAF cannot be credited solely to a faster kill chain but also its capability to disrupt its adversary's targeting cycle. Modern conflict operates under the framework of Systems warfare, this strategy

focuses on destroying systems rather than individual platforms which operate under them. Targeting in this doctrine focuses on functional systems which includes command structure, logistic nodes and early warning systems rather than military attrition. In the context of May war, PAF systematically disrupted the enemy's kill chain by jamming its sensors, spoofing radar systems and deploying decoys. Through these efforts the IAF was unable to complete its kill chain, rendering their targeting capability useless in a fast paced dynamic combat. This ensured not only the safety of PAF but also enabled a psychological supremacy over its adversaries.

By understanding the nature and operational requirement of modern air combat, PAF had demonstrated strategic foresight and an acute understanding of modern warfare. Though many commentators may praise the J-10 C and PL-15 missiles for its victory over in IAF, it was in fact Pakistan's superior networks, resolve, fast kill chains and its leadership which won the May 2025 war.

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Security

The Air War of May 2025: Every Kill Verified

Sajal Shahid

On 7 May 2025, 114 combat aircraft clashed in what has been described as one of the largest beyond visual range (BVR) air engagements since WWII During the 52-minute aerial battle triggered by India's Operation Sindoor, traditional visual confirmation of kills became difficult. Missile impacts occurred at unprecedented ranges from 160 km to 190 km, often beyond the horizon, while claims and counter-claims continued to spread rapidly across social media platforms, amplified by unverified facts and AI-produced imageries. Amid this torrent of conflicting claims, determining what actually happened was as disputed as the battle itself.

Amidst this fog of confusion, Pakistan's clear and unambiguous claims backed by published evidence as well as openness to independent verification provided a welcome breath of clarity. As the prevalence of BVR battles increases and the spread of disinformation continues to outpace verified data in shaping both domestic opinion and international perceptions, the authentication of aerial victories will become critically important. In this regard, the dedication of Pakistan Air Force (PAF) to a transparent and stringent verification system has been a key factor in ensuring that the battlefield triumphs are supported by factual evidence instead of mere empty rhetoric.

The PAF exhibits a record of verified triumphs starting with Squadron 15 called 'The Cobras'

destroying an Indian PR-57 Canberra in 1959, confirmed both by eyewitness account and a physical investigation of the debris. This kill pattern persisted in 1965 when Flight Lieutenant Imtiaz Bhatti destroyed two Indian Vampire jets which were again confirmed by both ground witness and pilot testimony. These historical victories, though largely backed by eyewitness reports, examination of debris, and aircraft Video Tape Recorders (VTR) where physical wreckage could not be recovered, were employed to give a clear and transparent starting point, by which all assertions were to be justified.

This culture of verification would persist into the modern age as an Indian MiG-21 was shot down after the aerial encounter at Balakot in 2019, confirmed by the capture of its pilot, Wing Commander Abhinanadan and the physical remains of the aircraft including its intact missile pods and all four missiles (two R-73 and two R-77). During the engagement, the PAF also shot down an Indian Su-30 fighter aircraft, the debris however fell in Indian territory. Following the incident, Pakistan opened the sites in Balakot to international observers and journalists to verify its claims independently. In sharp contrast to this, India's claims of shooting down a Pakistani F-16 jet contained no such backing and were instead disproven by physical audits of the fleet by US defence officials.

The May 2025 India-Pakistan crisis was a classic pattern of competing claims, as Pakistan claimed to have shot down seven Indian aircraft, including Rafales, MiG-29s, and Su-30MKIs which India tried to deny. Nevertheless, Pakistan could validate its claims by using a networked ecosystem whereby data collected by ground-based radars, Saab 2000 Erieye AEW&C aircraft, and J-10C fighters were integrated through the indigenous Link-17 datalink, resulting in a complete digital record of each engagement. Conclusions drawn from this data were presented globally through ISPR press briefings alongside additional proof such as tail numbers of specific Rafales and audio transcripts of IAF pilots (call sign Godzilla) noting a missing member in their formation. Exclusive access was granted to international analysts such as Alan Warnes, whose findings supported these claims and further validated the independent confirmations from US and French officials.

"In comparison, India's claims, such as assertions that its Russian-made S-400 system shot down Pakistani aircraft, remained unsubstantiated, with little publicly available evidence to support them."

As time passed this story became even weaker, and the Indian Chief of Defence Staff, General Anil Chauhan later admitted that Indian planes had been lost in the 7 May engagement. India also undermined its own arguments by rejecting the Pakistani proposal to conduct a joint audit of aircraft inventories with international observers.

This divergence in transparency between the two states highlighted a deeper contrast in how each side approaches the credibility of its operational claims. India stood strongly by its claims and refused all opportunities for independent verification as opposed to Pakistan, which provided empirical data and invited third-party scrutiny. In the current age of active disinformation, increased transparency enhances credibility and contributes to strategic stability which is especially crucial in the nuclearised environment of South Asia. The fact that the claims were founded on verifiable evidence enabled the PAF to reduce the risk of miscalculations and undermine the destabilising power of propaganda.

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The Art and the Artist: Pakistan's Response in the May 2025 Crisis

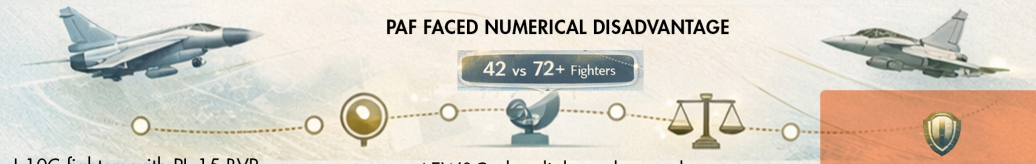
PAF as the Artist – Masterful Precision, Strategic Mastery, and Unbreakable Resolve

THE CANVAS: A SUDDEN ESCALATION

- Crisis triggered by Pahalgam terrorist attack
- India launched Operation Sindoor on May 7
- PAF executed a brilliant defensive response.

THE FIRST MASTERSTROKE – MAY 7 AERIAL ENGAGEMENT

PAF FACED NUMERICAL DISADVANTAGE



J-10C fighters with PL-15 BVR missiles,JF-17 Thunder excelled.

AEW&C, data links and ground radars made a Kill Chain.

Achieved standoff kills through precise coordinated attack.

OUTCOMES 7 - NIL

Indian aircraft downed: 4 Rafales,1 Su-30MKI,1 MiG-29,1 Mirage 2000.

Zero PAF losses.

THE MASTERPIECE – OPERATION BUNYAN-UN-MARSOOS (MAY 10)

TYPE:

Calibrated, multi-domain retaliatory strike led by PAF.

TARGETS:

- 26 Indian Military targets hit
- BrahMos storage sites.
- S-400 air defence systems, logistics depots, & command nodes.

Demonstrated precision, restraint, and strategic planning.

THE FINISHING TOUCH – TRI-SERVICE PRESS BRIEFING (MAY 11)

- Joint briefing by Pakistan for international observers
- Reinforced Pakistan's image of professionalism, calculated restraint, and decisive response

REVEALED:

Full conduct and success of Operation Bunyan-un-Marsoos.

Evidence: downed aircraft wreckage and neutralized Indian assets.

RESULT:

Ceasefire forced later the same day.

THE ARTIST AT WORK

PAF painted a portrait of resilience, precision, and strategic maturity.

PAF emerged as the undisputed artist of the May 2025 Crisis.

Pakistan's response was not mere reaction; it was art.

Analysis: Ayeza Areej, Research Assistant, Centre for Aerospace & Security Studies, Islamabad
Sources: CFR, Dawn, Key Aero | **Design Curator:** Hira Mumtaz

Emerging Technology

7-0 Global Reaction to the May 2025 Air Battle

Ayesha Shaikh

The May 2025 Air war between India and Pakistan was a unique development in the history of warfare, where Pakistan Air Force (PAF) downed 7 jets of the Indian Air Force (IAF), within a matter of minutes. It astonished observers all across the globe, considering the comparable difference in the size of both forces and their respective performance. One year ahead of the May 2025 Air War between India and Pakistan, failure of the Indian narrative in the face of the globally acclaimed Air dominance of PAF has shifted the global posture in favour of Pakistan. The military, strategic, and economic response from the international actors has certified the victory of Pakistan against the Indian misadventure.

Militarily, the peculiar dynamics of the conflict attracted significant global attention. Military strategists focused on the tactics and technologies used by PAF and extracted Air doctrine lessons from the conflict. The IAF had a two-fold preliminary advantage; firstly, it shaped the course of escalation as per its own convenience as an offensive actor, and secondly, it had a numeric advantage. However, the astonishing retaliation from the PAF, despite being dragged into the conflict by a force much larger in size, neutralised the Indian advantage. Thus, the doctrinal debate shifted from numeric advantage to network-centric and multidimensional warfare. Furthermore, both states resorted to the use of drone technology for the first time in the decades-long rivalry. In the aftermath, military strategists have highlighted the significant role of counter-drone technologies in the future of Air warfare.

Similarly, on the strategic front, the May 2025 Air war depicted that future of Air wars will be multi-domain and network-centric. The Numeric

advantage of IAF could not stand against the network-centric approach of PAF.

"Moreover, the propensity of India to escalate on the Air front has raised questions about deterrence, whereas the apt response from PAF has highlighted the relevance and strength of Pakistan of conventional deterrence."

Furthermore, beyond the conventional fronts, the narrative propagation has complicated the strategic calculus even more, as the role of successful narrative projection during the conflict has also gained strategic attention in the aftermath of the conflict. While Indian media went all out to propagate the false narrative, aligned with the Bharatiya Janta Party's anti-Pakistan jingoism, Pakistan's Inter Services Public Relations provided credible media coverage as well as evidence-based reports regarding the status of the conflict. Overall, independent sources verified the facts presented by Pakistan and determined that narrative warfare, based on misinformation, cannot stand fact-based, transparent official narrative.

Furthermore, multiple layers of the conflict have attracted strategic calculations in the aftermath. Firstly, the conflict depicted that air supremacy is a prerequisite for land or naval conquests. Secondly, the conflict has also been framed in the matrix of great-power politics between the U.S. and China. The victory in the air war has brought relative strategic autonomy to Pakistan in the aftermath, as it has been able to balance its regional and global foreign policy instead of resorting to the camp politics. Lastly, the success or failure of technologies in the conflict has gained a great deal of attention. PAF's seamless performance has highlighted the efficiency of Chinese J-10 C jets, whereas IAF's misadventure has raised concerns about the reliability of the French Rafale jets.

The military and strategic calculations have impacted the economics of defence procurement as well.

"The seamless performance of PAF turned out to be a successful debut of Chinese fighter jets in a combat situation. The trend subsequently shifted in favour of China, as Chengdu Air Corporation gained USD 7.6 billion due to the spikes in the sale of J-10 C fighter jets."

Furthermore, the demand for drones, stealth aircraft, and electronic warfare systems has also increased in the aftermath of the conflict.

In a nutshell, Pakistan has emerged as a victor out of the Indian misadventure in the region. One year ahead, Pakistan is standing as a proponent of peace in the region and beyond, whereas India is still stuck with Sindoor 2.0. Thus, the long-lasting reverberations of the Air Clash between India and Pakistan have shifted the regional strategic balance in favour of Pakistan. Over the past decade, India has developed a pattern of exploiting nationalist military escalation as a tool for domestic electoral campaigns. However, the political cost inflicted by the May 2025 air war on India, in addition to the economic cost, is likely to demand thorough recalibration from the Indian side to demarcate domestic politics from military misadventures in the future. Overall, the global response in the military, strategic, economic, and political domains has certified the victory of Pakistan in favour of a stable South Asia.

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Cost of War : Indian-Pakistan War May 2025

Short-Term Cost (4-Day Military Escalation)

Category	India	Pakistan
Stock Market Loss	$60 Billion	$3 Billion
Aerial Assets + Missiles	$750 Million	$26 Million
Military Operations	$260 Million	$100 Million
Trade Disruption	$60 Million	$20 Million
Aviation Disruption	$30 Million	$10 Million
Cricket Disruption	$50 Million	$10 Million
Conservative Total	**$61 Billion** (At Least)	**$3.2 Billion** (At Least)

Long-Term Airspace Closure Costs

Impact	India	Pakistan
Monthly Cost	~$54M	~$6.5M
Annual Cost	~$648M	~$79M
Key Driver	Higher flight costs	Loss of overflight fees

Security

Marka-e-Haq and the Air Defense Grammar of Aerial Warfare

Ayeza Areej

Marka-e-Haq transformed the May 2025 battlefield into a testing ground, where integrated doctrine and advanced technology redefined the future of aerial warfare. The war provided a paradigmatic example, where a well-integrated air-defence architecture and offensive-defence strategy could successfully counter even the most advanced threats. The unified air-defence architecture of Pakistan transformed numerical disadvantage into strategic superiority, providing crucial lessons on the need to integrate systems and employ multi-domain synergy in the twenty-first century. The May war was more than a fight in the air; it demonstrated that comprehensive planning, innovative technology, and a multi-layered defence can turn the tide in modern war.

The air defence architectures of both Pakistan and India before the May 2025 Crisis, were vastly divergent. On one hand, Pakistan not only employed an offensive-defence strategy but also a fully integrated network under a unified command by fusing Surface to Air Missiles (SAMs), Airborne Early Warning and Control (AEW&C) system, fighter jets and radars. India, on the other hand, had a formidable and advanced defence arsenal. Under the Narendra Modi regime, it heavily relied on sophisticated and costly imported defence platforms, including the S-400 air defence system and an expansive assortment of modern fighter jets like Rafales, Su-30MKIs, and MiG-29s. Despite having a numerical and technological edge, Indian Air Force (IAF) lacked a fully integrated architecture, which created exploitable lapses that the doctrinal coherence and operational synchronisation of the Pakistani forces were well placed to capitalise on.

It is a certainty that IAF was well prepared for Operation Sindoor, with targets identified, mission profiles simulated and pilots assigned to deliver precision-guided munitions at standoff ranges. India, to facilitate the operation, deployed its state-of-the-art air defence, weaponry and frontline resources in order to maximise operational effectiveness. However, what was supposed to be a strategic surprise turned out to be a counter-surprise of much greater intensity.

The IAF made faulty assumptions regarding PAF's capabilities and underestimated its training, resolve and preparedness. In contrast to India's expectations, PAF demonstrated doctrinal clarity and operational

readiness. Pakistan's Multi-domain Operations (MDOs) successfully integrated manned aircrafts, radars, drones, ground-based air defences, satellites, electronic warfare and Beyond Visual Range (BVR) weapons in an impregnable air defense architecture. An 'indigenous data link' provided exceptional situational awareness and enabled integration among all assets, resulting in the formation of a highly responsive and agile kill-chain. It enabled a higher degree of interoperability and nullified New Delhi's numerical advantage.

For countering a larger Indian strike package of 72 aircraft (including Rafales, Su-30 and MiG-29), Pakistan air defence efficiently employed approximately 40 fighter jets (including JF-17 Thunder and J-10C). The J-10C as the frontline defender provided PAF with rapid engagement ability and compressed the opponent's response window. Moreover, the PL-15 missiles employed on the J-10C fighter jet provided Pakistan's air defence with enhanced operational reach and extended engagement range beyond visual capacity. Its radar-guided design and capability to withstand electronic countermeasures provided a tactical edge to PAF. Thus, the results were unequivocal as PAF while defending its airspace managed to shoot down four Rafales, one MiG-29, one Su-30 and a Mirage-2000. The downing of Rafales was not merely a tactical success for Pakistan but also proved to be a major embarrassment for India.

The May conflict also exposed vulnerabilities of the top-notch Russian S-400 air defence system, which was debuted during this crisis. Although the system was claimed to be reliable, a Chinese-made CM-400AKG, deployed by JF-17 Thunder, successfully targeted the S-400 batteries in Poonch and Adampur. Apart from that, Pakistan's coordinated strikes targeted 26 Indian installations, including BrahMos Storage site, airbases, command nodes and logistic depots. It substantiated the claim that technological sophistication alone does not provide the operational supremacy of impenetrability.

After facing unprecedented setbacks from the aerial combat, India resorted to a new phase of escalation through drones. However, even during this phase, the reaction of Pakistan's air defence proved to be decisive and highly calibrated. Pakistan not only effectively intercepted 77 drones through a combination of hard kill and soft kill tactics but also launched its own salvo of drones against India, showcasing the strength of its 'multi-layered defence system.' Therefore, India's attempt to overwhelm Pakistan's air defences ultimately revealed susceptibilities in its own defence network.

The success of Pakistan did not depend on any single platform, missile or aircraft but on the combination of doctrine, organisation, training and technology in a coherent air-defence structure. This system turned the skies into a battlefield that could be controlled, where it is possible to detect, intercept and respond in a coordinated manner. The MDO operations enabled Pakistan to outpace the IAF in the conflict, which showed that firepower and numbers alone are no longer decisive.

Marka-e-Haq is not merely a case study about the past, but a template for the future war and the air defences employed. Network-centric supremacy and smooth integration of airpower,

drones, missiles, cyber capabilities, electronic warfare, and intelligence systems are increasingly becoming the determinants of strategic preeminence. Ultimately, in the modern-day war, the skies are no longer with the more powerful force, but with the side that plans better and acts more swiftly.

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Defence

Why the IAF's Post-Sindoor Spending Surge is a Sign of Panic

Muhammad Saad

After Operation Sindoor, India is spending billions of dollars on new weapons. This is being taken by many people as an indication of military prowess. It is not. This rush to procure weapons is in fact an acknowledgement that the Air Force in India had failed to do what it was meant to do. The costly jets and missiles that India had purchased over the years failed to yield the promised results.

Sindoor was soon followed by India in sealing the gaps which the operation had exposed. It was reported that Indian Air Force (IAF) is looking to speed up its purchases of more than 7 billion USD. This will involve other Rafale fighter jets with India already ordering 26 more Rafales to the Navy in 2024 at an estimated cost of about 3.9 billion USD. India is also seeking long-range standoff missiles, Israeli loitering munitions and increased drone capabilities. Special financial powers of the Indian military were activated to issue emergency procurement orders. The magnitude and rate of these purchases speak volumes.

Indian media and defence analysts have over the years considered the Rafale as a game changer. When India purchased 36 Rafales aircrafts at an approximate cost of 8.7 billion USD, analysts vowed that the aircraft would provide India with air superiority over Pakistan. Operation Sindoor disproved all those allegations. Indian aircraft did not even fly in Pakistani airspace when the fighting started. India solely depended on standoff weapons that were launched at a safe distance. The air defence system of Pakistan, comprising of the HQ-9 surface-to-air missile system and its own fighters, stood its ground. The line that the defences of Pakistan had drawn was one which India did not want to cross. That is not air dominance which IAF was seeking. That is the deterrence of Pakistan at its best.

The economic price of what India actually accomplished during Sindoor is painful to read. India fired an estimated $100 million worth of missiles and munitions in just a few days of the standoff. Some of these attacks were either in-

tercepted or not able to strike any significant military targets. The PAF had shot down several Indian aircraft, and at least one Rafale jet according to Pakistani sources and some western sources. To a nation which had spent almost $8.7 billion on the same planes, losing at least one to an enemy platform that cost a fraction of its price was a huge embarrassment. The expenditure was colossal but the outcome was not.

The reaction of India to this failure was to spend more. Almost immediately after the ceasefire, new procurement requests were made. This is not the action of a self-confident military force. This is panic. India had taken decades and hundreds of billions of rupees to develop its air force and when the time came it was halted at the border by a nation with a tenth of its defence budget. In 2024, the total defence budget of Pakistan amounted to about 7.7 billion USD, whereas the Indian defence budget was 74 billion USD. Yet despite that enormous gap in spending, Pakistan has performed much better

"The victory of Pakistan in Sindoor was not based on huge budgets but rather on intelligent decisions. The JF-17 Block III, a joint venture with China at a quarter of the price of a Rafale, was a viable frontline fighter."

The combination of Chinese and home-grown technology in the form of a layered air defence system enabled Pakistan to counter the costly standoff attacks by India. Pakistan never attempted to keep pace with India, weapon-to-weapon. Rather, it concentrated on creating a defence that was sufficient to deprive India the clean victory it desired. That approach worked.

The moral of the story is straightforward: do not get drawn into an arms race with India.

"The new wave of expenditure in India is the cost it is incurring as a result of its failure during Sindoor. It is trying to buy back the credibility and the fear factor that the operation failed to deliver."

Pakistan needs to keep spending prudently, investing in ability rather than in quantity and not to pursue the numbers that its economy cannot afford. This was won by smart and cost-effective defence. There is no need in altering a strategy that has already been proven.

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May 2025 Air War: Separating Indian Claims from Pakistan's Reality

INDIAN NARRATIVE

Air Superiority Claim:
Projected dominance in the skies.

Precision Strikes:
"Surgical" deep strikes on Pakistani

Attrition:
Destruction of PAF aircraft & defenses.

Tech Edge Highlighted:
Showcased Rafales, Su-30s, and integrated systems.

Controlled Escalation:
Airpower use as calibrated, not reckless.

Media Amplification:
Dramatic visuals of jets & missions reinforced

Downplaying Pakistan:
Dismissed counter-air operations as ineffective.

REALITY

Air Superiority Claim:
PAF gained air superiority in just 30 minutes of combat **7 IAF aircraft shot down**

Precision Strikes
Only civilian targets hit causing casualties

Attrition
No PAF aircraft or assets were destroyed

Tech Edge Highlighted:
Every IAF hi tech asset
Shot down including 4 Rafales

Controlled Escalation
PAF maintained escalation dominance

Media Amplification
Indian media lost repute and faced international criticism

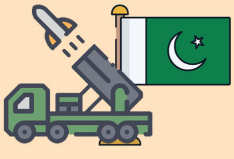
Downplaying Pakistan
PAF Air Strategy is being taught in aerospace academies

GLOBAL PERSPECTIVE

International observers highlighted: **Pakistan exercised restraint and controlled escalation.**

Indian attacks billed highly irresponsible act in a nuclearized environment

KEY TAKEAWAYS



Indian media exaggerated claims;
Pakistan's air defense remained credible and effective.

Air war proved Pakistan's capability to counter aerial aggression without escalating.

PAF has changed the dynamics of air warfare in the sub continent

Non-Traditional Security

The Cover-up: IAF Narrative of the May 2025 Air Battle

Shafaq Zernab

Even after one year since the India-Pakistan May war of 2025, the Indian discourse regarding Operation Sindoor remains uncertain under its pretence of restraint. The Pahalgam attack on 22 April, which killed 26 people, triggered an escalatory spiral. New Delhi quickly accused Pakistan-linked elements, while Islamabad refuted the allegation and demanded an independent investigation.

"On 7 May, India launched attacks deep inside Pakistan under what it later termed as Operation Sindoor. The political motive was intended to turn the crisis into coercive signalling by shifting the blame onto the enemy and projecting a sense of military superiority."

This episode, however, began to fray immediately as war seldom follows the intended script. Within minutes PAF shot down 7 IAF aircraft including 4 Rafales. On 8 May, Reuters reported that at least two Indian aircraft were shot down by a Pakistani J-10C, while the local government sources reported other aircraft crashes in Indian-occupied Jammu and Kashmir as well. Following a well-worn pattern, India's initial response was immediate dismissal of the unprecedented losses, labelling it as disinformation and outright deflection of the narrative. A few days later, Indian Deputy Chief of the Air Staff, Air Marshal A.K. Bharti, appeared in the media with a slightly altered official story. Without delving into details, he acknowledged that losses are a part of combat, but shifted the focus toward the fact that all their pilots were back home safe.

This shift mattered. IAF's narrative shifting from initial denial of losses to partial acceptance, without empirical support, not only raised suspicions regarding the platform but also put institutional credibility into question. India had branded Rafale as the symbol of regional airpower superiority. Thus, any setbacks were not merely tactical but carried psychological, organisational and political implications as well. The dissonance became even more pronounced when the Indian Chief of Defence Staff, General Anil Chauhan, admitted that there had been losses in the initial phases of war, although he denied Pakistan's numerical claims. He too focused less on aircraft losses and more on rectifying tactical errors, signalling a classic move of damage control.

On the contrary, Pakistan adopted an assertive counter-narrative. During the tri-service briefings following Operation Bunyan-um-Marsoos, DG ISPR projected a retributive, comprehensive and decisive account of Pakistan by presenting a transparent sequence, targets and results. The question to accept or to reject this narrative is sec-

ondary, but what matters is how Pakistan occupied the information vacuum presenting the truth before ambiguity could set in. At the same time, India's passive approach gave way to speculation where restraint became obfuscation. New Delhi's narrative was further undermined when the US President Donald Trump, France's Air Chief, General Jérôme Bellanger and a Dassault executive mentioned the loss of multiple Indian aircraft. New Delhi could neither fully support nor effectively deny the cumulative weight of this external validation. However, two months later, much to the amusement of the aviation community, the IAF Air Chief stated that his air force had shot down numerous PAF aircraft. The claim, probably meant to lift the sagging morale of the IAF, did not even resonate with the Indian public. If at all such frivolous claims had to be made, they would have been presented in the Indian Parliament's Monsoon session, where the government faced intense grilling on the subject by the opposition.

"After the conflict, India tried to recover from such disaster by procurement-based signalling. In April 2025, the $7.4 billion Rafale-M agreement with France was an effort in that regard, followed by the push to procure another 114 Rafales."

However, such attempts were mere theatrics by a service bruised in combat, which needed to reassure both public and foreign partners that its wider airpower capability is still intact.

Procurement is, however, only a palliative, not a cure to conceal structural problems like India's indigenous aspirations. One such notable instance was the absence of Tejas (a platform symbolic of self-reliance) on key showcases, combined with incidents like its crash-related inspection at the Dubai Airshow, which has heightened the need to focus on issues of reliability and programme maturity. Around the same time, India's own Chanakya Defence Dialogue offered some introspection. Senior military and industrial stakeholders highlighted bureaucratic inertias, fractious doctrines, and a lack of integration as structural hiccups. They indicated that it is not solely an issue of acquisition, but of coherence, as a whole, of the Indian military ecosystem.

This is where the idea of commitment trap becomes analytically salient. The Indian government pre-emptively framed the operation as decisive and controlled. Expectations were therefore pre-loaded. The outcome just had to conform to the story. However, when reality deviated, the government faced a structural dilemma; either publicly accept the losses and incur reputational costs or control the narrative for political gains. It opted for the latter, which backfired. Recalibration becomes politically fraught once a state bases its legitimacy on a superiority narrative. Institutional rewards favour those who promote this narrative rather than substantial solutions. Over time, this creates a distance between perception and reality.

Even a year later, the IAF is treading through this very disjuncture of evasion or assertion. Officially, it has tried to project the narrative of success, but the ambiguity prevails regardless. Therefore, a question still remains unanswered. When Operation Sindoor had been a scripted tactic of control, how come India remains ensnared in its own commitment trap? The answer lies in the evolving nature of warfare itself, where results are no longer evaluated by pure kinetic engagements, but by the narrative that follows it. When that interpretive process falters, even a limited engagement may gain inappropriate momentum.

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LOW-COST, HIGH-IMPACT WEAPON SYSTEMS
1
BVR Edge at Lower Cost
PL-15 missile + Chengdu J-10C
Outranged and engaged Dassault Rafale at significantly lower per-shot and platform cost.
PLATFORM COST
J-10C + PL-15
USD 50 MILLION + USD 2.2 MILLION
RAFALE + METEOR
USD 125 MILLION + USD 1 MILLION
J-10C
PL-15
2
Cost-Efficient Air Defence Superiority
HQ-9 system
Intercepted high-value BrahMos missile — neutralising expensive strike assets with cheaper defensive interceptors.
COST PER INTERCEPT
HQ-9 INTERCEPTOR
USD 0.3 MILLION
BRAHMOS MISSILE
USD 3.5 MILLION
BRAHMOS
3
Drone Swarms vs Legacy AD Systems
Low-cost drone swarms
Forced activation of costly Indian air defence systems (e.g., S-400), creating an asymmetric cost imbalance.
COST COMPARISON
DRONE SWARM (100 UNITS)
S-400 SYSTEM ACTIVATION
4
Indigenous Precision at a Fractional Cost of
Fatah-II
Delivered precision strikes on military targets at a fraction of cruise missile costs.
COST PER STRIKE
FATAH-II
USD 0.1 MILLION
CRUISE MISSILE
USD 3.5 MILLION
FATAH-II
5
Integrated Kil-Chain Advantage
Saab Erieye + ISR/EW systems
Enabled cheaper platforms to outperform India's higher-cost but less integrated mix (Rafale, Su-30MKI, S-400).
GROUND RADAR
ISR SYSTEMS
EW SYSTEMS
AIR DEFENCE SYSTEMS

The May 2025 PAF Vs IAF Air War
How to Lose a Billion Dollars in 30 Minutes?

Operation Sindoor Initial Strikes

India launched 24 missiles and air strikes on 9 targets across the border

01:05 AM – 01:30 AM

Immediate PAF Response

J-10C fighters + PL-15 missiles activated within minutes, triggering largest **BEYOND-VISUAL-RANGE AIR BATTLE**

7 Indian Platforms Downed in Opening Clash

(Pakistan official and independent assessments)

4 Dassault Rafale fighters $800 MILLION – first combatn loss of the platform

1 Sukhoi Su-30MKI fighter $50 MILLION

1 Mirage 2000 fighter $60 MILLION

1 MiG-29UPG fighter ~$40–45 MILLION

1 IAI Heron UAV ~$5–8 MILLION

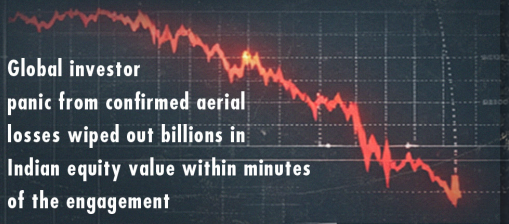
Total Hardware Loss Value in First 30 Minutes:

Approximately **$963-965 Million**

Trigger for $1 Billion Hourly Cost

Estimate of combined military + economic bleed activated instantly – India bore 80–85% **(~$800–850 million per hour)** due to larger mobilization and platform losses

Instant Market Shock Contribution



Global investor panic from confirmed aerial losses wiped out billions in Indian equity value within minutes of the engagement

Backfire Effect: India's "**30-minute** surgical strike" resulted in **immediate ~$1 billion** combined loss (hardware + activation of full war footing) before the first hour **ended.**

7th May 2025: Martyrs of the Indian Attack

Indian missile strikes targeted multiple locations across Punjab and Pakistan-administered Kashmir, resulting in civilian casualties across all age groups and professions.

All those martyred were **civilians** and **non-combatants, including minors.**

In Ahmedpur Sharqia near Bahawalpur, the martyred included a **three-year-old girl** amongst at least five victims after a mosque compound was hit.

In Muridke, three **members of the clerical staff** were martyred when a mosque and a **government health and educational complex** were struck.

In Pakistan-administered Kashmir, strikes on Muzaffarabad and Kotli destroyed two mosques, with **victims including a 16-year-old girl and an 18-year-old boy.**

Further casualties were reported in other parts of Punjab, including areas near Sialkot and Shakargarh.

Overall, at **least 31 Pakistanis** were martyred and among there were children, teenagers, and clerical staff.

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Aerospace

Emerging Technologies

Defence and Security Strategies

Cyber and Space Security

Political Economy

International Relations

Strategic Foresight

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To serve as a thought leader in the aerospace and security domains globally, providing thinkers and policymakers with independent, comprehensive and multifaceted insight on aerospace and security issues.

MISSION

To provide independent insight and analysis on aerospace and international security issues, of both an immediate and long-term concern; and to inform the discourse of policymakers, academics, and practitioners through a diverse range of detailed research outputs disseminated through both direct and indirect engagement on a regular basis.

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