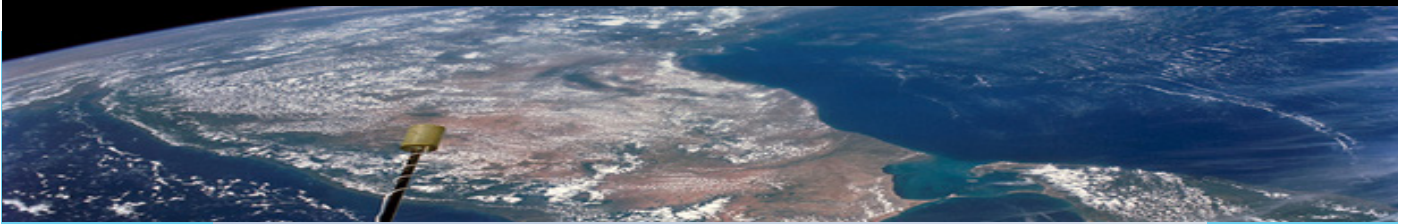




# CENTRE FOR AEROSPACE POWER AND STRATEGIC STUDIES (CAPSS)

Forum for National Security Studies (FNSS)

## AEROSPACE NEWSLETTER



A spectacular celebration of precision, patriotism, and aerial excellence, the iconic 'Suryakiran Aerobatic Display' of the Indian Air Force at the Sukhna Lake in Chandigarh

Source: <https://www.newsonair.gov.in/iaf-suryakiran-team-thrills-crowd-with-spectacular-celebration-of-precision-patriotism-aerial-excellence/>

**VOL VI NO 04**

**06 April 2026**

 Centre for Aerospace Power and Strategic Studies |  @CAPSS\_India

 Centre for Aerospace Power and Strategic Studies |  Centre for Aerospace Power and Strategic Studies

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*“Raksha Mantri Shri Rajnath Singh released ‘Defence Forces Vision 2047: A Roadmap for a Future-Ready Indian Military’ on March 10, 2026 envisages the transformation of the military into an integrated, multi-domain and agile force capable of deterring adversaries, responding across the full spectrum of conflict & protecting expanding strategic interests, amid the rapidly changing global and regional dynamics.”*

*- PIB, Delhi*

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## Opinions and Analysis

### The West Asia Imbroglio: A CAPSS and CHPM Joint Venture

24 March 2026

Source: CAPSS | <https://capssindia.org/the-west-asia-imbroglio-a-capss-and-chpm-joint-venture/>



#### Introduction: Weather as a Strategic Introduction

This is a joint paper written by scholars of CAPSS and CHPM on the ongoing conflict between Iran, Israel and the United States of America. With an emphasis on the employment of air power and the strategic context with implications in the region, the scholars give their perspective on the conflict as it unfolded during the first two weeks. AVM Anil Golani in his introductory remarks discusses the employment of air power as a coercive tool to achieve political objectives. Adrien Fontanellaz has given his analysis on the Iranian strategy in its employment of air power while Gp Capt VP Naik has analysed the campaign as carried out by both the United States and Israel. Dr Shalini Chawla and Dr Anu Sharma write

about the strategic context in West Asia with implications in India's immediate neighbourhood.

#### Elusive Peace in West Asia

by Air Vice Marshal Anil Golani (Retd), DG, CAPSS

February 28, 2026 witnessed the start of another conflict that was a long time coming. The deployment of USS Gerald Ford and Abraham Lincoln, two of the most powerful and sophisticated aircraft carriers of the United States in the Persian Gulf region earlier during the year signaled the intentions and resolve of the country. Israeli Prime Minister Benjamin Netanyahu saw the present window of opportunity that aligned with American President Donald Trump's proclivity to use force towards regime change, as a 'now or never' moment to decimate the regime in Iran. The twelve-day Operation 'Rising Lion' and 'Midnight Hammer' carried out by both Israel and the United States in June 2025 to neutralise Iran's nuclear capability and infrastructure along with the elimination of its nuclear scientists and military leadership now seems to have been in vain. The process of dialogue between the United States and Iran, with mediation by Oman was apparently close to fruition when Operations 'Epic Fury' and 'Roaring Lion' were launched concurrently by both the United States and Israel on February 28, 2026. These operations, unprecedented in scale and magnitude, have engulfed the entire region with

strategic implications that could well lead to greater instability reducing the chances of any rapprochement between Iran and the United States and Israel.

As this conflict enters its fourth week, it has become an existential crisis for Iran which will continue to leverage everything at its disposal to increase the cost for the United States, its allies in the region and Israel. For Israel, it seeks nothing less than total decimation of Iran and its military capability along with a regime change. For the United States, the most powerful nation in the world both in terms of military might and technological superiority, it sought a capitulation of the regime by using brute force through the instrument of air power. Even as the jury is out on the conflict there are major lessons that need to be learned not only by the nations directly engaged in conflict but also for those who seek to use military power to achieve political outcomes.

The proclivity to use air power by nations which can afford to do so has only increased in the recent past for a variety of reasons. Air power has become the most readily available instrument of military power that can deliver outcomes at the speed that only this medium provides with precision and accuracy that remains unmatched. Air power also has the unique ability to increase the intensity and scale of operations along with an ability to control the escalation matrix as deemed appropriate. While offensive air power with manned aircraft can effectively be used for

counter force and counter value targeting, the ability of drones and missiles along with ground-based air defence systems that are mobile can also wreak havoc on a superior adversary. Iran, with its ability to launch missiles and unmanned aerial systems, despite pounding by the U.S. and Israel, has been able to cause a significant dent in the operations of the United States and Israel. Iran has also attacked more than eleven countries in the region that have U.S bases, closed the Hormuz Strait and dealt a severe blow to energy production and transportation.

The salience of a clear and unambiguous selection and maintenance of aim as one of the most important principles of war cannot be undermined. From regime change, to destruction of the Iranian Air Force, Navy and the IRGC, destruction of its missile and drone production facilities to the elimination of its political leadership, the goalposts have continually been changing. The visceral hatred between the Iranian regime and the state of Israel which seeks total annihilation and nothing less, borders on being delusional to say the least. This hatred would only get worse by the unmitigated use of force that leads to civilian casualties on either side as the conflict progresses. Even as the USA realises the limitations of the use of force it would only find itself in a predicament that becomes even more difficult to handle as the effects of the conflict begin to roost at home with body bags and increasing inflation. While scenarios would have been gamed by the United States and Israel before the conflict, a clear end state and political objectives

appear to have been given the short shrift. In addition, the resilience of the Iranian regime and its ability to sustain missile production and launch capabilities is something that had apparently not been bargained for.

The consensus of allies and partners when an operation such as this is launched cannot be ignored. Unilaterally carried out by the United States and Israel, all their allies in the region find themselves being drawn into this conflict with unintended consequences. With inherent and impending danger to the lives of their citizens, adverse effects on their economies, trade and the vulnerability of the oil and gas production infrastructure the efficacy of protection by the United States that harbours bases in the region would increasingly be questioned.

The use of air power as a military instrument of force has several advantages that cannot be undermined. However, unbridled use of this instrument without clear objectives that include a political end state would invariably lead to unintended consequences, as is clearly evident from the present conflict in West Asia. The jury is still out whether West Asia would return to peace or continue to stay embroiled in a prolonged conflict that only exacerbates existing hostility between Iran, Israel and the United States. In addition, the utility of force as employed by the United States, Israel and Iran in this conflict would need a critical analysis of the use of air power in isolation, to achieve political objectives.

## **Precision, Paralysis and Persistence Multi-Domain Targeting in the Iran Imbroglio**

**by Gp Capt VP Naik VM, Senior Fellow,  
CAPSS**

### **Introduction**

Contemporary warfare has seen a radical change in the last decade, with attrition-based campaigns increasingly being avoided, and an effects-based approach making a comeback. Air power has become an instrument of choice and also an effective tool for controlling escalation. Increasingly, modern warfare is becoming a mélange of John Warden III's model of Centre of Gravity (CoG) targeting, David Deptula's concept of parallel warfare and John Boyd's theory of dominating the decision cycle. Wherever air power has not been used correctly, warfare has become attritional, and the ongoing Russia-Ukraine war is a stark example. The moment it becomes a war of attrition, asymmetric technology like drones and loitering munitions (LMs) assumes tremendous significance. What emanates from here is that technology like drones becomes more effective when forces become static, which is very typical of attrition warfare. Drones have therefore not really changed the tenets of application of air power, but have significantly redefined the conduct of terrestrial warfare.

In the US-Israel versus Iran conflict, overwhelming technological superiority

is being used by their combined force; however, resilience and innovative thinking have kept the Iranian system afloat, even after three weeks of relentless attacks. Neither the US nor Israel share land borders with Iran, and therefore, landing boots on the ground will always remain a challenge.

America primarily aims to end the Iranian nuclear dream because the world is witness to the strategic restraint that the US has to live with when faced with a nuclear-armed adversary. The woes of strategic miscalculations and underestimation of an adversary have returned to haunt the US. A moot question that emerges is, **“If Iran had the capability to target mainland US, would this war have started?”** This question has increasingly become synonymous with US strategic thought and a wider reflection of risk aversion and unacceptability of large-scale attrition.

Israel, on the other hand, sees this war as decisive in nature, driven by Iran's cry for death to the Zionist regime and death to Israel. It is far more existential for Israel as compared to the US, and therefore, Israel has a greater appetite for risk. Israel seeks a West Asia safe for Jews, and Iran seeks a West Asia safe for an Islamic Republic, largely emanating from the years of dissonance between the Islamic nations and Israel in the region.

Iran has prioritised systemic resistance over capitulation. In spite of losing its strategic leadership on the very first day,

the Iranian system did not collapse and has lately shown a distinct resolve. Use of a large number of drones and surface-to-surface missiles to saturate defences while simultaneously targeting US bases across the Middle East, Iran has also created the larger strategic narrative that the promised ‘US defence umbrella’ has multiple holes.

This paper seeks to understand the broad strategy of the combined US-Israeli force and also looks at the targeting philosophy during the war. In Multi Domain Operations (MDO), air power theories of John Warden, David Deptula, and John Boyd can be brought together to create a distinct air power operational paradigm that would be useful for prosecuting future wars.

## US-Israel Targeting Philosophy

What we see in the strategy adopted by the combined US-Israeli force is a congruence of John Boyd's Observe, Orient, Decide and Act (OODA) loop, creating an overarching scaffolding for adaptation of John Warden's systemic approach to warfighting and David Deptula's Effects-Based Operations (EBO). The core targeting philosophy adopted by the Americans and Israelis can be put into three distinct phases: –

### Phase I: Shock and Awe

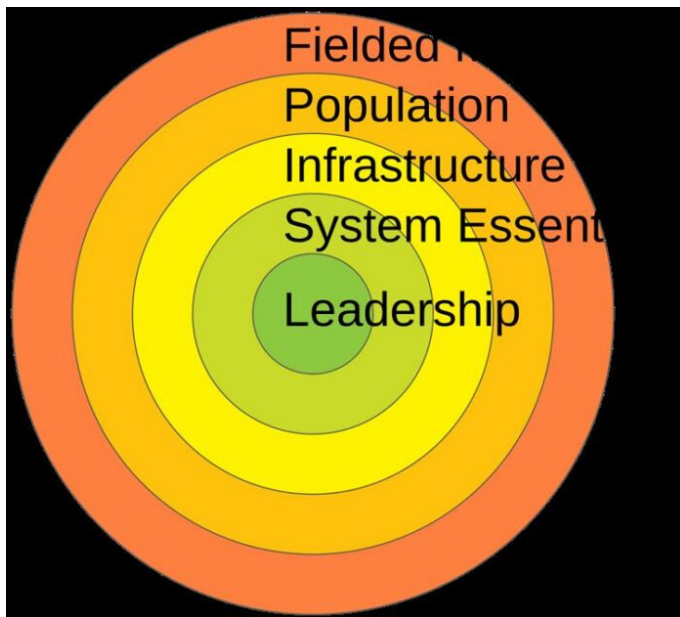
The main Concept of Operations (CONOPS) for this phase was to outthink and outpace the enemy's decision-

making cycle and affect its OODA loop. The US and Israeli forces operated at a much higher tempo than the Iranians and forced them into a reactive mode. The end state of the phase appeared to be the creation of adequate disorder and uncertainty to be able to launch parallel attacks on the Iranian leadership. John Boyd had prioritised that psychological victory must precede physical victory and therefore, [Schwerpunkt](#) (Focus of effort) was on decisive points, viz., strategic leadership, Islamic Revolutionary Guard Corps (IRGC) and Early Warning (EW) networks. The [first 96 hours](#) saw the US expend around 532 GBU-31/32/38 JDAMs and 375 TLAMs. In the same period, 325 US Patriot PAC-2, PAC-3 missiles, 618 of the Gulf partner countries' Patriots (18 months of production) and 310 SM-2/3/6 Navy Aegis systems were used in defensive operations. On the other hand, Israel used 450 Spice 2000/1000 guided bombs and 230 JDAMs during the first 96 hours. The Iranians traded their cheaper mass-produced munitions for the West's expensive, finite interceptors in that time period, a rather interesting trade-off. The Iranians expended 1,300 Shahed drones and 565 ballistic missiles, as reported by the Payne Institute's proprietary analysis.

- **Systemic Paralysis.** Operations Epic Fury and Roaring Lion began with systematic degradation of the Iranian OODA loop by targeting the internet, communication systems, surveillance radars and associated networks to keep the Iranians in the Observe and Orient

phase and not permitting them to make a decision. The Suppression/Destruction of Enemy Air Defences (SEAD/DEAD) campaign has continued ever since, primarily to gain information and decision dominance. The Iranian Command and Control (C2) grid was sufficiently degraded by striking the Headquarters of the Islamic Revolutionary Guard Corps (IRGC) to create the requisite degree of control of air for furtherance of operations. This targeting philosophy is in line with John Warden's five rings model (Figure 1), where leadership is a CoG and air power must be used to directly target it.

- **Leadership Elimination.** Having achieved the requisite degree of control of air and decision paralysis, the first day also saw long-range precision strikes on Iranian leadership and the elimination of the Iranian Supreme Leader, Ayatollah Ali Khamenei, along with the elimination of other top Iranian officials in their hierarchy. This targeting philosophy is in line with John Warden's five rings model (Figure 1), where leadership is a CoG and air power must be used to directly address it. The main aim was to target the inner rings first and simultaneously strike critical infrastructure and decision-making ability to cause functional paralysis. By targeting leadership and system essentials, a systemic collapse of Iran was envisaged.



## Phase II: Suppression of Military Capability.

This phase adopted David Deptula's concept of [Effects-Based Operations](#) (EBO), where classical sequential campaigns were replaced with parallel warfare and simultaneous strikes by continuously attacking leadership, infrastructure, armed forces and networks. The desired outcome was the creation of a strategic shock and causing a system overload. The main aim of this phase was not **'what to hit'** but **'what is the desired effect'**. The targeting philosophy was directed at overwhelming the adversary quickly before resistance formed. However, this was the phase where the desired effects had not quite manifested according to plan. A systems-based intelligence analysis is critical to the application of effects-based operations. Without adequate information about what an adversary relies upon to exert influence and conduct operations, parallel warfare cannot be effective. The Iranians were able to react, respond and retaliate with renewed

vigour, which caused the combined force of the US and Israel to rethink their targeting philosophy. In spite of the Iranian leadership being wiped out, the Iranian military system continued to function. Linearity in combat is no longer relevant, and because it is all about adopting a 'system-of-systems' approach, the initial part of the phase did not yield commensurate results.

- **Air Dominance.** In their quest for air dominance, the Americans and Israelis continued hitting Iranian air defence (AD) and networks to blind them. Whilst Iranian airfields and AD elements were constantly targeted, Iranians themselves were able to target US and Israeli air-fields in the region. Use of kamikaze drones and ballistic missiles further created chaos in the US and Israeli operations. This saw the focus of targeting shift from purely Offensive Counter Air (OCA) to suppression of Iranian missile infrastructure. Missile launchers, drone launch sites and missile storage dumps were constantly targeted but have not quite proved to be effective. Iran also started using asymmetric means to target US assets from the sea by using fast attack crafts and boats.

- **Response Suppression.** Surface-to-Surface Missiles (SSMs) coupled with drones and fast-attack boats caused Americans to rethink their targeting strategy, and their focus shifted to the source of these attacks. Unfortunately for the Americans, the

Iranian response mechanism appears to be a well-knit system with adequate resilience. While technology gives credibility, effectiveness is measured by the correct use of that technology. As a consequence, the US forces have now shifted focus to an attrition-based targeting philosophy by addressing economic targets and energy infrastructure. This appears to be a turning point in the conflict where initial coherence in strategy has degraded, and desperate measures to cripple the Iranian will to fight have come to the fore. This also seems to be a stage where the initially envisaged Conflict Termination Criteria (CTC), Desired End States (DES) and use of 'off-ramps' appear to have changed, contradicting an endearing Principle of War, i.e., Selection and Maintenance of Aim.

### Phase III: Pressure Campaign.

This phase saw the US and Israeli forces shift targeting to logistics and energy infrastructure. Fuel storage, military logistics and transportation networks have now begun to be targeted with the aim of weakening the regime's sustainment capability. The shift from counter-force to counter-value signals a reactive strategy not quite anticipated by the planners. The Strait of Hormuz has been closed by Iran, and the conflict seems to be entering another phase where the stark realities of modern warfare are clearly visible. Cyber warfare may not have crippled Iranian networks, Information and Cognitive Warfare may not

have impacted the Iranian people and more importantly, what has emerged is that the Iranian system has been able to take on the combined might of Israeli and the US forces, dragging the conflict into its fourth week.

- **Economic Strangulation.** US and Israeli forces had started targeting Iranian oil production and storage facilities, thereby escalating the conflict. However, over the past three weeks, Iranian oil has flowed freely and more importantly, Iran has been able to target oil infrastructure in all other neighbouring countries, causing widespread disruption. With Iran practically controlling the Strait of Hormuz, economic strangulation of Iran at this stage seems to have had little effect on the Iranian will to fight.

### The Convergence of Air Power Theorists.

Warden, Deptula and Boyd have all focused on a system-of-systems approach to warfare, using kill webs to counter kill webs. The first two weeks saw coherence in strategy where air power was used well; however, the resilience and response of the Iranians was not anticipated by both the Americans and Israelis. As a result, the next two weeks have shown a lack of strategic congruence in their targeting philosophy. This takes us back to what lies at the core of MDO, i.e., decision dominance and creating functional paralysis. Warden brings out the constituents of the system and clearly demarcates the five target rings

(Figure 1), he tells us **where and what to strike**. Deptula tells us how to strike, **how to carry out parallel operations and importantly, how to create the desired effects**. Boyd gives us a glimpse of cognitive warfare and **how to create decision dominance**. Together, these three theorists form the backbone of MDO and targeting philosophy. The **‘where’** and **‘how’** of the equation are known, the **‘when’** part of it is left to the planners, and that is where a pragmatic approach rather than an euphoriant approach may have yielded better results. The essence of EBO is how time and space are exploited in terms of the effects desired. That is where the crucial question of **‘when’** gets answered. Perhaps parallel counter-force and counter-value targeting, from the word go, would have resulted in desired results with greater rapidity and lesser mass.

### Putting Two and Two Together.

The [first press briefing](#) conducted by the White House on March 02, 2026, revealed that in the first 24 hours of the operation, more than 1,000 targets were struck. The targets included Iranian leadership, C2 nodes, ISR infrastructure and ballistic missile sites in coordination with cyber and space operations to disrupt communication and sensor networks. The very next briefing held on [March 04](#) brought out that the Americans had moved over 90 per cent of their troops from their bases in the region to safer locations out of Iranian weapon ranges. By [March 05](#), the briefings claimed that Iranian missile

launches had reduced by 90 per cent and drone attacks by 83 per cent since the first day. The briefing also mentioned the use of B-2 bombers striking over 200 targets inside Iran, including ballistic missile sites, using 2000-pounds penetrator bombs. The [March 10](#) briefing brought out that the combined force had struck over 5,000 targets since the beginning of the war, and also said that the strikes have significantly reduced the response options of the Iranians. Around the same time, a Reuters report dated March 10, 2026, reported that the number of ballistic missiles fired by Iran from February 28 onwards was in excess of 500, and the number of drones launched was in excess of 2,000 over 10 days. Though the numbers had seen a reduction, it has not been very substantial and even after three weeks, Iran has continued to fire ballistic missiles and launch drones across multiple targets in the region. By [March 13](#), the Americans claimed that the combined force had struck over 15,000 targets across Iran, averaging over 1,000 targets per day. The briefing on March 13 also brought out that only one per cent stand-off munitions were being used by the Americans.

Analysing open-source information and juxtaposing the White House briefings from the first three weeks of the conflict, what emerges is the stress on the number of targets struck and not what effect was desired and created. As usual, rhetoric tended to rule the roost, and the briefings were designed to overwhelm the world with numbers! Iranian retaliation did not see too

great a reduction, and ballistic missiles as well as drones continued to be fired with a fair amount of effectiveness. Yes, they were intercepted, but at what cost?

Another factor that emerges is that even a country like the US has a limited long-range precision arsenal, and eventually conventional weapons will come into play. Therefore, the use of precision weapons must be done with extreme caution to create the desired effects early in the operation and the congruence of **‘where, how and when’** would have yielded better results. Logistics stamina, especially for overseas operations, will remain critical. Warships and submarines will have a limited arsenal, especially with respect to weapons like the Tomahawk [Land Attack Missiles \(TLAM\)](#), and replenishment cycles will not necessarily be able to keep pace with the utilisation rate. Based on the numbers launched by the Americans and targets taken on, this factor has definitely resulted in the Americans being forced to significantly reduce stand-off weapon utilisation.

The briefings also brought out that preparation for this operation was going on for many months. The Americans were fully aware that most of their operating bases were within reach of the Iranian SSMS and drones. In spite of that, they launched operations from those bases and were forced to evacuate personnel within the first four days. What emerges is surprising. Either the Americans severely underestimated the Iranian response, or the effects desired from the initial volleys

of attacks were not achieved. Either way, the fact that comes to the fore is that the plan that looks very good on paper may not necessarily be effective when executed. After the first two days, the targeting philosophy of the Americans and Israelis appeared to constantly shift focus and appeared to be random, rather than well thought out. Reading between the lines, what appears to be a shift of targeting focus from counter force to counter value may be signalling that the Iranian AD was not fully destroyed, and the transition from precision to mass bombing only reinforces that fact. The coming days might give us a glimpse of the operational status of Iranian AD weapon systems and either substantiate or refute claims of the US and Israel having destroyed all AD weapons of Iran.

## Parting Shots

Air power is a critical enabler for the conduct of MDO and is perhaps an instrument of choice, as can be seen from all major conflicts occurring around the world. While a systems approach to targeting is effective and causes functional paralysis, it does not guarantee victory. Parallel warfare, decision dominance and CoG targeting are realities which must be addressed across multiple domains. Adversaries may be numerically and technologically inferior; however, the effectiveness of asymmetric response capabilities has the potential to offset the effectiveness of technology. Future warfare will be a healthy mix of non-kinetic and kinetic options, including dominance in the cognitive domain.

In the absence of accurate empirical data, open-source inputs from both sides offer a fairly accurate glimpse into what must have happened, and one can safely predict what might happen in the future. This war is far from over, and the longer it lasts, the more serious global ramifications will be. Boyd, Deptula, and Warden have given us a framework for conducting MDO; however, sequencing and prioritising operations will forever remain a challenge, and it is only after the war that introspection can be done. Rhetoric will forever mar realistic assessments, and narratives will always add to the fog of war. The Iran-US-Israel conflict, however, poses a very pertinent question to everyone researching this war: **“To what extent can a technology-driven, system-of-systems approach to targeting produce decisive outcomes against a resilient and adaptive adversary?”** The jury is out.

## True Promise 4: the Iranian Counter-Strikes

**by Adrien Fontanellaz Military Historian and Analyst Centre d'Histoire et de Prospective Militaire**

### Introduction

Despite being targeted by a series of highly successful decapitation strikes against their headquarters during the early hours of the war— the latter killing at least 40 senior officials, including the Chief of Staff of the Iranian Armed Forces,

Major General Abdolrahim Mousavi; the Commander of the Islamic Revolutionary Guard Corps (IRGC), Major General Mohammad Pakpour; the Secretary of Iran's Defence Council, Ali Shamkhani; the Iranian Minister of Defence, Brigadier General Aziz Nasirzadeh; and foremost the Leader of the Islamic Revolution, Ayatollah Ali Khamenei— the Iranians began to retaliate within minutes, thus initiating Operation “True Promise 4,” which mostly consisted of successive waves of missiles and drones.

The pace of the Iranian attacks slowed down markedly after the first three days of the war, but has continued unabated ever since, even though the country is on the receiving end of a pounding of an intensity unheard of for decades. By March 07, 2026, the Israeli Air Force had already dropped 6,500 bombs, whilst the Americans had struck a staggering 3,000 targets, according to the Israeli Defense Forces (IDF) and the American Central Command (CENTCOM), respectively. These numbers continue to grow at the same pace, with CENTCOM claiming to have struck a further 2,000 targets by day 10 of Operation Epic Fury, out of which a major portion was related to the Iranian offensive drone and missile array. The present article aims to explore why the Iranians are able to continue running their drone- and missile-centric retaliation operations under such adverse conditions, how their campaign is conducted, and finally what lessons might be drawn from their operations.

## The Sepah: An Overview

Iran has the particularity of maintaining two distinct armed forces, both operating under the umbrella of the Khatam al-Anbiya Central Headquarters. The Artesh is the regular army inherited from the time of the Shah. Its primary mission is the defence of Iranian territory, and it encompasses ground forces, a navy, an air force, and an air defence force. The IRGC, on the other hand, also known as the Sepah-e-Pasdaran commonly known as Sepah, answers directly to the Supreme Guide of the Revolution and is tasked with defending the regime against both external and internal threats, as well as conducting military interventions abroad. Like the Artesh, it includes ground forces, a navy, and an Aerospace Force, as well as the Jerusalem Force, which is responsible for its external operations. Unlike the Artesh, however, asymmetric warfare has been deeply ingrained in the IRGC's institutional culture since its inception. Many of its founding members had already been trained in guerrilla warfare prior to the Revolution. This strategic culture persisted thereafter, even as the Corps expanded significantly and conducted numerous large-scale conventional operations during the Iran–Iraq War.

In the early 2000s, Tehran faced the threat of an invasion of Iran by American forces in the aftermath of the Iraq War. In response to this perceived threat, General Mohammad Ali Jafari—

who served as a senior figure within the Islamic Revolutionary Guard Corps (IRGC) before becoming its commander in 2007—developed the so-called “mosaic doctrine.” After assuming leadership of the IRGC in 2007, he proceeded to implement this doctrine. It was designed to enable the IRGC to confront a vastly superior adversary such as the United States (US). Under this framework, the IRGC was reorganised into thirty-one provincial commands intended to operate with a high degree of autonomy. These units were structured to conduct both symmetric and asymmetric operations simultaneously, thereby allowing the force to continue fighting even if the regime's principal command centres were neutralised.

To ensure operational continuity under such conditions, both geographic and unit-level commands were granted pre-delegated authority to act independently if they became isolated from central command. In addition, military assets were dispersed and fortified in order to reduce their vulnerability to enemy strikes. Iran's drone and missile arsenals were also significantly expanded to strengthen deterrence against potential aggression, and these were stockpiled into massive underground complexes, the so-called “Missile cities.” Finally, this strategy was complemented by the development of the so-called “Axis of Resistance,” a network of alliances with various armed movements operating across the region, which Tehran sought to leverage as an additional means of strategic deterrence.

## The Long Swords of Persia

Iran, unable to modernise its air force after the Iran–Iraq War, invested heavily in its ballistic missile program starting in the early 1990s and supported initially by North Korea. Early developments included short-range missiles such as Shahab-1 (300 km) and Shahab-2 (500 km), derived from North Korean designs, followed by the solid-fuel Fateh-110 in 2002 and the medium-range Shahab-3 (1,000 km). Iran has since focused on improving missile accuracy, deployment speed, and the ability to evade missile defences, introducing technologies such as manoeuvrable re-entry vehicles, submunition warheads, and decoys. Newer systems include the Khorramshahr (2017), Khaybar Shekan (2022), and the Fattah-1 hypersonic missile (2023). In parallel, Iran developed cruise missiles, notably the Soumar (2015), based on the Soviet Kh-55 design obtained from Ukraine. Estimates suggest Iran possessed over 3,000 medium-range ballistic missiles by 2022, and about 2,500 by early 2026, despite combat losses and expenditure in June 2025, alongside much larger numbers of short-range missiles.

Similarly, Iran began developing its domestic drone industry during the Iran–Iraq War, initially with modest results. Over time, the program expanded significantly, leading to the production of a wide range of drone types. These include Medium Altitude Long Endurance (MALE) combat drones like the Mohajer-6 and Shahed-129, as well as low-cost one-way attack drones

such as the Shahed-101, Shahed-107, Shahed-136 and the newer Hadid-110, designed with reduced radar signatures and jet propulsion. Iran has also exported these drones, notably to Russia, where the Shahed-136 is produced as the Geran-2 and has been widely used in the war in Ukraine since late 2022.

## The IRGC Aerospace Force

The drones are widespread among the entire Iranian military apparatus. Both the regular air force and the IRGC Navy are known to possess them in high numbers, whilst the latter is also known to operate short-range ballistic missiles. The bulk of the Iranian long-range capabilities fell, however, under the precinct of the 15,000 to 20,000-men-strong IRGC Aerospace Force. It is divided into five commands. The air defence command is equipped with a wide range of air defence systems of national or Russian designs and operates in coordination with the Islamic Republic of Iran Air Defence Force under the umbrella of the Khatam-al Anbiya Air Defence Headquarters. The air operations command oversees the Corps' small fleet of airplanes and helicopters, but its offensive capabilities remained limited, with a handful of operational Su-22M4s and Tucano. A third command is responsible for spatial activities and has been credited since 2009 with the successful launch into orbit of several observation and telecommunications satellites. The drone command oversees the operation of the IRGC drone array, whilst the Missile

command is in charge of the short- and long-range ballistic missiles. In turn, the latter is organised into five main units: the 5th “Raad,” the 7th “Al-Hadid,” the 16th “Qaam,” the 19th “Zulfiqar,” and the 23rd “Al-Towhid” missile brigades. These units operate from at least two dozen underground, fortified missile bases, which are clustered and interconnected by tunnels. As a rule, longer-range missiles are deployed from central Iran, whereas shorter-range missiles are launched from the western and southern regions of the country. Some bases are equipped with reloadable underground launch silos, although most missiles must be transported and launched using truck-based transporter erector launchers (TELs).

#### **True Promise 4**

Following initial American and Israeli strikes, the Iranian Armed Forces launched its counterattack under Operation “True Promise 4,” mainly involving the IRGC Aerospace Force and Navy, with support from the Iranian Air Force. Early actions included several airstrikes until March 02, 2026, when two Iranian Su-24s were reportedly shot down by a Qatari F-15QA near Al Udeid Air Base while flying at very low altitude.

Consequently, Iran’s principal means of retaliation consisted of missiles and attack drones. However, the exact number of weapons deployed remains difficult to determine with any precision,

as Iranian authorities have not disclosed specific figures. Furthermore, the targeted infrastructure is dispersed across a vast geographical area spanning eleven countries. Several of these states, as well as the United States, have not released data regarding the number of weapons directed at their territory. Consequently, any assessment can provide only a partial view of the total quantity of weapons employed in these counterstrikes. Nevertheless, a Reuters review of available sources suggest that, at a minimum, 605 ballistic missiles, 15 cruise missiles, and 1,987 attack drones were launched against the United Arab Emirates (UAE), Qatar, Bahrain, and Kuwait between February 28 and March 10, 2026. Meanwhile, the United Arab Emirates Ministry of Defence acknowledged that by March 13, the UAE alone had been targeted by 285 ballistic missiles, 15 cruise missiles, and 1,567 attack drones. For its part, the IDF stated on March 10 that more than 300 medium-range ballistic missiles—approximately half of which carried cluster warheads—had been launched against Israel since February 28.

However, the Iranian forces operated under increasingly intense pressure from the American and Israeli air forces, which allocated a significant proportion of their sorties to targeting missile and drone units and interdicting missile sites by striking the entrances of their underground facilities, while Unmanned Combat Aerial Vehicles (UCAVs) continuously monitored the areas used for weapon launches. The missile

TELs were particularly vulnerable in this context, as they are relatively easy to detect via satellite during launches due to the substantial infrared signature generated by engine ignition. Consequently, although the IRGC conducted comparatively large missile volleys in the initial days of the conflict, the launch rate of its units declined markedly thereafter, especially for those based in western and southern Iran, where enemy air forces had greater freedom of operation. According to the IDF, 90 missiles were fired at Israel on February 28, followed by approximately 60 on March 1, and then roughly 20 per day until March 10. These attacks were conducted in small salvos, or even as single launches spaced several hours apart, resembling artillery harassment fire in their pattern and tempo. Similarly, 541 attack drones and 165 ballistic missiles were launched against the UAE during the first two days of the war. The pace of drone attacks against this country subsequently declined, falling to between 112 and 148 per day between March 2 and 8, before decreasing further to between 18 and 39 per day between March 9 and 14. In contrast, the number of ballistic missiles fired at the UAE remained relatively stable from March 2 onward, fluctuating between three and 16 missiles per day.

## Facing the Onslaught

The effectiveness of IRGC missile and drone attacks is limited by the dense and advanced air defence networks in the region. Israel has a multilayered system—

including Arrow, David's Sling, and Iron Dome systems—designed to counter Iranian ballistic missiles. Gulf states and Saudi Arabia have invested heavily in Patriot, THAAD, and other systems, supplemented by American batteries. While these networks also include short-range systems against drones, their primary vulnerability is the depth of interceptor stockpiles.

The United Arab Emirates, for instance, is assessed to have procured 192 MIM-140 Talon interceptors for its two THAAD batteries, 1,270 PAC-2, PAC-3, and PAC-3 MSE interceptors for its 13 Patriot batteries, and 400 missiles for its four Cheongung batteries. Between 28 February and 14 March 2026, Iran reportedly launched approximately 300 ballistic missiles against the country, and it can be estimated that between 600 and 900 interceptors may have been expended during these engagements. Other Gulf states possess similarly limited interceptor inventories relative to the scale of potential missile attacks. Kuwait, for example, reportedly acquired 504 interceptors for its eight Patriot batteries, while Qatar purchased approximately 1,125 interceptors for its 11 Patriot batteries. Compounding this vulnerability is the limited capacity to rapidly replenish interceptor inventories. Manufacturers are currently struggling to keep pace with the surge in global demand that has followed the February 2022 invasion of Ukraine. By December 2025, only 534 MIM-140 Talon interceptors had been delivered to

the US Armed Forces, highlighting the broader production constraints affecting the global supply of advanced missile defence interceptors. In the meantime, however, these sophisticated air defence systems successfully intercepted most Iranian missiles, with no more than one in ten of the latter penetrating the regional air defence network. The expenditure of air defence missiles related to the interception of drones is much more difficult to gauge because the first line of defence of the targeted states consists of Barrier Combat Air Patrols (BARCAP) flown by their jet fighters and combat helicopters, which shoot down a significant number of them, while the number of types of air defence systems able to counter the drone threat is much higher than the one able to counter ballistic missiles.

## **Iranian Targeting**

The Iranian air offensive followed both counterforce and countervalue lines of operation. From the outset, the campaign incorporated a significant Suppression of Enemy Air Defences (SEAD) component, with particular emphasis on targeting enemy long-range radar systems and the fire-control radars associated with Terminal High Altitude Area Defense (THAAD) batteries. By March 13, visual confirmation indicated that one American AN/FPS-132 long-range early-warning radar had been damaged at Al Udeid Air Base, while the AN/TPY-2 long-range surveillance and fire-control radar of a US THAAD battery deployed at Muwaffaq

al-Salti Air Base had been destroyed. In addition, at least three other radars of a similar type appear to have been targeted. Iranian forces also sought to degrade enemy command-and-control capabilities. This effort included strikes against the IDF General Staff headquarters in Tel Aviv, as well as US military headquarters facilities in Bahrain and Qatar. Alongside these attacks, satellite communications terminals were deliberately targeted. As of March 13, two such systems located at the US Fifth Fleet headquarters in Manama were visually confirmed destroyed, as were two similar installations at Camp Arifjan. Operation True Promise 4 also featured a substantial counter-air component, with multiple American and Israeli air bases subjected to repeated strikes. Satellite imagery revealed numerous impact points on the latter as well as the destruction of multiple hangars and other supporting infrastructures. Nevertheless, the full extent of the damage inflicted remains uncertain at the time of writing. According to leaks from US officials reported in the American press, five aerial refuelling tankers were damaged by Iranian strikes at Prince Sultan Air Base. Finally, the Islamic Revolutionary Guard Corps (IRGC) and the Artesh appear to have targeted elements of the Israeli intelligence apparatus as repeated strikes were conducted against facilities associated with the Israeli Military Intelligence Directorate (Aman), the Internal Security Service (Shin Bet), and Unit 8200, the latter being responsible for signals intelligence and electronic warfare operations.

Counter-value targeting, on the other hand, follows two distinct logics. The first seeks to increase the overall cost of the war against Iran to such an extent that the adversary is compelled to cease hostilities and concede to Iran's demands. In this sense, these operations serve a broader strategic objective. Other strikes, however, appear to be primarily retaliatory in nature and reflect the IRGC's established tit-for-tat approach, whereby facilities similar to those targeted in Iran are struck in response. For instance, the IRGC claimed responsibility for an attack on the office of Israeli Prime Minister Benjamin Netanyahu on March 1, presented as retaliation for the February 28 strike that resulted in the death of Ali Khamenei. Additional counter-value strikes targeted several US diplomatic representations, international airports, and data centres across the Gulf states, as well as, most notably, major oil infrastructure in Saudi Arabia, Qatar, the United Arab Emirates, and Oman.

## Conclusion

Several airpower-related lessons can already be drawn from Iran's operations in the conflict. First, although piloted aircraft were employed only marginally and operations were conducted within an asymmetrical strategic framework, Iranian commanders nonetheless followed a pattern familiar to airpower practitioners. From the outset, they committed substantial resources to suppression of enemy air defences (SEAD) and counter-air operations, in a manner broadly

comparable to the opening phases of conventional air campaigns. At the same time, multiple symbolic and economic targets were struck, enabling Tehran to exert pressure on the global economy and thereby raise the strategic cost of the conflict for Washington.

At the operational and tactical levels, the use of missiles and drones allowed Iran to project offensive airpower through systems developed and produced domestically at a fraction of the cost associated with acquiring and sustaining a modern combat aircraft fleet and its enabling capabilities—assets that remain largely beyond Iran's reach due to its international isolation. At the same time, the proliferation of such systems has compelled neighbouring states to invest in extremely costly defensive architectures. Operation True Promise 4 also underscores the critical importance of magazine depth in air and missile-defence interceptors. In this respect, the Gulf states and the United States appear to have erred by concentrating their acquisitions on systems designed primarily to counter high-end threats, thereby forcing them to expend expensive interceptors against extremely low-cost drones.

## **The Iran Crisis: Challenges for the Gulf and Pakistan**

**by Dr Shalini Chawla, Distinguished Fellow, Centre for Aerospace Power and Strategic Studies and Dr Anu Sharma, Assistant Professor, Amity Institute of Defence and Strategic Studies (AIDSS), Amity University, Noida**

### **Introduction**

The crisis in West Asia, which began with the large-scale offensive of the United States (US) (Operation Epic Fury) and Israel (Operation Roaring Lion) against Iran in February 2026, entered a more volatile phase with Iran's aggressive action against the neighbouring states. This has resulted in the rapid expansion of confrontation beyond traditional bilateral rivalries. What initially appeared as a localised escalation involving Iran and its adversaries has gradually transformed into a wider regional crisis with significant geopolitical implications. The immediate trigger for this escalation was a wave of joint US–Israeli airstrikes targeting key Iranian military and government installations. These operations targeted a range of strategic Iranian infrastructure in cities like Tehran, Isfahan, Minab, Kermanshah, Qom, Tabriz, Ilam, Karaj, Lorestan province, Zanjan, Urmia, Bushehr, Damavand, and Shiraz. The strikes also targeted missile production facilities, air defence systems, Islamic Revolutionary Guard Corps (IRGC) sites, and key command-and-control centres.

The strikes had two key objectives: (1) to degrade Iran's missile and drone capabilities, which underpin Tehran's deterrence strategy and pose threats to regional military bases, infrastructure, and maritime routes; and (2) they aimed to weaken Iran's regional influence by disrupting the logistical and operational networks supporting its partnerships with non-state actors across West Asia.

Iran's response was swift and carefully calibrated to demonstrate both deterrence and strategic resolve. Tehran launched a series of retaliatory missile and drone strikes targeting American military bases across the Gulf states, Israeli strategic installations, and critical infrastructure in several Gulf states hosting American military infrastructure. These attacks showcased the operational reach of Iran's missile and unmanned aerial capabilities, many of which were specifically designed to penetrate advanced air defence systems. Military facilities, energy infrastructure, and logistical hubs linked to the American military presence became primary targets, reflecting Iran's strategy of increasing the costs of direct confrontation for Washington and its regional partners. The strikes and counterstrikes quickly transformed what initially appeared to be a limited military exchange into a wider regional crisis.

At the core of the present crisis lie tensions surrounding Iran's nuclear programme, which was initiated in 1957. Over time, the programme evolved under changing security concerns and increasing

international scrutiny. Although Iran consistently maintained that its nuclear activities were intended for peaceful energy purposes, disputes over reporting obligations and uranium enrichment prompted the International Atomic Energy Agency (IAEA) to declare Iran in non-compliance in 2005. In response, the United Nations Security Council (UNSC) adopted Resolution 1696 in 2006, demanding the suspension of enrichment activities and imposing sanctions that significantly affected Iran's economy. A diplomatic breakthrough emerged with the 2015 Joint Comprehensive Plan of Action (JCPOA), which restricted Iran's enrichment programme in exchange for sanctions relief. However, disagreements over missile development, compliance issues, and America's withdrawal from the agreement in 2018 revived the tensions. These unresolved disputes escalated into confrontation between Iran, the US, and Israel, culminating in a twelve-day military escalation in mid-2025 after Israeli strikes on Iranian nuclear facilities.

### **The 2026 Escalation: From Strategic Rivalry to Regional Confrontation**

Unlike the 2025 crisis, the February 2026 confrontation has quickly spilt beyond a narrow Gulf-centric framework, drawing in a wider network of regional and extra-regional actors. Several Gulf states, including the Kingdom of Saudi Arabia, the United Arab Emirates (UAE), Bahrain, and Qatar, host major American military bases and strategic logistical infrastructure that

are integral to Washington's broader security architecture in the region. Air bases in Qatar, the UAE, Kuwait and Iraq and a naval base in Bahrain were attacked by Iranian missiles. As tensions escalate, the presence of these installations has expanded the geographic and strategic scope of the crisis, transforming Gulf states from peripheral stakeholders into potential theatres of confrontation.

The current escalation of hostilities in the region has widespread implications for the Gulf states, involving Iranian attacks on regional energy infrastructure or American military assets. Gulf economies remain deeply dependent on hydrocarbon exports, making critical infrastructure highly vulnerable. Targeted attacks have significantly disrupted production and export capacity, triggering volatility in global energy markets and raising insurance premiums. A more severe scenario involves the blockade of the Strait of Hormuz, through which a substantial portion of global oil and gas trade happens. Iranian blockade of this chokepoint has created energy supply shocks, increased global prices and forced Gulf states to rely on limited alternative export routes. In the longer run, such a disruption would also generate a broader logistical crisis, affecting shipping lanes, port operations, and supply chains across the region. Continuation of the crisis/conflict is likely to place the Gulf states in a highly precarious position, compelling them to navigate between their security dependence on the US and

the need to avoid direct confrontation with Iran. Eventually, the scenario would intensify regional instability and strategic uncertainty.

This evolving situation indicates a critical shift in the geography of conflict. Rather than remaining confined to the Persian Gulf or the immediate West Asian theatre, the confrontation is gradually intersecting with broader geopolitical dynamics that extend towards South Asia. Iran's historical, political, and economic linkages with countries such as Pakistan, Afghanistan, and India have created a wider arc of instability that connects the Gulf region with the subcontinent. Maritime routes, energy flows, diaspora networks, and security partnerships increasingly link developments in West Asia with political and strategic dynamics in South Asia. The current conflict has acquired cross-regional implications, extending its security impact on Pakistan. Historically, West Asian conflicts have influenced South Asia through ideological narratives and sectarian mobilisation. Pakistan faces particular vulnerabilities due to its delicate diplomatic balance with Iran, the Gulf states, and Western partners, alongside domestic sectarian sensitivities that could intensify amid regional polarisation. Escalation may also generate pressures along the Iran–Pakistan border, where militant networks operate.

### **Pakistan: Walking a Tightrope**

The conflict and intensifying tensions

in the region have been unnerving for Pakistan, especially because Pakistan has been struggling to recover from its domestic instability, economic crisis and diplomatic challenges which it faced over the last few years. Pakistan shares a strained relationship with Iran, and the sectarian and strategic tensions have not allowed for a sustained phase of stability in the bilateral relationship. In January 2024, Pakistan and Iran exchanged missile and drone strikes and the conflict was diffused without too much damage for both sides. There have been ineffectual efforts from both sides to negotiate and settle the tensions. The current conflict, where the Iranian nuclear infrastructure and oil storage depots and missile sites are targeted, is a matter of deep anxiety for Pakistan. The news of Iran's Supreme Leader, Ayatollah Ali Khamenei's death, led to violent protests in Pakistan. Approximately 15 to 20 per cent of Pakistan's population is Shiite Muslims, and instability in Iran is bound to have repercussions for Pakistan. Thousands of people gathered to condemn the US and Israeli strikes in Iran. There were protests around the US mission in Pakistan, and protesters attempted to storm the US consulate in Karachi, leading to 10 deaths.

Pakistan's southwestern province, Balochistan, which has remained restive with raging insurgency, will feel the ripples of instability and tensions in Iran. Balochistan shares around 900 km long border with Iran's Sistan and Balochistan province. The neighbours share ethnic and cultural ties. In

this respect, two issues are critical:

Insurgency and militancy remain a major concern. Iran-based Sunni separatist militant group Jaish-al-Adl (Army of Justice), composed mainly of Baloch. The group has seemingly been drawing support and emulating the war tactics of the separatist groups in Balochistan in Pakistan, including the Baloch Liberation Army (BLA). There have been reports of the cross-border nexus between the two groups.

The second issue, which is closely related to this, is the China-Pakistan Economic Corridor (CPEC), a USD 60 billion investment from China and a strong reflection of China's long-term commitment to Pakistan. The CPEC projects in Baluchistan have been frequently targeted by the BLA and the deadly military group Tehrik-i-Taliban Pakistan (TTP).

The economic impact of the crisis is serious on Pakistan, given the fact that Pakistan imports around 85 per cent of its crude oil from Saudi Arabia and the UAE. The oil is imported through the maritime route passing through the Strait of Hormuz. The Iran crisis has further impacted energy prices in Pakistan, which have already surged to fulfil the conditionalities of the International Monetary Fund (IMF) loan.

Remittances are a crucial part of Pakistan's economy, and those from Pakistanis working in the Gulf stand at around USD 20 billion every year. Unrest in the Gulf and Iranian attacks on the

Gulf countries will create an atmosphere of uncertainty, which is likely to dissuade Pakistani nationals from working in the Gulf.

On the diplomatic front, Pakistan is caught up in a precarious situation, and the ongoing conflict compels it to make some difficult choices. Before the conflict, Pakistan also tried to act as a mediator to diffuse the intensifying tensions between the US and Iran. The conflict raises some difficult questions for Islamabad. Pakistan has been trying hard to mend its relationship with the US after the Trump administration came into power. The leadership not only credited President Donald Trump for the ceasefire between India and Pakistan during the May 2025 conflict but also nominated Trump for the Nobel Peace Prize. Pakistan's participation in the controversial US-led Board of Peace, to address the Palestine issue, expresses its desperation to be in the good books of Trump and leverage strategic dividends. Pakistan is facing domestic pressure to withdraw from the Board of Peace. Even though Pakistan is upset with the US and Israel's strikes on Iran, it will be a challenge for Pakistan to raise its voice against American actions in Iran.

Although Pakistan is trying hard to remain neutral in the conflict, its relationship with the Gulf is complicated by the ongoing geopolitical and strategic shifts in the Gulf. In December 2025, Pakistan and Saudi Arabia signed a

Strategic Mutual Defence Agreement, which includes a clause on a collective defence framework. This indicates that any aggression against either country will be seen as aggression against both. Pakistan projected the agreement as a force multiplier and a strategic win in the wake of heightened tensions vis-à-vis New Delhi in 2025. But now, how far Pakistan will uphold its commitments following Iran's strikes against Saudi Arabia remains to be seen. Given the fact that it is engulfed in an intense cross-border conflict with Afghanistan. The core issue between the two neighbours has been Pakistan's claims that the Afghan Taliban regime has been sheltering and providing safe havens to the TTP, which has been responsible for conducting relentless terror attacks targeting the security personnel in Pakistan. Tensions have been high, and Pakistan is now conducting air strikes on the civilian targets. Surely, it would not be feasible for Islamabad to open another front in the Gulf, with the ongoing conflict with Kabul and persistent tensions vis-à-vis New Delhi.

## India's Challenges and Concerns

The current conflict in West Asia marks a significant escalation in the long-standing strategic rivalries surrounding Iran. Since February 2026, tensions that had historically remained confined to proxy conflicts and covert operations have moved into the realm of direct military confrontation. The crisis has heightened vulnerabilities in key maritime

chokepoints, particularly the Strait of Hormuz, through which a substantial share of global energy supplies pass. As a result, international energy markets have experienced volatility, insurance premiums for commercial shipping have increased, and concerns over supply chain disruptions have intensified. The conflict has also contributed to political uncertainty across the broader West Asia, prompting regional states to reassess their security postures and raising fears of wider escalation that could affect global trade and economic stability. This escalation has heightened vulnerabilities in global energy supply routes and increased risks to maritime security across the Persian Gulf and surrounding shipping corridors. Beyond the immediate military dimension, the confrontation generated widespread political uncertainty, compelling regional governments to reassess their security postures and raising fears of broader escalation. However, the present events indicate the breakdown of this uneasy equilibrium.

For India, the crisis presents a complex diplomatic and strategic challenge. New Delhi must balance its strong partnerships with Israel, the US, and Gulf states while maintaining important economic and geopolitical ties with Iran, including projects such as the Chabahar port and broader connectivity initiatives with Central Asia. Escalating tensions also threaten India's energy security and maritime trade routes, compelling policymakers to navigate the conflict with careful diplomatic calibration

while safeguarding national economic interests.

The impact of the continued Iran crisis on Pakistan is likely to intensify, leading to instability at the domestic level and strategic challenges for it at the international level. The terror groups in Pakistan would be the direct beneficiaries of the instability on Pakistan's borders. India needs to closely monitor developments and assess its options vis-à-vis Pakistan to safeguard its security and strategic interests.

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## FROM NYOMA TO MORAN Building Runways and Resolve

*Air Vice Marshal Anil Golani (Retd),  
DG, CAPS and Group Captain VP Naik VM  
| 10 Marchy 2026*

*Source: ORCA | <https://orcasia.org/article/1625/from-nyoma-to-moran>*

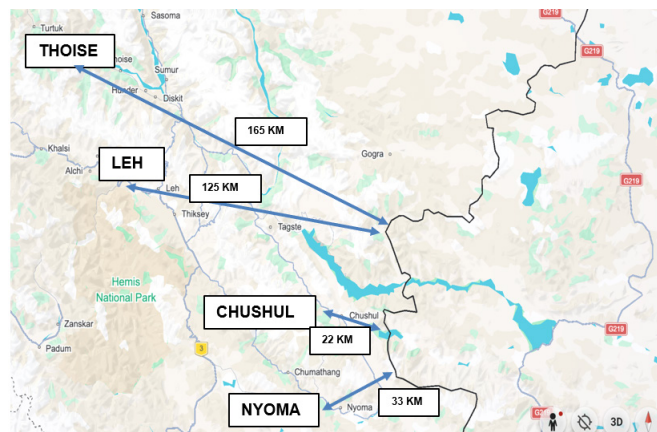
The development of infrastructure in Eastern Ladakh is vital for strengthening India's operational capabilities along the Line of Actual Control (LAC). The operationalization of Nyoma airfield enhances rapid troop deployment, logistics support, and Intelligence, Surveillance and Reconnaissance (ISR) in sensitive sectors such as Demchok and Pangong Tso. High-altitude operations remain challenging due to terrain, weather, and payload limitations, requiring resilient infrastructure and sustained logistical support. While China maintains several airbases and extensive transport networks in Tibet and Xinjiang, India retains the advantage of launching operations from lower-altitude bases in depth. Continued investment in airfields, Advanced Landing Grounds, and road and rail connectivity will improve operational readiness and resilience in the region.

The recent landing of an [Indian Air Force \(IAF\) C-130-J aircraft on February 14, 2026](#), at Moran Emergency Landing Facility (ELF) was a bold statement by India that it would no longer be reactive in protecting its territorial integrity. With only Leh and Thoise as full-fledged runways in Ladakh, operations in that area have always been

challenging due to poor road infrastructure and minimal air connectivity. Development of Nyoma Advanced Landing Ground (ALG) into a regular runway capable of sustaining full-spectrum air operations is a strategic game-changer. The airfield was officially [inaugurated on November 12, 2025](#) with the first landing carried out in a C-130 J aircraft by Air Chief Marshal AP Singh who is also a test pilot, sending a signal that the Indian Air Force leads from the front.

Infrastructure development across both sides of the India-China border has continued with increasing momentum in recent years, leading to higher deployment along with a concomitant reduction in trust. Upgradation of Nyoma airfield was aimed at enhancing flexibility of military response and facilitating Humanitarian Assistance and Disaster Relief (HADR) operations along the Line of Actual Control (LAC). While Nyoma airfield offers several advantages, it also displays national resolve to secure the region against any aggressive intent. This must be viewed in the broader context of the development of the region.

**Figure 1: Location of Nyoma**



Source: [Google Earth](#), with author's insertion of details

The strategic significance of the base also lies in its ability to considerably reduce response time in operations compared to IAF's Leh and Thoise airfields (Figure 1). The base would facilitate rapid induction of troops, heavy equipment and supplies, along with medical evacuation and enable last-mile connectivity in an area constrained by limited road infrastructure. The base also has strong deterrent value especially in sensitive sectors such as Demchok, Pangong Tso, Depsang-Chushul axis and Hamle and it enables sustained Intelligence Surveillance and Reconnaissance (ISR) operations.

In high-altitude areas, infrastructure development for air operations needs to be designed around the hard realities of extreme elevation and vulnerability to enemy attack. The emphasis, therefore, needs to be on sustainability, redundancy and survivability. The proximity of Nyoma to the LAC makes it vulnerable to attacks by the People's Liberation Army Rocket Force ([PLARF](#)) as well as the PLA's integral artillery. However, because Nyoma

is the only airfield in the region capable of supporting fighter and strategic transport operations, redundancy becomes a major operational consideration.

There are many constraints and challenges when operating from high-altitude airfields. High-altitude significantly affects lift and engine performance, requiring longer take-off runs and reducing payload capacity. Weather uncertainty and terrain impose additional operational planning requirements. The development of infrastructure is slow, and the construction of Hardened Aircraft Shelters (HAS), Fuel Oils and Lubricants (FOL) storage and Weapon Storage Areas (WSA) is tedious. In winter months, snow-clearing equipment is required, and summer operations are affected by ‘hot and high’ conditions due to increased ambient temperatures.

Ngari Gunsa and Hotan: Operational Analysis

China has five major airfields in Tibet, including three opposite Eastern Ladakh (EL) at Ngari Gunsa, Hotan and Kashgar (Figure 2). The PLAAF airfields are well developed, located in depth and have the advantage of being able to sustain large-scale operations. However, due to the high

elevation of these airfields, operations from them have serious weight and payload penalties. Aircraft would need to get airborne with minimal fuel and maximum weapons due to temperature and elevation considerations. Once airborne, aircraft would need to carry out aerial refueling to enhance their combat radius of action. This would entail significant time penalties and also make them vulnerable to long-range air-to-air and surface-to-air weapons. Due to large distances from each other, most airfields in Tibet and Xinjiang do not mutually support operations. Located significantly apart from each other, PLAAF airfields in the region become less effective due to topography.

Ngari Gunsa (Figure 2) has a long dual-use runway from where UAVs, fighters like J-11 and various ISR platforms can be operated in addition to strategic and tactical transport aircraft. However, due to adverse weather (crosswinds) and snow for a large part of the year, the base has limited capability for sustained high-intensity operations. The airfield is not likely to be a launch base for large operations and will be restricted to air defence and Combat Air Patrols (CAP) primarily for political signaling.

Figure 2: PLAAF Airfields in Tibet

| Airfield            | Elevation           | Runway  | Operational Role              | Approx Dist. from LAC / Nyoma                        |
|---------------------|---------------------|---------|-------------------------------|------------------------------------------------------|
| Ngari Gunsa Airport | 4,274 m (14,022 ft) | 4,500 m | Dual-use (major forward base) | 180-220 km east of Nyoma area<br>200-250 km from LAC |
| Hotan Air Base      | 1,424 m (4,672 ft)  | 3,700 m | Major rear PLAAF base         | 330-350 km from Ladakh region                        |
| Kashgar Air Base    | 1,380 m (4,529 ft)  | 3,200 m | Rear support node             | 550 km north of Leh                                  |

Hotan airfield is located at a much lower elevation than Ngari Gunsa but is almost double the distance from LAC (Figure 2). The base can launch sustained high-intensity all-weather operations and is also well-connected with China's interior infrastructure and transportation grid. All kinds of fighter, transport and bomber operations can be launched from Hotan. In the event of a crisis, Hotan, along with other interior bases, will launch most missions, and Ngari Gunsa and other smaller airfields will primarily be used for replenishment, forward CAP and ISR missions. The overall PLAAF strategy would be increased forward presence with rear-area sustainment. In such a scenario, sortie sustainability and not just proximity to the LAC will prove decisive. While Ngari is politically potent, it is severely operationally constrained. That is the primary reason why the PLA Rocket Force (PLARF), with its large arsenal of medium and short-range ballistic missiles, will play a decisive role if not neutralised or countered.

To mitigate operational restrictions from high altitude airfields, PLAAF has also created multiple heliports across the entire LAC and International Boundary (IB). China follows a hub and spoke infrastructure development model with an aim to link all major cities with high-speed rail and multi-lane highways. The large hubs are cities with well-developed air, road and rail infrastructure and capable of sustaining large scale operations. From these hubs smaller road and rail laterals branch out to the border areas and smaller towns. China has built extensive rail infrastructure

across high-altitude areas in Tibet (Figure 3). Inbuilt redundancy in the transportation network provides multiple options to PLA and also improves reaction time, mitigating the problem of shortage of airfields in the area.

**Figure 3: Rail Network in Tibet**



Source: [Tour Travel Tibet](http://tourtraveltibet.com), Accessed on March 04, 2026.

India needs to rapidly develop road, rail and air infrastructure along the LAC and IB for sustaining operations as well as connecting forward areas. ALGs like DBO and Fukche need to be upgraded and additional heliports created (Figure 4). To support this development, there will be a need to create more roads and high-altitude rail infrastructure in the region.

India has the advantage of launching air operations from in-depth bases with no major weight and payload constraints and that must be capitalised on. Development of forward airfields and creation of additional Greenfield Airports in EL, Central Sector and the North-East will go a long way in enhancing India's combat effectiveness. Existing airfields like Leh and Thoise also need to be upgraded with additional parallel runways, HAS and WSAs, facilitating all-weather 24x7 operations. Developing a

layered transportation infrastructure and carrying out dispersed operations would provide Indian forces adequate resilience from happening. In high altitude operations, geography and topography are combatants where not just aircraft numbers but resilient

**Figure 4: Indian Airfields and ALGs in Eastern Ladakh**

| Airfields                              | Elevation                  | Runway                  | Operational Role                                         | Promximity to the Chinese Border/LAC |
|----------------------------------------|----------------------------|-------------------------|----------------------------------------------------------|--------------------------------------|
| Nyoma Airfield                         | 13,700 ft<br>(4,200 m)     | 2.7 km rigid runway     | High-altitude forward base; fighter/transport operations | 30-50 km from LAC                    |
| Kushok Bakula Rimpoochee Airport (Leh) | 10,682 ft<br>(3,256 m)     | 2.75 km                 | Major IAF base                                           | 190 km from friction zones           |
| Thoise Air Base                        | High-altitude<br>(3,100 m) | 3.7 km                  | Dual use (military + civil)                              | Rear support base for Ladakh         |
| Daulat Beg Oldie ALG                   | 16,700 ft<br>(5,100 m)     | Semi-prepared/<br>Short | ALG for transport aircraft                               | near LAC (few km)                    |
| Fukche ALG                             | 14,300 ft<br>(4,360 m)     | Unpaved/<br>2.7 km      | Forward ALG                                              | Very close to LAC                    |

and options when required.

Nyoma is hence not just an airstrip; it is the unblinking beacon that not only displays national resolve at the LAC but also demands continued funding to prevent a future Galwan

operational logistics, engineering capability and ability to capitalise on defence in depth will prove decisive.

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## Air Power Musings One Nation, One Theatre, and One Plan

Gp Capt VP Naik VM | 12 March 2026

Source: CAPSS | <https://capssindia.org/air-power-musings-one-nation-one-theatre-and-one-plan/>



Image Source: Author's creation

In continuation of a series of articles on Higher Defence reforms, this article sheds light on the need for India-specific structures for modern war fighting. The first article was about whether Theatre Commands were required or not. Air Power Musings: Theatre Commands – To Be or Not to Be (published in CAPSS Journal, Defence and Diplomacy, <https://capssindia.org/wp-content/uploads/2025/09/7-VP-Naik.pdf>). The second article primarily explained the differences between Theatres and fronts and brought out the employment philosophy of the India Air Force. Air Power Musings: Theatre Commands Redux (Published on CAPSS website, In Focus, <https://capssindia.org/air-power-musings-theatre-commands-redux/>). The third article carried out a joint AI and human analysis of the need for reforms and what was wrong with the way India plans to fight, and articulated a problem statement. The fourth article

recommended possible structures for the reforms and brought out certain lacunae at the apex level. India's Higher Defence Reforms: Tactical Brilliance or Strategic Coherence, <https://capssindia.org/indias-higher-defence-reforms-tactical-brilliance-or-strategic-coherence/> published as an Expert View article on CAPSS' website. The fifth article brought out certain facts about modern war fighting and how the theatre construct was already an old concept. Air Power Musings: When Structure Lags Strategy, The Theatre Command Fallacy, <https://capssindia.org/air-power-musings-when-structure-lags-strategy-the-theatre-command-fallacy>. The aim of the series was to build a coherent argument towards higher defence reforms in India and bring out possible actionable options in the national security construct.

### Introduction

India's unique geostrategic problem of having two contiguous adversaries, who may act simultaneously, makes the threat manifest as a **single entity** on multiple fronts. The emerging geopolitical landscape in Myanmar and Bangladesh also merits strategic considerations, however, does it mean that India will need to create additional theatres to cater for Bangladesh and Myanmar?

The problem lies not in the number of threats, which would vary, but in how to handle the manifesting threat. The Iran imbroglio has further reinforced the need for a unified command. The United States

(US) and Israeli forces operate under their own, independent commands, where plans are made and executed. However, for the ongoing Iran operation, in spite of being a joint operation, there have been instances of bombing by Israel which the [Americans were not aware of](#). This brings out the need for unity of command to ensure integrated execution of operations. The Iranians, on the other hand, have a single unified command structure; however, execution is decentralised and left to the 31 autonomous provincial commands without any systemic coherence. The [Islamic Revolutionary Guards Corps \(IRGC\)](#) and the [Artesh](#) (the Islamic Republic of Iran Army) are two parallel and independent armed entities of Iran operating within the same geography and with their own forces. The Artesh has its integral Army, Navy, Air Force and Air Defence (AD) Force, while the IRGC has its own Ground Force, Navy, Aerospace Force (missiles and drones), [Quds Force](#) (supporting the axis of resistance and associated militia) and the Basij Organisation (Information Warfare). These are two forces fighting independently and without strategic guidance.

India is uniquely placed because its threats are geographically contiguous and strategically intertwined. China's Western Theatre Command (WTC) independently deals with India. Pakistan does not have a separate Theatre Command (TC) to handle contingencies in its West and East. However, the Indian thought process, seemingly in the final stages of reforms, is

still looking at the creation of TCs to enhance war-fighting capability. While there is no denying the fact that reforms are required in India's Higher Defence Organisation (HDO), ***the solutions being discussed appear to be in a desperate search for a problem.*** This article argues that the threat faced by India is singular in nature and could manifest either simultaneously or sequentially, forcing India to fight a two-front war within the same battle-space continuum. Thus, dividing the country into TCs based on a happy compromise of threat and geography risks fragmenting [strategic planning](#) for what is essentially ***one strategic problem.***

## Creating Artificial Boundaries

The concept of Theatres originated before the [Second World War](#), when forces had to be allocated and operated on separate continental fronts and across vast oceans. ***Geography forced*** these structures because that was what was required in those times. In India, we are trying to ***force geography***, and that can prove detrimental in the long run. Gujarat, Rajasthan, Punjab, Jammu and Kashmir, Ladakh, Uttarakhand, Sikkim and Arunachal Pradesh are contiguous and operationally connected, having a direct impact on each other. If dealt with by separate theatres, ***strategic prioritisation*** will become a major problem and be contested. A single national TC construct preserves the principle of Unity of Command and permits decentralised execution. More on that later. Thus, the need of the hour is to use

geography to one's advantage rather than making it an excuse for fragmenting forces. We should not create artificial boundaries and further complicate the issue.

## Two Front Contingency

India is one contiguous Theatre of War. Contingencies may arise with any of its neighbours, and each would constitute a separate front. We should not confuse [Theatres of War](#) with fronts and Theatres of Operations. Therefore, the opening of a front does not require an independent force structure to be activated. Additionally, India cannot assume that conflicts with either China or Pakistan will remain geographically isolated. Threats could very rapidly become national conflicts rather than remaining regional campaigns. This further reinforces the need for a single, integrated operational theatre of war.

Multi Domain Operations (MDO) involving land, sea, air, space, and cyber forces will require synchronisation and will be carried out across the entire country simultaneously, because MDO transcend conventional domain-specific war-fighting. If cyber, space and information campaigns are all pervasive and scarce resources like force multipliers remain centrally controlled, why then should war fighting become fragmented? Fragmenting would only create parallel systems, undermining effective Command and Control (C2). A single theatre construct would instead better align with modern warfare, enabling a system-of-systems approach to war-fighting.

Theatre Commands are a purely military reform, and rather than addressing the elephant in the room and **appreciating the situation**, India is trying to **situate the appreciation**. Modern war fighting will not purely be a military construct. Russia-Ukraine, Israel-Hamas and US-Israel versus Iran show that national resilience, resolve, and most importantly, capability will differentiate between the victor and the vanquished. It is easy to say that the armed forces need to be reformed, but very difficult to say that the problems are systemic and at the apex level. To develop a comprehensive capability, reforms in HDO must first take place at the highest level.

## India's Legacy HDO: The Need for Apex-Level Joint Planning

India's current C2 architecture is a legacy inheritance still being retained. What India needs is [force-reconfiguration](#) rather than force restructuring because the problem is **not about how we fight**, it is about **how we plan**. In India's past wars, when have the Army and the Navy been used to gain control of the air? Traditionally, the Air Force has been providing air support and shaping the battlefield for the Army and Navy; however, have the land forces ever been used to take on air force tasks like radar busting, artillery and rocket fires on airfields, and destruction of C2 nodes by their special forces? Control of the air is a prerequisite for advancing the land offensive and must be achieved jointly. Op Sindoor, the Ukraine-Russia war and the US-Israel war with Iran have shown

the importance of gaining requisite control of air for the furtherance of all operations. Therefore, gaining and retaining control of the air becomes a national imperative to be achieved jointly, requiring centralised planning. Two or three independent theatres are not likely to achieve strategic coherence because their operational imperatives would significantly differ.

MDO requires a **‘Whole-of-Nation’** approach to war-fighting, and that **‘whole’** cannot further be broken down into western theatre, northern theatre or a maritime theatre. Selection and Maintenance of Aim is one of the most enduring Principles of War. Having multiple aims at the grand strategic or the military strategic level will go against the principle. Russia did not adhere to it in the early days of the war, and the result is there for everyone to see. In addition, modern weapons have trans-geography reach. What if an adversary’s weapon hits a target in a different Theatre Command which has not been activated? Will that theatre now respond, or will only the theatre that is supposed to deal with that particular threat respond to the event? For example, in a conflict with Pakistan, Vishakapatnam is targeted, so who will respond to it and how? The unfolding problems are myriad, and the cascading effects will be counterproductive. These issues complicate effective decision-making and further add to the confusion, and in MDO, if decision-making is compromised, the battle will be lost. To take the argument further, Distributed Denial of Services (DDoS) attacks on critical infrastructure will happen across the nation and call for a mix

of kinetic and non-kinetic responses. Space, the ultimate high ground, does not distinguish between theatres, and more importantly, India’s adversaries also consider India one theatre of operations. Then Why should India not respond as one integrated entity?

## Realigning Operational Regional Commands

If planning needs to be done centrally at the apex level, the same is also true at the operational level of execution. The Indian Army has seven regional Commands; the Navy has three, and the Air Force has seven. A total of 17 Commands are spread across the entire country. If India were to operate as one integrated command, the existing regional commands would need to be merged and, more importantly, co-located, keeping geography and threats in mind. Strategic guidance must lead to operational coherence; therefore, we need to change the process of execution of kinetic operations at the operational level, and that is what is meant by force reconfiguration. This can be done by creating **Joint Forces Commands** (JFC) based on geography, which would exercise C2 at the operational level. Merger of regional commands would enable unity of command and permit decentralised execution. These JFCs would remain **operationally subordinate** to a single national Theatre and an associated Joint Forces Head Quarters (JFHQ) in order to remain strategically coherent.

In 2016, China realigned its forces from seven Military Regions to five

Theatre Commands, each dealing with a specific threat. China's threat landscape differs from that of India because it has geographically dispersed threats and a mix of continental as well as maritime domains. The Central Theatre Command (CTC) of China defends Beijing and acts as a strategic reserve for other commands. India's strategic landscape is more concentrated and geographically contiguous, making a single integrated theatre construct more suitable.

## The Single Point Advice of Matters Military

Establishing the post of Chief of Defence Staff (CDS) and creating the Department of Military Affairs (DMA) is a step in the right direction. The issue causing dissonance is that **war fighting** and **Raise, Train and Sustain (RTS) functions** have been merged, thereby creating additional reform hurdles. Clearly mandated [Allocation of Business](#) (AoB) rules by the Government of India must thus become the **first reform**. Subject Matter Experts must be able to render '**single point advice**' to the Government of India (GoI) on all matters related to the armed forces. This advice is **single-point** and not necessarily **single-person**. A single person makes the chain linear and susceptible to disruptions, and the same has been seen during Op-Epic Fury, where the death of the Supreme Leader of Iran adversely affected its apex decision-making ability.

With increased offensive capability to address strategic Centres of Gravity

(CoG), targeting leadership across all levels has now become fair game. In the present construct, the Chiefs of Staff Committee (COSC) is an efficient organisation, functionally effective and brings about strategic coherence. The single point advice, therefore, must be a collegiate function by the **CDS and the three Service Chiefs** (experts in their respective domains). War fighting and RTS functions, both must remain the mandate of COSC, performed by the JFHQ (war fighting) and HQ Integrated Defence Staff (IDS) for RTS functions headed by the [Chief of Integrated Defence Staff and Secretary to the Chairman COSC \(CISC\) heading the DMA](#).

## The Future of Warfare

In modern wars, kill chains have evolved into kill webs. There are no independent operations, and cyber and space are overarching capabilities capable of affecting all other domains. These form the bedrock of Multi-Domain Operations and are therefore not just the mandate of the armed forces. A national 'nervous system' is therefore the best way forward. The ability of a nation to demonstrate and adopt a '[whole-of-nation](#)' approach will prove decisive in the future. The vision document, '**The Defence Forces Vision 2047: A Roadmap for a Future-ready Indian Military**', unveiled by the Honourable Raksha Mantri (RM) on March 10, 2026, also speaks of the need for **integrating military strength with diplomatic, technological and economic**

**power to ensure national security.** The writing on the wall is clear; it is not just about the armed forces. The armed forces are an important cog in the wheel of a nation, but they are not the only cog. All cogs need to work together to strengthen and support the wheel and serve their own distinct purposes. The armed forces function best when C2 is **simple, clear and unified**. The soldier on the battlefield, the sailor in a submarine and the pilot in the cockpit of an aircraft require clarity of instruction to enable correct tactical actions. A **One Nation-One Theatre** approach would **align India's strategy with geography, reduce bureaucratic lethargy, enhance jointness** and most importantly, **translate synergy into a coherent strategy for integrated operations**.

India's security challenges demand a fundamental rethink of the existing C2 structures. We must embrace our geopolitical landscape and geographical context to adopt a framework specifically tailored to India's strategic reality. Given the possibility of simultaneous pressure from both China and Pakistan, multiple theatres will only fragment war-fighting capability. A **One Nation-One Theatre** architecture, supported by streamlined regional commands and an integrated network for MDO, would enable India to **reduce the teeth-to-tail ratio, preserve national character and strengthen national response** in arising contingencies.

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## Air Power Musings: The Storm After the Lull!!

Gp Capt VP Naik VM | 26 March 2026

[Source: CAPSS | https://capssindia.org/air-power-musings-the-storm-after-the-lull/](https://capssindia.org/air-power-musings-the-storm-after-the-lull/)



This article is a continuation of a previously published article on the US-Israel war with Iran (Operation Rising Lion and Operation Midnight Hammer), Air Power Musings: Silence of the SAMs, published as an 'In Focus' article on the CAPSS website. <https://capssindia.org/air-power-musings-silence-of-the-sams/> Published on July 01, 2025. The movie Hannibal (2001) was a sequel to The Silence of the Lambs (1991); similarly, this article is a sequel to The Silence of the SAMs.

### Introduction

On February 28, 2026, at 0945 Local Time, Tehran, the United States of America (USA) and Israel launched large-scale joint military strikes against Iran after failed nuclear negotiations. Named as Operation Epic Fury in the USA and Operation Roaring Lion in Israel, the joint strikes were aimed at targeting Iran's

Supreme Leader Ayatollah Ali Hosseini Khamenei. Later that day, the Supreme Leader of Iran was killed in an accurate missile strike, and on March 01, 2026, Iranian state television confirmed his death. In the Pentagon's Press Briefing on February 02, 2026, the US Defence Secretary Pete Hegseth laid down the strategic aim of the operation as follows: *"The mission of Operation Epic Fury is to destroy Iranian Offensive missiles and their production, destroy Iranian Navy and other security infrastructure and ensure Iran never has nuclear weapons."* He also mentioned that, though regime change was not the aim of the operation, regime change had already started because of the killing of Ayatollah Khamenei. What can be deduced is that both operations have been undertaken to annihilate Iran's war-waging potential and simultaneously destroy any existing nuclear capability. From an air power perspective, the relative silence of Iranian Air Defence (AD) or the sheer ineffectiveness of it has allowed the most fiercely protected and secure Centre of Gravity (CoG) of Iran, the Ayatollah to be located and killed on the very first day of the operation.

## Inferences

Ineffectiveness of the Iranian AD is not new, and was also clearly visible during Operation Midnight Hammer in July last year. What is surprising is that the Iranians did not learn anything from Operation Midnight Hammer. The ineptitude of AD in Iran does not necessarily mean that all its

AD assets have been destroyed. Neither does it mean that the entire AD Command and Control (C2) system has collapsed. What it does bring to the table is the ability of American and Israeli combined might to systematically degrade Iranian AD and make it functionally unusable. It is immaterial whether it was done using kinetic means or by non-kinetic methods; what is important is that air power, when used effectively, can provide a lethal blow on the very first day of the war, directly impact the decision-making ability of the adversary and simultaneously, by way of a tactical action, create strategic effects.

What can also be construed is that the Americans and Israelis were able to severely degrade the rudimentary, yet effective, AD system of Iran using a combination of Electronic Warfare to blind and confuse the Iranians, targeting leadership at the operational and strategic level to cripple the Iranian Observe-Orientate-Decide-Act (OODA) loop and create decision dilemmas. US experience with Ukrainian S-300s helped them understand the system and devise effective tactics to stay out of the SAM lethal envelope. Use of a combination of Tomahawk Land Attack Cruise Missiles, stand-off, air-launched precision weapons, and unmanned systems enabled the American and Israeli forces to carry out effective Suppression/Destruction of Enemy Air Defences (SEAD/DEAD).

## The Writing is Clear

Both the US and Israeli armed forces have extensive experience in SEAD/DEAD operations. When coupled with good Intelligence, Surveillance and Reconnaissance (ISR) operations as a prelude to all offensive action, they were able to systematically degrade Iranian AD. The use of stealth platforms and unmanned kamikaze drones enabled them to specifically target early-warning radars, communication nodes, and fire-control radars. This resulted in a crippled and fragmented AD incapable of putting up any prohibitive resistance. What the Iranians did not do is a long list worth analysing and examining. Some salient aspects of that are elaborated below for further analysis.

(a) After Midnight Hammer, the Iranians should have learnt their lessons. Surprisingly, they did not, and the same mistakes are being repeated. Had their AD survived and been able to target even a few American and Israeli aircraft, the narrative would have been totally different.

(b) The S-300 is a fairly potent system, and when integrated well, the system cannot easily be put out of action. The system is highly capable of undertaking independent operations in a denied environment; however, the Iranians failed to utilise that advantage. They should have been forward positioned, taken off the network and used when most needed. The world had seen the attack coming; why couldn't the Iranian leadership?

(c) *The Arman Long-Range Air Defence System, the Azarakhsh Low-Altitude Air Defence System, the Khordad-15 Air Defence System, the Bavar 373 Missile Defence System and the S-300 Missile Defence System create a layered AD architecture.* The integrated AD system is capable of detecting targets as far out as 1000 km (Ghadir and Sepher radars) and tracking them from 300 km down to very close ranges. Yet they all failed. A possible course correction and redesigning the tactical level architecture after Operation Midnight Hammer would have significantly enhanced AD effectiveness.

(d) The Iranian AD is controlled centrally by the Khatam al-Anbia Air Defense Head Quarters (KADHQ), an independent branch within the Iranian national armed forces that looks after all AD activities of the nation. An independent AD organisation only creates yet another silo, which prevents integrated and joint war fighting. In modern warfare, AD is an inalienable aspect of offensive operations, and the development of offensive air defence further highlights the need for AD operations to be integrated.

(e) Balakot, Op-Sindoor and Operation Midnight Hammer amply bring out the fact that a traditionally continental mindset focused on purely land warfare tends to keep air defence as a separate adjunct and precludes effective employment. Both Pakistan and Iran have a separate AD Command and operate independently, so do the Iranian and Pakistani Air Forces. As a result, when AD is placed under the

command of a surface force- commander, it tends to become linear and sequential, focused only on the Tactical Battle Area (TBA) where troops are in contact. Air Defence is far bigger; it encompasses the entire airspace above the battlefield. There are no air littorals there, nor can air space ever be divided. Just like action by surface forces cannot be divided into TBA and beyond TBA, just like sub-surface and surface elements are a contiguous part of larger Naval operations, air space cannot and should not be vertically separated. One must not fall into the trap of new jargon and colloquialisms and ignore strategic realities. Do so at your own peril!

(f) The importance of stand-off precision capability should not be ignored. The Americans and Israelis have managed to stay out of the lethal boundaries of all AD weapon systems of Iran, yet have managed to inflict severe damage to critical infrastructure. What emerges is the need for coordinated employment of manned and unmanned weapons to target CsOG at the tactical, operational and strategic levels. That is something only air power can accomplish. What must be remembered is that it is 'air power' being exercised and not necessarily the Air Force, which highlights the fact that ownership of assets is not important. It's the desired effect that can be created, which will be decisive. The US exercises air power from carrier and land-based platforms, and Iran exercises air power through medium and short-range missiles. Unmanned aerial platforms augment air power, and the combined effect

is debilitating. Fragment this capability and effectiveness will reduce exponentially.

(g) From available coverage of the war, it appears that the Iranian AD is primarily set up for peacetime operations and not necessarily for modern warfare. The Iranian AD has primary radar pick up on all aircraft entering its Air Defence Identification Zone (ADIZ) well before the aircraft physically enters its boundaries. However, operations under electronic jamming and in network denied environments are not something envisaged and trained for. While the equipment Iran possesses covers a large spectrum of engagement ranges, a largely defensive mindset precludes its offensive use.

(h) As the American long-range standoff weapons reduce in numbers with each passing day, there will be a time when conventional weapons like Laser Guided Bombs (LGBs) with range extension kits will be used. This will force the American aircraft to come closer to Iranian airspace and make them more vulnerable to the Iranian AD.

(j) For most armed forces arrayed for linear, two-dimensional warfare, Operation Absolute Resolve (Venezuela), Operation Midnight Hammer (Iran) and the Russia-Ukraine war provide both good and bad examples of how AD will determine survival. During Operations Absolute Resolve and Midnight Hammer, the AD of Venezuela and Iran was rendered ineffective. Venezuela and Iran both had effective weapons in their

AD arsenal; however, their employment philosophy was not quite in tune with the needs of the modern battlefield. The Americans were quick to capitalise on a weak employment philosophy. On the other hand, in the Russia-Ukraine war, AD on both sides has remained effective and, not surprisingly, it has turned out to be a battle of attrition.

(k) In the modern battlespace, tactical silence to preserve strategic survivability will prove to be the key to multi-domain resilience. Keeping some systems 'off the network' will give additional response options. Iran knew where attacks would emerge from, yet it failed to adapt. Combat adaptiveness and flexibility will be key to comprehensive defence and coordinated offence.

(l) In the event of AD collapse, it will no longer be just about fighter aircraft versus fighter aircraft. It will be the sheer dominating effect of air power that will come into play. Boots on the ground and ships in the seas will remain vital and will be able to roll in with minimal resistance. But, if the AD remains effective, the same is not true!!

(m) The larger lesson for Air Defence is that it is not just about hardware. Integration, realistic training, Electromagnetic (EM) spectrum dominance, C2 resilience, functional redundancy and ability to operate in environments of denial will prove decisive. The system must not collapse if any one of these elements fails.

(n) In modern wars, leadership can and will be targeted. How much are we thinking on those lines? Strategic, operational and tactical leadership will be threatened, and therefore, there is a need to protect them. The basic premise of good C2 is continuity of command. If that breaks down, C2 will break down.

## Parting Shots

Some questions that emerge are worth hovering on. [Are Iranian AD systems](#) still capable of being employed? Are the S-300 and Bavar systems active around strategic nuclear sites? Is there some semblance of an AD response mechanism still available? If the answer to any of these questions is 'yes', Iran will do well to exercise them now, and the US forces will do well to analyse them. A likely scenario that emerges is that the AD system may not be fully destroyed. It may be heavily degraded, emission-restricted and capable of localised defence. The right use of the appropriate weapon at the right time can always help retain national pride, because other than that, Iran really doesn't seem to have much of a choice. Given the USA's abhorrence of body bags, will there be American 'boots on the ground' in Iran? It is something we must wait and watch. History is replete with examples of American boots on the ground leading to strategic failures...We must all wait and watch if Operation Epic Fury will be an '**Epicurean Success**' or yet another '**Epic failure**'. The jury is out!!!.

## Drones as a Force Multiplier in Pakistani Taliban Operations

Ms Bantirani Patro | 11 March 2026

Source: CAPSS | <https://capssindia.org/drones-as-a-force-multiplier-in-pakistani-taliban-operations/>



### Introduction

The age of modern technology has eluded not even the Pakistani Taliban, which is increasingly integrating social media platforms, artificial intelligence (AI), and drones into its operations, with these tools becoming hallmarks of the group's resurgence following the Afghan Taliban's seizure of power in August 2021. The 2025 Global Terrorism Index identifies the Tehreek-e-Taliban Pakistan (TTP), formed in 2007, as having emerged as the fastest-growing terrorist group globally. The scale of its revival can arguably be attributed to the TTP's willingness to adapt to contemporary realities and absorb the concomitant technologies to enhance its tactical efficacy. Remarkably, such developments are occurring at a time when states themselves are exploring not only how emerging technologies can advance their national security objectives, but are

also increasingly concerned about the risks posed by their diffusion to violent non-state actors (VNSAs). In light of this, the use of sophisticated techniques such as drones – once exclusively and legitimately regarded as being under the jurisdiction of a 'state' – by the TTP and its affiliates warrants closer analysis, specifically as it accords them an aerial presence that mirrors a makeshift air force of their own.

### Nascent Adoption of Drones

As opposed to other conflict-prone regions, militant groups in the Afghanistan-Pakistan theatre have been rather slow to adopt new and emerging technologies for operational purposes, owing to three conceivable reasons. First, they have traditionally relied on cost-effective, easily accessible, and highly lethal methods such as Improvised Explosive Devices (IEDs) and suicide bombers. Second, the predominantly rural and open terrain of the Af-Pak region makes drones easier to detect and therefore more vulnerable to being shot down contrary to urban spaces. Third, a dearth of technical know-how, as well as the absence of foreign fighters facilitating the acquisition and use of drone technology, may also have contributed to this trend. This, however, is beginning to change.

This pivot in the TTP's case can be attributed in large part to its emir, Mufti Noor Wali Mehsud, whose efforts to unify the group's previously fragmented modus operandi have resulted in more calculated strategies. For instance, the TTP

dispensed with the policy of attacking non-combatants, instead focusing on targeted attacks against government personnel, and has abandoned any transnational jihadi agenda in favour of localised operations confined solely to Pakistan. Moreover, the TTP in its present form has expanded its media operations, circulating propaganda in multiple languages to reach diverse ethnic groups within Pakistan, and at times, leveraging AI tools to translate content into regional languages, which is subsequently disseminated across various social media platforms, particularly Telegram. The nascent use of drones, then, is emblematic of the TTP's trajectory, reflecting its increasing familiarity with, and adaptation to, modern technologies.

While the TTP had already acquired sophisticated weaponry left behind in Afghanistan by the United States, its use of drones for both attacks against security forces and Intelligence, Surveillance, and Reconnaissance (ISR) highlights its evolving repertoire of tactics. One such drone variant identified is the relatively low-tech, Chinese-manufactured, DJI Matrice. The ready availability of commercial quadcopter drones has enabled not just the TTP, but also its affiliates, such as the Hafiz Gul Bahadur (HGB) Group and Lashkar-e-Islam to deploy them. For instance, the HGB Group was suspected to have used drones six times between July and September 2024, primarily in Khyber Pakhtunkhwa's North Waziristan district.

In July 2025, Reuters was among

the first to report on Islamist militants in Pakistan beginning to use "commercially acquired quadcopter drones to drop bombs on security forces", citing several incidents in Khyber Pakhtunkhwa's Bannu district. Indeed, this was corroborated through an investigative report by Pakistan's leading newspaper, Dawn, in November 2025, which spotlighted the growing use of drones by militants in Bannu. With over 200 attacks involving the use of commercial, low-cost drones since June, one senior police officer quipped that the police now have "one eye on the barrel of the gun and another on the sky". The report further revealed the kind of munitions fitted in these quadcopters: improvised explosives, mostly GP-25 grenade launchers and small calibre mortar rounds. Some quadcopters are even reported to be equipped with thermal cameras, enabling night-time surveillance and attacks, with militants trying to stay ahead of security forces by frequently changing drone frequencies, so as to evade jamming systems.

### **Both Militants and the Military Turn to Drones**

However worrying, the use of drones by militants has not only given them an edge over the Pakistan military, or at the very least narrowed the gap, but has also introduced new layers of ambiguity for locals. Because the military also uses drones for ISR, locals cannot identify whether drones sighted in the sky belong to the militants or the military. In May 2025, for instance, a suspected quadcopter strike

in Mir Ali tehsil of KP's North Waziristan district killed four children and injured several others, precipitating a weeklong sit-in protest, with thousands of locals, who condemned the strike as a transgression of human rights, demanding transparency and accountability. As no militant group claimed responsibility, aspersions cast on the Pakistani authorities were promptly repudiated by the Inter-Services Public Relations (ISPR), the military's media wing, which said that the security forces had been "falsely implicated" and that the TTP had carried out the attack. Similar unclaimed drone strikes occurred in 2025, injuring over dozens and prompting Amnesty International to exhort Pakistani authorities to conduct investigations and provide appropriate compensation.

Now that drones have become a part of militants' arsenal, the Pakistan Army's own use of unmanned aerial vehicles in counterterrorism operations is likely to become more complicated. For residents of KP's tribal areas, drones already have a disquiet historical precedence, since they were subjected to deadly American drone strikes during the height of U.S. Global War on Terror and in the years that followed. Resultantly, the political sensitivity surrounding drone strikes has led the Pakistan government to not officially acknowledge the role of drones in its current counterinsurgency toolkit. In June 2025, The New York Times reported precisely on this, with a piercing headline, highlighting a striking irony: the very tactic that Pakistani officials used to censure

America for is now being embraced as part of the country's counterinsurgency strategy.

That said, the government has begun adapting to this developing threat. In some regions, the KP police has successfully used anti-drone guns against the machinations of militants. And this appears to have had an effect insofar as the number of drone attacks and night-time attacks has declined in areas where militants know the police possess counter-drone and night vision technologies. Yet still, the KP police remain over-stretched and under-equipped to deal with the changing nature of militancy. Security analysts have flagged the possibility of more lethal and frequent drone attacks as militants continue to experiment and improve their drone capabilities, and with the fusion of AI into drone technology, these concerns are likely to deepen. In the future, the likelihood of the Pakistani Taliban staging drone swarms cannot be ruled out; this looming threat remains true for many VNSAs, necessitating governments to invest significant capital in counter unmanned aerial systems (C-UAS).

## **How Drones could Destabilise the Region**

Given that the Af-Pak theatre's militant landscape is competitive, the Pakistani Taliban's reliance on drones could drive others like the Islamic State Khorasan Province (ISKP) and Baloch insurgents

to incorporate drones into their attacks to prove their credentials. That terrorists and militants have historically sought to emulate one another's best practices, especially when new methods prove to be effective in terms of both cost and impact, further bolsters this possibility. In this regard, pertinent examples of drone diffusion are instructive: several African states have seized manuals on drone use, indicating knowledge transfer among African non-state armed groups as well as from the Middle East to Africa.

ISKP's expressed intent in weaponising drones is noteworthy, as evidenced by Islamic State-affiliated channels having circulated manuals, outlining how commercially available drones can be morphed into tools for terrorism. Parallely, there are preliminary reports of Baloch insurgent groups using drones for ISR, albeit evidence remains, at best, limited; nonetheless, this has raised the spectre of them eventually employing drones for offensive operations. There is a past pattern of tactical adaptation. Baloch militants, once opposed to suicide bombing, have now embraced the tactic, likely drawing inspiration from the TTP, leading analysts to believe that their adoption of drone attacks may be less a question of if than when. Although militant drone warfare in Pakistan remains in its rudimentary stages, its implications could make a dent in the region's stability. The likes of the TTP, ISKP or Baloch militant organisations are unlikely to deploy drones with the sophistication seen among other VNSAs, such as Hamas,

the Houthis and Hezbollah, which benefit from a large degree of state sponsorship. While there is some speculation that the Afghan Taliban or al-Qaeda may be facilitating access to drone technologies for the Pakistani Taliban, such support would doubtfully match the level of assistance that groups like Hezbollah receive from benefactors like Iran.

Nevertheless, this marks a critical juncture in Pakistan's threat landscape. To guard against spill over effects and avoid the further erosion of trust between locals and the state, the Pakistani government would have to ensure that dual-use technologies like commercial drones are properly regulated, and that the smuggling of drones into Pakistan is reined in. This is especially critical given that drone technologies are progressing more rapidly than CUAS systems. However, Pakistan's patchy record of implementing basic but critical counterextremism policies calls into question the state's ability to respond decisively to this emerging, advanced-level threat. How Islamabad manages the spread of militant drone capabilities remains to be seen and will go on to shape the broader trajectory of militant adoption of emerging technologies.

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## Airpower

### When India Carried out the World's First Successful Air Strike on Enemy Political Leadership

Wg Cdr A Pichipoo Raja | 06 March 2026

Source: CAPSS | <https://capssindia.org/when-india-carried-out-the-worlds-first-successful-air-strike-on-enemy-political-leadership/>



Image: Government House Dacca following the IAF Strike, December 14, 1971 Credit: IAF Social Media

### Introduction

On February 28, 2026, the United States (US) and Israel jointly targeted the Iranian leadership, wiping out a large number of top leaders. Soon, the media started giving out details of how the operation was meticulously planned and executed. Militaries, at times, blow out of proportion the details of any operations. The media carried several such [stories](#) of exceptional intelligence and tactical brilliance. To put things in perspective, Ayatollah Ali Khamenei was the head of a state. Unlike heads of terrorist organisations like Osama Bin Laden or Mullah Omar, who needed to

hide for a living, Khamenei wasn't hiding. He wasn't targeted in any secret bunker, but at his regular office. The reason that the entire buildings had to be reduced to rubble also possibly hints at a lack of real-time intelligence regarding the exact position of the target. Otherwise, there is no reason why the entire complex was targeted, resulting in the death of his family members as well. Therefore, the claims that this was some superior intelligence-led operation are highly exaggerated.

More importantly, the success of any operation depends on the achievement of desired [objectives](#). There have been constant changes in the stated objectives of this conflict. While the tactical success of dropping the weapons on target has been achieved, the constant shifting of objectives makes any estimate of success difficult. Therefore, a quick detour to history is useful at this moment to learn from the wisdom of the past.

Till the twentieth century, targeting the political leadership of an adversary was seldom considered a viable military option. The political leadership was far from the battlefield. It was air power that made it possible to directly reach for the political leadership, bypassing the entire fielded forces. It will be interesting to note that India carried out the world's first air attack on a political leadership.

In February 1919, the new Emir of Afghanistan, Amanullah Khan, declared full independence, and this led to the

**Third Afghan War.** Nasrullah Khan, brother of the former Emir, sent an envoy to the Government of India. He wrote that he was the rightful heir to the throne, and would remain loyal to the British. He suggested that India should bomb Amanullah Khan's palace to achieve a decisive surrender.

The above message was entrusted to me by the Naib-us-Saltanat in great confidence, and I assure the British Government that they will find in Sardar Nasrulla Khan a much better friend.

As to the war, if troops are ordered to advance they will find nothing between Dacca and Kabul and if the Ark at Kabul is bombed by aeroplanes Amanulla Khan is sure to abandon everything and take to flight. I was in Kabul when the aeroplane came and everybody was so frightened that nearly half the city was deserted. Amanulla Khan lives in the eastern flank of the Ark and the bombing may be directed against his palace. The people are ready to revolt against Amanulla Khan and to release Sardar Nasrulla Khan and set him up on the throne, if only given an opportunity to do so by the bombing of Kabul. The Ningrahar people have looted Amanulla Khan's arms and ammunition and about ninety lakhs of cash at Jalalabad and are afraid of being punished for the loot if Amanulla Khan were to remain on the throne. They are therefore not keen on helping him and do not wish peace to be made with him. Of the army there is very little left. There are only three infantry and one cavalry regiments at Jalalabad, a couple of infantry regiments at Agam, one at Deh Bala, one at Kot, two at Kabi, and a squadron of cavalry as an escort to the Nazim in Ningrahar, and the strength of these units is not more than 600 strong each. This is all that the British will have to deal with and even these are very badly equipped.

Image: Message Requesting Bombing of Palace of the Afghan Ruler.

Credit: Government of India, Foreign and Political Department, Secret Frontier, Proceedings, September 1919, Nos. 6 – 195.

[The National Archives](#)

On May 24, 1919, a single aircraft, a Handley Page heavy **bomber**, bombed Amanullah Khan's palace in Kabul. It didn't reduce the place to rubble. The bombing proved instrumental in making Amanullah call for a **ceasefire** on June 03, 1919.

While this could be treated as the first instance of a strike against the political leadership, the most successful globally was the **strike** on the Government House in Dacca by the IAF during the 1971 war. On December 14, 1971, a MiG-21 formation of four aircraft from 28 Squadron IAF, led by Wing Commander Bhupendra Kumar Bishnoi, was tasked to strike the Government House at Dhaka at the precise time when a high-level meeting

was taking place. This was to be followed by another package of 02 X MiG-21s and 02 x Hunters. They were deliberately armed with rockets and not bombs, as the objective was psychological and not physical destruction. Starting at 1255 hrs, the first four aircraft hit the target. An UN Official who was present in the meeting **noted** that Mr AM Malik, the Governor, scrambled for a piece of paper and wrote his resignation just before the second wave of weapons hit. The whole cabinet resigned immediately. Within two days, the war ended with the largest surrender of troops.

Several aspects of this 1971 mission are relevant to the ongoing Op Epic Fury. Firstly, the intelligence was timely and accurate. The location of the meeting was changed when the aircraft were taxing out, and the target was updated accordingly. Secondly, the reader should imagine how exceptionally the intelligence apparatus was functioning, that, over fifty years ago, such real-time updates were possible in enemy territory. There were no satellites, mobile phones, datalinks, internet, CCTV, etc. Thirdly, the desired outcome was achieved with minimal loss of life. A noteworthy aspect was that IAF enjoyed air superiority after wiping out the entire PAF in East Pakistan in the initial days of the war. Yet the targeting was never reckless and was intended to cause as little loss of enemy life as the ends of military necessity demanded. There was no shortage of ammunition. Only the previous day, IAF had dropped 40 tonnes of bombs

at a single target – Joydebpur Ordnance Factory[4]. Lastly, in spite of the absence of precision-guided munitions, direct hits were achieved on the target. No debates in the media, including India, seem to have compared both these operations despite their similar objectives and employment. This aligns with the arguments in a recent [article](#) about the limited knowledge of Indian Military History despite its richness.

Success in any war is not measured in tonnes of bombs dropped, numbers of ships sank or numbers of enemy killed. It is in the achievement of objectives. At this moment, it is worth reproducing a [conversation](#) between Colonel Harry G. Summers, Jr., US Army, and Colonel Tu, North Vietnamese Army, Hanoi, on April 1975 following the US defeat in the Vietnam War.

***American: “You know you never defeated us on the battlefield”***

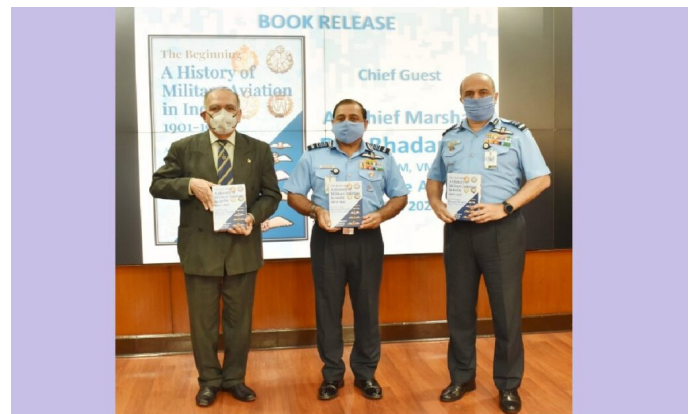
***Vietnamese: “That may be so”....” But it is also irrelevant”***

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## For the Sake of Military Effectiveness, Details of Indian Military Operations Need to be Told Accurately

Wg Cdr A Pichipoo Raja | 04 March 2026

[Source: CAPSS | https://capssindia.org/for-the-sake-of-military-effectiveness-details-of-indian-military-operations-need-to-be-told-accurately/](https://capssindia.org/for-the-sake-of-military-effectiveness-details-of-indian-military-operations-need-to-be-told-accurately/)



### Introduction

The recent controversy around the unpublished memoir of General MM Naravane (Retd) offers valuable lessons for the military. Looking beyond the controversy, it reveals a larger systemic failure of not letting one's own public/armed forces know the details of the Indian military operations. The result: despite the publisher's appeal stating that any circulation in any form is an infringement of copyright, the book's contents were openly discussed on TV debates. When official versions of important national security events don't exist, such TV debates are the only source to satisfy people's curiosity. This article attempts to offer a view on the different aspects of the issue and their relation to military effectiveness.

## How Important is Operational History to the Military?

Jim Mattis, the former United States (US) Secretary of Defense, wrote, “We have been fighting on this planet for 5,000 years, and we should take advantage of their experience.” This email went viral. He highlighted a practice of the US Marine Corps wherein, before every combat, they read specific books about the expected combat. He wrote, “Going into Kuwait 12 years ago, I read (and reread) Rommel’s Papers (remember “Kampfstaffel”?), Montgomery’s book (“Eyes Officers”...), “Grant Takes Command” (need for commanders to get along, “commanders’ relationships” being more important than “command relationships”), and some others. As a result, the enemy has paid when I had the opportunity to go against them, and I believe that many of my young guys lived because I didn’t waste their lives.” This relationship of reading as a path to saving lives on the battlefield seldom receives the attention it deserves in India.

## What Happens When Combatants Don’t Read Military History?

Colonel PK Gautam cites an example during the Kargil War. The Indian Army operations during Kargil in 1999 were named ‘Op Vijay’, even though the Liberation of Goa in 1961 was already named ‘Op Vijay’. This he cites as evidence of a complete lack of knowledge of their own military history amongst the entire planning staff in 1999. Likewise, there

are several accounts that claimed that Op Safed Sagar was the first time offensive air power was employed at high altitudes, forgetting entirely the First Indo-Pak War of 1947-48, especially the employment of aircraft at Zoji la and Skardu.

Today, even if one wants to read the Indian Military’s operational history, can they get an accurate account?

## Where are the Indian Operational Histories?

The last official history of any Indian military operation that has been published is that of the 1971 war. Government policy on the issue mentions that the operational history is to be declassified as early as possible and not later than 25 years from the date of compilation. Yet, the official history of Indian military operations such as Op Falcon (1986), Op Cactus (1988), Op Meghdoot (1984), Op Pawan (1987), Op Vijay (Kargil 1999), Op Khukri (2000) etc., hasn’t been published. Since 1971, several governments have been in power. Thus, it is neither a recent phenomenon nor linked to any particular government. It is a wider structural issue.

## Timeline For Publication of Operations Histories

| Compilation/Publication of War/Operations Histories                                                         |                      |                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Activity                                                                                                    | Duration             | Remarks                                                                                                                                                                                                                                                                                                                                                                                     |
| Formation of Committee for compiling War/Operations History, and if outsourced, appointment of Chief Editor | 2** Yrs<br>(0-2 Yrs) | - Within 02 years of completion of War/Operations/Military Campaign/Cessation of Hostilities                                                                                                                                                                                                                                                                                                |
| Compilation of War/Operations History                                                                       | 3** Yrs<br>(2-5 Yrs) | - Collection of historical/Operational and relevant non-operational/War Records including interviews of participants and stake holders, etc.<br><br>- Compilation of War/Operations History.<br><br>- Vetting of War/Operations History by all stakeholders and other agencies concerned.<br><br>- Incorporation of suggested changes, editing, and finalization of War/Operations History. |
| Approval and Dissemination of Compiled War/Operations history                                               | 1 Year               | - One copy of compiled War/Operations History to be forwarded to all stakeholders by History Division (for official use).                                                                                                                                                                                                                                                                   |

Source: Reproduced from the Policy on Archiving, Declassification & Compilation of War/Operations Histories, Issued by the Government of India (GoI) on June 17, 2021.

### Why are Operational Histories not getting published?

The steps to publishing the official history can be broadly classified as:

- Recording and Collection
- Storage and Preservation (Archiving)
- Compilation and Publication
- Dissemination

The first step is the accurate recording of events as they unfold. Countries like the US have Military History Detachments. These are small teams whose job in combat is to capture and record every detail. They are specifically trained and equipped to do this. This is extremely valuable, as people who are busy fighting seldom have the spare mental capacity to do this additional task. A log created at a later time is likely to be as flawed, as

the limits of human memory allow. In the absence of an institutional mechanism for professional recording of history, complete details of operations seldom get captured. The Unit War Diaries, which contain details of operations, could be extremely detailed or absolutely vague, depending on the Commanding Officer at that time.

Secondly, the custodian of the data is the armed forces. In the absence of specific training and institutions (history cell) at all levels, there is every possibility that some of the details of the operations are filed incorrectly among the huge pile of routine paperwork. They could also be routinely destroyed along with regular correspondence. Thus, there is a high chance that not every little detail of all operations remains preserved. Whatever data that now survives is sent to the MoD History Division, who are supposed to compile, publish and preserve. Once declassified, the data is then made available to the public. Thus, there is a capability gap at every step, right from recording to publishing, resulting in the situation that no history is published beyond 1971. This continues to be unresolved, possibly due to a lack of oversight and accountability.

It can be argued that official histories are not the only source of military history. Several well-researched books can be good alternatives. But for people to conduct research and publish books, the availability and accessibility of declassified official data are fundamental requirements. That leads to the next set of questions.

## **Where is the Indian Military Archival Data?**

For unknown reasons, the Indian military records are available on the IIT-Kanpur website. There is not even a hyperlink on the Ministry of Defence (MoD) website. As an additional layer of difficulty, the records are restricted by the system from being downloaded. Therefore, despite being digitised, one needs to read manually and take live notes. This cumbersome process restricts the user from using modern research tools.

A related aspect mentioned by some writers on the subject is that the Indian MoD demonstrates a reluctance to declassify military records when compared to Western democracies.

## **Why De-Classification is Difficult?**

Firstly, there is no incentive to declassify. Due to the nature of limited tenures, the decision to declassify needs to be taken by someone who is new to the chair and not privy to the details/contents of the document. It involves significant effort to read and make a decision. This has to be done in addition to all the regular work. Thus, this task seldom receives any priority. Secondly, history continues to hold significant electoral weightage in India. Poll speeches still find regular mention of Jawaharlal Nehru, Sardar Patel, and Indira Gandhi, who are long dead. A declassification of any military operational records is fraught with the risk of exposing some wrong decisions in history.

In hindsight, everyone is wise – but that doesn't matter in elections, and past actions could trigger new controversies.

Thus, the odds are tilted against a military record holder's decision to declassify operational records. Any individual will naturally find it safer to maintain the status quo during their tenure without attempting to initiate declassification. In the absence of a system of accountability for delays in declassification, these norms get codified as standard practices. Thus, while official histories are not published, not declassifying and disseminating official data also deprives independent research of authentic data. The outcome is an absence of an authentic Indian military history that is useful.

## **What Happens When Operational History Isn't Told Accurately?**

Daniel Kanhemann describes a bias using the acronym WYSIATI– What You See Is All There Is. He argues that people tend to make judgments and decisions based solely on the information readily available to them, while ignoring or underestimating the information that is not immediately present. In the absence of official histories and well-researched books, other forms of information end up filling the gap. Individual memoirs, interviews from unnamed sources, and conversations with veterans substitute as the sources of information on any operation. These are usually anecdotal, speculative and not verified. To quote an example, several books on Op Sindoor are

already available in the market despite no significant official disclosure of operational details. On most occasions, these convey individual opinions and speculations rather than established facts. But they end up being treated as real due to WYSIATI.

A widely known example is the case of the Kargil Review Committee Report (KRC). Several times, it has been repeatedly falsely claimed in talks that KRC recommended setting up theatre commands. The past credentials of the speaker, perfect articulation and confident delivery often convince any listener beyond doubt that whatever is being said is true. Yet, the misinformation on this one topic alone is so widespread that a separate article had to be published by the author earlier. This is not an isolated case, and several other folklores thrive when official information remains locked up. Sensational TV debates, short-form content generated from AI, etc., further distort facts, preventing the right lessons from being drawn. This distorts policy and doctrinal changes. An accurate articulation of history is needed, not an imaginary one.

## Conclusion

Indian society attaches great significance to valour. This is evident from the rich history of always having an all-volunteer military. Even during the rapid expansion during the World Wars, the two-million-strong military continued to be entirely voluntary. Yet, relying on valour and individual judgement alone is not a

good strategy. As India grows as a strong nation, paying attention to these issues would ensure consistent victories on the battlefield. In the absence of a US Marine Corps-like tradition of re-reading before combat in the Indian Armed Forces, the combatants are routinely deprived of the wisdom of the past. Folklore fills the gap in an undesirable manner. Battlefield is not the place to learn from one's own mistakes—certainly not at the cost of lives. Wars need to be read before wars can be fought.

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## Precision, Power, and Preparedness: Vayushakti 2026

*Ms Radhey Tambi, Mr Prahlad Kumar Singh, Ms Priyadarshini Baruah, Dr Javed Alam, & Ms Saima Azim | 05 February 2026*

[Source: CAPSS | https://capssindia.org/precision-power-and-preparedness-vayushakti-2026/](https://capssindia.org/precision-power-and-preparedness-vayushakti-2026/)



### Introduction

To read and discuss Air Power is one thing, but to be in the spectator gallery and witness the largest Fire Power Demonstration (FPD) of the Indian Air Force (IAF) unfold before one's own eyes offers a unique depth of appreciation that isn't easy to put into words. It was exhilarating to witness the skies alive with the thunderous roars of fighter jets piercing the clouds with precision and helicopters hovering with purpose. The air crackled with tension as surface-to-air and air-to-surface missiles were launched, creating a powerful spectacle of sound and light. As each missile soared through the sky, it left trails of smoke in its wake, while the ground trembled beneath as bombs detonated with ferocious intensity, shaking the earth as the targets were struck.

This spectacle of military power was engrossing. Transport aircraft soared overhead, their engines roaring with power, as the ground trembled beneath the thunderous blast of bombs striking designated targets. This extraordinary display unfolded in an area just a few kilometres from where India had previously conducted its nuclear test, creating a surreal atmosphere for all who witnessed it. That's the distinguished experience of the five civilian researchers of the Centre for Aerospace Power and Strategic Studies (CAPSS) at Vayushakti 2026, and it was nothing short of extraordinary. Against the backdrop of the vast blue sky that stretched endlessly above and the earthy hues of the terrain below, the scene unfolded an impressive showcase of the nation's air assets. These capabilities, honed through rigorous training and strategic deployment, have demonstrated their effectiveness in swiftly and accurately addressing regional conflicts. Additionally, they have played crucial roles in conducting humanitarian operations worldwide, successfully evacuating individuals from perilous conflict zones and providing a lifeline to those in distress.

### The Demonstration of Resolve

Vayushakti 2026 took place on February 27, 2026, at the Pokhran Air-to-Ground Firing range, Jaisalmer, Rajasthan. The event was attended by noble dignitaries, including the President of India, Smt. Droupadi Murmu, Raksha Mantri Shri Rajnath Singh, and the Chief of Air Staff, Air Chief Marshal AP

Singh. Guided by the core values enshrined in the Hindi phrase, *Achook, Abhedya aur Sateek*, the IAF showcased exceptional capabilities and operational readiness through various day and night missions. A significant highlight of this year's event was the emphasis on structured storytelling, particularly focusing on Operation Sindoor. The event also included coordinated Multi-Domain Operations, an integrated combat theatre, and simulated wartime scenarios.

The present form of Ex Vayushakti dates back to 1999, when the demonstration of India's Aerial firepower, human skills, and tri-service integration was displayed at Pokhran, and has continued since then. But the roots of the air power spectacle that displayed the entire range of the IAF's aerial platforms go back to 1954, in Tilpat near Delhi, which was witnessed by the then Prime Minister of India, Pt. Jawaharlal Nehru. The importance of the event grew immensely with the historic attendance of the Supreme Commander of the Indian Armed Forces, the President, N. Sanjeeva Reddy, who graced the occasion for the first time in 1978. His presence not only underscored the event's importance but also highlighted the connection between the military and the nation's leadership, marking a memorable moment in the annals of India's history.

The afternoon sun was low over the sands of Pokhran Firing Range when the silence was suddenly shattered by a sharp sonic boom. A Dassault Rafale streaked across the skies, marking the commencement of Vayushakti-26. From

the viewing area, it appeared that a live operation was taking place in stages. Vayushakti-26 was just not a simulated exercise, but it was also a strategic signaling as the international border is barely 125 km from Jaisalmer. The exercise was a mesmerising display of the IAF's prowess, showcasing its ability to seamlessly integrate a diverse array of platforms in a harmonious and synchronised manner. A total of 77 aerial platforms took part in the operation, including state-of-the-art fighter jets, agile combat helicopters and versatile transport aircraft, each playing a vital role in the unfolding drama above. The initial phase launched with an array of surveillance drones, which soared high, expertly pinpointing simulated ground targets. These drones diligently relayed real-time intelligence to the IAF's sophisticated Integrated Air Command and Control System (IACCS) network, making sure that every move was calculated and strategically aligned.

The tempo quickly increased as strike aircraft moved in to suppress enemy air defences. The formations targeted mock radar sites and missile batteries, and used Suppression of Enemy Air Defences (SEAD) and Destruction of Enemy Air Defences (DEAD) missions, loitering munitions, and fighter aircraft, the formations targeted mock radar sites and missile batteries, and created the way for the main strike package. This was followed by the coordinated attack runs. Fighters like the Sukhoi Su-30MKI, Mirage 2000, and SEPECAT Jaguar unleashed precision

air-to-ground munitions on simulated terror camps, bunkers, and logistics nodes.

While the offensive phase began overhead, the defensive grid on the ground also came to life. Surface-to-air missiles from the Akash and the SPYDER air defence system soared swiftly into the sky, demonstrating how a layered air defence network responds to aerial threats. Akash and SPYDER are just the tip of the icebergs of how India seeks to build its future-ready air defence systems. Mission Sudarshan Chakra and Project Kusha will definitely supplement the existing air defence capabilities.

As the dipping sun cast a warm glow over the expansive desert, the atmosphere shifted from the frenetic pace of the high-speed aerial acrobats to the quiet precision of special operations. In a phenomenal display of tactical innovation, Chinook helicopters gracefully soared through the twilight sky, deftly airlifting M-777 Ultra-light Howitzers in an underslung mode of operation. The message: when required, such methods can be used to rapidly deploy combat assets, and with an impressive blend of strength and agility. Mil Mi-17 helicopters flew low over the area, inserting Garud Commando Force commandos and Para Special Forces men for a mock rescue mission. Transport aircraft, including the Lockheed Martin C-130J Super Hercules and the Airbus C-295, then made assault landings on a forward runway, delivering and evacuating troops in minutes. The darkness didn't

matter. Fighters returned to the range to display precision strikes in low-visibility conditions, while armed helicopters such as the Hindustan Aeronautics Limited (HAL) Prachand and HAL Dhruv assisted ground forces below. The exercise came to a halt when a single Boeing C-17 Globemaster flew overhead in a symbolic ceasefire fly-past.

### **Automation in Action: The Drone Show**

In the climactic stage of the exercise, the sky erupted into a breathtaking display as hundreds of precisely coordinated drones filled the air, creating a silent but powerful spectacle. Their synchronised movements painted patterns against the sky, casting an enchanting glow that transcended the usual noise of the world below, transforming the scene into a silent yet profound, powerful spectacle. The massive drone formation transformed the desert sky into a digital canvas, with each drone moving in perfect synchronisation to create dynamic shapes and images. The choreography displayed the precision and coordination that swarm technologies require, each drone maintaining exact distances from the others, guided by algorithms that ensured smooth formations despite the desert winds. For the audience, the display was captivating; whereas for strategic observers like us, it clearly signalled something deeper: the increasing role of automation, artificial intelligence (AI), and networked systems in modern Air Power. However, what elevated the drone show from spectacle

to strategic storytelling was the narrative it presented. The formations followed the theme of the IAF's journey "from inception to execution," visually recounting key milestones in the force's history. As the drones shifted across the sky, they recreated moments that have shaped India's air power identity, operations from the 1965 war, the bombing of Tiger Hill during the Kargil conflict, to the most recent Operation Sindoor. Each formation reminded the audience that the Indian Air Force's current capabilities are rooted in decades of operational experience and strategic evolution.

In luminous formations across the night sky, the drones depicted the sequence of an air campaign planning, precision targeting, and coordinated execution. This symbolised how modern air operations are increasingly shaped by intelligence, surveillance, digital networks, and rapid decision-making cycles. The narrative clearly conveyed that contemporary warfare is no longer defined solely by platforms but by the integration of data, technology, and speed.

The show came to a spectacular close with a vibrant map of India glowing radiantly against the night sky, the contours of the nation beautifully outlined. The crest of the Indian Air Force was illuminated proudly and showcased the iconic tricolour of saffron, white, and green. Accompanying this stunning display was the exercise motto, adding an inspiring touch. Witnessed by hundreds, the moment carried both symbolism and intent. The display of the drone show

successfully showcased that the Indian Air Force is not only proud of its legacy but also firmly focused on the future. The exercise's display before the sunset highlighted the destructive precision of modern air power, and the second part of the exercise, after sunset, the drone show emphasised its evolving technological backbone. Together, they conveyed a decisive message: the Indian Air Force is undergoing a significant transformation into a multi-domain force. This evolution encompasses not only the traditional roles of pilots and aircraft but also advanced technologies such as algorithms, integrated networks, and autonomous systems. Together, these elements create a synergised operational environment where human skill and cutting-edge technology come together to enhance agility and effectiveness in modern aerial warfare.

## Conclusion

Operation Sindoor highlighted India's resolve in air power to thwart its adversaries, but Vayushakti-26 demonstrated the IAF's capabilities and future roadmap. The exercise over a three-hour period dropped approximately 120 tonnes of ordnance over a 2-square km area, and showcased the lethality and precision with which the IAF operates. Vayushakti 2026 was far more than a display of firepower—it was a captivating display of the IAF's transformation into a modern force projecting aerospace power in all domains. From high-intensity strike missions and integrated air defence operations to precision night and special operations, the

exercise displayed operational readiness. The continuous coordination among aerial platforms, ground systems, and digital networks reflected a force increasingly defined by flexibility and versatility. The exercise also displayed the unity of command, effective control, and seamless communication, which help shorten the Observe, Orient, Decide, Act (OODA) loop, leading to effective warfighting and the winning of wars. The grand drone display symbolised the shift towards automation, artificial intelligence, and network-centric warfare. At the same time, the narrative of past operations embedded in the display reinforced the idea that this technological evolution is firmly grounded in decades of combat experience. Ultimately, through Vayushakti 2026, the IAF made it clear that as a force it honours its legacy, but is ready to embrace the future, to project power, safeguard national security, and respond swiftly across the full spectrum of aerospace.

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## Bharat Aero 2026 Held in Bengaluru

Mr Arjun Prakash Iyer | 16 March 2026

Source: CAPSS | <https://capssindia.org/bharat-aero-2026-held-in-bengaluru/>



### What is Bharat Aero?

Bharat Aero 2026 is a premier defence and aerospace conference co-organised by Centre for Aerospace Power & Strategic Studies (CAPSS), Society of Indian Defence Manufacturers (SIDM) and Hindustan Aeronautics Limited (HAL). It was held at V.N. Ghatge Auditorium in Bengaluru on Wednesday, March 11, 2026. The conference was a high-level summit dedicated to advancing India's military aviation ecosystem by building strong collaboration amongst the defence manufacturing industry and developing an understanding between the industry and the end users (the Indian Army, Navy, and Air Force). The event consisted of a series of panel discussions featuring insightful contributions from armed forces leadership, defence industry executives, and government agencies regarding the pursuit of strategic autonomy and technological self-reliance.

Key themes of the conference included the transition from licensed production (“Make in India”) to indigenous design (“Design in India”), modernisation of the combat aircraft fleet through the induction of platforms like the LCA Tejas Mk.1A/ MK.2, AMCA and TEDBF, and integration of artificial intelligence and unmanned combat systems.

The panellists highlighted the critical need for collaborative Research & Development, streamlined Quality Assurance certification processes, and increased private sector participation to address not just the contemporary operational gaps, but also ‘future-proof’ India’s war-making and fighting capabilities. The event aims to create a national roadmap intended to transform India into a global hub for aerospace manufacturing and innovation by 2047.

## Events of the Day

The welcome address was delivered by Air Vice Marshal Anil Golani (Retd.), DG-CAPSS, who highlighted how Air Power has been playing a leading role in the recent and ongoing conflicts across the globe, and why it is necessary for India to indigenise its defence manufacturing complex. This was followed by the inaugural address by the guest of honour, Air Marshal Seethepalli Shrinivas, PVSM, AVSM, VSM, AOC-in-C, HQ Training Command, IAF, who reemphasised the IAF’s commitment to indigenisation and advocated for a “whole-of-nation

approach” towards technology-intensive warfare. He also stated that indigenisation is not a luxury, but a ‘national imperative’.

The first session also included addresses by Mr Arun T. Ramchandani, President of SIDM, who delivered the opening remarks, Mr Jayakrishnan S, Chief Executive Officer, HAL (Bangalore Complex), who delivered the keynote address, and the Vote of Thanks, delivered by Mr Neeraj Gupta, Vice President of SIDM and Managing Director of MKU Limited.

Following the high tea, the Industry Exhibition was inaugurated by the guest of honour. This was followed by the second session of the day, which focused on the IAF’s Fixed Wing Aircraft Manufacturing and Upgrades Ecosystem. The session was moderated by Air Marshal Anil Chopra, PVSM, AVSM, VM, VSM (Retd.), former DG-CAPSS and Advisor (Aerospace), SIDM. The session started with the moderator emphasising India’s need to shift toward indigenous design and intellectual property ownership. Air Marshal Chopra highlighted the critical shortage of aircraft in the IAF, currently operating at 29 squadrons, and emphasised the need for surge production capabilities.

Air Vice Marshal Tejpal Singh, AVSM, VM, provided a user-perspective on how defence manufacturers can augment the IAF’s multi-pronged strategy to address current and future challenges in induction, indigenisation, and innovation. Mr A.P.V.S.

Prasad, representing CEMILAC (Centre for Military Airworthiness & Certification), and Mr Nagaraja RB, representing DGAQA (Directorate General of Aeronautical Quality Assurance), in separate speeches, addressed various procedural changes brought about in Quality Assurance and Certification procedures over the past years, and highlighted measures that manufacturers could take to overcome these hurdles

Dr Amitabh Saras, Program Director, ADA, DRDO (Aeronautical Development Agency, Defence Research & Development Organisation), set the ground for the expectations in the percentage of indigenous components on the upcoming Tejas Mk.2 and AMCA platforms, and revealed plans to involve a private-sector Lead System Integrator (LSI) to work alongside HAL, creating a more robust domestic manufacturing ecosystem. Dr Naresh Palta, Former Chair SIDM, Karnataka State Chapter, touched upon India's gap in indigenous design competencies for critical components such as aeroengines and avionics. His address covered the industry perspective and advocated for a 'collaborative' outlook between Foreign OEMs (Original Equipment Manufacturers) and Indian manufacturers, rather than a 'competitive' outlook.

At the end of the session, Mr Jeetendra Gavankar, CEO of Safran India, provided the perspective of foreign OEMs in the Indian manufacturing domain, particularly in the years following the adoption of

the "Make in India" policy. He stated that the policy has enabled the growth of the Indian defence manufacturing industry. He also stated that such developments would make it easy for collaboration between foreign and Indian firms in both R&D and manufacturing.

## Helicopters, UAS, and Counter-UAS Systems

The next session was centred around the induction and integration of new technology in the domain of Helicopters and Unmanned Aerial Systems. This session was moderated by Air Chief Marshal Rakesh Kumar Singh Bhadauria, PVSM, AVSM, VM (Retd.), former Chief of Air Staff of the IAF and an experienced test pilot. The first two addresses were made by officers from the IAF, Air Vice Marshal Ashish Singh, VM, VSM [ACAS Ops (Remote)] and Air Vice Marshal Sanjeev Vashishth, VM [ACAS Ops (T&H)], who, in detail, laid out the expectations of the IAF from the manufacturing sector regarding the capabilities of Unmanned Aerial Systems (UAS) and Manned-Unmanned Teaming (MUM-T).

Group Captain Harsh Vardhan Thakur (Retd.), HAL Test Pilot, made a presentation on various UCAV and MUM-T systems that HAL is currently pursuing, and provided an idea of how the Public Sector Undertaking aims to meet the IAF's expectations. Mr Sameer Joshi and Colonel Aravind Mulimani (Retd.) provided an industry perspective

regarding employment of UAS and Counter UAS systems, and how private defence manufacturers would meet the IAF's requirements. They also reassured that the private sector is adequately prepared to meet any challenges/requirements posed by the armed forces of India.

The final address of the session was by Mr GVS Bhaskar, who provided perspectives on Helicopter MRO (Maintenance, Repair, and Overhaul) and insisted that the User, OEMs, and third-party suppliers must align their goals to foresee MRO requirements beforehand and meet the requirements accordingly.

### Maintenance of Legacy Fleets

The final session of the day was chaired by Air Marshal Vikram Singh and covered user and industry perspectives on maintaining the IAF's legacy fleets, such as the Chetak helicopters and SEPECAT Jaguar fighter aircraft. Representing the IAF's perspectives were Air Commodore Jino George (Commodore Maintenance Planning) and Air Commodore Ashutosh Shrivastava (Commodore Eng H). This was followed by an address by Air Vice Marshal K Sundaramani on the maintenance of legacy Air Defence systems of the IAF. The industry perspective was provided by Mr S Balasubramani. The discussion covered issues related to the operation of said fleets and how the IAF and Industry Manufacturers could work together to sustain them through streamlined supply chain efforts and maintenance planning.

## Why the Rafale Multi-Role Fighter Aircraft is India's fastest route to air power superiority

*Air Vice Marshal Anil Golani, DG, CAPS | 09 February 2025*

*Source: Indian Express | [https://indianexpress.com/article/opinion/columns/rafale-fighter-aircraft-indian-airforce-air-power-10522716/?utm\\_source=whatsapp&utm\\_medium=social&utm\\_campaign=WhatsappShare](https://indianexpress.com/article/opinion/columns/rafale-fighter-aircraft-indian-airforce-air-power-10522716/?utm_source=whatsapp&utm_medium=social&utm_campaign=WhatsappShare)*



The Rafale MRFA deal is thus a genuine win-win for the IAF and its combat potential (Express Photo)

Operation Sindoor, the conflict between India and Pakistan in May 2025, once again demonstrated air power as the instrument of choice in India's security calculus. Simultaneously, the deepening China-Pakistan nexus, aided by Türkiye's support to the Pakistan Air Force (PAF), has created an increasingly adverse regional air power balance that India can ignore only at its peril. While the IAF achieved its national objectives in this conflict, its shrinking fighter inventory remains a serious and persistent concern. Against a sanctioned strength of 42 fighter squadrons, the IAF is currently down to 29, while the PAF fields 22 squadrons and plans to induct J-35 fifth-generation aircraft

from China.

The turn of the century marked a proud milestone with the maiden flight of the indigenously designed Tejas Light Combat Aircraft, signalling the emergence of a domestic aerospace ecosystem. Around the same time, the IAF initiated the case for 126 Medium Multirole Combat Aircraft (MMRCA) to address its fighter shortfall. However, negotiations on the 108 aircraft to be built in India stalled due to a lack of common understanding between HAL and Dassault on manufacturing and contractual obligations, leading to the withdrawal of the RFP in June 2015.

During this long, inconclusive process, India's adversaries inducted modern fourth- and fifth-generation aircraft in significant numbers, worsening the asymmetry created by the IAF's declining combat strength. To address this critical gap, Prime Minister Narendra Modi, during an April 2015 visit to France, agreed to purchase 36 Rafale aircraft in flyaway condition through an Inter-Governmental Agreement (IGA). The Cabinet Committee on Security approved the IGA in August 2016 as an operational necessity after the earlier procurement effort had failed.

In parallel, the LCA project continued, but delays in integrating indigenous radar and weapons and in engine deliveries meant it could not substitute for the planned MMRCA acquisition. Recognising this, the IAF issued a Request for Information in 2018 for 114 Multi Role Fighter Aircraft (MRFA).

A government-appointed committee examined the responses to recommend a path for rapid induction of technologically advanced fighters. The options included the F-16 and F-18 from the United States, Eurofighter Typhoon, Gripen E from Sweden, and Su-35/MiG-35 from Russia. US-origin platforms would fall under International Traffic in Arms Regulations, requiring explicit export approval, licensing for technology transfer and end-use restrictions, while Gripen's General Electric engine brought similar constraints. Russian aircraft raised concerns about technology levels, and the Eurofighter's consortium structure complicated prospects for an inter-governmental deal.

Taking into account induction timelines, life cycle cost, techno-industrial fit and the IAF's urgent operational needs, the committee recommended expanding Rafale numbers. The IAF already operates 36 Rafales, and the Indian Navy plans to induct 26 Rafale M aircraft, making further Rafale acquisition particularly attractive. Additional Rafales would bring substantial operational, commercial and logistical benefits through commonality with existing fleets. With Maintenance, Repair and Overhaul facilities already offered by Dassault Aviation, further induction would lower overall costs and help rationalise the IAF's diverse fighter inventory, reducing sustainment burden and improving availability.

The Rafale MRFA acquisition promises a significant IAF capability enhancement

within a relatively short timeframe as inductions progress over the next few years. The government's insistence that 60 per cent of production value be realised domestically will also give a major boost to the indigenous aerospace and defence industry. Past experience with Mirage and Rafale platforms, and the reliability of Dassault and France as partners, weigh heavily in favour of this choice despite concerns about dependence on a single foreign OEM. A foreign OEM producing fighters in India with a domestic partner would promote genuine self-reliance and directly support the development and production of the LCA Mk II and the Advanced Medium Combat Aircraft.

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The Rafale MRFA acquisition promises a significant IAF capability enhancement within a relatively short timeframe as inductions progress over the next few years. The government's insistence that 60 per cent of production value be realised domestically will also give a major boost

## Space

### GNSS disruption, asymmetric warfare emerge as key features of widening West Asia conflict

Bala Chauhan | 23 March 2026

Source: *Indian Express* | <https://www.newindianexpress.com/nation/2026/Mar/23/gnss-disruption-asymmetric-warfare-emerge-as-key-features-of-widening-west-asia-conflict>



The extent of GNSS interference has surged sharply in recent months following the war in West Asia. (Photo | AP)

BENGALURU: Electronic warfare, particularly interference with Global Navigation Satellite Systems (GNSS), has emerged as a central feature of the ongoing West Asia conflict involving the United States, Israel, and Iran, significantly disrupting maritime operations in and around the Strait of Hormuz.

“Ships rely heavily on Global Positioning System (GPS) and Automatic Identification System (AIS) systems for navigation. Now, these signals are being jammed or spoofed. Ships may appear in the wrong location or lose navigation data entirely, which is very dangerous in

congested waters,” said Commodore (Dr) Arun Pratap Golaya (Retd), VSM.

He stressed the scale and technical nature of the disruption: “Spoofing creates false positions (eg, ships appear at a wrong position or at impossible speeds), while jamming blanks signals.”

“Both erode reliance on GNSS for precise routing, collision avoidance (via AIS integration), and safe transit in congested waters. It compounds physical threats (mines, drones, missile strikes) and has contributed to the de facto choke on Hormuz shipping.”

The extent of GNSS interference has surged sharply in recent months. “Analysts like Windward reported over 10,000 vessels affected globally in Q2 2025 alone, marking an eightfold quarterly increase. After the escalation in early 2026, more than 1,100 vessels were impacted in just 24 hours in the Persian Gulf. Within days, the numbers rose to over 1,600 vessels. In total, thousands of ships in and around the Strait have shown navigation anomalies,” he said.

Golaya added that the fallout is not limited to shipping visibility.

“This creates risks of collisions, grounding, and loss of situational awareness. It also makes it harder for authorities to track vessels, especially when ships switch off tracking systems due to fear. GNSS spoofing or jamming is also an effective counter-drone measure.

This disruption affects aircraft as well,” he added.

The warnings have been echoed by global monitoring agencies, including the Information Fusion Centre – Indian Ocean Region, which has flagged the situation as volatile and advised heightened caution for vessels transiting the region.

The growing reliance on such electronic disruption underscores a broader shift towards asymmetric warfare in the conflict. “Iran has used ‘asymmetric methods, which are relatively low-cost but highly effective, such as drones, anti-ship missiles, fast boats, sea mines, and electronic interference. They don’t need a large conventional navy to create disruption. Even the threat of these actions is enough to deter shipping companies and insurers,” Golaya said.

The Strait of Hormuz, a narrow waterway connecting the Persian Gulf to the Gulf of Oman, carries nearly 20 per cent of the world’s energy supplies and is critical for India’s energy security.

“A substantial percentage of our crude imports comes from countries like Saudi Arabia, Iraq, the UAE, Kuwait, and Qatar. As per recent data, this amounts to around 2.6 million barrels per day from the region, making it a critical supplier base for India. In addition to our crude imports, a significant share of LNG and LPG also passes through this narrow stretch,” he noted.

Despite not formally controlling the Strait, Iran has leveraged its geographical position effectively.

“No single country ‘owns’ it outright. Iran has weaponised its geographical advantage extremely easily, and the current war proves it. Many countries have stated Iran’s warnings/closures are not legally binding, since insurance remains an issue as the risk rises, the traffic has plummeted. The Strait may not be officially closed, but in practical terms, it is severely restricted. Shipping traffic has dropped sharply because of the risks,” he said.

Under the United Nations Convention on the Law of the Sea, vessels are guaranteed transit passage through such straits, but enforcement remains contingent on geopolitical realities.

“Ships have the right to transit freely... however, in practice, enforcement depends on military and political power rather than just legal provisions,” Golaya added.

He also pointed to the persistence of disruption despite military pressure.

“Even with US/Israeli strikes degrading Iran’s navy, the threat persists—mines and asymmetric assets are cheap, hard to clear quickly, and create fear. Reopening could take from weeks to months despite efforts.”

## ISRO Expanding Student Participation in Space Missions, 11 Student Satellites Already Launched: Jitendra Singh

12 March 2026

Source: DD News | <https://ddnews.gov.in/en/ISRO-expanding-student-participation-in-space-missions-11-student-satellites-already-launched-jitendra-singh/>



Union Minister of State for Science and Technology Dr. Jitendra Singh on Thursday said the Indian Space Research Organisation (ISRO) is expanding student participation in space missions through structured programmes that allow young researchers to design satellites, develop payloads and participate in real mission experiments.

Replying to an unstarred question by Sumitra Balmik in the Rajya Sabha, Singh said the government is committed to widening access to space technology so that students from institutions across the country, including those in tier-2 and tier-3 cities, can contribute to India's growing space ecosystem.

The minister said ISRO has launched several initiatives aimed at providing hands-on exposure to space technology

for students and researchers.

### Student Satellite Programme Gaining Momentum

Singh said that ISRO's Student Satellite Programme, led by the U R Rao Satellite Centre, encourages academic institutions to design and develop satellites with technical mentorship from ISRO scientists. The organisation also supports integration and launch opportunities for these satellites through its missions.

So far, the Indian National Space Promotion and Authorisation Centre (IN-SPACe) has authorised 17 student satellites and payloads, of which 11 have already been successfully launched, the minister informed.

These projects have involved several academic institutions including the Indian Institute of Astrophysics, Indian Institute of Space Science and Technology, RV College of Engineering, Amity University Maharashtra, MIT World Peace University, Assam Don Bosco University and CV Raman Global University, reflecting growing national participation in student-led space missions.

### Competitions and Innovation Initiatives

Singh said student engagement is also being promoted through national competitions organised by IN-SPACe. These include satellite and model rocketry competitions in which 97 student teams comprising nearly 850 students have participated.

One such event – the Model Rocketry and CanSat India Student Competition – was organised jointly by IN-SPACe, ISRO and the Astronautical Society of India in October 2025 at Kushinagar in Uttar Pradesh. The event saw 67 teams with nearly 500 students design, fabricate and launch model rockets carrying CanSat payloads to an altitude of about one kilometre.

### **Internship and Research Support**

The minister said students are also benefiting from internship and project trainee programmes that provide research exposure at ISRO centres for undergraduate, postgraduate and doctoral students.

To strengthen collaboration between universities and ISRO scientists, the government has established Space Technology Incubation Centres (STICs) across various regions. These centres support students in developing indigenous space technologies under expert mentorship.

In addition, Regional Academic Centres for Space (RAC-S) have been created to help students from smaller towns and institutions access ISRO programmes and research opportunities.

### **Strengthening Space Education Ecosystem**

Singh also highlighted the role of ISRO's RESPOND Programme, which provides financial and technical support to

universities undertaking research in space science, technology and applications.

He said the All India Council for Technical Education has approved a Space Technology Minor Course, while a national committee has been formed to promote adoption of space technology education in line with the Indian Space Policy 2023.

The government has also earmarked around ₹10 crore annually for educational outreach activities in space science and technology.

Singh said IN-SPACe is further supporting the next generation of space entrepreneurs through mentorship from domain experts, pre-incubation programmes and co-working facilities at its technical centres.

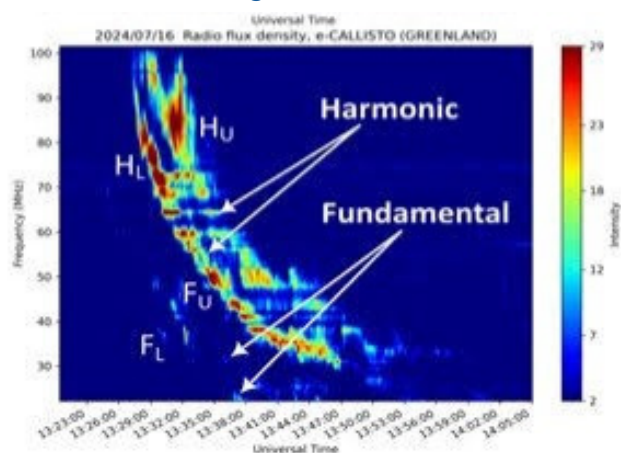
"These initiatives are part of the government's broader vision to build a vibrant and inclusive space ecosystem in India, where students, startups, academic institutions and industry all contribute to the country's expanding role in the global space sector," the minister said

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## Solar Study Cracks Long-Standing Radio Burst Mystery, Offers Boost to Space Weather Forecasting

27 March 2026

Source: DD News | <https://ddnews.gov.in/en/solar-study-cracks-long-standing-radio-burst-mystery-offers-boost-to-space-weather-forecasting/>



Researchers from the Indian Institute of Astrophysics (IIA) have made a significant breakthrough in understanding a long-standing solar mystery, a development that could strengthen space weather forecasting capabilities. The study decodes why the relative strength of two types of radio emissions — fundamental and harmonic — varies in solar radio bursts triggered by flares and coronal mass ejections.

These bursts, known as Type II solar radio bursts, are generated by shock waves moving through the Sun's corona at speeds of nearly 1,000 km per second. Traditionally, scientists expected the fundamental emission — the base signal — to be stronger than its harmonic counterpart. However, observations over time revealed

inconsistencies, with harmonic emissions occasionally appearing stronger, puzzling researchers for decades.

The IIA-led team analysed data from the global CALLISTO network and observations from the Gauribidanur Radio Observatory to examine 58 such solar events. Their findings indicate that the variation depends on the location of the solar activity. Events occurring at higher solar longitudes (beyond 75°) tend to produce stronger harmonic emissions, while those closer to the centre of the solar disk show stronger fundamental emissions.

Scientists attribute this behaviour to refractive effects in the solar corona, along with the direction and viewing angle of the emissions. In cases where solar activity occurs at extreme angles, fundamental emissions often fail to reach Earth effectively, making harmonics appear stronger due to their wider propagation angles.

Published in the journal *Solar Physics*, the study adds a crucial piece to the puzzle of how solar shocks generate and transmit radio waves. Researchers believe these insights will improve the interpretation of solar data and enhance predictions of space weather events that can impact satellite communications and navigation systems on Earth.

The team also highlighted the growing importance of large-scale data analysis, noting that future research could leverage

machine learning techniques to extract deeper insights from the vast datasets collected by global solar observatories.

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## Decoding NavIC: Why India's Navigation System is Down, Not Out

*Dr Y Nithiyanandam | 23 March 2026*

*Source: Takshashila | <https://takshashila.org.in/content/blogs/20230323-Navicisnotout.html>*

After my opinion pieces on the state of NavIC, a couple of friends asked me some pertinent questions. These are good questions, and I thought of explaining the same for larger audiences.

### 1. Why Four Satellites? What Makes India's Approach Different?

Yes, four satellites are the least number needed for accurate three-dimensional navigation. A receiver must figure out four things at once: its own clock error, latitude, longitude, and altitude. Four signals, four equations. If you get below that, the maths just doesn't work anymore. But this is where India's design philosophy is considerably different from that of the other major navigation systems. GPS, GLONASS, Galileo, and BeiDou are all global systems. They are built so that at least four satellites can be seen from anywhere on Earth at any given moment.

That global goal needs big groups of twenty or more satellites in Medium Earth Orbit that are always circling the Earth. India made a different choice that made perfect sense. NavIC is a regional system that covers India and a 1,500 km area outside its borders. For that limited goal, ISRO used a smarter orbital strategy that combined Geostationary (GEO) satellites, which stay above the equator and look like they're not moving in the sky, with Geosynchronous (GSO) satellites, which are tilted at an angle and move in a slow figure-eight pattern over India every day. This combination of seven satellites gives constant, high-elevation coverage over India without having to chase worldwide coverage. It was a nice solution in theory. In practice, it works well, but only when all the satellites are working.

### 2. How Accurate is NavIC when it Works on its Own?

This is where the idea of "Dilution of Precision" (DOP) becomes important to comprehend. At its heart, it's an issue in geometry. Indeed, taking back memory to my university days two decades ago we studied this first. It is necessary to get four satellite signals, but that is not enough for acceptable precision. Where those satellites are in the sky compared to each other is also important. The geometry is bad if all four signals come from satellites that are close together in one quadrant of the sky. The ranging lines are almost parallel, and slight time errors lead to big location errors. To get good precision,

satellites need to be spread out across the whole sky, with some high above and others in different directions and heights. This spread makes triangulation geometry crisp and fixes positions tightly. A bad spread causes what is officially known as high DOP, which signifies bad accuracy no matter how strong the signals are. Even with all seven satellites working, 24 hours NavIC's DOP performance was not the same over all of India. In southern India, across Kerala, Tamil Nadu, and Karnataka, satellites were well spread out over the sky and were very accurate. The geometry was relatively weaker throughout northern and northeastern Indias. The DOP readings were at levels that were problematic for operations. These are, most importantly, the areas that are closest to India's most important strategic borders. Over the past few years, satellites have stopped working because their atomic clocks, which are the precise timekeepers that every navigation satellite needs, have broken. This has caused the constellation to shrink, the geometry to get worse, and the accuracy to drop a lot. When combined with other navigation systems like GPS or Galileo, NavIC may still be able to help with placement. A smartphone that uses more than one constellation will always work better than one that only uses one. The accuracy gains from combining constellations are not small; they are very large. But this is where the strategic conflict comes in: the whole point of NavIC was to make India less dependent on foreign systems that may be refused or degraded in a geopolitical crisis. An indigenous

navigation system that only works when American or European satellites support it is not genuinely independent. India's goal should be to build a NavIC constellation that is both accurate and strong enough to stand on its own.

### **3. Can't ISRO Just Launch Three more Satellites Quickly?**

This is the most prevalent mistake, and it's important to be clear: no, you can't just launch three navigation satellites whenever you want. You can't just install NavIC satellites in a low orbit and start using them right away since they aren't Earth observation satellites. To provide the correct amount of geometric variation to the constellation, each NavIC satellite must be moved into a very specific position in geosynchronous orbit, with a specific longitude, inclination, and altitude. The whole system is a carefully planned arrangement of how things move in space. This implies that the three new satellites can't all be sent into space on the same rocket. To get the constellation back to its original shape, they need to be launched at separate times and into different orbits. Every launch needs its own planning, mission design, and sequencing for getting into orbit. There are no shortcuts; it takes time.

What next? It's not enough for NavIC to just deploy one additional satellite into space to fill a gap. To restore the constellation's geometric integrity, not merely its headcount, at least three satellites

need to be added in a planned and ordered way. The engineers and mission planners who are working on this are completely aware of these limits, and you can be sure that work is being done. However, NavIC should not be taken for granted while the rest of India's infrastructure becomes more reliant on it. Today, GPS-based positioning is used to build precision agriculture, utility monitoring, infrastructure surveys, fleet management, and a lot of other civilian applications. As these dependencies increase, the necessity for a resilient, autonomous indigenous navigation system intensifies — not diminishes. The military aspects of this dependency, which have their own serious effects, need to be talked about in more length and separately. The bottom line is clear: NavIC is a strategically important system that is not yet ready for use. It is not an option to restore it and make it so that it can work reliably without external constellations. It is a national necessity.

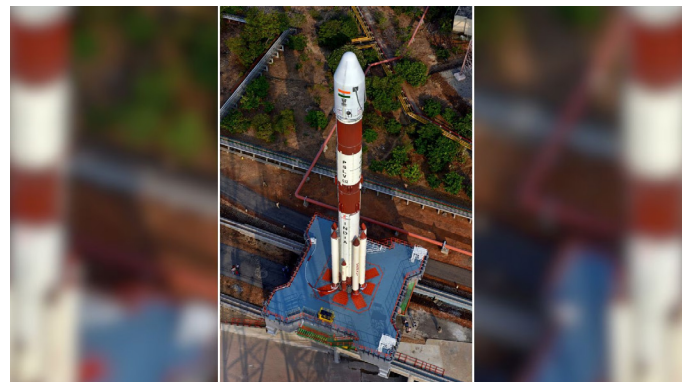
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## Aerospace Industry

### Satellite Communication Infrastructure and support to Space Missions

25 March 2026

Source: [PIB | https://www.pib.gov.in/PressReleasePage.aspx?PRID=2245191&reg=3&lang=2](https://www.pib.gov.in/PressReleasePage.aspx?PRID=2245191&reg=3&lang=2)



Department of Telecommunications announced and implemented Satellite Communication Reforms-2022 to facilitate the ease-of-doing business, streamlining a number of processes and rationalizing various charges.

Also, the Space Sector reforms announced in 2020, enable larger participation of Non-Government Entities (NGEs) for building/leasing, owning and operating the satellite systems for providing satellite-based services. The Government of India, as part of its 2020 space sector reforms, established an autonomous nodal agency, namely Indian National Space Promotion and Authorization Centre (IN-SPACe) under Department of Space (DOS), to promote and oversee private sector participation in space activities. Various

measures to encourage and hand hold private sector have been announced and implemented by IN-SPACe, such as Seed fund Scheme, Technical Centre, Design Lab for NGEs, Skill Development in Space Sector, ISRO facility utilisation support, Technology Transfer to NGEs, creation of IN-SPACe Digital Platform to connect with all the stakeholders of space ecosystem etc.

It is envisaged that the infrastructure created will also support the space missions.

Department of Telecommunications (DoT) has launched the Telecom Technology Development Fund (TTDF) Scheme to promote and fund research and development (R&D) in communication technologies, fostering collaboration between academia, start-ups, research institutes, and industry to enhance the telecom ecosystem in India. This is also likely to support development of advanced antenna systems.

To encourage indigenization, Department of Telecommunications issued instructions on 05.05.2025 which inter-alia, includes that the licensee having Global Mobile Personal Communication by Satellite Service (GMPCS) authorization under Unified License (UL), will aim at indigenisation to a level of at least 20% of their ground segment of the satellite network that is established at the end of 5 years post the date of launch of commercial operations.

It is envisaged that these initiatives will enhance the diffusion of space technology and strengthen the space sector infrastructure including space communication network, satellite mission support and technological self-reliance.

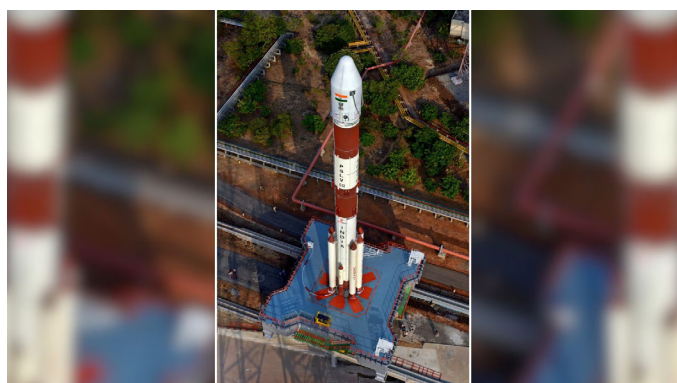
This information was given by the Minister of State for Communications and Rural Development Dr. Pemmasani Chandra Sekhar in a written reply to a question in the Lok Sabha today.

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## India's Navigation Satellite System Suffers Major Setback: 1 of 4 Operational IRNSS Satellites Fails

15 March 2026

Source: *Indian Express* | <https://indianexpress.com/article/india/navic-satellite-irnss-1f-failure-atomic-clock-malfunction-10581224/>



India's indigenous navigation satellite system—Navigation with Indian Constellation (NavIC)—has suffered a major setback with one of its four operational satellites reporting a failure “at the end of 10 years since its launch”, according to Indian Space Research Organisation (ISRO) officials.

The Indian Regional Navigation Satellite System's IRNSS 1-F, launched on March 10, 2016, failed after its last functional atomic clock malfunctioned, space department sources indicated. The satellite had been operating with only one of its three onboard atomic clocks.

At least four indigenous navigation satellites must be fully operational for the NavIC system to provide navigation services to the public and government agencies such as railways and the military.

Senior ISRO officials associated with the NavIC satellites and the space programme did not respond to queries on the failure of the IRNSS 1F satellite. ISRO chairman Dr V Narayanan did not speak on the issue but referred to an official statement posted on its website.

“On 13th March 2026, the procured on-board atomic clock stopped functioning. However, the satellite will continue to function in-orbit for various societal applications to provide one way broadcast messaging services,” ISRO said in an official statement on Friday night.

“IRNSS-1F satellite launched in March 2016 has completed its design mission life of 10 years on 10th March 2026,” the statement posted on the ISRO website said.

Although ISRO has launched 11 satellites since July 2013 for the nearly Rs 2,250 crore NavIC system, six satellites have failed primarily due to defective imported atomic clocks in the initial years, and on a few recent occasions, due to orbital issues.

Last year, in a reply in Parliament, the Union government had reported that only four of 11 satellites launched for the NavIC system were operational for positioning, navigation, and timing services, with the others being used on a sub-optimal basis.

“As of now, 11 satellites have been put in orbit. Some of them are not functioning. At present, four satellites are providing

Position, Navigation and Timing (PNT) services, four satellites are being used for one way message broadcast, one satellite got decommissioned after its end-of-life service. Two satellites could not reach the intended orbit,” Minister of State for the PMO, Jitendra Singh, said in a reply in the Lok Sabha on July 23, 2025.

With the reported failure of the IRNSS 1-F, the functional NavIC satellites for PNT services at present are only the IRNSS 1-B, IRNSS 1-L, and IRNSS 1-J (NVS-01). With the reported failure of all atomic clocks on the IRNSS 1-F, a total of six of 11 Indian satellites meant for the NavIC system have failed due to the atomic clocks.

“Location services provided by the NavIC system in India are going to be affected,” space department sources said.

Last year, in the July 23 reply in Parliament, the Union government had stated that “around 12,000 trains are targeted for tracking in real-time using NavIC and other GNSS constellations” and that “around 8,700 trains are already equipped with NavIC along with other GNSS constellations”.

### **Previous Failures of NavIC satellites**

Apart from the latest incident, five satellites launched for the NavIC system have experienced atomic clock failures: IRNSS-1A (launched on July 1, 2013), IRNSS-1C (October 16, 2014), IRNSS-1D (March 28, 2015), IRNSS-1E (January 20, 2016), and IRNSS-1G (April 28, 2016).

Accurate time keeping lies at the heart of navigation systems since the determination of a person’s position on earth is subject to the accurate calculation of delays in signal transmission from satellite to earth.

Small errors in atomic clocks on satellites can skew position data by several hundred kilometres. ISRO incidentally started work on the IRNSS program in 1999 after the Kargil war, where Indian defence forces could not use US-owned GPS systems to provide locational aid to its soldiers in the conflict zone.

ISRO admitted in July 2016 that IRNSS 1A had developed problems due to malfunctioning atomic clocks and indicated that replacement satellites would be launched with modified clocks.

The atomic clocks in the IRNSS satellites launched after July 2016 (IRNSS 1H, 1-I) have carried modified versions of the original clocks provided by an European supplier under a \$ 4 million euro deal for an estimated 45 clocks (three clocks are present on each satellite).

The IRNSS 1-J, which is currently operational, and the IRNSS 1-K, which reported an engine failure last year, are also called NVS-01 and NVS-02 satellites on account of being a second generation of IRNSS navigation satellites that are equipped with a mix of indigenous and foreign atomic clocks.

Though a seven-satellite constellation

is considered ideal for the NavIC system, four fully operational satellites are also considered to be sufficient to provide navigation services. “To provide a solution for position navigation and timing, only four satellites are needed—for timing, only one satellite is sufficient, and for position navigation, four satellites are sufficient. So we do have an indigenous solution through the IRNSS constellation at present,” the spacecraft director for the NVS-02 mission, Kartik A, had said on January 29, 2025, soon after the launch of the IRNSS 1-K (NVS-02), which did not achieve an optimum orbit location.

### **Satellites Failing to Reach Optimum Orbits**

Two satellites—the IRNSS 1-H launched on August 31, 2017, and the IRNSS 1-K (NVS-02) launched on January 29, 2025—have had problems on account of not reaching their optimum orbits after launch.

On February 25, 2026, nearly a year after the failure of the IRNSS 1-K satellite orbit manoeuvres, ISRO released a public statement on the findings of a failure analysis exercise. “On separation of the satellite from the launch vehicle, a series of autonomous activities on the satellite were carried out including the solar panel deployment and stabilizing the orientation for power generation. However, the orbit raising operations from the elliptical to circular orbit could not be carried out,” the statement said.

“The apex committee after thorough analysis of the simulation data concluded that the prime reason for the observation was found to be the drive signal not reaching the pyro valve of the oxidizer line of the engine meant for orbit raising. The committee concluded that the most likely cause for the observation is the disengagement of at least one contact (in each of the main and redundant paths) of the connector,” the statement added.

ISRO has also suffered two successive launch failures in the 2025-26 period for its workhorse PSLV rocket, resulting in an overall stalling of the launch pipeline for space programmes, including the NavIC satellite programme.

“The PSLV-C62 mission encountered an anomaly during the end of the PS3 stage. A detailed analysis has been initiated,” ISRO said about the PSLV C62 launch failure on January 12, 2026. “A national level expert committee constituted is reviewing the reason for anomaly in PSLV Vehicle,” ISRO said in another statement on February 25, 2026.

The Union minister of state for space had stated in Parliament in July 2025 that a new generation NavIC satellite “NVS-03 is planned to be launched by end of 2025” and “subsequently, with a gap of six months, NVS-04 & NVS-05 are planned to be launched”. But these timelines have not been realised after the launch failures for the PSLV C61 on May 18, 2025, and the PSLC C62 launch on January 12, 2026.

ISRO plans to launch three second-generation NavIC satellites—NVS-03/04/05—in the future “to augment NavIC base layer constellation with enhanced features for ensuring continuity of services”.

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## Data Patterns to Equip Tejas Mk2 with Next-Gen Avionics, Smart Cockpits and High-Tech Sensor Fusion Capabilities

Raj Basu | 28 March 2026

Source: [Defence.in](https://defence.in/threads/data-patterns-to-equip-tejas-mk2-with-next-gen-avionics-smart-cockpits-and-high-tech-sensor-fusion-capabilities.17303/) | <https://defence.in/threads/data-patterns-to-equip-tejas-mk2-with-next-gen-avionics-smart-cockpits-and-high-tech-sensor-fusion-capabilities.17303/>



Data Patterns (India) Ltd., a prominent domestic electronics manufacturer, is stepping up as a crucial contributor to India’s Light Combat Aircraft (LCA) Mk2 programme.

The company is developing advanced cockpit and avionics systems for the upcoming medium-weight fighter jet.

Crucially, the technological foundations

laid for the Tejas Mk2—which is currently targeting its maiden flight by mid-2026—are expected to be adapted for India’s ambitious fifth-generation Advanced Medium Combat Aircraft (AMCA) programme.

The firm is designing a "smart cockpit" and a sophisticated avionics architecture aimed at dramatically improving a pilot's situational awareness and mission control.

By integrating high-level sensor fusion, these systems are built to process multiple data streams simultaneously.

Because the design prioritises future upgrades, experts believe this digital infrastructure will eventually serve as the baseline for the AMCA stealth fighter, which is slated for a prototype rollout around 2028.

As the nation accelerates its self-reliance in military aerospace, private enterprises like Data Patterns are becoming indispensable to the domestic supply chain.

They are supplying the essential mission systems that empower modern jets to survive and dominate in highly contested combat zones, directly supporting the government's push to increase the indigenous content of the Tejas Mk2 to roughly 80%.

### Smart Cockpit and Integrated Avionics for Next-Generation Fighter Operations

The Tejas Mk2’s new smart cockpit is engineered to surround pilots with a fully

digital interface.

This environment is specifically tailored to handle massive amounts of real-time battlefield data and sensor feedback without overwhelming the operator.

In contemporary air warfare, the cockpit functions as the ultimate command centre.

Data Patterns is building a unified display system that seamlessly merges inputs from the aircraft's radar—such as the indigenous Uttam AESA radar planned for the Mk2—along with electronic warfare alerts, targeting pods, and secure communication channels.

This effort establishes a robust technological base for India's future airborne platforms.

These next-generation cockpits will feature high-resolution displays, intelligent algorithms for sensor fusion, and automated mission software.

This combination enables pilots to rapidly analyse complex tactical scenarios and make split-second decisions during high-intensity aerial engagements.

The engineering expertise gained from the LCA Mk2 project will be directly transferable to the AMCA stealth fighter.

For a fifth-generation aircraft like the AMCA, flawless sensor integration and data management are mandatory to maintain a low radar profile while executing multi-

domain operations.

## **Advanced IRST and Missile Approach Warning Systems for LCA Mk2**

Beyond cockpit displays, Data Patterns is supplying critical defensive and offensive sensors for the Tejas Mk2. This includes Missile Approach Warning Systems (MAWS) and Infrared Search and Track (IRST) capabilities.

To build these high-tech sensors, the company is collaborating with a European tech firm. However, the manufacturing process is heavily focused on maximising 'Made-in-India' components, aligning with national self-sufficiency goals.

An IRST system is a game-changer in modern combat, allowing a fighter jet to locate airborne adversaries using their heat signatures instead of relying on traditional radar.

This passive tracking means the Tejas Mk2 can hunt enemy aircraft without emitting radar waves that would otherwise reveal its own location—a vital tactic in stealth and electronic warfare.

Complementing the IRST, the MAWS acts as a defensive shield. It detects incoming missile threats early and automatically deploys countermeasures, such as jamming signals or flares.

This automated defence mechanism is crucial for keeping the aircraft and pilot safe in hostile, heavily defended airspace.

## Transitioning from Subsystem Supplier to Full Defence Systems Provider

Data Patterns is not just making isolated parts; it is undergoing a major corporate evolution.

The company is moving away from being a basic subsystem vendor to becoming a primary provider of comprehensive defence solutions and fully integrated systems.

Notably, the firm is currently part of a broader private-sector consortium bidding to build the AMCA fighter itself.

This strategic pivot mirrors a broader transformation within the Indian defence industry.

Private corporations are stepping up to lead the integration of entire mission systems and advanced platform technologies, rather than merely delivering standalone hardware pieces.

By taking on end-to-end design and integration, Data Patterns is positioning itself as a primary technology ally for the armed forces.

Their portfolio is expanding to cover massive initiatives, ranging from fighter jets and missile networks to ground radars and electronic warfare arrays.

With the Tejas Mk2 and AMCA programmes gaining momentum, private Indian firms will play an increasingly dominant role.

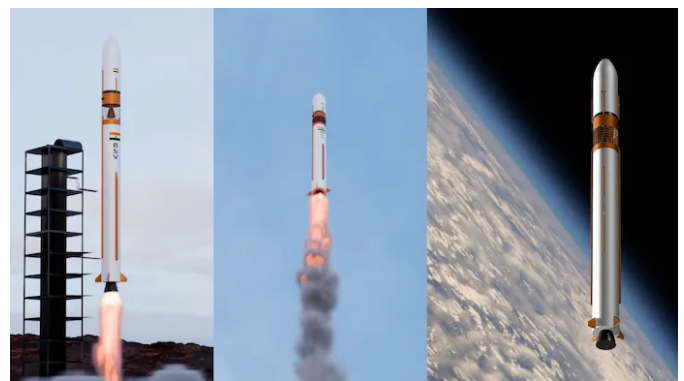
This collaborative effort between the government and private sector is the cornerstone of the Aatmanirbhar Bharat initiative, ensuring the military is equipped with cutting-edge, homegrown technology.

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## Meet Agasthya-1: Ex-Isro scientists are building a rocket to launch in 24 hours

Radifah Kabir | 29 March 2026

*Source: India Today | <https://www.indiatoday.in/science/story/bharath-space-vehicle-agasthya-1-rocket-surat-gujarat-isro-ex-scientists-launch-site-kodinar-tamil-nadu-2888767-2026-03-29>*



Agasthya-1 is Bharath Space Vehicle (BSV)'s 28-metre two-stage rocket powered by liquid oxygen and kerosene engines, designed to carry small satellites to low Earth orbit. (Photo: Bharath Space Vehicle)

India's private space revolution has a new name, and it comes from an unexpected address. Bharath Space Vehicle (BSV), a startup incorporated in 2024 and headquartered in Surat, Gujarat, is building what could be one of the country's most credible private rocket

programmes.

The founding team brings combined 70-plus years of experience inside the Indian Space Research Organisation (Isro).

BSV is developing Agasthya-1, a two-stage expendable rocket powered by two LOX/RP-1, or liquid oxygen and kerosene engines, designed to provide reliable and affordable access to space.

Standing 28 metres tall, the small-lift vehicle targets the small-satellite market, capable of delivering 500 kg to a Sun-Synchronous Polar Orbit (SSPO) and 800 kg to a low-inclination low-Earth orbit (LEO) at roughly 400 km altitude.

### **Why Does Liquid Fuel Make Agasthya-1 Different?**

Most Indian small-satellite rockets, including Isro's own SSLV (Small Satellite Launch Vehicle), run on solid propellants.

BSV has chosen a liquid bipropellant engine, LOX and RP-1, for a straightforward reason: you can fully test it before launch.

With solid motors, you light the candle on launch day and hope for the best.

With liquid engines, BSV's fly-what-you-test philosophy allows the second-stage engine to undergo a 10-to-40-second hot-fire acceptance test, while the first-stage engine gets a 3-to-4-second pre-launch hot-fire check.

Stage separation and fairing jettison, or the act of dropping the protective nose cone of a rocket, can also be validated on the ground, reducing the chance of inflight failure considerably.

This also enables launch readiness within 24 hours of notice, a growing requirement for defence and disaster-response satellite operators.

### **Who is Behind Agasthya-1?**

The founding team includes Dr N. Vedachalam, former Director of Isro's Liquid Propulsion Systems Centre (LPSC), who led development of the cryogenic upper stage for the Geosynchronous Launch Vehicle (GSLV), including the successful testing of India's first cryogenic engine for 1,000 seconds.

A Padma Shri awardee, he continues to consult for Isro, DRDO, and the Ministry of Defence.

Co-founder and CTO S.V. Sharma is a structural engineering veteran from the Vikram Sarabhai Space Centre (VSSC), who earned his M.Tech from IIT Kanpur in 1972 and worked directly under Dr A.P.J. Abdul Kalam on the SLV-3 (Satellite Launch Vehicle 3)

He contributed to the ASLV (Augmented Satellite Launch Vehicle), PSLV (Polar Satellite Launch Vehicle), GSLV, and GSLV Mk-III programmes.

Bhavin Patel, the COO and CFO, is an

aerospace engineer from IIT Kanpur.

spaceport.

## **Could Gujarat Become India's Third Spaceport?**

BSV has proposed a launch complex near Kodinar in Gujarat's Gir Somnath district.

Gujarat's Science and Technology Minister Arjun Modhwadia told the state assembly that IN-SPACe has identified a suitable location between Diu and Kodinar for a satellite launch facility, comparable to Sriharikota.

The coastal location offers open sea access and favourable launch corridors for specialised satellite trajectories.

Isro had earlier evaluated a Gujarat site for its SSLV launch complex before Kulasekarapattinam in Tamil Nadu was selected.

If Kodinar moves forward, India would have its first west-coast orbital launch option, reducing dependence on a single

## **What does this mean for India's Space Push?**

BSV has signed a framework MoU with IN-SPACe and Isro, securing access to national testing facilities, technical expertise, and launch infrastructure.

India's New Space Policy of 2023 opened the launch vehicle market to private players, and BSV joins Skyroot Aerospace and Agnikul Cosmos in betting on frequent, affordable launches for small satellites.

A startup from Surat, built by the engineers who gave India the GSLV, now wants to add a new chapter to that story.

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**“Airpower in its very nature has fundamental, enduring, though variable attributes that individually are unique, especially when compounded synergistically for performance.”**

**- Colin S. Gray**



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