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# Beyond Deterrence by Punishment — India's Precision Strike Doctrine and the Pralay Revolution

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GS3

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MAINS RELEVANCE: GS Paper 3



## INTERVIEW ANGLE

*"How does Pralay's salvo launch capability change India's conventional deterrence calculus against Pakistan and China simultaneously?"*

## WHY IN NEWS

DRDO's simultaneous salvo launch of two Pralay ballistic missiles at the Integrated Test Range (ITR) in Chandipur, Odisha marked a decisive step in the system's user evaluation trials — demonstrating not just the missile's precision, but its ability to defeat adversary Anti-Ballistic Missile (ABM) defences through coordinated saturation strikes.

## THE CONCEPTUAL SHIFT: FROM PUNISHMENT TO DENIAL

For decades, India's conventional deterrence rested on the concept of **deterrence by punishment** — the credible threat to impose costs so severe that an adversary would refrain from aggression. Nuclear weapons provided the ultimate backstop. But in the grey zone below the nuclear threshold — the domain of sub-conventional conflict, border skirmishes, and limited conventional war — India's deterrence architecture was weaker than its strategic posture suggested.

The gap was real and documented: India lacked a **precision conventional strike capability** that could hold adversary military infrastructure at risk without crossing the nuclear threshold. The Prithvi series, India's workhorse short-range ballistic missile since the 1990s, was liquid-fuelled (requiring 30–45 minutes to prepare), less accurate, and operationally cumbersome. The BrahMos supersonic cruise missile, while extraordinarily capable, is expensive per unit and optimised for high-value point targets.

Pralay changes this calculation. It introduces **deterrence by denial** at the conventional level — not just threatening punishment after an adversary acts, but holding adversary military capabilities at risk in real time, creating operational hesitation before conflict escalates.

## WHAT PRALAY ADDS TO INDIA'S DETERRENCE ARCHITECTURE

### Salvo capability as the force multiplier:

The salvo launch at Chandipur was not a test of one missile — it was a test of a system. The simultaneous launch of two Pralayas from separate launch vehicles requires:

**Command and control synchronisation** — coordinated fire orders across dispersed Transporter-Erector-Launcher (TEL) units

**Trajectory deconfliction** — ensuring two missiles targeting the same or nearby targets do not interfere

**Saturation logic** — understanding how to overwhelm adversary ABM systems through simultaneous multi-vector approaches

Pakistan's ABM architecture (HQ-9 from China, LY-80, and an emerging layered defence) is designed to intercept singular ballistic threats. A salvo of two Pralayas simultaneously is qualitatively different — it forces the ABM system to allocate interceptors across multiple threats while managing the manoeuvring terminal phase of both missiles. The mathematics of interception rapidly become unfavourable for the defender.

This mirrors the operational logic China used to justify its salvo doctrine for DF-15 and DF-16 missiles — and India has now demonstrated it is building a comparable capability.

### NavIC independence as strategic sovereignty:

Pralay's guidance system integrates **NavIC (Navigation with Indian Constellation)** — India's indigenous satellite navigation system. This is not a redundancy feature; it is a strategic necessity.

GPS is an American system. In any India-China or India-Pakistan conflict that involves US equidistance or US support to one party, GPS accuracy can be selectively degraded or denied. The 1999 Kargil conflict, where the US reportedly declined to provide precision GPS data to India's forces, demonstrated this vulnerability in a conflict context.

NavIC's encrypted military signal (Restricted Service) provides accuracy of better than 1 metre — beyond GPS standard accuracy — and is under India's sole control. Pralay's NavIC integration means its precision is not contingent on American goodwill in a conflict scenario.

## THE TWO-FRONT CONTEXT

India's defence planners have operated under a **two-front threat perception** since at least 2013, when then-Army Chief General Bikram Singh formally articulated it. The possibility of simultaneous conflict with Pakistan (exploiting a China-India confrontation) is a credible scenario that shapes India's force posture.

**Against Pakistan:** Pralay deployed in Rajasthan, Punjab, or forward positions can strike Lahore, Rawalpindi, Islamabad, and key Pakistani military bases (Sargodha air base, Pakistani Army Corps headquarters at Mangla and Gujranwala) from standoff ranges without exposing delivery assets to Pakistani air defence. At 500 km maximum range, it creates a deep conventional strike capability that threatens Pakistani strategic military infrastructure — not just tactical forward positions.

**Against China (LAC):** The more demanding problem is the high-altitude scenario. PLA logistics in Tibet — the supply routes through Depsang, Demchok, Galwan, and the Sichuan-Tibet highway — are the critical vulnerabilities in any extended PLA campaign in Ladakh or Arunachal Pradesh. Pralay deployed in Ladakh or Arunachal Pradesh can reach these supply nodes at ranges well within its 500 km envelope, threatening PLA logistics sustainability without requiring India's Air Force to penetrate contested airspace over the Tibetan Plateau.

China has deployed DF-11, DF-15, and DF-16 missiles in positions that can reach Indian cities and military bases. Pralay gives India an asymmetric counter — not targeting Chinese cities (which would invite nuclear signalling) but threatening PLA military logistics and forward deployed positions.

## THE DOCTRINE GAP: CAPABILITY WITHOUT STRATEGY

India's acquisition of Pralay is a capability decision. The harder question is whether India has a **conventional strike doctrine** to employ it.

**The Cold Start problem, revisited:** India's Cold Start Doctrine (now officially the Proactive Strategy) envisions rapid, shallow armoured thrusts into Pakistan before international pressure forces a ceasefire — holding limited territory as a bargaining chip. Pralay adds a standoff dimension: before armoured units cross the border, precision fires can degrade Pakistani air defences, command nodes, and artillery positions. This is a conventional suppression-of-enemy-air-defences (SEAD) and counter-battery role that changes the tempo of any initial military phase.

**Escalation management:** The risk is inadvertent escalation. Pakistan's nuclear doctrine includes the threshold of a threat to its survival as a state. If Pralay strikes are perceived as targeting Pakistani strategic command infrastructure, even accidentally, the escalation risk increases. India needs a targeting doctrine that distinguishes between military operational targets and strategic command nodes.

**The counter-force vs. counter-value debate:** Pralay's 10-metre CEP makes it a true counter-force weapon — capable of targeting military hardware, runways, radar arrays, and ammunition depots with precision. This is qualitatively different from counter-value deterrence (threatening civilian or economic infrastructure). Counter-force capability, if properly doctrined, can lower conflict termination costs — the adversary can absorb military losses without existential threat — but requires strict targeting discipline.

## UPSC RELEVANCE

**Prelims:** Pralay (DRDO; ITR Chandipur; 150–500 km; 500–1,000 kg conventional warhead; INS + GPS + NavIC; quasi-ballistic; solid-fuelled; salvo-capable); NavIC (7 satellites; 3 GEO + 4 GSO; RS signal <1 m accuracy; ISRO); Integrated Test Range Chandipur (Odisha; DRDO; India’s primary missile test facility); ABM systems (Israel Arrow; Russia S-400; Pakistan HQ-9; India S-400 + MRSAM + QRSAM); BrahMos (Indo-Russian; Mach 2.8–3; 300–800 km).

**Mains GS-3:** India’s conventional deterrence architecture — the gap below the nuclear threshold | Pralay and India’s two-front threat: Pakistan and China simultaneously | NavIC strategic significance beyond civilian navigation | Salvo doctrine and the mathematics of ABM defeat | Cold Start Doctrine and Proactive Strategy — how precision fires change the operational calculus.

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## ★ FACTS CORNER — KNOWLEDGEPEDIA

### PRALAY MISSILE — CORE DATA:

- Type: Conventionally armed, surface-to-surface, quasi-ballistic missile
- Developer: DRDO (Armament Research and Development Establishment contribution; missile by DRDO systems labs)
- Range: 150–500 km (adjustable)
- Payload: 500–1,000 kg conventional warhead (HE, thermobaric, or penetrator)
- Guidance: INS (Inertial Navigation System) + GPS + NavIC; CEP: ~10 metres
- Propulsion: Solid fuel (canister launch; TEL-based; operational in minutes)
- Trajectory: Quasi-ballistic — manoeuvres in terminal phase to defeat ABMs
- Test site: ITR Chandipur-on-sea, Balasore district, Odisha
- Salvo test: 2 missiles simultaneously; user evaluation trials December 2025 / January 2026 for Indian Army

### INDIA'S SHORT-RANGE CONVENTIONAL STRIKE EVOLUTION:

- Prithvi-II: 350 km; liquid-fuelled; 500–1,000 kg; Army/Air Force; slower to deploy
- Prahaar: Cancelled/modified earlier conventional strike attempt (150 km)
- Pralay: 150–500 km; solid-fuelled; replaces Prithvi for conventional precision strike
- BrahMos: 300–800 km; supersonic (Mach 3); cruise (not ballistic); high-value point targets

### NAVIC (NAVIGATION WITH INDIAN CONSTELLATION):

- Former name: IRNSS (Indian Regional Navigation Satellite System)
- Satellites: 7 (3 GEO + 4 GSO)
- Coverage: ~1,500 km around India
- SPS (Standard Positioning Service): ~5 m accuracy
- RS (Restricted Service): Encrypted military signal; <1 m accuracy
- Manager: ISRO; NAVIC Management Centre (NMC)

### INDIA'S ABM/MISSILE DEFENCE ASSETS:

- S-400 Triumph: Russia; 3 of 5 squadrons delivered; 40 km interception range for aircraft; can engage ballistic missiles
- MRSAM (Medium Range Surface-to-Air Missile): Israel IAI + DRDO; 70–100 km
- QRSAM (Quick Reaction Surface-to-Air Missile): DRDO; 30 km; fully indigenous

### OTHER RELEVANT FACTS:

- Kargil conflict (1999): US reportedly declined GPS precision data to India — strategic lesson for NavIC development
- Cold Start Doctrine (now Proactive Strategy): Rapid shallow armoured thrust before UNSC ceasefire; limited aims
- Pakistan HQ-9: Chinese-origin long-range air/missile defence system
- DF-15 / DF-16: Chinese short-range quasi-ballistic missiles; PLA equivalent to Pralay
- CEP (Circular Error Probable): Radius within which 50% of warheads land; lower = more precise

Sources: DRDO, PIB, The Hindu



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