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Pralay Missile — India's Indigenous Precision Strike Capability Comes of Age

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WHY IN NEWS

DRDO successfully conducted a salvo launch trial of the Pralay surface-to-surface quasi-ballistic missile at the Integrated Test Range, Chandipur, Odisha — two missiles fired in rapid succession from the same launcher both hit targets with Circular Error Probable under 10 metres. The trial brings Pralay close to formal induction into the Indian Army, giving India an indigenous precision strike system comparable to Russia's Iskander-M and China's DF-12.

WHAT IS A QUASI-BALLISTIC MISSILE?

To understand Pralay's significance, it helps to understand the missile taxonomy:

Ballistic missiles follow a high, arcing trajectory (like an artillery shell, but propelled by a rocket into or near space before re-entering). Their flight path is predictable — anti-ballistic missile systems can track and intercept them because the trajectory is calculable once the missile is launched.

Cruise missiles (like BrahMos) fly low and sustained — powered throughout their flight, hugging terrain to avoid radar, and capable of directional changes. They are accurate but relatively slow (subsonic to supersonic) and can be intercepted by air defence guns and surface-to-air missiles.

Quasi-ballistic missiles occupy a hybrid space. They follow a relatively flat, depressed trajectory — lower than a true ballistic missile but higher than a cruise missile. Critically:

- They travel at **hypersonic-adjacent speeds** (Mach 6+) in their terminal phase
- They can **manoeuvre mid-flight** (unlike true ballistic missiles), making their terminal trajectory unpredictable
- They are launched from mobile ground platforms — no fixed launch infrastructure to target and destroy

The combination of high speed, manoeuvring terminal phase, and solid-fuel quick launch makes quasi-ballistic missiles like Pralay extremely difficult to intercept with current-generation air defence systems.

PRALAY: TECHNICAL PARAMETERS

Pralay (Sanskrit: *destruction/dissolution* — the cosmic end-of-era event) was developed by **Research Centre Imarat (RCI)**, DRDO's premier missile development laboratory in Hyderabad. RCI specialises in navigation, guidance, and control systems for missiles — it also developed the guidance for Agni, BrahMos navigation, and SAAW.

Parameter	Detail
Type	Surface-to-surface quasi-ballistic
Propulsion	Solid fuel (two-stage)
Range	150–500 km (adjustable by payload mass)
Speed	Mach 6+ (terminal phase)
Accuracy (CEP)	< 10 metres
Payload	~350–500 kg conventional warhead
Navigation	Ring-laser gyro + advanced terminal guidance (electro-optical/IR seeker)
Launch platform	Canisterised, road-mobile TEL (Transporter Erector Launcher)
Launch preparation time	Minutes (solid fuel; canisterised — no fuelling required)
Manoeuvring	Pull-up manoeuvre in terminal phase to avoid interception

Salvo capability — demonstrated in the January 2026 trial — means the launcher can fire two or more missiles in rapid succession at the same or different targets. This is critical for saturation attacks that overwhelm air defence systems.

THE STRATEGIC GAP PRALAY FILLS

India's existing precision strike architecture has two main elements:

BrahMos (300+ km variant): The BrahMos supersonic cruise missile is India's premier precision strike weapon — accurate, powerful, and proven in naval and air-launched versions. But its cruise profile makes it detectable by air defence systems with enough advance warning. Its cost (~₹25-35 crore per missile) also limits saturation employment.

Agni series (700–5,000+ km): India's ballistic missile arsenal from Agni-I to Agni-V covers medium to intercontinental ranges and carries nuclear warheads under the nuclear triad strategy. These are not conventional precision strike weapons — they are strategic deterrent assets.

The gap: **conventional precision strike at 150–500 km** with survivability against air defence. This is exactly where Pralay sits.

For India's security calculus:

Pakistan border: Pakistan's major airbases, ammunition depots, radar sites, and command infrastructure are within 150–500 km of India's western border. Pralay can strike these with precision without alerting nuclear escalation thresholds (it is a purely conventional weapon)

LAC/China: PLA logistics nodes, supply depots, and airfield complexes in Tibet and Xinjiang are within 500 km of India's northern border. Pralay's range and accuracy makes it relevant here

Naval targets: Pralay can be adapted for anti-ship roles — a capability India is developing

THE SALVO LAUNCH: WHY IT MATTERS

The January 2026 trial specifically demonstrated **salvo launch** — two missiles from the same TEL, fired in rapid succession, both hitting targets accurately. This is operationally significant because:

Overwhelm air defences: Modern air defence systems like China's HQ-9 or Pakistan's LY-80 take time to re-engage after a launch. A salvo — multiple near-simultaneous arrivals — can saturate radar and intercept capacity

Redundancy: If one missile is intercepted or malfunctions, the second still hits the target

Time-on-target (ToT) attacks: Multiple missiles from different directions arriving simultaneously at the same target can be coordinated with a salvo launch

The salvo capability distinguishes Pralay from simpler single-shot systems and places it in the same operational tier as Russia's Iskander-M (which has a two-missile salvo capability that was extensively used in Ukraine).

PRALAY VS. REGIONAL COMPARATORS

System	Country	Range	Speed	Notes
Pralay	India	150–500 km	Mach 6+	Quasi-ballistic; salvo capable; near induction
Iskander-M	Russia	500 km	Mach 6–7	Used extensively in Ukraine; manoeuvring warhead
DF-12 / M-20	China	100–280 km	Mach 6	Deployed at LAC-adjacent bases in Tibet
Fatah-II	Pakistan	400 km	-	In development; quasi-ballistic
LORA	Israel	430 km	Mach 4.5	Export system; Israel used operationally

Pakistan is developing its own quasi-ballistic systems (Fatah-II). China's DF-12 is already deployed. India's Pralay closes a meaningful capability gap.

DEFENCE INDIGENISATION CONTEXT

Pralay is produced using:

Solid rocket motors from Advanced Systems Laboratory (ASL), DRDO, Hyderabad (also makes Agni motors)

Navigation and guidance systems from RCI, Hyderabad

Canisterised TEL (Transporter Erector Launcher) from Indian private sector (reports suggest Bharat Forge and TATA Advanced Systems as candidates)

Warhead and fusing from Terminal Ballistics Research Laboratory (TBRL), Chandigarh

This supply chain is almost entirely indigenous — unlike India's earlier reliance on Russian Smerch rockets (250 km MLRS) or Israeli EXTRA rockets for longer-range conventional fires. The Pralay programme is a model for Atmanirbhar Bharat in precision strike.

UPSC RELEVANCE

Pralay missile (quasi-ballistic; RCI DRDO; Hyderabad; Chandipur ITR; range 150-500 km; CEP <10m; Mach 6; solid fuel); salvo launch; Integrated Test Range (Chandipur, Odisha); BrahMos (cruise; supersonic; India-Russia joint venture); Agni series (ballistic; nuclear triad)

MAINS GS-3:

"Explain the strategic significance of the Pralay quasi-ballistic missile for India's conventional deterrence. How does it address capability gaps in India's precision strike architecture?" | "Analyse the indigenisation of India's missile programme — what has been achieved through DRDO's programmes like Pralay and what remains dependent on imports?"

INTERVIEW:

"Does India's acquisition of precision strike missiles like Pralay risk conventional escalation with Pakistan or China? How should India manage the stability-instability paradox in South Asia?"

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PRALAY MISSILE — CORE DATA:

Full form: Pralay (Sanskrit: annihilation/dissolution)

Type: Surface-to-surface quasi-ballistic tactical ballistic missile

Propulsion: Solid fuel (two stages)

Range: 150–500 km | Speed: Mach 6+ | CEP: < 10 metres

Payload: ~350–500 kg conventional warhead

Navigation: Ring-laser gyro inertial + electro-optical/IR terminal seeker

Developer: Research Centre Imarat (RCI), DRDO, Hyderabad

Test site: ITR Chandipur, Odisha (Kalam Island)

Status: User trials complete (salvo); near Army induction

MISSILE TAXONOMY (FOR PRELIMS):

Ballistic missile: Propelled initially; coasts in arcing trajectory; predictable re-entry

Cruise missile: Air-breathing; sustained power; terrain-hugging; slower but highly manoeuvrable

Quasi-ballistic: Flat/depressed trajectory; manoeuvres in terminal phase; hypersonic speed

Hypersonic glide vehicle (HGV): Separate category — glides after rocket boost; Mach 5+

INDIA'S PRECISION STRIKE ARCHITECTURE:

BrahMos: Joint venture (India-Russia); supersonic cruise; 290 km (extended 450 km+ variant approved); cost ~₹25-35 crore/missile

Agni-I: 700 km; Agni-II: 2,000 km; Agni-III: 3,000 km; Agni-IV: 4,000 km; Agni-V: 5,000+ km (MIRV capable)

Pralay: 150-500 km conventional; quasi-ballistic; new capability tier

Nirbhay: Subsonic cruise; 1,000 km; turbofan-powered; stealth profile; under development

DRDO KEY LABS (HYDERABAD CLUSTER):

RCI (Research Centre Imarat): Navigation, guidance, control; Pralay, Agni guidance, SAAW

DRDL (Defence Research and Development Laboratory): Missile structures and aerodynamics; Akash, Nag

ASL (Advanced Systems Laboratory): Solid rocket motors; Agni, Pralay propulsion

INTEGRATED TEST RANGE (ITR), CHANDIPUR:

Location: Wheeler Island (now APJ Abdul Kalam Island), Odisha coast, Balasore district

DRDO's principal missile test facility

Tests conducted: Agni series, BrahMos, Pralay, SAAW, Helina

Sources: Insights on India, PIB, DRDO

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