



Agni-P (Prime)

Why in News

Recently, a **new generation nuclear capable ballistic missile Agni-P (Prime)** was successfully test-fired by the [Defence Research and Development Organisation \(DRDO\)](#) from **Dr. APJ Abdul Kalam island** off the coast of Odisha, Balasore.

Key Points

- ▮ **Shot in the arm**
 - ▶ Agni-P's range of 1,000-2,000 km is too short to reach targets in China's mainland, but can cover all of Pakistan's territory
 - ▶ Being a canisterised missile, it can be transported easily and fired at very short notice
 - ▶ It will replace the Prithvi, Agni-1 and Agni-2 missiles in India's arsenal that were built two decades ago with tech now considered obsolete
 - ▶ It will enter service as a two-stage, solid propellant missile. Both stages will have composite rocket motors and guidance systems with electro-mechanical actuators
 - ▶ Agni-P and Agni-5 originate from the Integrated Guided Missile Development Programme launched by then DRDO chief Dr APJ Abdul Kalam in the early 1980s



Agni-P is a new generation **advanced variant of the Agni class** (under [IGMDP - Integrated Guided Missile Development Program](#)).

- ▮ It is a **canisterised missile** with range capability between 1,000 and 2,000 km.
 - Canisterisation of missiles reduces the time required to launch the missile while improving its storage and mobility.
- ▮ Many **advanced technologies** including composites, propulsion systems, innovative guidance and control mechanisms and state-of-the-art navigation systems have been introduced. The Agni-P missile **would further strengthen India's credible deterrence capabilities**.
- ▮ In comparison to other Agni class missiles, Agni-P has improved parameters including manoeuvring

and accuracy.

▪ **Agni Class of Missiles:**

- They are the mainstay of India's nuclear launch capability.
- Range of other Agni Missiles:
 - **Agni I:** Range of 700-800 km.
 - **Agni II:** Range more than 2000 km.
 - **Agni III:** Range of more than 2,500 Km
 - **Agni IV:** Range is more than 3,500 km and can fire from a road mobile launcher.
 - **Agni-V:** The longest of the Agni series, **an Inter-Continental Ballistic Missile (ICBM)** with a range of over 5,000 km.

IGMDP (Integrated Guided Missile Development Program)

- It was conceived by Dr. A.P.J. Abdul Kalam to enable India attain self-sufficiency in the field of missile technology. It was approved by the Government of India in 1983 and completed in March 2012.
- The 5 missiles (**P-A-T-N-A**) developed under this program are:
 - **Prithvi:** Short range surface to surface ballistic missile.
 - **Agni:** Ballistic missiles with different ranges, i.e. Agni (1,2,3,4,5)
 - **Trishul:** Short range low level surface to air missile.
 - **Nag:** 3rd generation anti-tank missile.
 - **Akash:** Medium range surface to air missile.

Canister Based Launch System

- Canister based launch system- serves as a **container for transportation**; a housing during **storage aboard** a vessel; provides **operational flexibility**.
- A canister launch system can be either hot launch, where the missile ignites in the cell, or cold launch, where the missile is expelled by gas produced by a gas generator which is not part of the missile itself, and then the missile ignites.
- **Cold launch** is safer than hot launch as the ejection system will eject the missile by itself even if there is a missile failure. In case of **Agni V, it will be a cold launch**.
- In case of hot launches, the problem is the heat produced by the missile at the time of launch. The **hot launch** is better for small missiles as the ejection part itself will be done by using the missile's own engine.

▪ **Nuclear Triad:**

- Nuclear triad, a three-sided military-force structure consisting of **land-launched** nuclear missiles, **nuclear-missile-armed submarines**, and strategic **aircraft (e.g. Rafale, Brahmos) with nuclear bombs** and missiles.
- DRDO had in January 2020 successfully test-fired a 3,500-km range **submarine-launched ballistic missile, K-4**, from a submerged pontoon off the Visakhapatnam coast.
- Once inducted, these missiles will be the mainstay of the **Arihant class of indigenous ballistic missile nuclear submarines (SSBN)** and will give India the stand-off capability to launch nuclear weapons submerged in Indian waters.
 - INS Arihant, the only SSBN in service, is armed with K-15 missiles with a range of 750 km.
- In the past few years, India has been able to complete its nuclear triad. This is especially important given India's **No-First-Use policy** while reserving the right of massive retaliation if struck with nuclear weapons first.

Source: TH

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