

Nuclear Triad

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Nuclear Triad

The **Nuclear Triad** of India is a three-sided military-force structure consisting of **ICBMs (land-based nuclear missiles)**, **SSBNs (nuclear-missile-armed submarines)**, and **Strategic Bombers (strategic aircraft with nuclear bombs and missiles)**. The theory underlying the triad is that spreading the country's extensive nuclear arsenals across various weapons platforms and dimensions would provide a **Credible Minimum Deterrence (CMD)**. In 2018, with the deployment of **INS Arihant (an SSBN)**, a Strategic Strike Nuclear Submarine, India got its fully operational Nuclear Triad.

Components of India's Nuclear Triad

India's Nuclear Triad, as with other nations, comprises three components, each having the capability of a nuclear strike - Land, Air, and Naval (Sea).

Land-based Components

It mainly includes missiles that can be launched from land-based platforms such as **ICBMs** (Inter-continental Ballistic Missiles), **SRBMs** (Short Range Ballistic Missiles), **etc.** The ICBMs are quite **responsive** and **lethal**.

- ICBMs are deployed in hundreds of silos and can be launched and reach targets within minutes, creating a nearly insurmountable targeting problem for adversaries.
 - For example, the **Agni-V missile** can go up to a range of 5500 Km with nuclear warheads.
- Other land-based missiles that can support the triad are **Prithvi, Akash, Trishul**, etc.

Sea-based Component

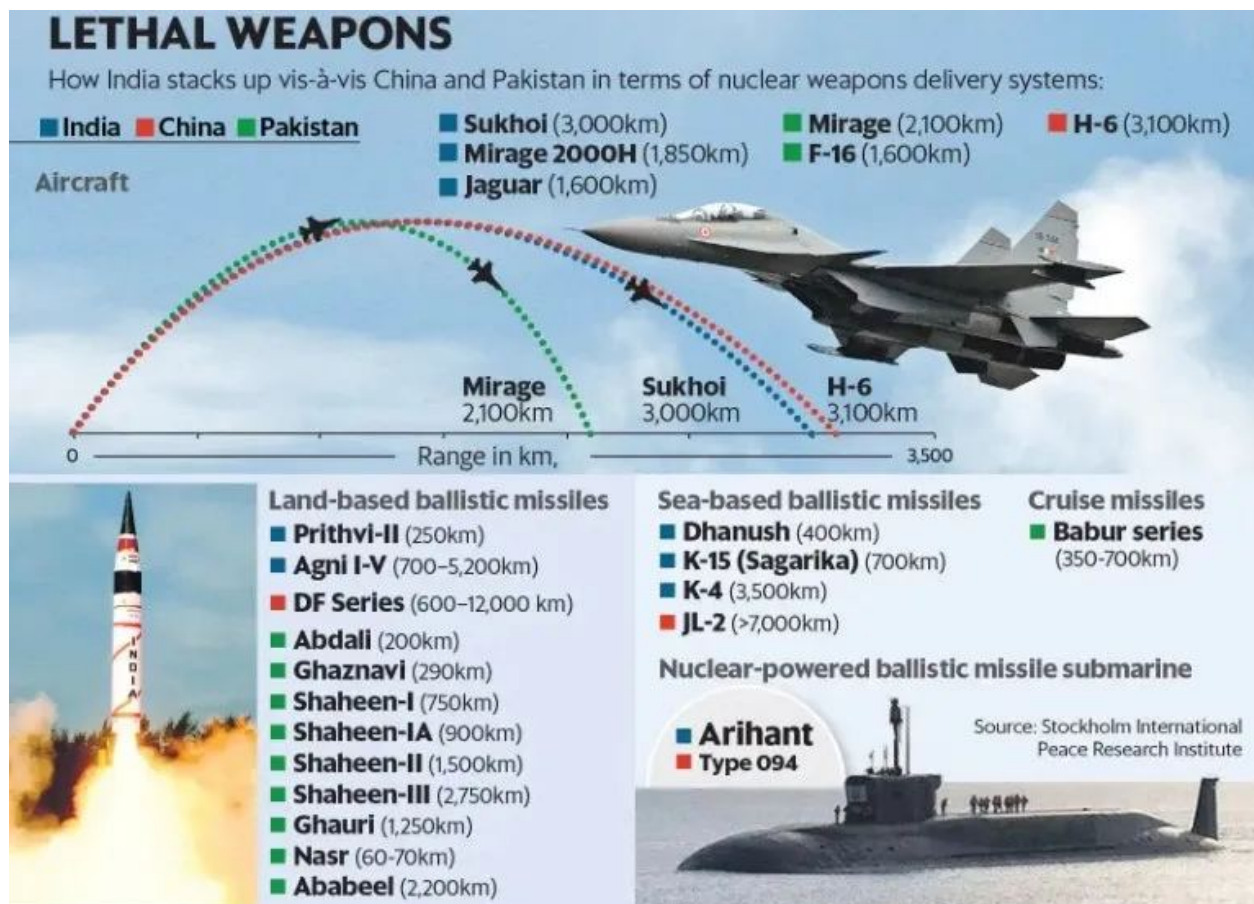
This component majorly includes the Ship Submersible Ballistic Nuclear Submarines (**SSBNs**).

- **The SSBNs are considered survivable** because a portion of the SSBN fleet is always on patrol, making it very difficult for potential adversaries to track all of them, contributing to their survivability.
 - For example, **INS Arihant** with **K-15 Sagarika missiles** (700 Kms range) and **K-4** (3500 Kms range) missiles.
- Also, the trials are going on with **INS Arighat** which has a possibility of getting inducted by **2024**.
 - It is more suitable to carry more K-4 missiles than INS Arihant.
- The SSBNs play a crucial role in the Second Strike against any nuclear attack complementing the Nuclear Doctrine as their location is unknown.

Air-based Component

It majorly includes the **Bombers which are considered as flexible for attacking**. The bomber aircraft are flexible and can resolve during a crisis and provide a variety of deployment and yield options when placed on alert.

- The aircraft that would work as bombers include the **Sukhoi Su-30MKI, Mirage 2000H, SEPECAT Jaguar**, and most importantly **Rafale**.
- The Land and air strike capabilities are controlled by **Strategic Forces Command**, a part of the **Nuclear Command Authority**.
 - NCA was created in **2003** and is responsible for the **management** and **administration** of the country's tactical and strategic **nuclear weapons** stockpile.
 - NCA is the **authority** responsible for command, control, and operational decisions regarding **India's nuclear weapons programme**.



Significance of India's Nuclear Triad

India is among very few countries (**United States, Russia, China, India, and Pakistan**) which have achieved the capability of nuclear triad. The Nuclear Triad has its own significance in providing security to a nation.

- **Capability of Second Strike:** The Nuclear Triad helps the country to counter-attack a nation after being attacked by nuclear warheads.
 - This triad ensures that even after being hit by a nuclear warhead, one can counter the attacking nation.
- **Balance of Power:** For India, this triad is very crucial, since it shares its borders with its **nuclear-empowered** adversaries such as **Pakistan** and **China**.
 - Both countries have sophisticated arsenals and believe they have the assets to credibly harm India.
 - Having a nuclear triad, India is now aiming to counterbalance China's assertiveness in South Asia.
- **Credible Minimum Deterrence:** It is one of the objectives of **India's Nuclear Doctrine** which is complemented by possessing a fully operational nuclear triad.
 - It provides sufficient deterrence from any attacking nation by creating a **fear of the consequences** (Second strike).
- **Massive Retaliation:** As per the Nuclear Doctrine, India's second strike would be massive and the Triad supplements it.
 - Hence, the Triad provides **resilience** and **feasibility** to counter.

Limitations of India's Nuclear Triad

The deterrence of a nuclear triad depends on the vehicles (platforms) and the capabilities of missiles. The Nuclear Triad of India, though complete, still faces a few shortcomings.

- **Regarding sea-based components:**

- There is a need for **more than one SSBN** (nuclear-powered ballistic missile submarine) to ensure continuous deployment at sea.
- The K-15 missiles' utility is **limited by its 750 km range**, which means that to counter China, submarines need to be present in the South China Sea to make the K-15 effective.
- The INS Arihant has the capacity to carry a **lesser number** of long-range **K-4** missiles (still in development).

- **Regarding Strategic Bombers:**

- The air component of the triad includes nuclear warheaded **Strategic Bombers** for which India depends on other countries like Russia (**Sukhoi**), France (**Rafale**), etc.
- This increases the **import burden** on the country as well. Thus, indigenisation of the platforms and missiles is the need of the hour.

- **Regarding land-based components:**

- India has ICBMs as part of the triad but these can be tracked by Ballistic Missile Defence technology in the early phase of flight.
- Other advanced technologies such as **Fractional Orbital Bombardment Systems (FOBS)**, **Hypersonic Glide Vehicles**, **Hypersonic Cruise Missiles**, etc. need to be developed, and these are in the development stage in India.

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