K4 Missile: India’s New Nuclear-Capable Ballistic Missile

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Context:

India has recently tested its **K4 missile**, a **submarine-launched ballistic missile (SLBM)**, significantly boosting its nuclear deterrence and strategic capabilities. The test, which took place in the **Bay of Bengal**, demonstrated India's progress in enhancing its second-strike capability and strategic defense posture.

Key Details of the K4 Missile:

- **Type**: Submarine-launched ballistic missile (SLBM)
- Unlike submarine-launched cruise missiles, SLBMs are capable of delivering nuclear payloads over long distances.
- Modern SLBMs often carry **Multiple Independently Targetable Reentry Vehicles (MIRVs)**, enabling a single missile to strike multiple targets.
- **Range**: **3,500 kilometers**
- This range allows India to target distant regions while maintaining a strategic deterrent, even from underwater platforms.
- **Guidance System**:
- The missile uses a **combination of inertial navigation system**, **GPS/NavIC satellite guidance** for mid-course corrections, and **terrain contour matching** for terminal guidance, ensuring precision and accuracy.
- **Engine and Propellant**:
- The missile features a **two-stage solid rocket motor** and utilizes **solid rocket propellant**, enhancing its reliability and efficiency.

- **Key Feature**:
- The K4 missile is an adaptation of the **land-based Agni-III missile**, specifically designed for launch from submarines. This is crucial for ensuring a **credible second-strike option**, which is vital for a nation's nuclear deterrence strategy.

Strategic Significance:

- The successful development and testing of the K4 missile enhance India’s strategic defense capabilities by providing a **credible second-strike capability**. This ensures that, even in the event of a nuclear attack, India can retaliate effectively from submarines, which are harder to detect and target.
- **India’s Defense Research**: The **Defence Research and Development Organisation (DRDO)**, the agency responsible for this development, plays a pivotal role in strengthening India’s defense capabilities. DRDO was established in 1958 and has since been at the forefront of India's military technology development.

This missile test marks a significant milestone in India's nuclear deterrence strategy, reinforcing its defense readiness and maintaining stability in the region.

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