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# INS Aridhaman and the Completion of India's Nuclear Triad: Power, Prudence, and Provocation

THE HINDU

12 April 2026

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# INS Aridhaman and the Completion of India's Nuclear Triad: Power, Prudence, and Provocation

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## INTERVIEW ANGLE

"India now has three SSBNs but its longest-range operational SLBM (K-4) can only reach parts of China — does completing the triad actually complete minimum credible deterrence?"

## WHY IN NEWS

India commissioned **INS Aridhaman (S4)** — its third nuclear-powered ballistic missile submarine (SSBN) — in early April 2026, significantly strengthening the naval leg of India's nuclear triad. *The Hindu* editorial examines whether the commissioning completes India's deterrence architecture or whether critical capability gaps remain, particularly in range and survivability.

## THE TRIAD — WHY THE SEA LEG MATTERS MOST

India's **No First Use (NFU)** nuclear doctrine — announced in 1999, reaffirmed in the 2003 Draft Nuclear Doctrine — is only credible if India retains a **survivable second-strike capability**: the ability to absorb a first nuclear strike and still retaliate with catastrophic force.

The three legs of a nuclear triad:

LEG	INDIA'S PLATFORM	
<b>Land (ICBMs/IRBMs)</b>	Agni-IV (3,500 km), Agni-V (5,000+ km)	Fixed or semi-mobile; potentially targetable in pre-emptive strike
<b>Air (aircraft)</b>	Rafale, Su-30 MKI (nuclear-capable)	Airfields can be targeted; pilots detectable
<b>Sea (SSBNs)</b>	Arihant class — Arihant, Arighat, Aridhaman	Hardest to find; most survivable; best second-strike assurance

The sea leg — SSBNs operating silently in ocean depths — is the most survivable. An adversary cannot preemptively destroy what it cannot locate. This is why **India’s SSBN programme, known as the Advanced Technology Vessel (ATV) project**, is the crown jewel of India’s nuclear deterrence.

## INS ARIDHAMAN — WHAT MAKES IT DIFFERENT

INS Aridhaman (S4, Arihant class) is a significant step up from its predecessors:

PARAMETER	INS ARIHANT (S <sub>2</sub> )	INS ARIGHAT (S <sub>3</sub> )	INS ARIDHAMAN (S <sub>4</sub> )
Displacement	~6,000 tonnes	~6,000 tonnes	<b>~7,000 tonnes</b>
Length	~111 m	~111 m	<b>~130 m</b>
VLS missile tubes	4	4	<b>8</b>
K-15 Sagarika capacity	Up to 12	Up to 12	<b>Up to 24</b>
K-4 SLBM capacity	Up to 4	Up to 4	<b>Up to 8</b>
Indigenous content	~55%	~70%	Higher

Key improvement: Aridhaman **doubles the missile payload** (8 VLS tubes vs 4), doubles the K-4 capacity (range: 3,500 km), and carries a higher acoustic-stealth profile. Built at the **Ship Building Centre, Visakhapatnam**.

## INDIA’S OPERATIONAL SLBM ARSENAL

MISSILE	RANGE	STATUS
K-15 Sagarika	750 km	Operational
K-4	3,500 km	Operational
K-5	6,000 km (est.)	In development — not yet deployed

The **K-4 (3,500 km)** is currently India’s longest-range operational submarine-launched ballistic missile. Launched from the Bay of Bengal, it can reach most of China — but not the northwestern Xinjiang region or Beijing if launched from India’s home waters.

**The K-5 (estimated 6,000 km)** — reportedly being developed for Aridhaman — would provide full-China coverage from Indian Ocean patrol areas. However, it is **not yet an operational missile** and has not been confirmed as deployed on Aridhaman.

## THE CREDIBILITY QUESTION

*The Hindu* editorial raises a pointed question: **Does completing the triad complete deterrence?**

### **The Range Gap**

- A submarine operating in India's home waters (Bay of Bengal, Arabian Sea) with the K-4 can reach China's eastern seaboard and most major cities
- But credible deterrence against China requires **assured second-strike capability regardless of patrol area**
- If India's SSBNs are limited to coastal waters due to acoustic signature or tracking concerns, the deterrent value is reduced

### **The Anti-Submarine Warfare Threat**

China's rapidly improving Anti-Submarine Warfare (ASW) capabilities — including ASW aircraft, hunter-killer submarines, and undersea surveillance networks — mean that India's SSBN survivability is not guaranteed. India needs to improve:

- **Acoustic stealth** (quieter reactors and propulsion)
- **Long-range patrol capability** (to operate far from Chinese ASW reach)
- **Undersea communication systems** (to maintain command-and-control during a strike)

## STRATEGIC CONTEXT — CHINA'S BUILD-UP

China currently operates:

- 6 Type 094 (Jin-class) SSBNs
- The JL-3 SLBM (range: ~10,000 km) — capable of striking CONUS from Chinese home waters

India's 3 SSBNs with the K-4 (3,500 km) represent a real deterrent but not strategic parity. *The Hindu* editorial is not arguing for parity — India's doctrine is **minimum credible deterrence**, not maximum or mutual assured destruction — but argues that "minimum" must keep pace with adversary capability improvements.

## THE INDIGENISATION ACHIEVEMENT

The ATV programme represents India's most sophisticated indigenous defence undertaking — arguably more complex than any surface warship or aircraft:

- **Miniaturised pressurised water reactor:** 83 MW (Arihant) and an upgraded version (Aridhaman) — entirely indigenous design
- **Integrated Combat Management System:** indigenous

- **Sensor suite:** largely indigenous
- **VLS tubes and launch systems:** indigenous

The programme demonstrates that India’s **DRDO, BARC (Bhabha Atomic Research Centre), and Navy** can collaborate on systems of extreme technical complexity. The lessons from the ATV programme are now being applied to India’s next-generation nuclear submarine (S5 and beyond).

## UPSC RELEVANCE

PAPER	ANGLE
GS2 — Security	India’s nuclear doctrine (NFU); nuclear triad; minimum credible deterrence; China-India-Pakistan nuclear equation
GS3 — Defence Production	ATV programme; indigenous SSBN; DRDO + BARC + Navy collaboration
GS2 — IR	India’s strategic posture; deterrence stability in South Asia
Prelims	NFU doctrine; SSBNs by name (Arihant, Arighat, Aridhaman); K-4 range; VLS tubes
Interview	Does India’s No First Use doctrine remain credible given Pakistan’s tactical nuclear weapons?

*Commissioned: **early April 2026** | Type: SSBN (nuclear-powered ballistic missile submarine) | Class: Arihant | Built at: **Ship Building Centre, Visakhapatnam** | Programme: **Advanced Technology Vessel (ATV)** | Displacement: **~7,000 tonnes** | Length: **~130 m** | VLS tubes: **8** (vs 4 in Arihant/Arighat) | K-4 capacity: **up to 8** | K-4 SLBM range: **3,500 km** | K-15 range: **750 km** | India now has: **3 SSBNs** (Arihant + Arighat + Aridhaman) | India’s nuclear doctrine: **No First Use (NFU)** | Minimum Credible Deterrence | Nuclear triad: land (Agni) + air (Rafale/Su-30 MKI) + sea (Arihant class) | GS2: Security & Defence; GS3: Defence Production, S&T*

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