India’s first indigenous ballistic missile submarine

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Manifest pedagogy

The questions on the defence carriers, warheads, weapons and equipment appear in the Prelims. In mains, the questions on defence capabilities, doctrines and policies appear. One can list all facts separately and revise for prelims and the write-ups can be used for comprehensive mains coverage.

In news:

India’s first indigenous ballistic missile submarine (SSBN), the INS Arihant, had completed its first deterrent patrol.

Placing it in syllabus:

1. Science and Technology- developments.
2. Indigenization of technology and developing new technology.

Static dimensions:

1. Nuclear Triad
2. Nuclear Security Doctrine
3. Nuclear Command Authority
4. Stealth Technology

Current dimensions:

1. INS Arihant
2. India’s defence/naval/submarine capabilities

Content:

After the successful patrol by India's first indigenous ballistic missile submarine (SSBN), the INS Arihant, India has officially entered the triad of its nuclear capabilities – on land, air, and sea.

Features of INS Arihant:

Feature	Details
Displacement	6000 tonne
Speed	Submerged: 24 knots Surfaced: 15 knots
Test depth	350m
Men Capacity	95-100 officers and men
Sensors used	USHUS sonar Panchendriya (The first indigenously developed sonar system for submarines)

The submarine's exterior is uneven and the hull is placed on a mat covered with tiles. The tiles help in absorbing sound waves and provide **stealth capability** to the submarine.

A strategic deterrent patrol is one where an SSBN with a full complement of nuclear-tipped missiles sails towards its intended area of deployment and within range of an adversary's targets.

In case of an attack by a nuclear-armed adversary, **India's Nuclear Command Authority (NCA)** can order the submarine to launch its weapons.

Deterrent patrols are meant to dissuade a potential nuclear-armed adversary from launching a nuclear first strike. Once a submarine sails out into the deep ocean, it is extremely difficult to detect, track and destroy, making it the most

survivable platform of the nuclear triad that consists of aircraft-dropped and ground-fired nuclear missiles.

All five permanent members of the UN Security Council deploy their SSBNs on deterrent patrols. The robustness of the deterrent is decided by missile ranges, number of weapons and, most critically, the ability to have one platform on continuous patrol. China was the last entrant into this club with its SSBN making its first deterrent patrol as recently as December 2015.

The Nuclear Command Authority (NCA)

The NCA comprises of an Executive Council and a Political Council. The Chairman of the Political Council is the Prime Minister. The Executive Council is chaired by the National Security Advisor (NSA).

It is the sole body which can authorise the use of nuclear weapons.

The order will be passed via a sophisticated Extremely Low Frequency (ELF) communication system.

Nuclear Triad

A **nuclear triad** is a three-pronged military force structure that consists of land-launched **nuclear** missiles, **nuclear**-missile-armed submarines and strategic aircraft with **nuclear** bombs and missiles.

The triad becomes effective when you have a submarine operational at all times, and that would require a fleet of four such vessels at the very least.

INS Arihant was inducted into service in August 2016.

Three other SSBNs are being built under the Defence Research and Development Organisation’s Advanced Technology Vessel (ATV) project in Vizag.

Stealth technology

To understand stealth technology, we need to know about the basic working principle of a radar. A radar sends out electromagnetic waves, which reflect on an obstruction and return. This signal is processed in order to determine the exact position, size and direction of target. This spoils the element of surprise of the attacking party.

Stealth technology works on the principle of eliminating radar reflections. This can be done by either

- Absorbing radio waves (RAM coatings)
- Deflecting radio waves (Shaping of the surfaces)

The radio waves are electromagnetic waves of varying frequencies. The methods of deflection and absorption of EM waves complement each other in order to create a stealth aircraft/ship.

Naval Stealth:

The most widely spread misconception of stealth warships is that they are invisible to radar and are as stealthy as stealth aircraft. Stealth ships are in fact very much visible on radar. But the difference is that the ships would be detected at the same distance, but will appear with a much smaller blip on the radar and the enemy will not know the difference between these warships and smaller merchant ships. Naval stealth is mainly to appear smaller and blend in with other ships and boats.

Nuclear Security Doctrine

The essential purpose of any **nuclear doctrine** is to codify a country’s beliefs and principles to guide action and ensure uniformity of “thought and action” during peace and war. In other words, the **nuclear doctrine** conveys the underlying conditions about **nuclear** weapons use to the adversary in an

unambiguous manner.

India had made its Nuclear Doctrine in 2003 and the characteristics of India's Nuclear Doctrine are as follows;

1. The basic principle of India's nuclear doctrine is "No First Use". According to this policy, nuclear weapons will only be used in retaliation against a nuclear attack on Indian Territory or on Indian forces anywhere.
2. India needs to build and maintain a Credible Minimum Deterrent. This includes;
3. Sufficient and survivable nuclear forces to inflict unacceptable damage to the enemy.
4. Nuclear Forces must be operationally prepared at all times.

- Effective Intelligence and Early Warning Capabilities.

1. Communication of Deterrence Capability to the enemy.
2. If a country invades India by nuclear missile, its retaliation will be this much massive and terrible that the enemy experience an unacceptable damage and would not be able to recover easily.
3. The right to take nuclear action against the enemy will only be taken by the elected representatives of the people, i.e. the political leadership of the country, although the cooperation of the Nuclear Command Authority will be necessary.
4. Nuclear weapons will not be used against non-nuclear state.
5. If there is any chemical or biological attack against India or Indian security forces, then India will keep the option of nuclear attack open in its response.
6. A continuance of strict controls on export of nuclear and missile related materials and technologies, participation in the fissile material Cut-off Treaty negotiations and continued observance of the moratorium on nuclear tests.

7. India will continue to support the global initiative to create a nuclear free world and will push forward the idea of discrimination free nuclear disarmament.

Test Yourself: Mould your thoughts

What is a nuclear triad? Do you think with this India is moving towards Credible Minimum Deterrence? Explain.