



Indian Submarines and Naval Ships for UPSC Exam

Project 75 India

- P75I was first cleared in 2007, but lay dormant until now after undergoing numerous changes.
- The P75I project is part of a 30-year submarine building plan that ends in 2030.
- The project cost is about Rs. 45,000 crore.
- As part of this plan, India was to build 24 submarines — 18 conventional submarines and six nuclear-powered submarines (SSNs) — as an effective deterrent against China and Pakistan.
- This project envisages the construction of six conventional submarines with better sensors and weapons and the **Air Independent Propulsion System (AIP)**.
- The project has been cleared under the strategic partnership model.

Background

- In 1999, the **Cabinet Committee on Security** had approved a '**30-Year Plan for Indigenous Submarine Construction**'. It was to develop two production lines on which six submarines would be built each named **Project 75** and **Project 75 (I)** with foreign submarine makers.
- These two projects will replace ageing **Sindhughosh** and **Shishumar** class submarines of Indian Navy, which numbered around 13.
- The submarines in the **P75 Scorpene-Class** are powered by the **conventional diesel-electric propulsion system**.
- The **first Scorpene submarine, Kalvari**, was commissioned in **2017** and it would go for a normal refit after six years in 2023, during which time the **Air-Independent Propulsion (AIP)** would be installed.
- **AIP technology** is being developed by the **Defence Research and Development Organisation (DRDO)** to provide submarines **long-range and extended endurance capabilities undersea**.
- **Second Scorpene Khanderi** was inducted in



September 2019.

The third Scorpene submarine, Karanj, will be delivered to the Indian Navy by December 2020.

- The remaining submarines (**Vela, Vagrir, and Vagsheer**) in the series are in advanced stages of manufacturing and trials.

Air-independent propulsion (AIP)

- AIP is any marine propulsion technology that allows a non-nuclear submarine to operate without access to atmospheric oxygen.
- It can augment or replace the diesel-electric propulsion system of non-nuclear vessels.

PROJECT

28

- **P 28** is a project under which four Anti Submarine Warships have to be built indigenously in India by **Garden Reach Shipbuilders And Engineers (GRSE) , Kolkata.**
- *Project 28* was approved in 2003, with construction of the lead ship, INS Kamorta commencing on 12 August 2005.
- Three of the four corvettes, **INS Kamorta , INS Kadmatt** and **INS Kiltan** were commissioned in 2014, 2016 and 2017 respectively.
- **INS Kavaratti** is under construction and slated to be completed by end of 2017.



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- The warships are named after the islands in the **Lakshadweep archipelago**.
 - The *Kamorta* class corvettes are intended to succeed the Kora-class corvette by precedence and Abhay-class corvette by role.
 - *Project 28's* objective was to enhance localization and development of warship construction industry in India.
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Project 15B

- Project 15B is a class of stealth guided missile destroyers currently under construction for the Indian Navy.
- It is also known as the Visakhapatnam class.

The class comprises four ships

- INS Visakhapatnam
- INS Mormugao
- INS Imphal
- INS Porbandar
- All of the destroyers are being built by the Mazagon Dock Limited (MDL) in Mumbai.
- These ships have been designed indigenously by the Indian Navy's Directorate of Naval Design, New Delhi.
- The destroyers are an improved version of the Kolkata-class (Project 15A) and will feature enhanced stealth characteristics.



Features

- The P15B destroyers incorporate new design concepts for improved survivability, sea keeping, stealth and manoeuvrability.
 - Enhanced stealth features and use of radar transparent deck fittings which make these ships difficult to detect.
 - P15B ships will be equipped to carry and operate two multiple role helicopters.
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Akula Class – Attack Submarine

Types

- **Conventional Submarines:** These are the ones which are powered by electric motors and batteries.
E.g. Project-75 Class Submarines
- **Nuclear Powered Ballistic Submarines:** These are powered by nuclear fuel, thereby capable of operating underwater for longer durations. Primary role of such submarines is to provide strategic deterrence.
E.g. INS Arihant
- **Nuclear Powered and Armed Submarines (SSN):** These marines have unlimited endurance and high speeds and are armed with cruise missiles and heavyweight torpedoes, thus complementing carrier battle groups.
E.g. Akula Class Submarines.

Akula Class Submarines

- The Akula Class Submarine uses a nuclear reactor for propulsion, allowing it to remain underwater for an extended period of



time which makes its detection impossible.

- This class of Submarine can be used for multiple tasks like hunting enemy submarines, intelligence surveillance etc.
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INS Chakra

- INS Chakra is a Russia-made, nuclear-propelled, hunter-killer akula class submarine.
 - INS Chakra is one of the quietest nuclear submarines around, with noise levels next to zero.
 - INS Chakra has been taken on lease from Russia for 10 years and would provide the Navy the opportunity to train personnel and operate such nuclear-powered vessels.
 - The INS Chakra joined the Eastern Naval Command at Visakhapatnam in 2012.
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INS Arihant

- INS Arihant is the first of five nuclear missile submarines planned for induction.
 - It is to be equipped with K 15 (or BO-5) shortrange missiles with a range of over 700 km and the K 4 ballistic missile with a range of 3,500 km.
 - At present, the only nuclear - powered platform in service is the INS Chakra, a Akula class SSN on lease from Russia.
 - The induction of INS Arihant marks the completion of India's nuclear triad.
 - A nuclear triad refers to the nuclear weapons delivery via land, air and sea i.e. land-based intercontinental ballistic missiles (ICBMs), strategic bombers, and submarine-launched ballistic missiles (SLBMs).
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INS Kiltan

- It is the indigenously-built anti-submarine warfare stealth corvette.
- It has been recently inducted into the Indian Navy.
- It is the latest indigenous warship after Shivalik Class, Kolkata Class and sister ships INS Kamorta and INS Kadmatt.
- It is India's first major warship to have a superstructure of carbon fibre composite material resulting in improved stealth features.
- The ship derives its name from one of the islands in Aminidivi group of the Lakshadweep and Minicoy group of islands.

Losharik (AS-12 or AS-31)

- It is a highly advanced **Nuclear powered submarine** of **Russia**.
- This week a fire accident was reported on the submarine within the Russian territorial waters.
- It is a deep-diving special missions ship, operated by the Russian Navy.
- It is capable of withstanding high pressures at great depths, enabling it to survey the ocean floor.
- It's interior hull is built using titanium spheres which makes the vessel dive up to 6000 metres. A regular submarine can go to the depth of only 600 metres.
- It is generally carried under the hull of a larger submarine and is capable of releasing a smaller submarine itself.
- According to Russian military the submarine was carrying out 'bathymetric measurements' or underwater mapping.
- But the the US and its allies



feared that Russia might be developing new, secretive ways to tap or even cut undersea **Fiber-optic cables** that carry transatlantic Internet traffic.

- In recent years, U.S. and British military officials have warned that Russian submarines have been spotted close to the cables.
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INS Shivalik and INS Sindhukirti

- These are the Indian Navy's **indigenously** conceived design and constructed frontline stealth frigate.
 - **INS Shivalik** is the **Shivalik-class** advanced, stealth-minded, guided-missile frigate warship.
 - It is the **first stealth warship** built by India at Mazagon Dock Limited in Mumbai s part of the Indian Navy's **Project 17**.
 - It is equipped with a wide range of electronics and sensors.
 - In addition, it uses **HUMSA** (hull-mounted sonar array), **ATAS/Thales** Sintra towed array systems.
 - It is equipped with a mix of Russian, Indian and Western weapon systems.
 - It also has improved stealth and land attacking features over the preceding *Talwar*-class frigates.
 - It is the first Indian navy ship to use the **CODOG** (COmbined Diesel Or Gas) propulsion system.
 - **INS Sindhukirti** is the seventh **Sindhughosh-class, diesel-electric submarine** of the Indian Navy, built at the Admiralty Shipyard and Sevmash in the Soviet Union.
 - It is among the oldest operational submarines in the Navy.
 - It has been virtually rebuilt with modern sensors weapons and systems which make it "a hole in the water" for the Navy.
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INS Sagardhwani

- It is the Oceanographic research vessel of **DRDO**.
- It is maintained and operated by the Indian Navy.
- It is a 'Marine Acoustic Research Ship' (**MARS**) designed and developed by 'Naval Physical and Oceanographic Laboratory' (**NPOL**), Kochi.
- NPOL is a premier systems laboratory of DRDO.
- The ship is fitted with state-of-the-art equipments like the latest wave height measuring radars, marine radio etc.
- It is exclusively used for the scientific and research programmes of NPOL.

INS Tarkash

- It is a state-of-the-art stealth frigate of the Indian Navy.
- It is the 5th Talwar-class frigate constructed for the Indian Navy, built at the Yantar shipyard in Kaliningrad, Russia.
- It is equipped with a versatile range of weapons and sensors capable of addressing threats in all three dimensions.

INS Nilgiri



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- INS Nilgiri is the first ship of the **Project-17A**.
 - **Project 17A** frigates is a design derivative of the **Shivalik class stealth frigates** with much more advanced stealth features and **indigenous weapons and sensors**.
 - The P17A frigates incorporate new design concepts for improved survivability, sea keeping, stealth and ship manoeuvrability.
 - These frigates are being built using integrated construction methodology.
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India's Aircraft Carrier

- Currently, Indian Navy opera only a single carrier, the 44,000-tonne INS Vikramaditya bought from Russia.
- INS Vikrant, is an indigenous aircraft carrier being built in Cochin Shipyard.
- It is a 40, 000 tonne carrier and expected to join service by 2021.
- INS Vishal, proposed to be India's 2nd indigenous aircraft carrier has stalled since 2017 awaiting defence ministry's clearance.
- It was conceived as 65,000 tonne class carrier. The clearance was mainly delayed owing to its production cost.
- Recently, Indian government has approached UK to build state of the art aircraft carrier along the lines of Britain's HMS Queen Elizabeth.
- The talks are under way to buy detailed plans for the 65,000-ton British warship to build a so-called "copycat supercarrier" to be named INS Vishal in 2022.
- This India-UK Naval deal would follow the sale of INS Viraat to India in 1987, which was decommissioned 2 years ago.

INS VISHAL:



- INS Vishal, also known as Indigenous Aircraft Carrier 2(IAC-2), is a planned aircraft carrier to be built by Cochin Shipyard Limited for the Indian Navy.
- It is intended to be the second aircraft carrier to be built in India after INS Vikrant(IAC-1), and the first supercarrier to be built in India.
- The proposed design of the second carrier class will be a new design, featuring significant changes from Vikrant, including an increase in displacement.
- An Electromagnetic Aircraft Launch System (EMALS) CATOBAR system is also under consideration. Its name Vishal means 'giant' in Sanskrit.

INS Sahyadri

- INS Sahyadri is an indigenously built stealth frigate.
- It participated in trilateral Malabar war games with Japan and the U.S. off the Coast of Guam.
- It recently participated in RIMPAC and has been adjudged **runner-up in an innovation competition.**
- INS Sahyadri presented the 'idea of integrating yoga into our daily life as technology for well-being during extended deployments for ships'.
- The idea was appreciated by representatives of participating countries.

Operation 'Madad'



- The operation 'Madad' has been launched by the Southern naval command at Kochi.
- It is for assisting the state administration of Kerala and undertaking disaster relief operations due to the unprecedented flooding experienced in many parts.
- Flooding in many parts is due to incessant rainfall and release of excess water from Idukki and other dams.
- INHS Sanjivani has been deployed for rendering medical assistance.

Submarines list of the Indian Navy for UPSC Exam

Class	Type	Boats	Origin
Nuclear-powered submarines (2)			
<u>Chakra (Akula II) class</u>	<u>Attack submarine (SSN)</u>	<u>INS Chakra</u>	<u>Russia</u>
<u>Arihant class</u>	<u>Ballistic missile submarine (SSBN)</u>	<u>INS Arihant</u>	<u>India</u>
Diesel-electric submarines (14)			
<u>Shishumar class</u>	<u>Attack submarine</u>	<u>INS Shishumar</u> <u>INS Shankush</u> <u>INS Shalki</u> <u>INS Shankul</u>	<u>West Germany</u> <u>India</u>
<u>Kalvari class</u>	<u>Attack submarine</u>	<u>INS Kalvari</u> <u>INS Khanderi</u>	<u>France</u> <u>India</u>
<u>Sindhughosh class</u>	<u>Attack submarine</u>	<u>INS Sindhughosh</u> <u>INS Sindhudhvaj</u> <u>INS Sindhuraj</u> <u>INS Sindhuratna</u> <u>INS Sindhukesari</u> <u>INS Sindhukirti</u> <u>INS Sindhuvijay</u> <u>INS Sindhurashtra</u>	<u>Soviet Union</u> <u>Russia</u>



Planned

Class	Type	Boats	Origin
Nuclear submarines (1)			
<i>Arihant class</i>	Ballistic missile submarine (SSBN)	INS Arighat	India
Diesel-electric submarines (5)			
Kalvari class	Attack submarine	INS Karanj INS Vela INS Vagi INS Vagsheer	France India

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