INS Karanj

Why in News

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

- INS Karanj is a part of **Project-75** and was launched in **January 2018.** It is currently in advanced stages of sea trials.

Project-75

- It is a programme by the **Indian Navy** that entails building **six Scorpene-Class attack submarines.**
- The programme has been undertaken with transfer of technology from French company Naval Group (formerly known as DCNS) at the Mazagon Dock Limited (MDL).
- 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 remaining submarines **(Vela, Vagir, and Vagsheer)** in the series are in advanced stages of manufacturing and trials.

Air-Independent Propulsion

- Conventional submarines use a diesel-electric engine, and must surface for oxygen required for fuel combustion. If fitted with an **Air Independent Propulsion (AIP) system,** the submarine

needs to take in oxygen less frequently.

- While many naval powers, including India, have acquired **nuclear-powered submarines** for deep-sea operations, conventional diesel-electric variants are considered useful for coastal defence. The latter are optimised for stealth, and their weapons and sensors provide for effective operations close to the shore.
- Diesel-electric submarines require them to come to the surface frequently to charge their batteries, their underwater endurance time is less. 'Air-independent' propulsion technology helps to make the diesel generator less dependent on surface air.

Source: TH

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