



Abort Mission for Gaganyaan

For Prelims: Abort Mission for Gaganyaan, ISRO, GSLV Low Earth Orbit, ISS

For Mains: Gaganyaan Mission and its Significance

Why in News?

[Indian Space Research Organisation \(ISRO\)](#) will conduct **two unmanned 'Abort Mission'** in 2022 to ensure crew safety during the Gaganyaan mission.

- This is a part of **ISRO's roadmap for the country's first manned flight to space.**
- The first test vehicle for this purpose was **launched in September 2021.**

Why Abort Mission Before Gaganyaan?

- The abort missions are **meant to test the systems that can help the crew escape from the spacecraft mid-flight in case of a failure.**
 - ISRO already conducted a pad abort test — where the crew can escape from the spacecraft in case of an emergency at the launch pad — in 2018.
- For the abort missions, ISRO has **developed test vehicles that can send the systems up to a certain height, simulate failure, and then check the escape system.**
 - Escape system is designed with **five “quick-acting” solid fuel motors with a high burn rate propulsion system**, and fins to maintain stability.
- The crew escape system **will separate from the crew module by firing explosive nuts.**
- ISRO's focus is **on perfecting the system that will launch and land Indians on missions to space and to protect the astronauts** if the mission fails.

What is Gaganyaan Mission?

- **About:**
 - Gaganyaan is a mission by the [Indian Space Research Organisation \(ISRO\)](#).
 - Under the Gaganyaan schedule (to be launched in 2023):
 - Three flights will be sent into orbit.
 - There will be two unmanned flights and one human spaceflight.
 - The Gaganyaan system module, **called the Orbital Module** will have three Indian astronauts, including a woman.
 - It will circle Earth at a [low-earth-orbit](#) at an altitude of 300-400 km from earth for 5-7 days.
- **Payloads:**
 - The payload will consist of:
 - **Crew module:** Spacecraft carrying human beings.
 - **Service module:** Powered by two liquid propellant engines.
 - It will be equipped with emergency escape and emergency mission abort.
- **Launch:**

- [GSLV Mk III](#), also called the **LVM-3** (Launch Vehicle Mark-3,) the three-stage heavy lift launch vehicle, will be used to launch Gaganyaan as it has the necessary payload capability.
- **Training in Russia:**
 - In June 2019, the Human Space Flight Centre of the ISRO and the Russian government-owned Glavkosmos signed a contract for the training, which includes Russian support in the selection of candidates, their medical examination, and space training.
 - The candidates will study in detail the systems of the Soyuz manned spaceship, as well as be trained in short-term weightlessness mode aboard the Il-76MDK aircraft.
 - The Soyuz is a Russian spacecraft. The Soyuz carries people and supplies to and from the space station.
 - The Il-76MDK is a military transport plane specially designed for parabolic flights of trainee astronauts and space tourists.

What is the Significance of Gaganyaan Mission?

- **Enhancement of Science and Technology:**
 - It will help in enhancement of science and technology levels in the country and help inspire youth.
 - Gaganyaan will involve numerous agencies, laboratories, disciplines, industries and departments.
 - It will help in the development of technology for social benefits.
- **Improvement of Industrial Growth:**
 - It will help in the improvement of industrial growth.
 - Recently, the Government has announced a new organisation, IN-SPACe, part of reforms to increase [private participation in the space sector](#).
- **International Collaboration:**
 - It will help in improving international collaboration.
 - One [International Space Station \(ISS\)](#) put up by multiple countries may not be enough. Regional ecosystems will be needed and Gaganyaan will focus on regional needs: food, water and energy security.

What are the other Upcoming Projects?

- **Chandrayaan-3 Mission:** India has planned a new moon mission named [Chandrayaan-3](#). It is likely to be launched in 2022.
- **Shukrayaan Mission:** The ISRO is also planning a mission to Venus, tentatively called Shukrayaan.
- **XpoSat:** Space observatory, XpoSat, designed to study cosmic x-rays.
- **Aditya L1 mission:** It will see an Indian spacecraft going 1.5 million kms away to the L1 or Lagrangian point between the Sun and Earth.
 - There are five Lagrangian points between any two celestial bodies where the gravitational pull of both the bodies on the satellite is equal to the force required to keep the satellite in orbit without expending fuel, meaning a parking spot in space.

[Source: IE](#)