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Mission Gaganyaan

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Why is in news? First batch of crew recovery team of Mission Gaganyaan completed Phase-1 of training

The first batch of crew recovery team of Mission Gaganyaan completed Phase-1 of training at Indian Navy's Water Survival Training Facility (WSTF) at Kochi.

Utilising the state of the art facility, the team comprising of Indian Naval Divers and Marine Commandos underwent recovery training of crew module in varied sea conditions.

The two weeks training capsule covered a brief on the conduct of the mission, actions to be taken during medical exigencies and familiarisation with different aircraft and their rescue equipment.

Gaganyaan was initially envisaged that the Rs. 10,000 crore, the mission aims to send a three-member crew to space for five to seven days by 2022 when India completes 75 years of independence.

First unmanned mission is planned in December 2021. It has been **delayed due to the Covid-19 induced lockdown**. The mission is **expected to be launched in 2023**.

Gaganyaan is a mission by the **Indian Space Research Organisation (ISRO)**.

Under the Gaganyaan schedule: 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.

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.

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.

With this launch, **India will become the fourth nation** in the world to **launch a Human Spaceflight Mission** after the **USA, Russia and China**.

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.

Significance of the Gaganyaan mission:

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It will help India in **achieving self-reliance, in line with the vision of Atma Nirbhar Bharat** and also boost the capacity development in launching satellites under the Make in India Initiative.

It will **reduce India's dependence on foreign cooperation** in this direction.

It will also **enhance the research and development (R&D) at science and technology levels** especially in the space sector.

It is **in line with India's progress towards a sustained and affordable human and robotic programme** to explore the solar system and beyond.

Gaganyaan will **focus on regional needs** because one International Space Station (ISS) may not be enough to cater to global requirements.

The programme **will strengthen international partnerships and global security** through the sharing of challenging and peaceful goals

Challenges:

Environmental Hazards: Hostile space environment with a lack of gravity and atmosphere and danger of radiation.

Astronauts may have **medical issues due to Microgravity** (Transition from one gravity field to another affects hand-eye and head-eye coordination leading to orientation-loss, vision, muscle strength, aerobic capacity, etc.) and **isolation** (Behavioural issues are likely to crop up when astronauts are confined into small spaces and have to rely on limited resources).

They may encounter depression, cabin fever, fatigue, sleep disorder and other psychiatric disorders.

Artificial Atmosphere: There are two choices for an artificial atmosphere, **either an Earth-like mixture of oxygen in inert gas or pure oxygen**. A pure or concentrated oxygen atmosphere is toxic and has fire risk, especially in ground operations.

Aerospace Technology Challenges: Space flight requires much higher velocities than air transportation. Travelling in a rocket is like sitting on an exploding bomb with a speed increasing from 0 to over 25,000 km per hour in a few minutes. Anything may go wrong during the launch and pre and post phases, including the explosion of the rocket.