Chandrayaan-3

Published On: 20-02-2023

Why is in news? Chandrayaan-3 lander completes key tests

In a boost to India's moon mission, Chandrayaan-3 successfully underwent **EMI-EMC (Electro - Magnetic Interference/ Electro-Magnetic Compatibility)** at U R Rao Satellite Centre, Bengaluru. The test was conducted between January 31 and February 2. The Indian Space Research Organisation (ISRO) announced this on 19th February.

Chandrayaan-3 interplanetary mission has **three major modules: the Propulsion module, Lander module, and Rover**.

The mission's complexity calls for **establishing radio-frequency (RF) communication links between the modules**.

The EMI-EMC test is conducted for satellite missions to **ensure the functionality of the satellite subsystems in the space environment and their compatibility** with the expected electromagnetic levels.

The Chandrayaan-3 mission is a **continuation of Chandrayaan-2**, which was launched in July 2019 and had the **goal of putting a rover on the lunar South Pole.**

The Vikram lander's subsequent failure prompted the development of a different mission to show off the landing skills required for the 2024 lunar polar exploration mission that is being proposed in collaboration with Japan.

It will have a landing module and an orbiter. **But unlike Chandrayaan-2, this orbiter won't be equipped with a research payload**.

Its job will only be confined to carry the lander to the moon, oversee the landing from its orbit and communicate between the lander and the earth station.

Chandrayaan-2:

Chandrayaan-2 consisted of an **Orbiter, Lander and Rover**, all equipped with scientific instruments to study the moon.

The Orbiter would watch the moon from a 100-km orbit, while the Lander and Rover modules were to be separated to make a soft landing on the moon's surface.

ISRO had named the **Lander module as Vikram**, after Vikram Sarabhai, the pioneer of India's space programme, and the **Rover module as Pragyaan**, meaning wisdom.

It was sent aboard the country's most powerful geosynchronous launch vehicle, the **GSLV-Mk 3**.

However, lander Vikram, instead of a controlled landing, ended up crash-landing and prevented rover Pragyaan from successfully travelling on the surface of the moon.

The Orbiter, Lander, and Rover components of the Mission were assembled with the **intention of investigating the Moon's south pole.**

It sought to explore the Moon's exosphere, surface, and subsurface as a whole in a single mission, rather than just one particular location.

Why was the Lunar South Pole targeted for exploration?

The Lunar South pole is especially interesting because the **lunar surface area that remains in shadow is much larger than that at the North Pole.**

There could be a **possibility of presence of water** in permanently shadowed areas around it.

In addition, the **South Pole region has craters that are cold traps and contain a fossil record** of the early Solar System.

GSLV-Mk 3:

Geosynchronous Satellite Launch Vehicle Mark-III was **developed by Indian Space Research Organisation** (ISRO), is a **three-stage vehicle**, designed to **launch communication satellites into geostationary orbit**.

It has a mass of 640 tonnes that can **accommodate up to 8,000 kg payload to Low Earth Orbit (LEO) and 4000 kg payload to GTO (Geo-Synchronous Transfer Orbit**).