

GSLV

MK III

WHY IN NEWS?



Recently, GSLV MK III D1 rocket (GSAT 19) was launched successfully from Satish Dhawan Space Centre, Sriharikota, Andhra Pradesh

NEED



Currently ISRO's geosynchronous satellite (GSLV MK II) can carry satellites weighing only two tonnes

BACKGROUND

The first experimental flight of LVM3, the LVM3-X/CARE mission lifted off from Sriharikota in 2014 & successfully tested the atmospheric phase of flight. Crew module Atmospheric Reentry Experiment was also carried out in this flight. This was the first testing of the indigenous cryogenic engine

FEATURES



It is the heaviest rocket to be launched from India till now. It can lift payloads of up to 4000 kg to Geosynchronous Transfer Orbit and 10000 kg into the Low Earth Orbit

3 STAGE

It is a three stage vehicle with an indigenous cryogenic upper stage engine (C25). It has been designed to carry heavier communication satellites into the Geosynchronous Transfer Orbit



Apart from the upper cryogenic stage, the vehicle has two solid strap-on motors (S200) and a core liquid booster (L110)



For the first time there will be no transponders on the satellite. It will be using a new way beaming data down using multiple frequency beams. It is therefore called "a high through put satellite"



For the first time, it would have indigenously made Lithium ion batteries



This spacecraft would have advanced technologies including miniaturized heat pipe, fibre optic gyro, Micro Electro-Mechanical Systems (MEMS) accelerometer

SIGNIFICANCE



It would also save foreign exchange reserves of the government provided that presently the heavier Indian communication satellites are launched from the French Guiana



It would also be a foreign exchange earner with foreign customers using the services of GSLV MK III provided by ISRO



It would also act as a carrier to travel people/ astronauts into space



The cost of launches would also be reduced because of introduction of the cryogenic engine



The indigenous components of the rocket would help India to become self-reliant in terms of technology. The indigenous batteries developed can also be used to power electric vehicles in India



It would boost India's communication resources given the fact that there has been a boom of the communication industry in India and there is a high demand for transponders in space related to it

SLV-3



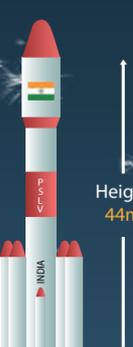
Lift-off weight 17t
Propulsion All Solid
Payload mass 40 kg
Orbit Low Earth Orbit

ASLV



Lift-off weight 39t
Propulsion All Solid
Payload mass 150 kg
Orbit Low Earth Orbit

PSLV-XL



Lift-off weight 320t
Propulsion Solid and Liquid
Payload mass 1860 kg
Orbit 475 km Sun Synchronous Polar Orbit (1300 kg in Geosynchronous Transfer Orbit)

GSLV MK 2



Lift-off weight 414 t
Propulsion Solid Liquid & Cryogenic
Payload mass 2200 kg
Orbit Geosynchronous Transfer Orbit

PAYLOAD MASS 4000 kg

LIFT-OFF WEIGHT 640 t

HEIGHT 43.43 M

ORBIT GEOSYNCHRONOUS TRANSFER ORBIT

PROPULSION SOLID LIQUID & CRYOGENIC

ISRO

GSLV Mk III

INDIA

WAY FORWARD



Indigenous cryogenic engine is the first step to expand the capacity of the communication systems of India. Now India should focus on expanding the technology to carry out a payload of about 6-7 tonnes (many developed countries have this capacity). This would help in improving the telecommunication density in India with the rising aspirations of the population of the country