

# GSLV-D5 / GSAT-14 Mission

05 January, 2014

## THE MISSION

GSLV-D5 carrying on-board the GSAT-14 Satellite lifted-off from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota at 04:18 PM (IST) on January 05, 2014. After a flight of 17 minutes 5 seconds, GSAT-14, a communication satellite, was injected into a Geosynchronous Transfer Orbit with a Perigee of 175 km and an Apogee of 35,945 km with an orbital inclination of 19.3 degree with respect to the equator. Immediately after the injection, ISRO's Master Control Facility took over the control and commanding of GSAT-14. The solar panels of the satellite were deployed as planned, and the satellite was oriented towards the Sun. The first orbit raising operation of GSAT-14 was planned at 07:58 PM (IST) on January 6, 2014. The remaining two orbit raising operations were planned on January 7 and 9, 2014 to place the satellite in geostationary orbit.



## Design Improvements in GSLV-D5

- Redesign of Lower Shroud which protects the cryogenic engine during atmospheric flight of GSLV-D5
- Redesign of the wire tunnel of the cryo stage to withstand larger forces during flight
- Revised Aerodynamic characterisation of the entire launch vehicle
- Inclusion of Video Imaging System to monitor lower shroud movement during various phases of flight
- **Improvements in the Cryogenic Upper Stage:-**
  - ◆ Modified design of the Fuel Booster Turbo Pump (FBTP), taking care of the expansion and contraction of the bearings and casing at cryogenic temperatures
  - ◆ Modification of Ignition Sequence to ensure the smooth, successful and sustained ignition for Main Engine (ME), Steering Engine (SE) and Gas Generator (GG)

In addition, indigenisation of many critical systems including Liquid Hydrogen Propellant Acquisition System (to prevent the possibility of contamination), Polyimide pipelines and Liquid Oxygen & Liquid Hydrogen Level Sensors has been successfully accomplished. In order to validate the design improvements, the following extensive qualification tests have been carried out on the engine at the Main Engine Test (MET) facility and the High Altitude Test (HAT) facility:

- Two acceptance tests for flight unit of FBTP
- High altitude tests to confirm the ignition sequence in flight under vacuum
- Cryogenic Main Engine (200 sec) and Steering Engine (100 sec) acceptance tests

## SPECIFICATIONS

<b>Height</b>	49.13 m
<b>Lift-Off Mass</b>	414.75 t
<b>No of Stages</b>	3
<b>Payloads</b>	GSAT-14
<b>Inclination (deg)</b>	19.3 <sup>0</sup>
<b>Apogee</b>	35,945 km
<b>Perigee</b>	175 km
<b>Launch Pad</b>	Second Launch Pad (SDSC, SHAR)





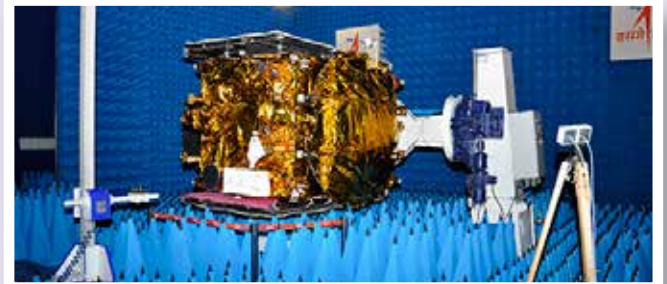
# GSAT-14

## THE SATELLITE

GSAT-14 is the 23<sup>rd</sup> Geostationary Communication Satellite of India built by ISRO. GSAT-14 structure is based on ISRO's 2 ton class platform (I-2K satellite bus). The main objectives of GSAT-14 mission are: To augment the In-orbit capacity of Extended C and Ku-band transponders and to provide a platform for new experiments.

Some of the new experiments being flown on GSAT-14 are:

- Fiber Optic Gyro
- Active Pixel Sun Sensor
- Ka-band beacon propagation studies
- Thermal Control coating experiments



## SPECIFICATIONS

<b>Weight</b>	1928 kg
<b>Power</b>	2600 W, One Li-Ion Battery
<b>Stabilisation</b>	Momentum biased 3-axis stabilised mode
<b>Antennas</b>	One 2 m and One 2.2 m single shell shaped reflector Antennae (transmit and receive)
<b>Type of Satellite</b>	Communication
<b>Payloads</b>	<ul style="list-style-type: none"><li>• Six extended C-band transponders for Indian mainland and island coverage with 36 dBW Edge of Coverage Effective Isotropic Radiated Power (EOC-EIRP)</li><li>• Six Ku-band transponders covering the mainland India with 51.5 dBW EOC-EIRP</li><li>• Two Ka-band Beacons operating at 20.2 GHz and 30.5 GHz to carry out attenuation studies</li></ul>
<b>Mission / Orbit Life</b>	12 Years

