सत्यमेव जयते
Ministry of Earth Sciences

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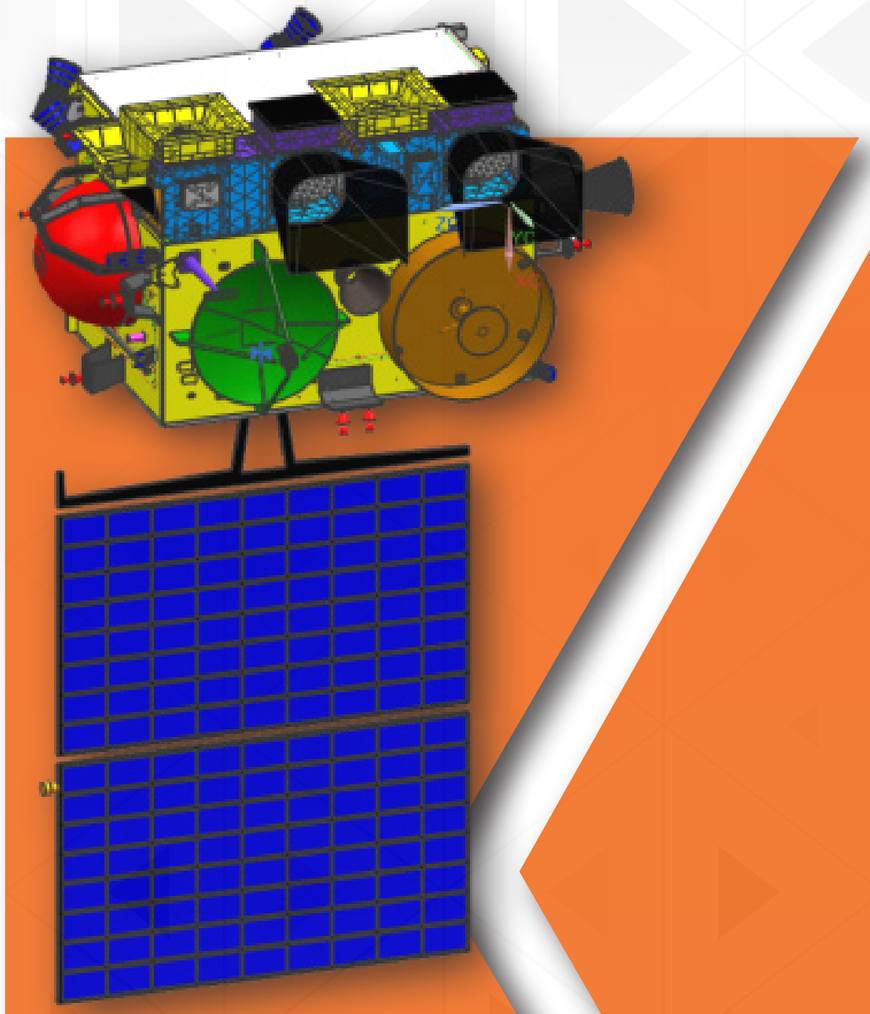


GSLV-F14
INSAT-3DS

GSLV-F14/ INSAT-3DS MISSION

GSLV-F14 is the 16th flight of India's Geosynchronous Satellite Launch Vehicle (GSLV) and the 10th flight with Indigenous Cryo stage. This is the Seventh operational flight of GSLV with indigenous Cryogenic stage. The configuration of GSLV-F14 Payload Fairing is 4m diameter Ogive version.

The GSLV-F14 with indigenous Cryogenic stage will place INSAT-3DS satellite into a Geosynchronous Transfer Orbit. Launch is planned from the Second Launch Pad (SLP) at Satish Dhawan Space Centre, SHAR.

16th

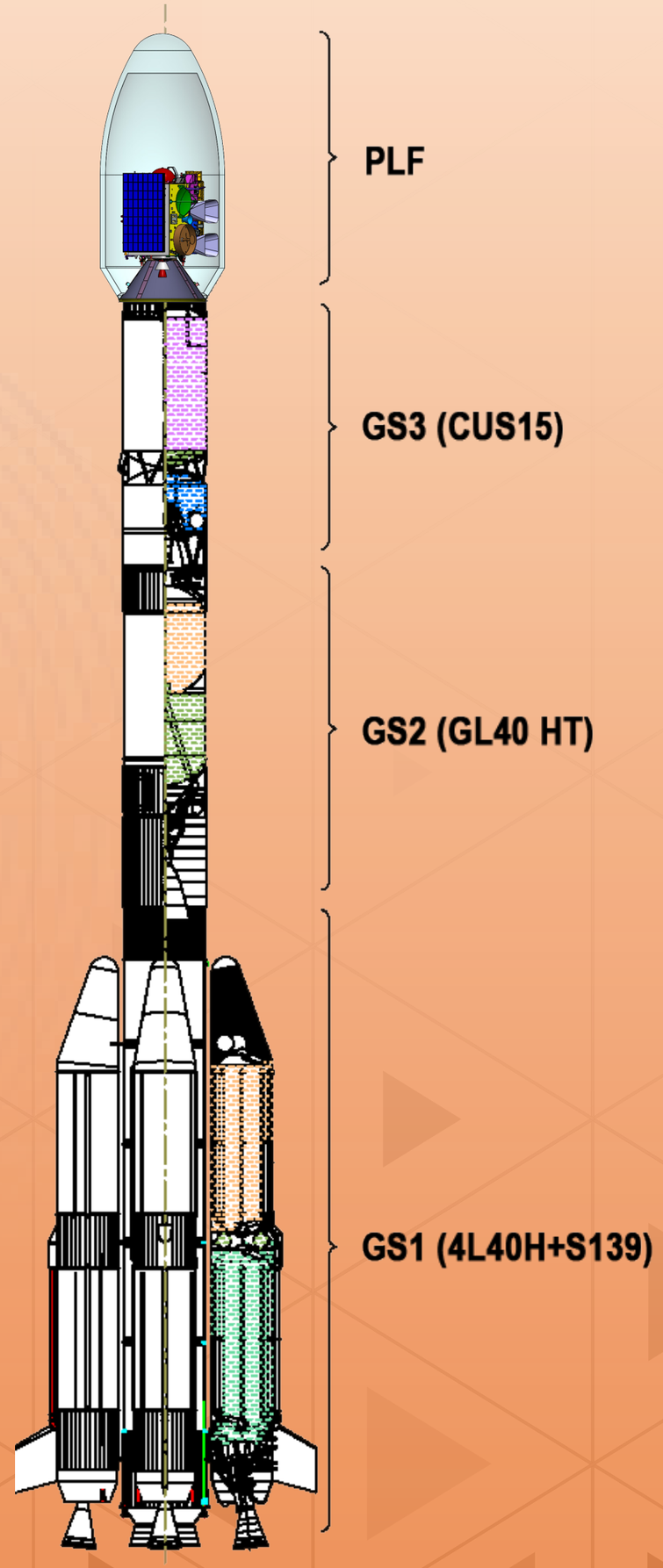
Flight of
India's Geosynchronous Satellite Launch Vehicle
GSLV

10th

Flight with
Indigenous Cryo Stage

7th

Operational
Flight with
Indigenous Cryo Stage



GSLV-F14 Vehicle characteristics

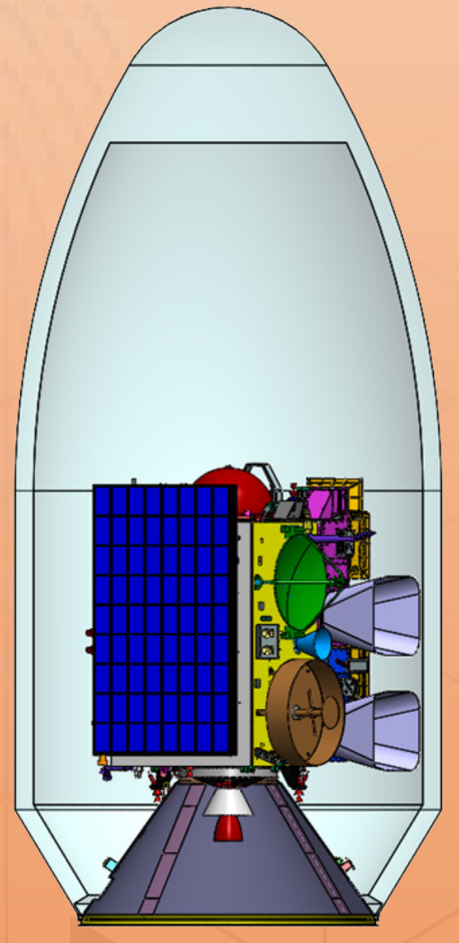
Vehicle Height	51.7 m
Lift off mass	420 t
Stages	3
First Stage (GS1)	S139+4L40H
Second Stage (GS2)	GL40HT
Third Stage (GS3)	CUS 15 (Indigenous)

GSLV-F14 Stage Characteristics				
Stages	**First stage (GS1)**		**Second stage (GS2)**	**Third stage (GS3)**
Parameter	4 L40H	S139		
Length (m)	19.682	20.176	11.958	9.894
Diameter (m)	2.1	2.8	2.8	2.8
Propellant	UH25 & N_2O_4	HTPB	UH25 & N_2O_4	LH_2 & LOX
Propellant mass (t)	170.7	138.1	42.1	14.5
Stage Mass at Lift-Off (t)	191	160.8	47.3	17.1

GSLV-F14 Mission Specifications

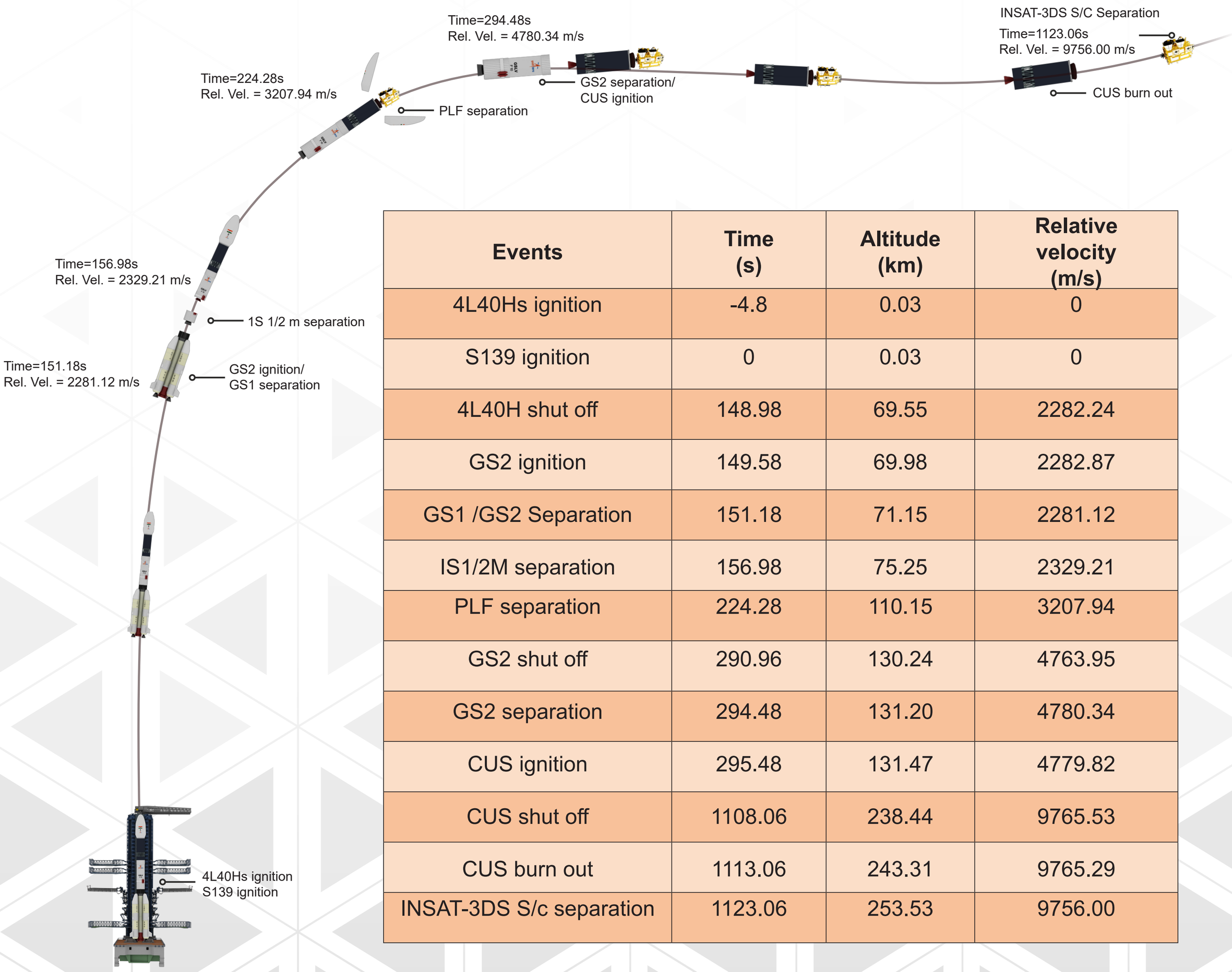
Orbit	GTO
Perigee	170 km **
Apogee	36647 km *
Argument of Perigee	178 ± 0.5 deg.
Inclination	19.35 ± 0.1 deg.
Launch Azimuth	104 deg.
Payload Mass	2274 kg

* * Band on Perigee : 167 km - 173 km
* Band on Apogee : 33540 km – 40781 km



Payload Accomodation in GSLV-F14

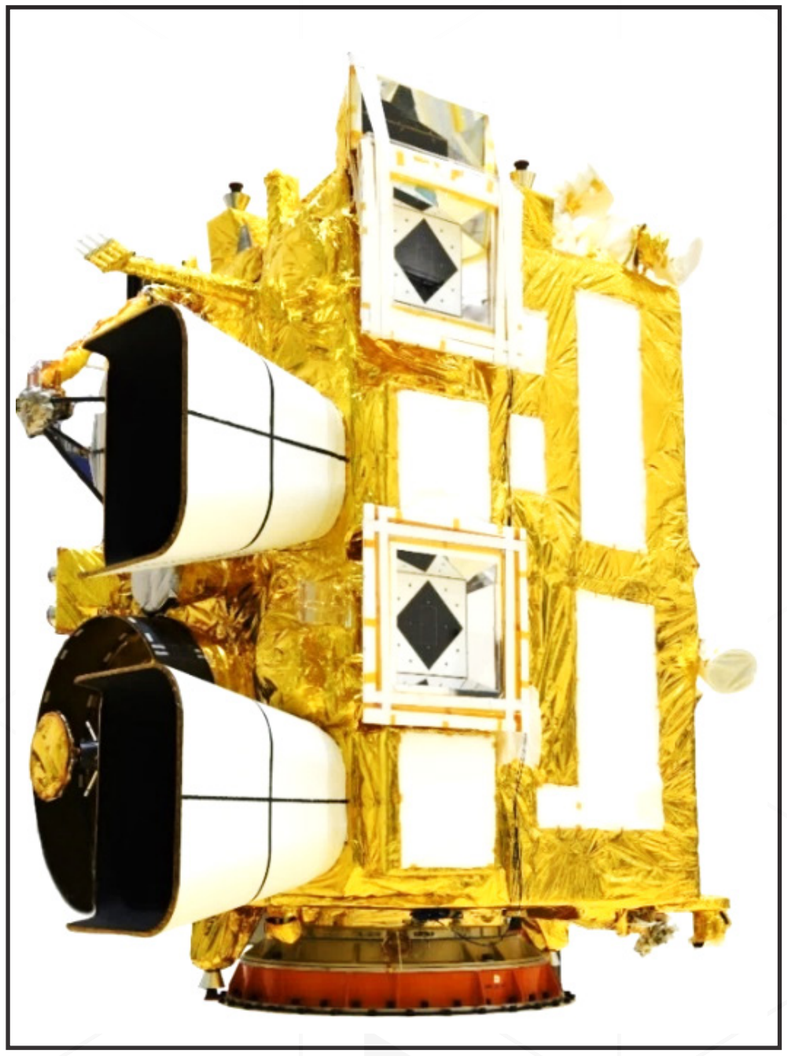
GSLV-F14 Flight Sequence



Events	Time (s)	Altitude (km)	Relative velocity (m/s)
4L40Hs ignition	-4.8	0.03	0
S139 ignition	0	0.03	0
4L40H shut off	148.98	69.55	2282.24
GS2 ignition	149.58	69.98	2282.87
GS1 /GS2 Separation	151.18	71.15	2281.12
IS1/2M separation	156.98	75.25	2329.21
PLF separation	224.28	110.15	3207.94
GS2 shut off	290.96	130.24	4763.95
GS2 separation	294.48	131.20	4780.34
CUS ignition	295.48	131.47	4779.82
CUS shut off	1108.06	238.44	9765.53
CUS burn out	1113.06	243.31	9765.29
INSAT-3DS S/c separation	1123.06	253.53	9756.00

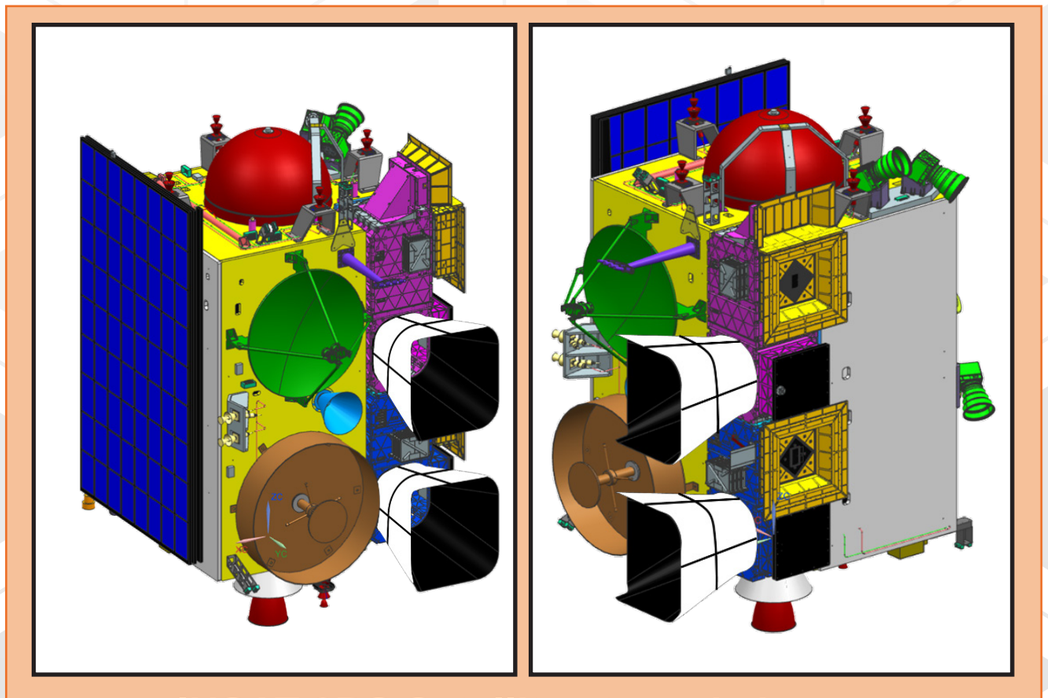
INSAT-3DS Satellite

INSAT-3DS Satellite is a follow-on mission of Third Generation Meteorological Satellite from Geostationary Orbit. The Satellite is an exclusive mission designed for enhanced meteorological observations, monitoring of land and ocean surfaces for weather forecasting and disaster warning. INSAT-3DS Satellite will be augmenting the Meteorological services along with the presently operational INSAT-3D and INSAT-3DR in-orbit satellites.

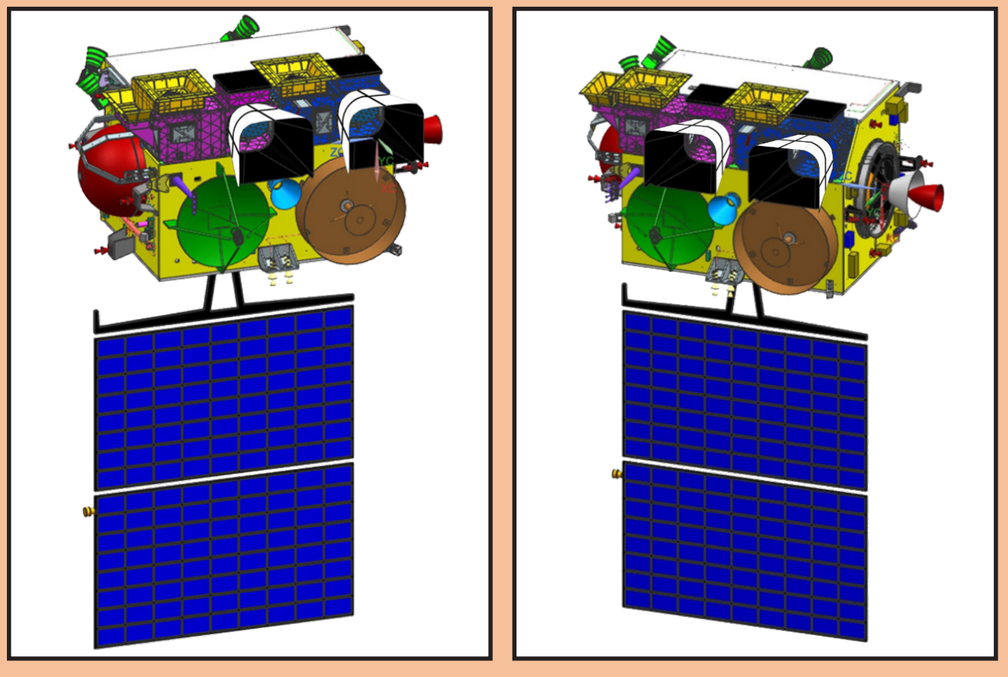


The primary objectives of the mission are:

- ✓ To monitor Earth's surface, carryout Oceanic observations and its environment in various spectral channels of meteorological importance.
- ✓ To provide the vertical profile of various meteorological parameters of the Atmosphere.
- ✓ To provide the Data Collection and Data Dissemination capabilities from the Data Collection Platforms.
- ✓ To provide the Satellite Aided Search and Rescue services.



INSAT-3DS Satellite stowed views



INSAT-3DS Satellite deployed views

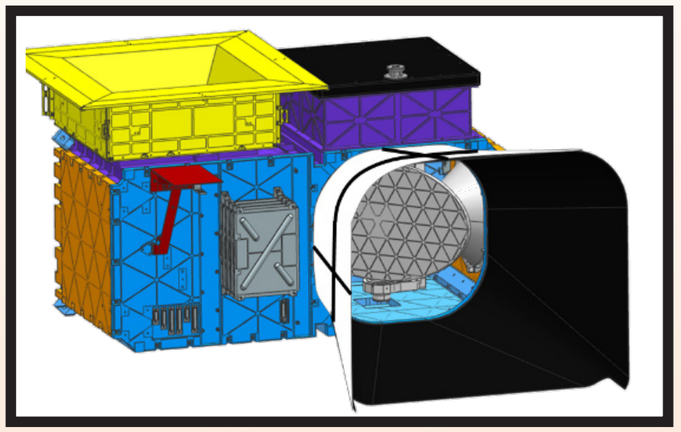
Salient Features of the Satellite:

The satellite is a user funded project with Ministry of Earth Science (MoES), configured around ISRO's well proven I-2k bus platform with a Lift-Off Mass of 2274 kg. Indian Industries have significantly contributed in the making of the Satellite. The Satellite carries 6 Channel Imager, 19 Channel Sounder payload, Data Relay Transponder(DRT)and Satellite aided Search and Rescue (SA&SR) transponders. Imager and Sounder payloads are similar to the payloads flown on INSAT-3D and INSAT-3DR with significant improvements in radiometric performances.

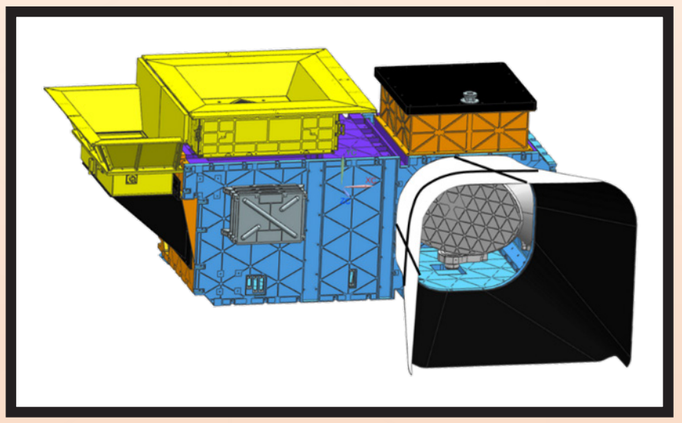
Mission	✓ Meteorological services ✓ Data relay and Satellite Aided Search & Rescue services
Payloads	✓ 6 channel Imager ✓ 19 channel Sounder ✓ Data Relay Transponder (DRT) ✓ Satellite Aided Search & Rescue transponder (SAS&R)
Orbit	✓ Geostationary orbit
Structure	✓ I-2k platform
Thermal	✓ Passive and active thermal control system ✓ Bi-annual yaw flip to reduce thermal load on the passive coolers
Power generation	✓ 42V Sunlit regulated single bus ✓ Power generation 1505W (Equinox) ✓ I-2k Solar panels and Li-Ion 100Ah Battery for eclipse support
Launch vehicle	✓ GSLV with 4m dia. Ogive Payload Fairing ✓ Standard 937mm dia. interface

INSAT-3DS Payloads

- ✓ **Imager Payload:** INSAT-3DS Satellite carries a multi-spectral Imager (optical radiometer) capable of generating images of the Earth and its environment in six wavelength bands.
- ✓ **Sounder Payload:** INSAT-3DS satellite carries 19 channel Sounder payload having 1 Visible channel and eighteen narrow spectral channels. Sounder will provide the information on the vertical profiles of the Atmosphere - temperature, humidity etc.
- ✓ **Data Relay Transponder (DRT):** Receives globally Meteorological, Hydrological and Oceanographic data from automatic Data collection platforms/Automatic Weather Stations (AWS) from multi-user and relays back to user terminal.
- ✓ **Satellite aided Search and Rescue (SA&SR) transponder:** Relays a distress signal / alert detection from the beacon transmitters for Search and Rescue purposes with global receive coverage in UHF band.



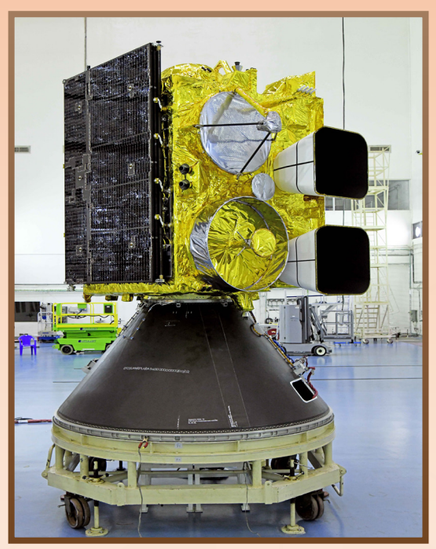
Imager Payload



Sounder Payload

The payloads will generate major geophysical parameters such as Atmospheric Motion Vector (AMV), Sea and Land surface temperatures (SST, LST), Cloud properties & microphysical parameters, Fog, Rainfall, Snow Cover, Snow Depth, Fire, Smoke, Aerosol, Water Vapour Wind (WVW), Upper Tropospheric Humidity (UTH), Humidity Profile and Total Ozone etc to study about Atmosphere, Land and Ocean. Subsequently, Data products are generated catering to varied range of applications.

Various departments of Ministry of Earth Sciences (MoES) such as India Meteorology Department (IMD), National Centre for Medium Range Weather Forecasting (NCMRWF), Indian Institute of Tropical Meteorology (IITM), National Institute of Ocean Technology (NIOT), Indian National Center for Ocean Information Services (INCOIS) and various other agencies and institutes will be using the INSAT-3DS Satellite data to provide improved weather forecasts and meteorological services.



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