

# PSLV-C33 / IRNSS-1G Mission

28 April, 2016

## THE MISSION

PSLV-C33 carrying on-board IRNSS-1G Satellite lifted-off from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota at 12:50 PM (IST) on April 28, 2016. After a flight of 19 minutes 42 seconds, IRNSS-1G was injected into an elliptical orbit of 283 km X 20,718 km inclined at an angle of 17.867° to the Equator (very close to the intended orbit) following which the satellite successfully separated from the PSLV fourth stage. It was inserted into a sub Geosynchronous Transfer Orbit (sub-GTO)

IRNSS-1G is the seventh navigation satellite of the seven satellites constituting the Indian Regional Navigation Satellite System (IRNSS) space segment. Like its other IRNSS predecessors, IRNSS-1G also carries two types of payloads – navigation payload and ranging payload.

## PSLV - C 3 3

### THE LAUNCH VEHICLE

PSLV-C33 in its 35<sup>th</sup> flight used the 'XL' variant of PSLV, equipped with six strap-ons, each carrying 12 tons of propellant. It is the 13<sup>th</sup> time the 'XL' configuration has been flown.

### SPECIFICATIONS

<b>Height</b>	44.4 m
<b>Lift-Off Mass</b>	320 t
<b>No of Stages</b>	4
<b>Payloads</b>	IRNSS-1G
<b>Inclination (deg)</b>	17.867°
<b>Apogee</b>	20,718 km
<b>Perigee</b>	283 km
<b>Launch Pad</b>	First Launch Pad (SDSC, SHAR)



### STAGE CHARACTERISTICS

	Stage-1	Stage-2	Stage-3	Stage-4
<b>Nomenclature</b>	Core Stage PS1 + 6 Strap-on Motors	PS2	PS3	PS4
<b>Propellant</b>	Solid (HTPB based)	Liquid (UH25 + N <sub>2</sub> O <sub>4</sub> )	Solid (HTPB based)	Liquid (MMH + MON-3)
<b>Propellant Mass (t)</b>	138.2 (Core), 6 x 12.2 (Strap-on)	42	7.6	2.5
<b>Stage Dia (m)</b>	2.8 (Core), 1 (Strap-on)	2.8	2	1.3
<b>Stage Length (m)</b>	20 (Core), 12 (Strap-on)	12.8	3.6	3

# IRNSS-1G

## THE SATELLITE

IRNSS is an Independent Regional Navigation Satellite System designed to provide position information in the Indian region and 1500 km around the Indian mainland. IRNSS provides two types of services, namely, Standard Positioning Services (SPS) provided to all users and Restricted Services (RS) provided to authorised users.

A number of ground facilities are responsible for satellite control ranging and integrity monitoring as well as time keeping, generation and transmission of navigation parameters, etc., have been established in eighteen locations across the country. The successful launch of IRNSS-1G, the seventh and final member of IRNSS constellation, signifies the completion of the IRNSS constellation.

Like its other IRNSS predecessors, IRNSS-1G also carries two types of payloads – navigation payload and ranging payload. The navigation payload of IRNSS-1G transmits navigation service signals to the users. This payload is operating in L5-band and S-band. A highly accurate Rubidium Atomic Clock is part of the navigation payload of the satellite. The ranging payload of IRNSS-1G consists of a C-band transponder, which facilitates accurate determination of the range of the satellite.

### Applications of IRNSS

- Terrestrial, Ariel and Marine Navigation
- Vehicle tracking and fleet management
- Terrestrial navigation aid for hikers and travellers
- Disaster Management
- Integration with mobile phones
- Mapping and Geodetic data capture
- Visual and voice navigation for drivers



### SPECIFICATIONS

<b>Weight</b>	1425 kg
<b>Power</b>	1660 W, one Li-Ion battery of 90 Ampere-hour capacity
<b>Stabilisation</b>	Zero momentum system, orientation input from Sun and Star Sensors and Gyroscopes; Reaction Wheels, Magnetic Torquers and 22 Newton thrusters as actuators
<b>Propulsion</b>	440 Newton Liquid Apogee Motor, twelve 22 Newton Thrusters
<b>Type of Satellite</b>	Navigation
<b>Payloads</b>	<ul style="list-style-type: none"><li>• L5 and S-band Navigation with Rubidium Atomic Clocks</li><li>• C-band Ranging Payload</li><li>• Corner Cube Retro Reflectors for LASER Ranging</li></ul>
<b>Mission Life</b>	12 Years

