

# PSLV-C27 / IRNSS-1D Mission

28 March, 2015

## THE MISSION

PSLV-C27 carrying on-board the IRNSS-1D Satellite lifted-off from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota at 05:19 PM (IST) on March 28, 2015. About 19 minutes 25 seconds after lift-off, PSLV-C27 placed IRNSS-1D into an elliptical orbit of 282.52 km X 20,644 km (very close to the intended orbit) and successfully separated from the PSLV fourth stage. Four orbit manoeuvres were conducted from Master Control Facility to position the satellite in the Geosynchronous Orbit at 111.75° East longitude with 30.5° inclination. IRNSS-1D is the fourth satellite of the seven satellites constituting the Indian Regional Navigation Satellite System (IRNSS) space segment. The satellite carries two payloads – navigation payload and ranging payload.

## PSLV - C 2 7

### THE LAUNCH VEHICLE

PSLV-C27 in its 29<sup>th</sup> flight used 'XL' variant of PSLV. This is the 8<sup>th</sup> time '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-1D
<b>Inclination (deg)</b>	30.5°
<b>Apogee</b>	20,650 km
<b>Perigee</b>	282 km
<b>Launch Pad</b>	Second 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)	42.0	7.6	2.5
<b>Max Thrust (kN)</b>	4819 (Core) 6 x 716 (Strap-on)	804	240	7.3 x 2
<b>Stage Dia (m)</b>	2.8 (Core), 1 (Strap-on)	2.8	2.0	1.3
<b>Stage Length (m)</b>	20 (Core), 12 (Strap-on)	12.8	3.6	3.0

# IRNSS-1D

## THE SATELLITE

The configuration of IRNSS-1D is similar to that of IRNSS-1A, 1B and 1C. The satellite has been released in less than four months after the launch of its predecessor. The IRNSS-1D carries two types of payloads – navigation payload and ranging payload. The navigation payload of IRNSS-1D will transmit navigation service signals to the users. This payload will be 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 the satellite IRNSS-1D consists of a C-band transponder which facilitates accurate determination of the range of the satellite. IRNSS-1D also carries Corner Cube Retro Reflectors for LASER ranging.

### 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
- Precise Timing



### 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>	10 Years

