**INSAT-3DR**

INSAT-3DR is identical to INSAT-3D in terms of Sensors and products.

INSAT or the Indian National Satellite System is a series of multipurpose Geo-stationary satellites launched by ISRO to satisfy the telecommunications, broadcasting, meteorology, and search and rescue needs of India. Commissioned in 1983, INSAT is the largest domestic communication system in the Asia Pacific Region. The satellite is monitored and controlled by Master Control Facilities that exist in Hassan and Bhopal. INSAT-3DR is a multipurpose geosynchronous spacecraft with main meteorological payloads (imager and sounder). The main objectives for this mission are to provide an operational, environmental and storm warning system to protect life and property. INSAT3DR is monitoring the earth’s surface, oceanic observations and also provide data dissemination capabilities. It provides Broadcast Satellite Services (BSS) through two S-band transponders. The data acquisition and processing system is established at Space Applications Centre, Bopal Campus, Ahmedabad, India. The processing of INSAT-3DR data is taken place broadly in four steps.

1. Ground receiving system to receive data
2. Data Reception (DR) system to generate raw data (L0) files
3. Data Processing (DP) system to process L0 data and produce L1B data files (Calibrated and Geo located)
4. Product generation and Dissemination system

It is positioned at 740 East Longitude.

**INSAT-3DR Introduction**

INSAT-3DR is a dedicated meteorological spacecraft designed for enhanced meteorological observations and monitoring of land and ocean surfaces for weather forecasting and disaster warning. INSAT-3DR is configured on I-2K bus with Sounder, Imager and Data Relay Transponder (DRT) and Satellite Aided Search & Rescue (SAS&R) Payloads. INSAT-3DR with a lift of mass of about 2211 kg was flown on September 08, 2016 by GSLV-F05. Communication Payload sub systems are configured to support INSAT system for DRT SAS&R and Meteorological Payload services.

The mission goal is stated as "to provide an operational, environmental & storm warning system to protect life & property and also to monitor earth's surface and carryout oceanic observations and also provide data dissemination capabilities"

The satellite has 3 payloads

* Meteorological (MET) - IMAGER and SOUNDER
* Data Relay Transponder (DRT)
* Satellite Aided Search and Rescue (SAS&R)

The geophysical parameters that will be extracted from INSAT-3DR are Outgoing Longwave Radiation (OLR), Quantitative Precipitation Estimation (QPE), Sea Surface Temperature (SST), Snow Cover, Snow Depth, Fire, Smoke, Aerosol, Cloud Motion Vectors (CMV), Water Vapour Winds (WVW), Upper Tropospheric Humidity (UTH), Temperature, Humidity Profile and Total Ozone, Fog, Visible Wind Vectors and other value added parameters from Imager and Sounder.

**INSAT-3DR Objectives**

INSAT or the Indian National Satellite System is a series of multipurpose Geo-stationary satellites launched by ISRO to satisfy the telecommunications, broadcasting, meteorology, and search and rescue needs of India. Commissioned in 1983, INSAT is the largest domestic communication system in the Asia Pacific Region. The satellites also incorporate transponder(s) for receiving distress alert signals for search and rescue missions in the South Asian and Indian Ocean Region, as ISRO is a member of the COSPAR-Sarsat programme.

The main objectives for this mission are to provide an operational, environmental and storm warning system to protect life and property. INSAT-3DR will

* Monitor earth's surface and carryout oceanic observations and also provide data dissemination capabilities,
* Provide Broadcast Satellite Services (BSS) through two S-band transponders.,
* **INSAT-3DR SpaceCraft**
* The INSAT-3DR is a momentum-biased 3-axis stabilized spacecraft using star trackers for precise pointing control. The spacecraft has a launch mass of 2211 kg with a dry mass of 907 kg. It is in Geostationary orbit, altitude of ~35, 786 km, location at 74° East. The three-axis stabilized geostationary satellite carries two meteorological instruments: a six channel Imager and an IR Sounder. Along with the channels in Visible, Middle Infrared, Water Vapor and Thermal Infrared bands, the Imager includes a SWIR channel for wider applications. The Sounder will have eighteen narrow spectral channels in three IR bands in addition to a channel in visible band. It also has a Data Relay Transponder and Satellite based Search & Rescue Payload. Several innovative technologies like on-the-fly correction of scan mirror pointing errors, biannual yaw rotation of the spacecraft, micro-stepping SADA, star sensors and integrated bus management unit have been incorporated to meet the stringent payload requirements like pointing accuracies, thermal management of IR detectors and concurrent operation of both instruments.
* A passive radiant cooler is used to cool the infrared detectors of imager and sounder instruments. The temperature of the detectors is maintained at 95 K (BOL) and 100 K (EOL). The passive cooler also maintains the sounder filter wheel temperature at 213 K.