2022

Operational DCS status report and status of implementation of best practices

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Coordination Group for Meteorological Satellites

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Executive summary

ISRO has an effective meteorological data collection system based on INSAT & GSAT series of satellites and through associated ground infrastructure. Currently three satellites INSAT-3DR, INSAT-3DS, and GSAT-17 carry data relay transponders that help in collecting real-time data for meteorological, hydrological, and oceanographic applications. The Indian Meteorological Department (IMD) has established necessary ground infrastructure as well as dissemination mechanisms to provide the necessary service to the users. Various operational products are generated and disseminated using the IMD platforms.

In 2025, 15 cyclones were monitored and real-time alerts were generated including 3 land falling cyclones (Montha, Senyar and Ditwah).

Current GEO Satellites (INSAT-3DR, INSAT-3DS, GSAT-17)

- The Geostationary Satellites INSAT-3DR, INSAT-3DS and GSAT-17 are carrying Data Relay Transponder (DRT) in UHF x C band. These satellites are operating at 74°E, 82°E and 93.5°E respectively.

- The payloads are operating in the 402 MHz band for uplink and 4.5 GHz band for down link.

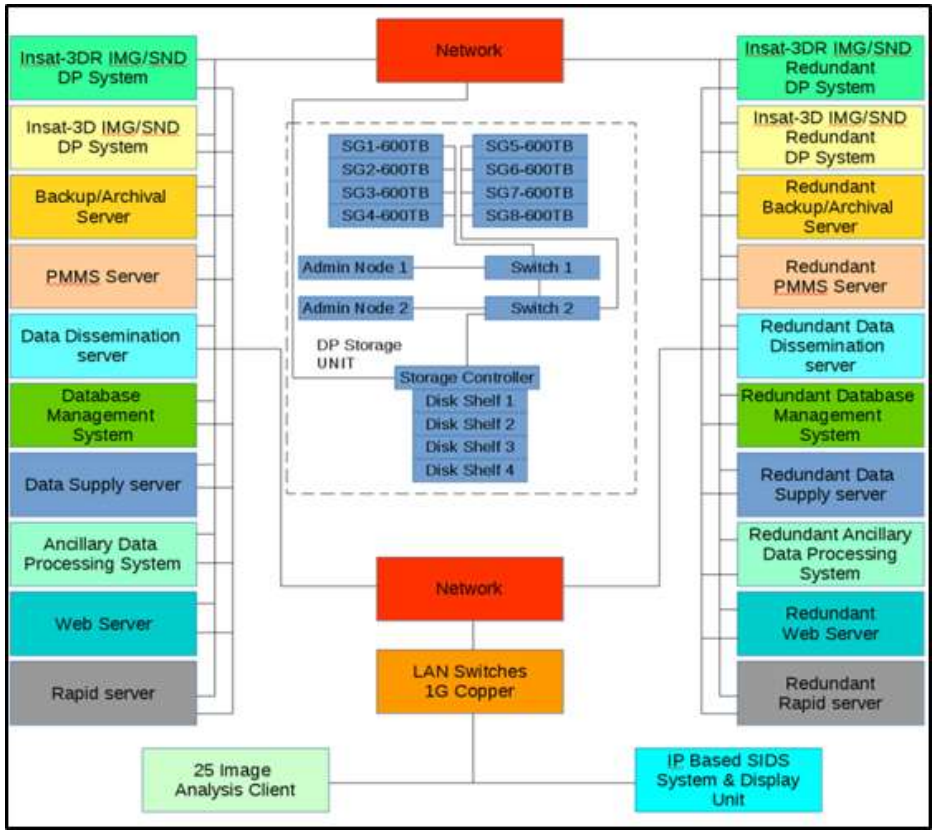
- These help in collecting realtime data for meteorological, hydrological and oceanographic applications, from automatic data collection platforms (DCP)

Current GEO Satellites (INSAT-3DR, INSAT-3DS, GSAT-17)

- DRTs are supporting:
  - ~1200 automatic weather stations
  - 64 automatic tide gauges
  - ~600 terminals for water resources
  - ~100 terminals of snow and avalanche Study
  - 50 terminals for environment radiation monitoring
  - 375 terminals for moored buoy data collection
  - 15 terminals for tsunameter
  - ~21000 terminals for distress alert transmitter

INSAT-3DR and INSAT-3DS – geostationary meteorological satellites

- Indian Meteorological Department (IMD) has established Multi-Mission Meteorological Data Receiving & Processing System (MMDRPS) to receive the data from meteorological satellites.
- Three earth stations have been setup under MMDRPS Project.
- MMDRPS systems have advanced servers capable to process the complete set of data within 7 minutes after completion of scan.
- System has storage capacity of order of petabytes which facilitates online sharing of processed data for all Indian meteorological satellites to the registered users as per IMD data policy.
- The processed data is shared through Web-based secured satellite Data Supply System.



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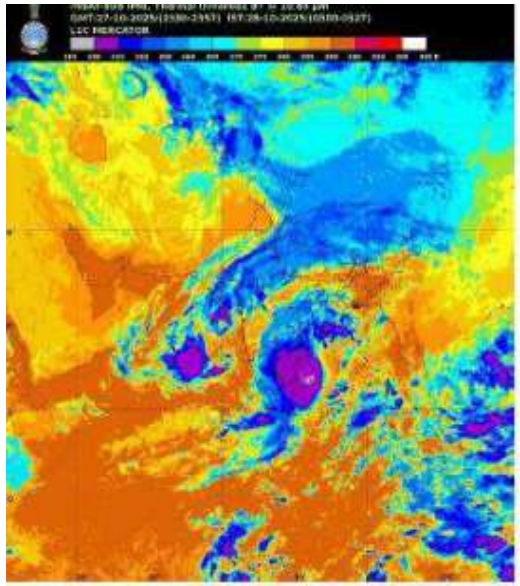
INSAT-3DR and INSAT-3DS – operational products

- Cloud images in the Visible, Short wave Infra-red, Mid Infra-red, Thermal Infra-red, Water Vapour Channels
- Atmospheric Motion Vectors (IR Wind, Water Vapor Winds, MIR/Visible Winds)
- Sea Surface temperature
- Outgoing Long-wave radiation
- Land Surface Temperature (LST), Insolation, Quantitative Precipitation Estimates
- Nighttime Fog, Smoke, Fire, Snow Cover, Aerosol Optical Depth
- Upper Tropospheric Humidity, Cloud top Temperature, Cloud top Pressure, Temperature & Humidity profiles, Total ozone, Total/Layer Precipitable Water Vapour, Stability Indices
- Wind derived products such as Vorticity (at 850mb,700mb,500mb, 200mb levels), Wind Shear, Mid-level Wind Shear, Shear Tendency, Low-level Convergence, and Upper-Level Divergence using Imager Wind product

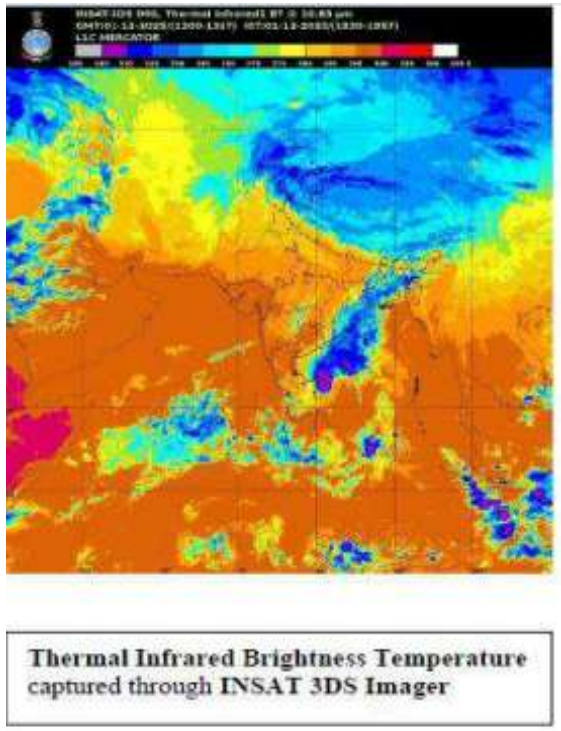
INSAT-3DR and INSAT-3DS – cyclone monitoring



Thermal Infrared Brightness Temperature captured through INSAT 3DS Imager

Observed Track

Cyclone ***Montha*** Imagery (25th to 30th October 2025)



Thermal Infrared Brightness Temperature captured through INSAT 3DS Imager

Observed Track

Cyclone ***Detwah*** Imagery (26th Nov to 03rd December 2025)

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Thank you

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