

- Radar Network of India Meteorological Department, at present, has 14 S-band and 25 X-band radar and radars including 5 DWRs.
- Out of 14 S-band radars, 11 are installed at Kolkata, Paradip, Visakhapatnam, Machilipatnam, Chennai, Sriharikota, Karaikal, Kochi, Mumbai, Goa and Bhuj and are used for cyclone detection. 5 installed at Chennai, Kolkata, Visakhapatnam, Machilipatnam, Sriharikota are Doppler Weather Radars and are operational w.e.f. 22.2.2002, 29.1.2003, 8.12.2004, 26.07.2006 and 9.4.2004 respectively. Chennai, Kolkata, Visakhapatnam and Machilipatnam Doppler Weather Radars were procured from M/s Gematronik and Sriharikota Doppler Weather Radar was developed by ISRO under IMD-ISRO collaboration. 6 S-band Radars installed at Karaikal, Kochi, Goa, Mumbai, Bhuj and Paradip are analogue type. 2 S-band radars at Sriganganagar & Jaisalmer are used for storm detection and one radar at HQ is used for training & testing purpose.
- Out of 25 X-band radars, 9 installed at Kolkata, Chennai, Guwahati, Ranchi, Delhi, Lucknow, Mumbai, Nagpur and Agartala airports are being used for Storm detection and 17 for wind finding. All the wind finding radars also have the facility for Weather observations. 10 old X-band radars were replaced by new X-band radars in 1996 that are equipped with computerized operations & controls.
- X-band radar installed at Srinagar outlived its life and therefore, decommissioned and dismantled.
- S-band radar at Karaikal has been upgraded by NASA, USA under “Tropical Rainfall Measuring Mission (TRMM)” and is being used for revalidation of data from satellite borne radar of NASA for rainfall measurement.
- It is also planned to replace the remaining existing old conventional CDRs by the state of art S – Band Doppler Weather Radar in a phased manner. Doppler Weather Radars provide vital information on radial velocity within a tropical cyclone which is not available in conventional radar.
- Conventional radar provides information only on reflectivity whereas Doppler Weather Radars provide information on velocity and spectral width in addition to reflectivity.
- Various Meteorological, Hydrological and Aviation products derived from Doppler Weather Radar data using a variety of software algorithms are very useful for forecasters in estimating the storm’s center, its intensity, fixing its position and predicting its future path and safe navigation of aircrafts and ships.
- India Meteorological Department is modernising its observational network. Modernisation program includes replacement of all the radars with Doppler Weather Radars in phased manner. Doppler Weather Radars will also be installed at some new locations to fill data gaps.
- Under 1<sup>st</sup> phase of modernization, 12 old and obsolete radars at Delhi, Patiala, Lucknow, Patna, Mohanbari, Agartala, Paradip, Bhopal, Nagpur, Goa, Karaikal and Hyderabad will be replaced by DWRs procured from M/s Beijing Metstar Radar Company Ltd Beijing, China. 2 indigenous DWRs manufactured by M/s BEL, Bangalore will be installed at Mumbai and Kochi.
- One Doppler Weather Radar procured from M/s Beijing Metstar Radar Company Ltd Beijing, China has already been installed and declared commissioned w.e.f. 22-04-2010 at Palam Airport New Delhi. Installation at Hyderabad is under progress and is likely to be commissioned in the month of May, 2010. Construction of buildings at other places is under progress. Doppler Weather Radars at these sites are likely to be installed / commissioned by the end of the year, 2010 as and when the buildings for these radars are ready. The existing conventional radars will be decommissioned and dismantled after installation of Doppler Weather Radars.

- Out of two Doppler Weather Radars manufactured by M/S BEL, Bangalore has already been delivered by M/S BEL at Bhuj and the process of installation has been initiated. The second radar will be installed at Mumbai and expected to be installed / commissioned before start of Monsoon.
- Old and obsolete conventional radars installed at Delhi, Mumbai, Goa, Bhuj, Mohanbari have been decommissioned and dismantled to give way for building construction and installation of Doppler Weather Radars.
- Two C-Band Radars are also under procurement. These will be installed at Delhi (HQ) and Jaipur. These are expected to be installed / commissioned before Oct, 2010 under 1<sup>st</sup> phase of modernisation.
- 34 more Doppler Weather Radars, having dual polarization capability will be in 2<sup>nd</sup> and 3<sup>rd</sup> phase of modernisation. Some of them will replace old and obsolete conventional radars.
- India Meteorological Department has also plans to establish of National Weather Radar Operation Centre (NWROC) which will be responsible for maintenance of India Meteorological Department's radar network, archival and dissemination of data, development of algorithms for new products, network planning and Research and Development.
- The existing digital Doppler Weather Radars have been networked through VPN connectivity together and to a server located at India Meteorological Department HQ, New Delhi .
- The data is being received at the server and processed by SIGMET IRIS software installed on it for generating composite image . The software also converts format of the raw data to NetCDF, HDF5, UF and BUFR Oper for assimilating into NWP models and for ingesting in SYNERGY system supplied by MFI.