

DWR RADAR & Radiosonde Industrial Visit
India Meteorological Department Machilipatnam
04-March- 2026

Department of IoT



A Report on the Industrial Visit to the
Doppler Weather Radar Station,
India Meteorological Department (IMD),
Machilipatnam



DWR RADAR & Radiosonde Industrial Visit
India Meteorological Department Machilipatnam
04-March- 2026

INDUSTRIAL VISIT *DWR RADAR, IMD, Machilipatnam*

DATE	:	04.03.2026
SECTION	:	II Year(Y24)
EVENT	:	Industrial Visit

Faculty Coordinators:

Dr. KTPS Kumar, Alt-HoD, Assistant Professor, IoT
Dr. P.Eswar, Assitant Professor, IoT

EVENT DESCRIPTION:

An industrial visit was organized by the Department of Internet of Things for the II-year students of the Even Semester on 4th March 2026, between 10:00 to 17:00 hours. The visit was conducted to the India Meteorological Department (IMD), Machilipatnam, a premier national organization dedicated to meteorological research, weather forecasting, and atmospheric data analysis.

The primary objective of this visit was to bridge the gap between theoretical concepts learned in the classroom and their practical applications in the real world. Through this industrial exposure, students gained an in-depth understanding of meteorological observations, data collection techniques, and the role of advanced radar and radiosonde systems in weather prediction and analysis.

The IMD, being the national meteorological agency of India, operates under the Ministry of Earth Sciences (MoES) and plays a crucial role in providing accurate weather forecasts, issuing timely warnings about severe weather events, and supporting sectors such as agriculture, aviation, shipping, and disaster management.

This visit provided an excellent opportunity for students to observe firsthand the technologies and methodologies employed in monitoring atmospheric phenomena, thereby enhancing their technical knowledge and appreciation of how engineering contributes to meteorological science.

DWR RADAR & Radiosonde Industrial Visit
India Meteorological Department Machilipatnam
04-March- 2026

The visit was structured into various sessions to provide a comprehensive learning experience:

Introduction to IMD:

The program commenced with an introductory session on the India Meteorological Department, its history, organizational structure, and significance in the nation's socio-economic development. Officials from IMD briefed the students about the department's objectives, data collection networks, and the importance of meteorological observations in day-to-day life and national planning. The discussion also highlighted IMD's role in climate monitoring, disaster preparedness, and scientific innovation within the field of weather forecasting.



India Meteorological Department DWR Radar Station Machilipatnam

DWR RADAR & Radiosonde Industrial Visit
India Meteorological Department Machilipatnam
04-March- 2026

Meteorological Instruments and Equipment:

During the visit, students were introduced to a wide range of meteorological instruments and measuring devices used by the India Meteorological Department (IMD) for systematic data collection. These instruments are essential for recording critical atmospheric parameters such as temperature, pressure, humidity, wind speed, and wind direction, along with rainfall intensity, solar radiation, and sunshine duration. The IMD officials demonstrated how these instruments are calibrated, maintained, and synchronized with automated data loggers to ensure precision and accuracy. Students also learned about the integration of digital technologies and sensors that help in real-time data transmission to centralized monitoring systems.



1. **Observation Stations:** The students had the opportunity to visit multiple observation stations within the IMD facility. These included both manual and automatic weather stations equipped with essential instruments like anemometers, barometers, rain gauges, and thermographs. The tour provided insights into how continuous environmental monitoring is conducted and how data from these instruments are consolidated to form a complete meteorological profile. The session also emphasized the importance of spatial and temporal consistency in meteorological observations and the role of observation networks in maintaining nationwide weather databases.

DWR RADAR & Radiosonde Industrial Visit
India Meteorological Department Machilipatnam
04-March- 2026



DWR RADAR & Radiosonde Industrial Visit
India Meteorological Department Machilipatnam
04-March- 2026

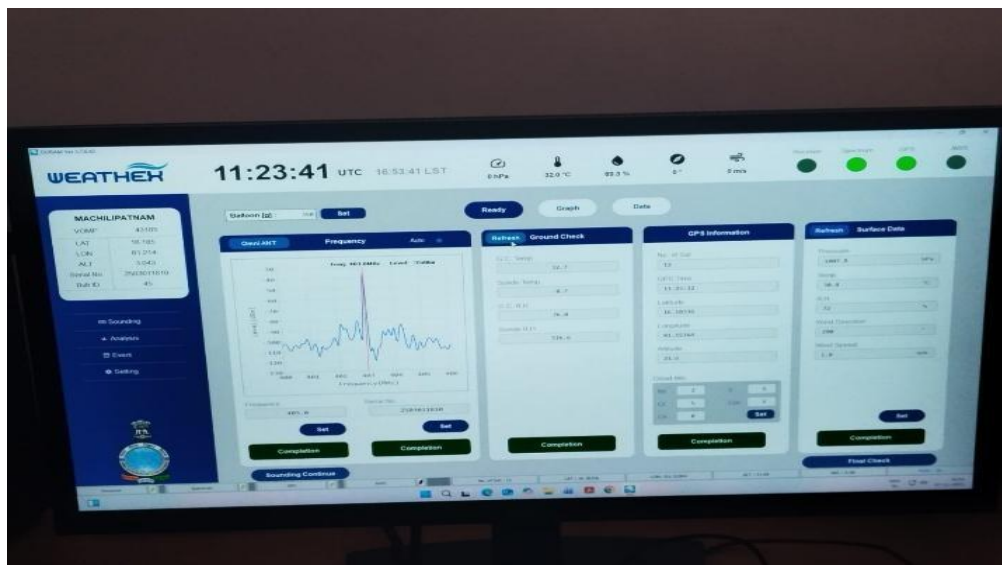


2. **Doppler Weather Radar (DWR):** One of the most fascinating parts of the visit was the exposure to the Doppler Weather Radar (DWR) Station. Students observed firsthand the functioning of advanced radar systems used to detect, measure, and track precipitation, as

DWR RADAR & Radiosonde Industrial Visit
India Meteorological Department Machilipatnam
04-March- 2026

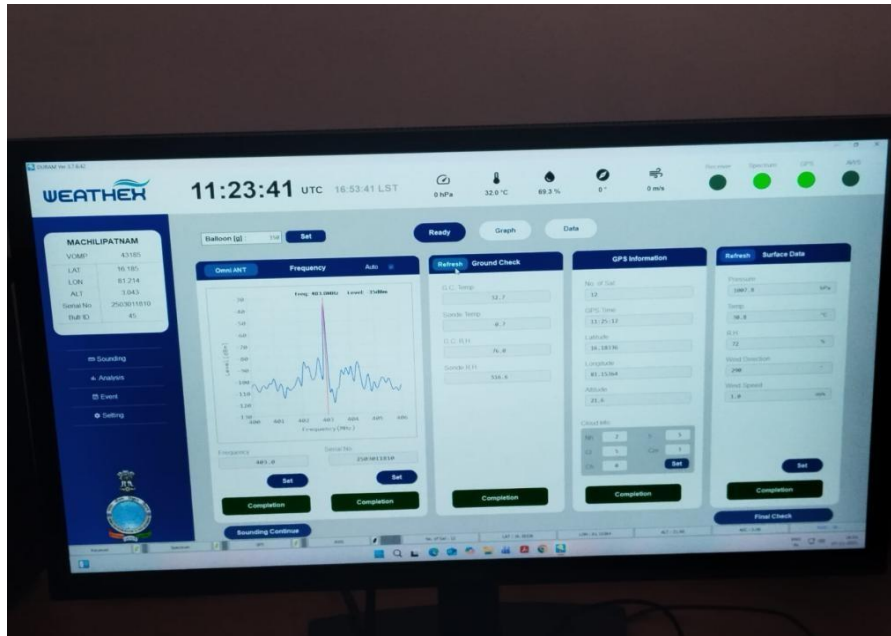
well as monitor storm movements and atmospheric disturbances. IMD officials explained the principle of the Doppler effect and demonstrated how radar echoes are processed to determine the intensity, velocity, and movement of rain clouds. The students gained an understanding of how DWR data supports real-time forecasting, cyclone tracking, and disaster management operations across the country.

- 3. Radiosonde Observation:** Another key highlight of the visit was the Radiosonde Observation Session, conducted at 4:30 PM on 07 March 2026. Students witnessed the preparation and release of radiosondes sophisticated weather balloons equipped with miniaturized sensors that record atmospheric parameters such as temperature, humidity, pressure, and wind speed across various altitudes. IMD scientists explained the data transmission process through telemetry and how the collected information contributes to upper-air analysis for weather modeling and prediction. The students were fascinated by the complexity and precision involved in launching and tracking these high-altitude instruments.



DWR RADAR & Radiosonde Industrial Visit
India Meteorological Department Machilipatnam
04-March- 2026

4. **Data Recording and Analysis:** In this segment, students explored the procedures for recording, processing, and interpreting meteorological data. They learned how raw observational data is digitally archived, validated, and processed using analytical software to generate accurate weather forecasts. The session underscored the importance of data quality assurance, error correction, and data visualization for decision-making in weather forecasting and climate research.



DWR RADAR & Radiosonde Industrial Visit
India Meteorological Department Machilipatnam
04-March- 2026

Conclusion

This industrial visit served as a vital learning experience, allowing students to connect theoretical knowledge with practical field applications. It enriched their understanding of how engineering principles and technological innovation are integrated into meteorological observation and forecasting systems. By witnessing the operations of IMD's advanced facilities, students developed a deeper appreciation for the scientific and societal significance of weather monitoring, forecasting accuracy, and data-driven decision-making in safeguarding the nation from natural hazards.