

DON BOSCO INSTITUTE OF TECHNOLOGY
(Engineering College)

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION

Report on Industrial Visit

EVENT: Industrial visit to Satellite Earth Station, Yeur, Thane

Department of Telecommunication, BSNL

SPEAKERS: 1. Mr. Ashok Katakdhond, Divisional Engineer (Satellite Mtce)
2. Mr. Ganesh S., SDE Telecom Officer
3. Mr. Vinod Bansal, Junior Telecom Officer
4. Mr. Dharmendra , Technical Assistant.

DATE & TIME: 20th March, 2017, 10 a.m. to 4.30 p.m.

EVENT IN-CHARGE: Prof. Madhavi S. Pednekar

Learning Objective:

Industrial visit to the satellite station was organized with the objective of providing an enlightening experience for the students to see the real time set-up and a practical demonstration of the theory they had studied in the subject of satellite communication.

During lab sessions, students will be able to understand and effectively perform the experiments based on link design parameter measurement in the lab.

All the students reached at Yeur at 10 a.m. Mr. Ashok K., divisional manager has welcomed the gathering and given a brief introduction on the organization hierarchy, BSNL functionality and operations at Earth Station, their roles and responsibilities.

The students were then divided into three groups and each group underwent three vigorous sessions. In the first session, students were explained about the basic transmission and reception blocks of the C-Band INSAT 3C satellite system by Mr. Ganesh S. The students were shown a number of equipment that was handling satellite live traffic. He explained and demonstrated the precautions and measures that are taken while handling such equipment. Students were also able to visually observe the spectrum of C-Band (IDR), Ku- Band and Ka-Band HUB.

Corporations and organizations that require financial and other information to be exchanged

between their various locations use Artificial Satellites (about 3000) to facilitate the transfer of data through the use of very small-aperture terminal (VSAT) networks. In the second session, VSAT architecture and networking by VSAT for data communication was demonstrated to the students. Mr. Ganesh has explained about back haul connectivity by OFC.

For the third session, students were taken outside the earth station but within the premises where various satellite antennas were located. Mr. Dharmendra has explained various types of antennas used in satellite communication and explained in brief their work and function. He described the significance of their position and orientation. The students were also shown the generator systems responsible for keeping satellite system running without any hindrance. At the end of each session the speakers handled the doubts and queries of the students. The students will be performing an experiment based on this visit wherein they will be required to observe and analyze the satellite spectrum.

At the end a summarized session followed by interactive Q & A session was handled by the concerned authority.

Students have learned following technical points -

Satellite Earth Station Equipment

- C- Band INSAT 3C :currently in use to connect Port Blair to Yeur, Kolkata and Delhi
- Link Capacity is 34Mbps
- Intermediate Frequency used is 70 ± 18 MHz i.e. 52 to 88 MHz
- Receiver Range is 3.7 to 4.2 GHz. Radar cutoff filter at receiver attenuates frequencies up to 3.6GHz with 50dB attenuation
- Trans. rejection filter prevents mixing of transmitted and received data.
- Beacon signal is measured to determine quality of signal
- Network Operation Control Central (NOCC), Sikanderabad, controls all operations
- Antenna used has diameter 11m (remote antenna has 3m diameter, primary antenna has 7.5m diameter)
- LNA used is 45° K (remote uses 90° K LNA, Primary uses 120° K LNA)

- Antenna Control unit for tracking satellite movements, it performs a check every 30 minutes
- Antenna Movements are of two types : azimuth and elevation
- Beacon Tracking Receiver (BTR) works at 4187.5 MHz and its spectrum is observed using spectrum analyzer
- Bit Error Rate (BER) limit is 10^{-6} (anything more, say 10^{-5} , is not acceptable)

INSAT series has

- 500 MHz Bandwidth with 24 C Band Transponders, 6 S Band Transponders, 2 Extended C Band Transponders
- Each transponder has a bandwidth of 40 MHz of which 4 MHz is used as Guard bands and the rest 36MHz is utilized for traffic
- Out of the 24 C Band Transponders, 1-12 are horizontally polarized (used for uplink) and 13-24 are vertically polarized (used for downlink)

Conclusions

- If you are seeking a challenging career with a progressive company, consider Telecom Industry players as they offer an unparalleled work environment in which they consider employees to be their most valuable asset, seek to help them achieve their career goals and encourage creative thinking.
- The Telecom Industry has excellent opportunities for positive, results-oriented team players who are flexible thinkers, possess outstanding interpersonal skills, and enjoy an entrepreneurial environment. They offer career advancement and an outstanding benefits and compensation package.
- So this industrial visit made us to gain practical knowledge relevant to satellite communication concepts and related applications.

Prepared By: Ms. Madhavi S. Pednekar , EXTC Department.