Industrial Visit to Rajeev Gandhi International Airport

First we started from Uppal at 8:20 AM and reached to primary and secondary RADAR (Airport Authority Of India) by 9:20 AM which is 4km away to airport. They divided us into batches and then they gave us a brief introduction about RADAR before visualizing us. They took us to a place where RADAR is located which is at 17 degress temperature. RADAR is divided into primary and secondary RADAR.

PRIMARY RADAR: This consists of transmitter, receiver, high power amplifier (PSR – TX , PSR – A , PSR – HPA) . These are back-end supplies if one fails then other comes into existence. In primary RADAR, we take the modulated signals from the receiver and give them to the transmitter (26mv) through RF drivers which gives us output and now the output is given to PSRTX-HOA and then splitted into 8 parts. In splitter the signals will combine and will be given to circulator and directional couplers. Now these are given to the antenna from the transmitters. Thus primary RADAR is the term is used to detect and localize potentially non-cooperative targets. In olden days primary Radar where very bulky due to usage of large transmitter. These are measured in 60 notticle miles where 1 notticle = 1.85 km. But now these size is being reduced for 10kw. The pulse width required for primary Radar is 10micro sec. The Radar will detect the signals above 150mts. These type of Radar uses low vertical resolution antenna but good horizontal resolution. This Radar scan 360 degrees around the site on single elevation angle. It can thus give the distance and radial speed of the target. The advantage of primary Radar are used for detecting the target and can be used to monitor the movement of vechiles on ground. The disadvantages are the target and altitude can note identified directly. Primary Radar is used based on principle of echolocation. This converts high power emitted by Radar into a narrow wave front. This is used for detecting and measurement of if there is presence of target. Finally primary antenna is non-cooperative with aircraft. It is used as the complimentary to secondary Radar.

SECONDARY RADAR: This is called as monopolesurvaline secondary Radar(MSSR). This is the cooperative with aircraft. In this the radial, speed, height are predefined. This is used in ATC (Air Traffic Control) that not only detect and measures the position of aircraft. In this ground system exists. It transmits the signals to the target and also transmits the received signals by controller.

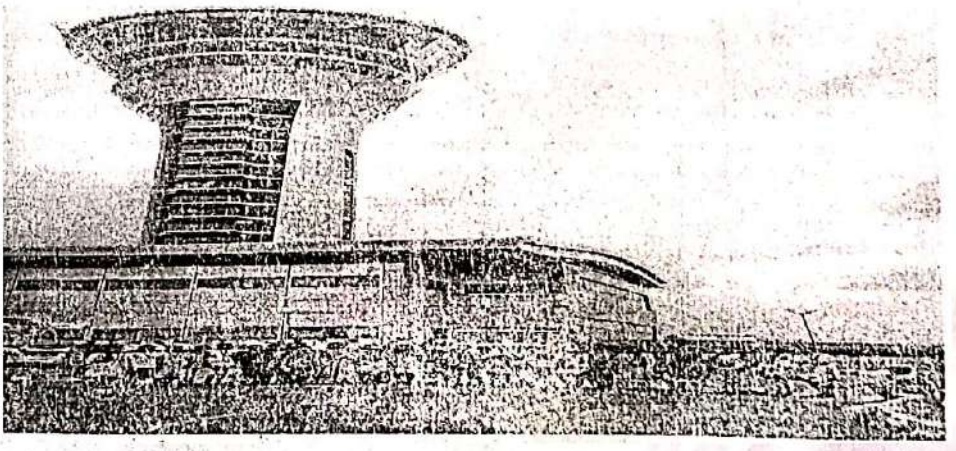
ICAO (International Civil Aviation Organization) decides main principle for all stations. The advantage of SSR is the energy we get back the same energy what we give. The disadvantage of SSR is it requires a target aircraft to carry a operation

ANTENNA: The antenna used here is the parabolic antenna for primary Radar and the lock periodic antenna used for the secondary Radar. This will be rotating 360 degrees so that the antenna can detect each and every signal. It is used for both receiving and transmitting purpose. Twisted wave guide is used to convert rectangular wave to circular wave. The speed is being reduced from 1500rpm to 14 rpm using breaks, clutters and reducers.

From here we moved to ATC. The data and signal received by the Radar are now sent into the Air Traffic Controls.

ILS (INSTRUMENTAL LANDING SYSTEM):

This system gives the guidance for aircraft i.e., wheather the flight is landing on the centerline of the runway or enables aircraft to land if pilot are unable to establish visual contact with runway. The angle required by the aircraft to land on the runway is horizontal 3degree optimumangle. Very high frequencies are used to communicate with pilot.



ILS USES:

The use of Instrumental Landing System are localizer and glide path. Localizer is a system of horizontal guidance in ILS, which is used to guide aircraft along the axis to runway.

Glide path tells that pilot to touch pilot to touch the ground at exact point of the runway the pilot controls the aircraft so that the pilot slope indicator remains centered on the display to ensure the aircraft is following the glide path of approximant above horizontal to remain above obstructions and reach the runway at the proper touch down point i.e., it provides vertical glidance.

During the landing aircraft if the aircraft is the at left of the runway then the glide path guides the pilot to move the center line of the runway by giving a signal 90KHZ and if the aircraft is atright then gives a signal 150KHZ to move to center line.

The threshold located at a point other than the physical beginning or end of runway. Aircraft is expected to land beyond the threshold.

DMA-Distance Measuring equipment which is used to give the exact distance from deviation.

Finally we went to area control center. There we acknowledge about how the flight will take off and land in term of height and speed.

HOD-ECE
Head of the Department
Electronics & Communication Engineering
Nalla Narasimha Reddy Education Society's
Group of Institutions - Integrated Campus
Chowdariguda(Vill), Ghatkesar (Mdl), R.R.Dist-501301