

Equipment will assist the pilots to operate on the ground under extremely poor visibility conditions. The Project includes the construction of an entirely new technical block and a 150-foot high control tower, where the new system is to be installed without interruption of operations.

- b) In December 1992, Westinghouse, USA signed a Rs 900 million contract to install four Monopulse Secondary Surveillance Radars (MSSR) and four ASR-9 Airport Surveillance Radars (ASR) at Trivandrum, Ahmedabad, Hyderabad and Guwahati to provide for en route airspace requirements. These radars will cut fuel costs, save flight time and enhance the revenue earnings of the NAA. As part of the contract, Westinghouse has entered into a joint venture agreement with Bharat Electronics Limited (BEL) to manufacture these radars for the domestic and export markets.
- c) In May-June 1993, the NAA awarded a Rs. 150 million contract to Gujarat Communications and Electronics Limited (GCEL) to supply 23 Distance Measuring Equipment (DME) units. GCEL is also in the process of executing a previously-awarded Rs. 170 million contract to supply 232 Doppler VHF Omni Range units.
- d) Installation of Doppler Very High Frequency Omni-Range (DVOR) with DME at Patna and Delhi.
- e) Installation of ILS at Bhubaneswar, Trichy, Khajuraho, Delhi (Secondary Runway), Kanpur and Ranchi.
- f) Computer-based Speech Switching Systems at Bombay, Delhi, Calcutta, Madras, Ahmedabad, Hyderabad and Nagpur.
- g) DME with glide path at Amritsar, Calcutta, Guwahati and Varanasi.
- h) DME at Bhopal, Jaipur, Trichy, Kanpur and Khajuraho.
- i) High Power Distance Measuring Equipment (DME) at Coimbatore.
- j) VOR at Dimapur and Pratapgarh
- k) Extended Range VHF Air/Ground communication at Ahmedabad.

#### Long Term Plans.

In September-October, 1992, the ICAO Assembly recommended the establishment of Satellite Aided Communication Navigation Surveillance System. This will help in switching over from ground based equipment to a Satellite Aided Communication System. Future Air Navigation System (FANS) envisages the establishment of global positioning system. It will involve:

- Covering the entire Indian landmass by 23 MSSRs, with Mode 'S' capability;
- Data and Voice communication links to the SSR locations through Indian Satellites;
- Indigenous development of an Airborne VHF data link;
- Data communication for AFTN messages through Indian Satellites by means of a packet-switched network. The master stations will be near Delhi and Bombay and the receiving airports will be provided with Very Small Aperture Terminals (VSAT);
- With implementation of the FANS concept the number of Flight Information Regions (FIRs) will be reduced from its present 5 to 2; and
- Long range and oceanic coverage interaction will be with INMARSAT through the Videsh Sanchar Nigam Ltd (VSNL) earth station at Arvi.

Electronics Corporation of India Ltd (ECIL) claims that as a first step it has designed, developed and installed a FANS at Madras airport recently. It is estimated that for full implementation of FANS, an expenditure of more than Rs. 1.0 billion would have to be incurred.