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CURRENT NATIONAL UPPER AIR ACTIVITIES – INDIA

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Summary and purpose of document

This document provides briefings on current national upper-air activities in India.

Action proposed

The meeting is invited to take into account information presented in this document when discussing issues related to a high priority issues.

Current national upper air activities – INDIA

1. India Meteorological Department, Govt. of India is responsible for running a network of 35 upper air radiosonde stations (34 RS/RW and 1 RS) in India. Tracking Radars are being used at 16 stations and rest are radiotheodolites. IMD also runs three more RS/RW stations in the Himalayan Mountain Region for study of Meteorology in the Mountains as R&D project. IMD has in-house production facility for radiosonde and maintenance of radiotheodolites / radars.

2. IMD is passing through a rapid modernisation phase, adopting a two pronged strategy to replace its old and obsolete radiotheodolite with state of art equipments and upgrading the existing stations with auto computation system using the new IMD – MKIV radiosonde. For ten stations (7 operational and 3 R&D) new IMS – 1500 Radiotheodolite from Inter Met systems, USA has been purchased. More than half of them are in operation and rest shall be made operational in next couple of months. The Radiotheodolite is used with new IMD – MKIV radiosonde.

3. At the existing stations acquisition and processing of radiosonde data is being made fully automatic using a new computation system devised by IMD and M/S SAMEER, Mumbai, India using new IMD – MKIV radiosonde. The system uses existing antenna and receiver and connects to the computer using a signal-processing unit. In the first phase ten stations of the southern India are being changed (6 are operational & 4 will be completed by November 2003). By March 2004 another 12 stations will be completed. The change over to new radiosonde shall be completed by middle of 2004 for all the IMD stations.

4. The new IMD – MKIV radiosonde uses time sequencing for getting PTU data in place of pressure sequencing. The sonde sends the data set at a 2 second interval. The Met data frequency range is from 25 to 1200 Hz. Existing aneroid in the baroswitch is being used as a pressure sensor. For temperature rod thermistor continues. Lithium Chloride hygristor has been replaced by carbon hygristor. The sondes are developed and manufactured at IMD facility in New Delhi.

5. The processing software has capability of on line plots of PTU data, generation of T-Phi gram, TEMP message, Climate TEMP, Monthly registers etc. The processed data is available for about every 10 meters height at 0.15 deg temperature interval. The software has provision for thorough check up of radiosonde at site which include finding out characteristics for conversion of sensor resistance to tones (frequency) over the complete range and generation of new constants specific for the sonde. It can use calibration constants of the individual temperature and humidity sensor. Software has rigorous quality checks, for checking the correct contact numbers, identification of bad / noisy data, deletion / correction of the data, filling of missing data through its horizontal and vertical consistency checks.

6. As future plan IMD is to start one more station at Jaipur shortly and upgrade its one station from RS to RS/RW. IMD is in the process of replacing another 14 radiotheodolites with the latest state of art equipment & likely to finalise the purchase in the year 2004. The system are planned to be in place & operational by middle of 2005.

7. Towards upgrading its radiosonde another compact, lightweight sonde using the latest Silicon pressure sensor is at R&D stage. Necessary expertise is available in the country. It shall be possible to modify the existing software for acquisition and processing of data from the new sonde coming up in the future. IMD is currently using 401 MHz as well as 1680 MHz bands and plans to change over to 1680 MHz completely. All the new Radiotheodolites are to be operated on this frequency band. IMD is also in process of change over to a new 1680 MHz transmitter for the radiosonde which is highly stable and frequency selection by dip switches.