Modernization Process of NMC Colombo, Sri Lanka.

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ABSTRACT

Modernization of a conventional meteorological institute is a challenging task. Not only the introduction of new systems also the subjective matters such as changing the work routing of operators also plays an important role. After Tsunami disaster in December 2004, the Department of Meteorology (DoM) Sri Lanka including its National Meteorological Centre (NMC) started entering its modernization era. New Global Telecommunication System (GTS) which is a TCP/IP based system replaced the conventional and old 50 baud teleprinter based system. The new system has the capability of generating weather charts and maps automatically. Automatic Rainfall Recording System which is a pilot project with four rain sensors also has been introduced. After introducing new technology, the conventional operators and meteorological personnel in the department were fear to the new technology and had their minds that they loose their jobs due to the automation. Among the new systems to be implemented in next two years, Automatic Weather Observing System comprising of 38 AWSs, Lightning Detection System, Doppler Radar System, and Upper Air Observing System are the most important ones. DoM starts its programmes to educate the meteorological personnel to cater the new technical demands apart from its infrastructural changes with new designs. Capacity building programmes have been planned in order to improve the quality of service in the institute.

1. Introduction

Meteorological observations in Sri Lanka started in the form of rainfall measurements which dates back to year 1850. Systematic recording of observations started during 1866-1883 under the Survey General of Ceylon. Present Department of Meteorology was enacted in the parliament in October 1948. The observation network consists of 22 meteorological stations managed by the Department of Meteorology and 42 Agrometeorological stations managed by various Government and Statuary Institutions. In addition, over 350 rain gauge stations supplement this network. DoM presently uses conventional techniques for its day today work. Since its inception various technical collaboration programmes have been operated in DoM Sri Lanka.

2. Evolution of the meteorological data communication

GTS communication link between Colombo NMC and New Delhi RTH was established using ITU 5 based tele-printer network. Sagem TX-20 tele-printers have been used for communicating meteorological data between Colombo DoM and New Delhi Regional Communication Hub(RTH) . The reliability of the link was not good due to the condition of the link and the complexity of the tape perforator and the tape reader.

Fig. 1 Sagem TX-20 Teleprinter

Fig. 2 Interface Unit

In mid 1995 all these tele-printers were replaced by PCs and conventional dot matrix printers. Interface unit and software development were locally done by DoM. Two separate PCs were used for data transmitting and receiving. Data exchange was extremely slow due to the narrow bandwidth of 50 bauds. Nevertheless this system was far better than the tele-printer based

PC based system was used until June 2007.

Fig. 3 Data Receiving PC

3. New Messir Corobor GTS Link

After Tsunami disaster occurred in Sri Lanka on 26th December 2004, many donor countries helped to restore country's socio economic condition. There were various projects for improving country's disaster mitigation plan. USAID (USA) helped to DoM for upgrading the existing conventional 50 baud GTS communication link. TCP / IP based new Messir Corobor GTS system was introduced in June 2007. The new system comprises with two Messir Communication Servers, Messir – Comm Supervision terminal, two Messir-Vision Workstations and Messir-Aero Workstation at Colombo (Katunayake) International Airport. Messir Comm is a GTS Meteorological Message Switching and Telecommunication System open to all new communication means. The system is fully compliant with the WMO Manual on GTS. It has connection to all types of subscribers such as TCP-IP socket, FTP, Ethernet, LAN/WAN, RMDCN, email, web server function, X25, PSTN, ISDN, leases lines, fax machines, AFTN, low speed telegraphic lines, telex lines, radar and satellite image systems (Meteosat-MSG, GMS, GOES, HRPT..etc), SADIS and Automatic Weather Observing Systems.

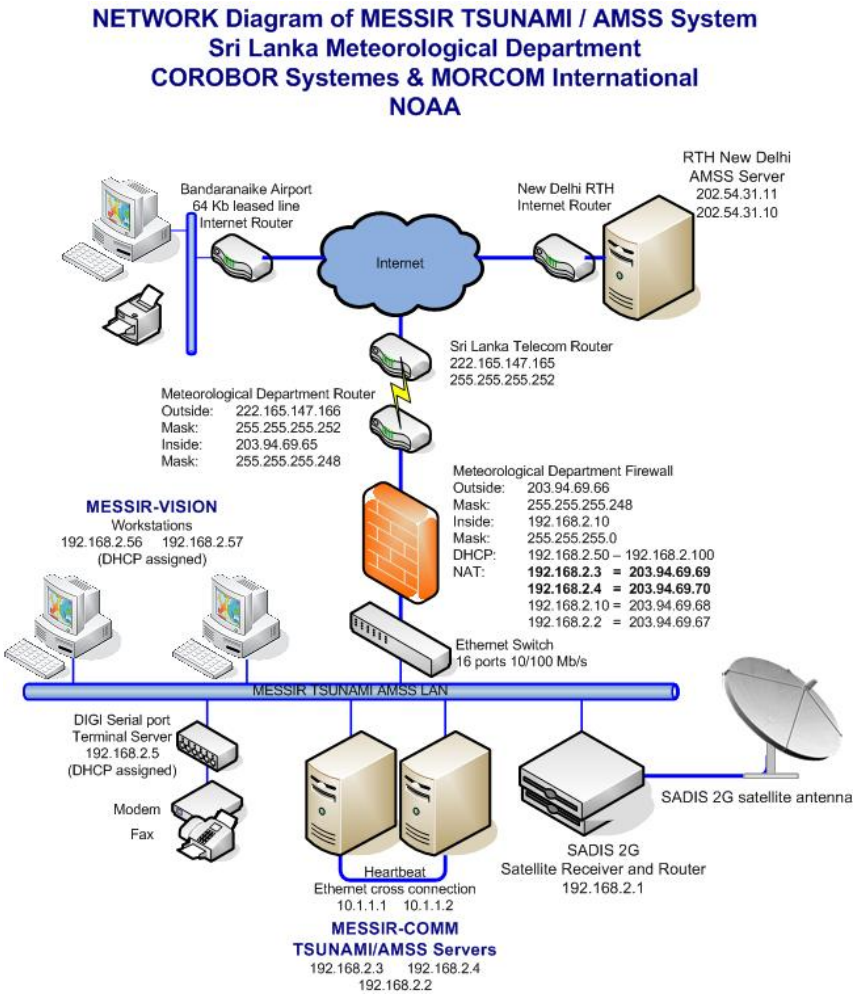

Fig. 4 New GTS Network

The new system has the facility of switching all types of data and products such as Text messages (Synop, Temp, Metar..etc), Binary products (GRIB, BUFR..etc), Files in WMO format and satellite and radar images.

4. Future projects

4.1 Automatic weather observing system (AWOS)project which comprise with 38 automatic weather stations and VSAT equipment for data communication. This project was funded by Japan International Cooperation Agency (JICA). Preliminary stage of this project has already been completed and within next few months the equipment installation will schedule to start.

4.2 Upper Air system is to be installed at Colombo NMC in September 2008. This project also has been funded by JICA.

4.3 Lightning Detection Network project has to be implemented in 2009. Lightning phenomena is very common in Sri Lanka. Human and property damage increase day by day. A reliable and timely forecast lightning system is required.

5. Capacity building programme

After introducing new technology, the conventional operators and meteorological personnel in the department were fear to the new technology and had their minds that they loose their jobs due to the automation. Communication officers who used to handle meteorological data collection in manually are content with the new system. Meteorological officers who take care observation, were not quite happy with the new technology at the beginning. After conducting a general awareness programme of the introduction of new technology, they gradually understand the situation. IT knowledge of the vast majority of the meteorological community in Sri Lanka is very poor therefore many training programmes have to be planned. The government training institute also conducts basic IT courses for these officers.

6. Conclusion

After introducing the new TCP/IP based GTS system DoM starts a new era. Efficiency of data communication has been drastically improved. After getting AWOS, the quality of data will be enhanced. Automatic generated weather charts can be now issued. Training of staff is gradually started to overcome the technological gaps.