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Summer Period Communication Services at Maitri

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ABSTRACT

A three-member DEAL team provided the communication link between for Indian Antarctic Expedition and India. A brief description of the services rendered during the summer period of the 27th expedition is mentioned.

Keywords: Antarctica, Maitri, Communication, Summer Expedition.

1.0 INTRODUCTION

Defence Electronics Applications Laboratory (DEAL) has been associated with Indian Antarctic Expeditions since 1991, i.e. from the 11th expedition. Antarctica being an isolated continent did not have elaborate High Frequency (HF) propagation model. Targeting this as a major activity, DEAL has been carrying out voice and data experimentation over multi-hop HF channel between Antarctica and India. Later on, Adaptive HF communication was also tried, which is still being pursued. From year 1995-96 onwards, i.e. 15th Indian Antarctic Expedition, DEAL took over the total communication responsibility at Maitri. Since then, DEAL officials have been offering communication support to Indian station Maitri, based on its rich R&D experience.

Radio room in Antarctic base Maitri is well equipped and has latest state of the art communication equipment, capable of operating in extreme conditions of Antarctica. In Antarctica communication is a vital requirement. Communication services allow scientists to remain in contact with their research laboratories at the mainland (India); it makes possible to exchange ideas, transfer real-time data and scientific information. Communication also helps to maintain the morale of the expedition members. VHF Radios are used for local communications, such as contact with the field parties, contact with vehicle convoys and in routine activities of Indian Antarctic base Maitri. VHF communication is also used for aviation band communication for safe flight operations.

HF and satellite phones are used for medium and long distance connectivity with field parties, ship and mainland.

2.0 COMMUNICATION DURING VOYAGE

Role of the communication team starts from the day of sailing. During voyage- phone, fax, email facility is provided to the members by using the system available on board ship. Calling time and email size are kept to a minimum, to restrict the expenditure on communication. Regular HF contact with India and Maitri is also maintained throughout the journey. Messages for scientific and logistic information, HF-schedule are regularly exchanged between ship and Maitri. During onward, as well as return voyages, regular messages are exchanged with NCAOR, Goa about the expedition progress and other activities.

3.0 COMMUNICATION PROVIDED BY DEAL AT MAITRI

3.1 VHF Based Fixed and Mobile Communication

- Connectivity between field parties and Maitri Radio Station.
- Communication with local and convoy vehicles.
- Regular VHF/HF communication with Russian station Novolazarevskaya.

3.2 Flight Operation: Aviation Band

- Communication with helicopter pilots for real-time weather, logistic and flight specific information updates for safe heli-operations.

3.3 INMARSAT based Telex, Fax, Email and Telephone services

- Email facility to expedition members with INMARSAT-B terminal.
- Round-the-clock telephonic facility to expedition members with INMARSAT-Mini-M terminal.
- Smooth operation of INMARSAT MINI-M based FAX facility.
- Scientific Data transmission:
  - 6 hourly online synoptic data transfer to IMD-HQ, Delhi with INMARSAT-C Terminal.
  - Data for Geomagnetic field variation to IIG, Mumbai.

- Automatic weather report to SASE, Chandigarh.
- Digital Seismic data to NGRI, Hyderabad.
- Report and data transmission of scientists to concerned organizations.

3.4 HF Communication around Maitri and with India

- HF Communication between DEAL (India) and Maitri.
- Reception of HF-based weather charts, broadcast from Pretoria (South Africa), for analysis of Meteorological forecasting by IMD scientists.

4.0 PARTICIPATION IN INSTALLATION OF EARTH STATION AT MAITRI

One of the major achievements of the 27th Indian Antarctic Expedition was the establishment of India's own satellite Earth Station at Maitri. This has facilitated video-conferencing, video-streaming, internet facility, real-time communication, online scientific data transmission to parent institutions, faster data transfer, streaming of limited television channels from India to Maitri etc. The link has a bandwidth of around 1 Mbps to operate at the data rate. This was a most ambitious project, which provided a vital link between Antarctica and India.

Along with ISRO and ECIL members, the DEAL team also actively participated in installation of the satellite Earth Station at Maitri. At the close of the summer period, the DEAL team has taken over the responsibility of operating the Earth Station to provide uninterrupted services to expedition members.