

Report on R&DE(E) Tasks during Tenth Antarctic Expedition

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Introduction

The R&DE (Engrs) has been associated with the Indian Scientific Expeditions to Antarctica since Third Expedition. It has contributed towards the logistic/scientific programme by designing and fabricating the DRDO complex, Dobson Hut, sledges and the systems for Dakshin Gangotri Complex at Antarctica. In continuation of the support, R&DE (Engrs) has designed and fabricated the entire Maitri station which stands today majestically as a totally indigenous station.

Three representatives of this establishment were nominated as members of Tenth Antarctic Expedition to provide technical assistance to the team in construction and repair/setting up of refrigeration systems.

Tasks/Additional Facilities

As a part of the expansion programme of Maitri station, certain additional facilities have been planned to be provided in a phased manner. The following additional facilities were planned:-

- (a) Generating set accommodation.
- (b) Housing for Effluent Treatment Plant.
- (c) Structure for National Physical Laboratory's sodar experiment.
- (d) Dome type structure as experimental Green House.
- (e) Walk-in-type cold storage.
- (f) Cargo handling.

In addition to above, following tasks were allotted to the members:-

- (a) Providing Technical Assistance in erection of the above mentioned new facilities and maintenance of Maitri station.
- (b) Repair of defective refrigeration units and setting up of new units for walk-in type cold storages.
- (c) Study the environmental pollution and control aspects at the station.

- (d) Study the effect of snow loading on the buried Dakshin Gangotri Station structures and the possibility of retrieving costly equipment from within the structure.
- (e) Study the ground configuration around the main station and recommend areas suitable for future expansion, especially locations of laboratory complex and garrage-cum-workshop.

Personnel

The following personnel represented the R&DE(Engrs) during this expedition:-

- (a) Lt. Col. S Bhatia
- (b) Shri V S Shinde, Scientist
- (c) Shri S V Gowd, Scientist

Details of Additional Facilities

Generating set accommodation

This structure was given priority for the expedition. The stores were transported from the ship as per the sequence of construction. The accommodation was completed by 17th Feb 1991, as per the schedule.



Fig. 1. Generating set accommodation.

Housing for Effluent Treatment Plant

The proposed site for housing the Effluent Treatment Plant was discussed with the Leader, Station Commander and the Army team representatives. After many deliberations, gravity flow of the effluent from the station was found advantageous than pumping. Hence the alternative site adjacent to the lounge of the main station was selected. It was, however, decided to construct a modified housing, using old foundation beams and certain items of the ETP such as wall panels, runners etc. to house the new B-3 Klargest. Extension of this housing would be carried out subsequently.

NPL Structure

Construction of the structure for National Physical Laboratory's Sodar experiment was undertaken simultaneously with the generating set accommodation. It was completed well in time.

Dome Structure

The experimental Green House in the shape of a dome was erected by members of the DRDO summer team, assisted by scientists and members of the ITBP and other expedition members. In spite of inclement weather the work was completed in six days. This structure has been constructed adjacent to generating set accommodation. (Fig. 2)



Fig. 2. Dome structure.



Fig. 3. Extension of 'A' Block.

Walk-in-Type Cold Storage

Two walk-in-type cold storages were planned to enhance the storage capacity of frozen food for wintering teams at Maitri. Two bays of 'A' block were extended to house this cold storage. After the concreting of the floor, the erection of the cold storage was completed by scheduled time. The commissioning of the refrigeration units for the cold storages was done to the satisfaction of the entire wintering team. However one refrigeration unit had to be sent back due to leakage of gas.

Details of Tasks

Besides providing technical assistance to Expedition for erection of new structures, guidance was also provided to them on certain maintenance tasks such as provision of steel bracings below the Green House and Block 'B'. The southern corner of the Main Block and Block 'B' was strengthened by providing steel section in the corridor to support the walls against maximum wind turbulence. Rewelding of some of the broken joints below the Main Block was also carried out. The old Green House was provided with an external polythene cladding for protection against direct UV radiation.

Repairs to six defective deep-freezer units and one refrigerator container was also carried out by Shri S.V. Gowd.

Study was carried out around the station premises of the different types of wastes which are likely to cause environment and water pollution.

Study of the buried structure at DG could not be carried out owing to safety precautions as nobody was allowed to enter DG station as per the instructions of the Leader,

Study of the ground configuration around Maitri station has been carried out with respect to the Laboratory complex and the Garrage-cum-workshop which are likely to be undertaken by the subsequent Antarctic Expeditions.

Shri V.S. Shinde, Scientist of R&DE(Engrs) was deployed as Officer-in-Charge for loading of cargo on board ship at Antarctica, About 75 helicopter sorties weighing approximately 200 tonnes were organised as per the construction sequence and the demand received from Maitri station. He also handled about 50 sorties of back loaded stores from Maitri. The job involved was tedious and required co-ordination with the ship crew, Air-Force, Navy and Maitri station, as well as co-ordination with expedition members for mobilisation of manpower.

Conclusion

It was the endeavour of the representatives of the R&DE(Engrs) as members of the Tenth Antarctic Expedition, to be useful members of the team. They contributed their maximum, may it be during loading and unloading operation at Maitri/Ship, the additional tasks of extension of 'A' Block or construction of Dome structure etc.