

Report on hydrographic survey of Antarctica by XVI Indian scientific expedition

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Background

1. India is a member of the Permanent Working Group on Co-operation in Antarctic (PWGCA). As per the International Scheming of the Charts for the Antarctica region duly approved by the (PWGCA) Charts Nos 9050 and 9051 covering Approaches to the Indian Permanent Stations has been assigned to India. Based on the Indian request, the (PWGCA) has also accepted to redesign the limits of the Charts so to include the Indian Permanent Station "MAITRI". Therefore it is important for India to carryout a detailed scientific survey of these two areas in a phased manner by deputation of hydrographic scientific team as part of the Indian expeditions to Antarctica.
2. A Hydrographic survey team formed part of XIV Antarctica Expedition to study the suitability of equipment, feasibility of ship and boat operation and human endurance in extreme cold conditions. The team was able to collect valuable bathymetric data from point of view of preparation of charts, with in the form of tracing placed at Enclosure I.

Achievements of XVI Antarctica expedition

3. As a part of XVI Scientific Expedition to Antarctica, one Hydrographic team consisting of one Meteorological Officer, One Hydrographic surveying officer and one Hydrographic surveying recorder were deputed to embark MV Polar Bird. The following tasks were assigned to the Hydrographic team:-
 - a) Collection of bathymetric data in fresh area for eventual publication of nautical chart.
 - b) Collection of physical oceanographic data in the area of survey.
 - c) Gather sufficient expertise in operating survey motor boats, survey equipment and deployment of field parties under extreme cold conditions.
 - d) Participation in the land survey form Continental Shelf to "Maitri"
4. Hydrographic Task Undrtaken. The survey in Antarctica was carried out on World Geodetic System 1984 (WGS84) Datum universal Transverse Mercator projection Grid, Zone 32 with Central Meridian 09deg E. The inability to build sites on icy shelf necessitate temporary marking of Geodetic Control stations . GPS 200 in Kinematics mode was used for position fixing.

- 5 Calibration of Equipment. Extensive field trials of survey equipment such as distomat, trisponder, Global Position Fixing system etc. were carried out for studying their performance under harsh conditions.
6. Topographical Features: the coastline falling within Approaches to India Bay (Chart No. 9051), Princes Ashid Coast was delineated by the Survey team. A tracing is placed at enclosure.
7. Bathymetry: Attempts were made by the survey team to collect Bathymetric data in the India Bay but same were not successful in view of frequent breakdowns of survey motor boat. Based on the experience of previous expedition some modifications were carried out in the Survey Motor Boats but could not produce desired results. The office had pursued a case of hiring of survey launch from M/s Reiber Shipping of Norway for Expedition. Since the approval of Naval Headquarters for emabrkation of a hydrographic survey team was not accorded the case could not be progressed further.
8. **Recommendaitons** : The following recommendations have been made by the Hydrographic Team with a view to optimise the data collection during the future Antarctica Expeditions:-
 - a) Feasibility of hiring a boat especially designed for operating in Antarctica for future expeditions.
 - b) The revision of existing composition of survey team to include following:-
 - i) Hydrographic Surveying Officer - 01
 - ii) Hydrographic Survey Recorder – 01
 - iii) Engine Room Sailor – 01
 - iv) Electrical Sailor – 01