

Report of Naval Contingent-XXI Indian Antarctic Expedition

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Introduction

The Hydrographic Survey of Antarctica during the XXI Indian Antarctic Expedition was undertaken by the Survey Team in accordance with the National Hydrographic Office directives. A Hydrographic Survey team consisting of Lieutenant Commander Neeraj Thapliyal and SK Rai Petty Officer was deputed to the National Center for Antarctic and Ocean Research, Goa to participate in the XXI Indian Scientific Antarctic Expedition.

Activities in Antarctica

On arriving at Antarctica equipments were checked by the respective expedition members. The GPS 200, Current meter and other meteorological equipment sent in the container were received and checked by the survey team on 16 Jan 2002.

The survey was carried out on a scale of 1:2,00,000 within the area bounded by following limits:-

Latitude 69° 24' 00". 0 Sto 70° 4V.00.0 S

Longitude 11° 00' 00". 0 Eto 14° 00'. 00" E

The ship sounding was conducted on 16, 18, 25, 26, 27 and 30 Jan 2002, during the time the ship was waiting for weather to improve so that helo operations could be planned and ship be berthed alongside. Meteorological and Oceanographic observations were carried out during the entire period continuously. The various specifications of the survey undertaken by the team are enumerated in the succeeding paragraphs.

Geodetic Control

Horizontal control for the entire survey was established in WGS 84 Datum and plotted on Mercator projection with scale true at 66° S. For ease of plotting, the area was divided in two sheets, Northern sheet from 69° 24' S to 70° 20' S and Southern Sheet from 70° S to 70° 47' S. GPS coordinates directly obtained from the ship fitted GPS "Trimble Navtrac XL" were used for sounding. No control was established for this purpose.

Digital Surveying System

The ship fitted Trimble GPS system NAVTRAC XL was used for sounding.

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The ship fitted Trimble GPS system Navtrac XL was used for position fixing while sounding, for the entire survey. The performance of the system was satisfactory and reliable throughout the survey. The instrument had digital output port, but the same was already connected to the radars.

Bathymetry

Two Russian made echo sounders were available on board, model M4, designed for measuring depth up to 50 meters and model Nel M3B designed to measure depth up to 500 meters. With an average depth of 100 to 200 meters at Antarctica near India bay, the only option was to use to echo sounder model NEL M3B. 8.2. The sounding lines were run approximately 1 cm apart on the scale of survey perpendicular to the depth contours. Sounding density was not changed for delineation of the shoals, which was considered adequate to meet the desired standards of accuracy and thoroughness on scale of the survey. When the ship was not following any particular course, spot soundings were also taken.

The observed depths were corrected for index error of the echo sounder, ship's draught and sound velocity. The accuracy of sounding was well within stipulated accuracy standards.

Achievements During XXI Antarctica Expedition

- (a) During the Expedition a total of 200 Nautical Miles of sounding was completed.

- (b) During the Expedition 100 Nautical Miles of ice shelf was delineated.
- (c) Valuable Oceanographic and Meteorological data was collected.
- (d) Sound Velocity and Current observation were undertaken at various locations.
- (e) Approximately 500 Nautical Miles of Passage Sounding was undertaken.
- (f) The relevant data of Antarctica Region was collected for inclusion in sailing direction.
- (g) The team gained valuable experience in operation of various survey equipments/systems in Polar Areas.
- (h) Data collected during previous expeditions was validated by the data collected during this expedition.