

Pioneering a Land Route from Maitri to Polar Plateau

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Introduction

An Indian expedition to the South Pole is being planned. A presentation to this effect was given to the COAS which was attended by the Joint Secretary, Department of Ocean Development (DOD), Mr. Anil Mishra amongst other senior officers from MO, Dte and E-in-C's Branch. It was decided that two officers would be deputed in the 19th expedition to Antarctica to explore the feasibility of carrying out an Overland Expedition to the South Pole from Maitri. The National Centre for Antarctic and Ocean Research (NCAOR) gave its approval for the inclusion of the two officers in this expedition. Following is the report of the reconnaissance (recce) carried out by the officers during the course of the expedition.

Objectives

The authors from E-in-C's Branch were deputed to carry out the necessary recce for the South Pole Expedition. Following tasks were allotted to them:

- (a) Reconnoiter and open an overland route to the Polar Plateau and to the first fuel dump (Depot 1), located around 72°S latitude.
- (b) Determine the fuel efficiency and load pulling capabilities of the snow scooters available at Maitri.
- (c) Determine the fuel efficiency and load pulling capabilities of the latest Kassbohrer vehicles available at Maitri.

Preparation for the Recce

Prior to departure from Goa, a series of meetings was held by the Centre Director of NCAOR, Dr. P.C. Pandey to discuss the requirements of the recce team. Amongst others, the Leader of the Expedition,

Mr. Arun Chaturvedi, a veteran polar man and Mr. Bhaskara Rao, Director-Logistics & DOD Observer for the expedition, also attended the meetings. All possible help was promised for the recce team. The recce team was inducted to Maitri on 24th December 1999. Following actions were taken on reaching Maitri as a part of the preparation for the recce :

- (a) The snow scooters were lying in a state of disuse for the last two years. With the help of EME technicians of the previous Winter Over Team, 4 of the 5 available snow scooters were made operational. The authors teamed up with Mr M. Javed Beg & Dr A.V.K. Prasad of Geological Survey of India (GSI) and thus two snow scooters were driven, along with an overland convoy, from Maitri to India Bay, a distance of about 100 km. This was to test the road worthiness of these snowmobiles and to prepare the team for the recce. The snow scooters were found to be in working condition. These snow scooters were also used extensively at India Bay by the Army team, handling fuel and other cargo.
- (b) After induction of the scientific team to Maitri, the helicopters were available for carrying out aerial recce. An initial aerial recce was carried out along the central part and the eastern margin of the Somoveken Glacier to search for a likely route to the Polar Plateau. The surface was found to be heavily crevassed and gradient too steep to allow any safe passage for the vehicles. It was then decided to shift the focus of aerial recce to the western edge of the Glacier along the Orvin Mountains. This route was found more promising and the gradient was gradual enough to permit movement of vehicles with load. GPS readings of the tentative route were taken from the helicopters (Table-1), as marked on the Sketch Map.
- (c) It was decided to establish a mountain camp along with the geologists of GSI for confirming the route selected on ground. The camp was established at the base of Gjeruldsenhogda nunatak at 71°57'S and 10°46'E at an altitude of 2100 m (7500'). The snow scooters to be used for recce were to be brought under slung with helicopters. However this plan could not materialize as the helicopter crew failed to shift the snow scooters to the camp.
- (d) It was finally decided to reach the camp using two Kassbohrer snow tractors and two snow scooters. A portable camping module, "Sankalp", was to be used as the mobile shelter. The two vehicles so selected were a PB-330 and a PB-270 vehicle. Fuel for these vehicles was taken in a half bin container.

Table 1: GPS Coordinates for the Route from Maitri to Polar Plateau

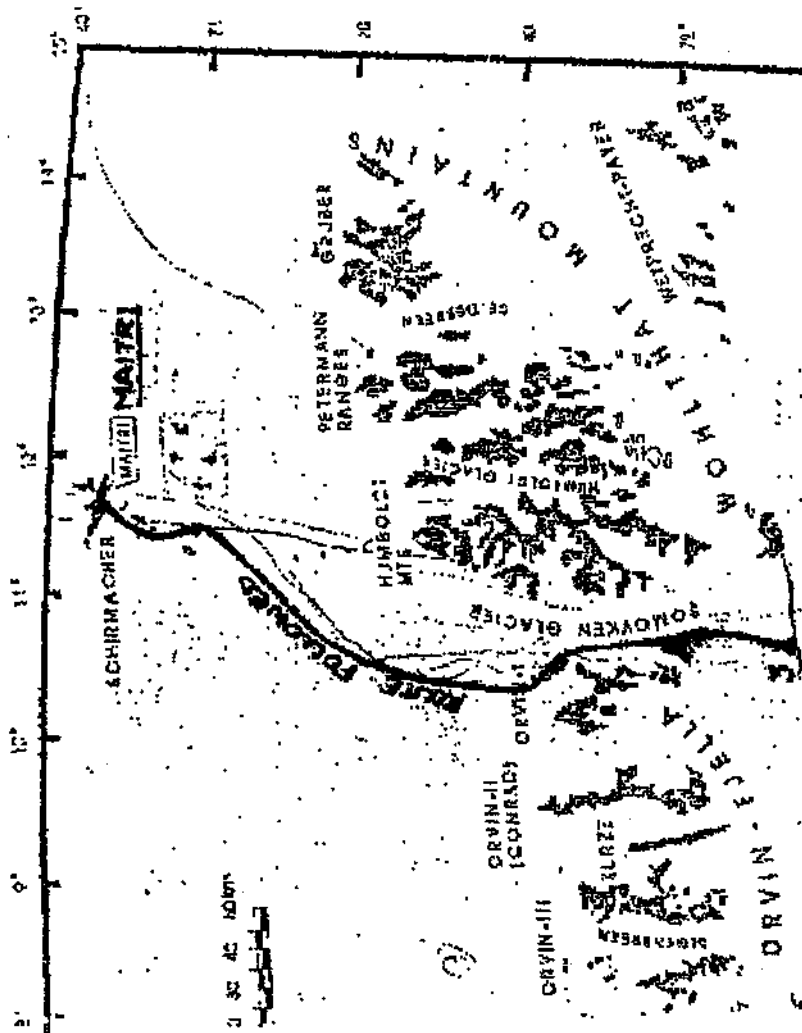
1.	70°45'57"S	11°44'03"E (from Maitri)
2.	70°52'59.4"S	11°29'34.8"E
3.	70°55'21"S	11°31'54.6"E
4.	70°57'41.4"S	11°33'04.8"E
5.	70°58'24.6"S	11°31'12"E
6.	71°00'49.8"S	11°23'16.2"E
7.	71°03'31.2"S	11°20' 23.4"E
8.	71°05'41.4"S	11°17'36.7"E
9.	71°06'57.4"S	11° 14'25.9"E
10.	71°07'49.2"S	11°04'59.4"E
11.	71°12'09"S	10°55'33.6"E
12.	71°17'37.8"S	10°49'07.2"E
13.	71°20'52.2"S	10°45'37.8"E
14.	71°24'20.4"S	10°41'48"E
15.	71°27'39"S	10°38'42.6"E
16.	71°30'43.8"S	10°36'32.4"E
17.	71°32'50.4"S	10°34'48"E
18.	71°34'48"S	10°32'49.8"E
19.	71°36'17.4"S	10°31'51.6"E
20.	71°37'06"S	10°33'1.8"E
21.	71°39'36.6"S	10°33'34.2"E
22.	71°41'21.6"S	10°36'30.6"E
23.	71°43'41.4"S	10°42'15"E
24.	71°46'07.2"S	10°43'04.8"E
25.	71°47'23.4"S	10°41'15.6"E
26.	71°49'09"S	10°39'20.4"E
27.	71°57'22.8"S	10°48'00"E
28.	71°57'53.4"S	10° 46'34.2"E (Camp site at Gjeruldsenhogda)
29.	71°57'52.6"S	10°51'24"E
30.	72°02'56.5"S	10°51'59.4"E
31.	72°04'30.4"S	10°51'00.3"E
32.	72°11'08.6"S	10°51'53.9"E (Southernmost point reconnoitered)

Convoy Team to the Polar Plateau

The overland convoy to reach the Polar Plateau left Maitri at 1530 hr on 27th January 2000. In this extremely risky venture of establishing a new ground route, through a heavily crevassed Antarctic glacier, the convoy was led on two snow scooters by:

- (a) Maj Anand Swaroop (Engrs): Recce member of 19th expedition.
- (b) Capt R. Rajesh Bhat (Engrs): Recce member of 19th expedition.

1. MAURI
2. CAMP AT GJERULDSENHOGDA
3. SOUTHERNMOST POINT OF RECCE



The other members of the team followed in two PB-vehicles:

- (c) Maj Ravi Sangwan (EME) : OIC-Army team of 19th expedition.
- (d) Mr. TVP Bhaskara Rao : NACOR/DOD- Observer of 19th expedition.
- (e) Maj VV Kadam (EME) : OIC-Army team of 18th expedition.
- (f) HMT Sitaram : Vehicle mechanic of 18th expedition.
- (g) Hav R.B. Singh : Vehicle electrician of 18th expedition.

Observations: Route from Maitri to Camp

The distance from Maitri to the camp at Gjeruldsenhogda was 170 km along the route selected by the helicopters. The following observations were made along the route :

- (a) The going was relatively easy. The terrain is of hard and compacted snow and provides good grip to the vehicles pulling loads.
- (b) The gradient rises gradually from 200 m altitude of Maitri to 2100 m at the campsite. The slope is quite steep at three or four places, however the convoy vehicles pulling loads can easily negotiate these slopes. If required, the loads can be double towed, i.e. two vehicles pulling one load in tandem.
- (c) The aerial recce by helicopters proved to be quite precise as no crevasses were encountered by the surface vehicles.
- (d) The temperature varied from - 15°C during daytime to - 22°C after sunset.
- (e) Katabatic winds up to 20 knots were common after 1800h everyday.

Observations: Route from Camp to Polar Plateau & Back

The team reached the campsite after 2200 hours and camped there for one day. On 29th January, the camp was wound up and the vehicles proceeded towards the Polar Plateau. After four hours of driving, the team reached an altitude of 2400 m and was on the Polar Plateau. The GPS reading of the location was 72°11'S 10°52'E. Following observations were made on the Polar Plateau:

- (a) The terrain was gradually sloping upwards to the south. Sastrugis were encountered with greater frequency than earlier and these were higher than before.
- (b) Temperature was -18°C and wind was not very appreciable.

- (c) The terrain was expected to rise gradually to the south and possibility of encountering crevasses ahead was not very likely. No hill features or nunataks could be seen south of the last point of the recce.

Having accomplished the task of reaching the Polar Plateau successfully on vehicles, the convoy team returned to Maitri. The return journey took only 17 hours of driving down, though the weather turned bad and heavy snow drift was encountered on way. The team reached back Maitri on 30th January 2000 at 1900 hours.

Observations on the Vehicles and Equipment

Following observations were made about the Kassbohrer vehicles and snow scooters:

- (a) PB 330 vehicles are capable of pulling up to 15 tons of load effectively on normal gradients. They consume about 1.8 to 2.0 litres of fuel per kilometer.
- (b) Snow scooters available at Maitri are capable of pulling up to 500 kg of load on sledges and travel about 3 km per litre of fuel in the best of conditions. However fuel efficiency may be taken as 2 km per litre for planning purposes.
- (c) Clothing available at Maitri is not adequate while travelling on snow scooters. Gloves are grossly inadequate and some modifications to keep the hands heated must be taken up with the manufacturers of snow scooters.
- (d) INMARSAT terminal can only be used effectively up to 72°S. After that no communication is possible with the portable Mini 'M'- terminal.
- (e) Kassbohrer vehicles, especially PB-330s, are very well suited to reach the South Pole and back without any major problems.

Conclusion

The opening of a land route from Maitri to Polar plateau is a great achievement for the Indian Antarctic Expedition. For the very first time in the history of Indian Antarctic endeavor, vehicles were able to reach the Polar Plateau. This will pave the way for carrying out greater scientific activities on the Polar Plateau, an area of Antarctica that is comparatively less explored. It can now be conclusively stated that an Overland expedition

from Maitri to the South Pole is very much possible. It is suggested that a detailed presentation be carried out to officials of DOD, NCAOR and Army HQ on the modalities of the First Indian Expedition to the South Pole in light of this successful recce.

Acknowledgements

This landmark achievement would not have been possible without the active participation of all the team members of the 19th expedition and WOT of the 18th expedition; Maj V V Kadam & Maj Ravi Sangwan, OICs-Army teams, with their respective expeditions, Mr. Javed Beg & Dr. Keshava Prasad from GSI, Capt Venkatesh, Capt Kapil Taneja and the army team members of both the old and new expeditions. But for their help and motivation, it would not have been possible to complete the tasks allotted. The recce team is also thankful to the M/S Pawan Hans Helicopters for their assistance during the aerial recce, which proved to be so crucial in identifying the route. Last but not the least, the help rendered by Mr TVP Bhaskara Rao, DOD-Observers, during the convoy has acted as a motivation and inspiration to attempt the most difficult task and come out successful.