

Report of the environmental task force

RASIK RAVINDRA

DoD observer

In pursuance of the recommendations of the National Group on Monitoring of Antarctic Environment, it was decided by the National Co-ordination Committee to send a Task Force, dedicated solely to environmental monitoring and massive clean-up operation in the area around Indian Antarctic base, Maitri. The Task Force which formed a part of the XVI Indian Antarctic Expedition comprised :

Shri Rasik Ravindra, Environmental Officer-cum-observer

Capt. V. Saini

Nb Sub Dalwinder Singh

Hav Suresh Singh

Hav Md Nazim Khan

Hav Darshan Singh

NK Aghav Baburam

L/NK Umesh Kumar

The Environmental Task Force (hereafter referred to as ETF) was assigned following jobs to be accomplished during the austral summer of XVI Indian Antarctic Expedition (IAE) :

- a. Identification of an alternate site for summer camp in the vicinity of Maitri,
- b. Identification and backloading of disused equipment, machinery, vehicles and other structures, etc.,
- c. Environmental clean-up of Maitri and its environs. Back loading of the waste,
- d. Study of sewerage pit, incineraters and biodegradation plants.

Selection of alternate site for summer camp

Background Information

The existing summer camp is situated about 200 meters north of Maitri station at the southern bank of Priyadarshini lake. Initially the summer camp had only three huts supplied by a U.K. based firm and erected during IV IAE. These huts, named as kitchen hut (Annapurna), Scientist's hut (NPL hut/Nandadevi) and Hyderabad/Tirumala hut, have 23'x16' working space in ground floor, The

lofts have partitions to provide sleeping berths for 12 persons in each hut.

As the number of scientists in summer component of the expeditions gradually increased, some knock down type of huts were erected subsequently giving rise to a cluster of dwellings along necessary utility facilities, such as toilet, urinal, bath module, etc., communication room, Laser heterodyne hut, Recreation room, several masts for scientific programme were added gradually. The net result has been the mushrooming of temporary modules and structures largely in an unplanned manner without a proper layout plan. Some of the unnecessary and unrequired structures, such as green house dome and railway track also found their way.

The Alternate Site

To overcome the existing environmental hazards posed by the close proximity of the kitchen, bath, toilet and urinals to the Priyadarshini lake (which supplies the drinking water to the station), it was decided by the Department of Ocean Development (DOD) to select an alternate site for the summer complex where living and laboratory facilities could be provided to about 40 expedition members (mostly scientists).

Extensive traverses were taken by me in different parts of Schirmacher Oasis. Existing topographical maps, prepared by Survey of India and Arctic and Antarctic Research Institute of Russia, were also scanned. The assignment of selection of site for the alternate camp had to be given top priority as the area was to be taken up by the survey of India team for a detailed topographical mapping on 1:1000 scale, with 1 m contour interval.

Out of six different sites surveyed, three probable locations were shortlisted. These were:

1. Area around erstwhile German hut in the western Schirmacher,
2. Area north of Priyadarshini lake,
3. Area east of Maitri station on Maitri - Novolazarevskaya road.

Several aspects, such as proximity to the Maitri station (which would continue to provide essential services like medical, communication, etc.), availability of approach road for the movement of men and material, availability of permanent source of fresh water (having regular source of intake of melt water) and availability of suitable area for sewage discharge into a low topographical area away from the catchment of Priyadarshini lake, were considered for selecting the ideal site among the above three probable locations.

The site, mentioned at serial No.3, was found to be most suitable, satisfying most of the important criteria. This site is located between 500 and 700m east of Maitri station and is connected to latter by a land surface motorable road. While the drinking water would continue to be supplied by the Priyadarshini lake, the treated grey liquid can be discharged in a naturally occurring depression, further east, that does not fall in the catchment area of the lake.

The detailed topographic survey of the area by Survey of India has been completed. Preliminary appraisal of the area shows a naturally occurring water divide between the catchment of Priyadarshini lake and the depression / lake earmarked for sewage disposal.

Environmental tasks

The area around Maitri was surveyed jointly with the Leaders of XV and XVI IAE as also with Army Team officer incharges to assess the work load and to get familiarised with the changes / modifications which have taken place since 1991, when I had worked as Station Commander of Maitri.

Most of the areas around generator rooms, workshop accommodation, make-shift vehicle shelter, fuel and vehicle park showed extensive damage to the soil by way of spillage of oil and lubricants. There were pools of spilled fuel, lubricants and grease. Cotton waste, gunny bag rags soaked with lubricant and grease had embedded themselves in the soil hardened by frozen moisture. The plastic and iron packing strips, cardboard packing boxes, empty cartridges of antifreeze capsules, oil filters, splinters of broken wood, polythene wrappers, paper waste and empty fruit juice cans were found scattered at various places. The entire working area was divided in to 17 sectors for the purpose of clean-up operation. These were :

1. Sector between Aditya and the Green house dome - the site of burnt generator accommodation.
2. Sector behind "A" Block- which had huge stockpile of junk accumulated since X IAE.
3. Sector between "A" and "B" Block of the station which had oil spillages, defunct railway track, HF transmission line and leaking oil tanks etc.,
4. Area east of "A" Block generator room.
5. Workshop accommodation which was filled with snow/ice and required massive clean up operation.
6. Summer camp kitchen sector that had an open incinerator site.
7. Area around summer camp having unused construction stores, junk from burnt incinerator toilets, spare masts, etc.,
8. NPL's 9 m mast with accessories, sodar shield and unused construction stores of Laser Heterodyne hut.
9. Three open incinerator sites of earlier expeditions west of the station.
10. Sector between the summer camp and Maitri, including four MGS platforms.
11. Area around Bhaskara and German generator rooms.
12. Area around fuel park south of the station.

13. Area around jwala, the incinerator unit.
14. The sector around Priyadarshini lake.
15. Area along Maitri - Novo and Maitri - Dozer point road.
16. Green house dome, and
17. Windmill structure.

Details of the clean up operations

1. The biggest eyesore in the environs of Maitri was the burnt generator accommodation. This particular structure, constructed during X IAE was completely gutted down in April 1992 (XI IAE) giving rise to huge pile of charred wood, twisted iron, iron girders, iron sheets and metal strips, etc.,. The iron girders, which formed the base of the accommodation were fixed with concrete foundation. There was a completely charred layer of wooden sleepers over it. One of the earlier expeditions had removed the iron trusses from the spot and dumped the same in sector 2, The place was being used for storing waste food stock and some miscellaneous station stock. The ETF spent nearly 10 working days in clearing the site of nearly 35-40 tonnes of junk material. The waste mostly comprised iron junk, wooden splinters and waste food stock as old as 1988.

The operation left behind an ugly spot of concrete bases. To impart the area a clean look, as many as 160 MGS panels lying scattered in different parts of the station were gathered and assembled together in the form of a platform measuring 70'x 27'. The area around this platform was levelled using dozers. This platform has been converted into a basketball court by providing two rings with nets, suspended from angle iron stands at two ends. No trace of burnt accommodation has been left at this site.

2. The area behind "A" Block appeared to have been used by successive expedition teams as junk yard where heavy iron trusses of burnt generator accommodation, waste generator parts, distorted iron sheets in addition to construction stores, viz. new plywood and sunmica sheets, door and insulated double window panels, electrical wires and cables, new diesel tanks, asbestos sheets, gypsum boards, etc., were stored.

The ETF loaded two full containers, ETF 3 & ETF 4, and two half bins (ETF 11 & ETF 12) with this junk. Since the trusses were too heavy to be lifted manually Mantis crane was used to load these on to the bins. The useful constructional and electrical stores like window frames, double glasses for windows, 2" dia towards workshop accommodation where these were stacked in the empty container.

3. The sector between Block "A" and "B" falls in the rear of Maitri station. This "U" shaped area had a 160' long defunct railway track which

could not be put to any use since VIII IAE as no transportation of the stores over it was possible in the area where the track existed. The track was dismantled by removing 40 pieces of rails or 8' length each, several fish plates, bolts and wooden base planks. The retrieved material was shifted from the site and loaded in the open bin No.ETF 12.

There was a pool of snow melt having thin layer of oil over it. The water was drained out using a pump while the oil was collected in a barrel for back loading.

The area around the stilts below the "B" Block had lot of unserviceable stores and waste collected over the years. These stores, apart from occupying space were also causing obstruction to the free passage of air and snow below the station resulting in accumulation of snow. The entire area was cleaned by removing these stores.

A white tank mounted on iron pillars and situated in this area, as also the joints in the rubber hoses carrying the fuel from this tank to generator and boiler rooms, were found leaking. The leakage was pointed out to the expedition members and things set right.

HF transmission wires, mounted on rectangular iron stands, ran from behind the station to the HF antenna about 100' away from "A" Block. These cables had become defunct as use of the same was discontinued for the last couple of years. Moreover, the transmission wires used to block the motorable road running from workshop accommodation to the green house. The wires along with the stands were removed for backloading, leaving the antenna intact as desired by DOD.

Area east of "A" Block, stretching from the Green House to the entire length of Generator room (containing 4,62.5 K VA gen sets) fell in sector 4. This sector had huge pile of wooden trusses, plywood sheets, wooden sleepers, dozer parts, etc. in one portion. The other part closer to "A" Block's gate, was heavily soaked with lubricants and grease, thrown out of the generator room windows and door. Being on the windward side of the station, there was a heavy snow accumulation in this area. The snow melt in the summer had given rise to wet ground which was found to be full of waste spares and other junk from genset room.

The ETF collected 4 barrel load of waste, comprising oil filters, grease, cotton waste, used batteries, anti-freeze capsules etc. the barrels were loaded for transshipment out of Antarctic waters.

Some of the construction stores lying here were shifted to workshop area, while the wooden trusses and planks were stacked systematically for use in the proposed work on "A" Block, in connection with M.I. Room structure.

The Workshop accommodation was filled with snow, turned into hard

ice. Since the floor had loose pebbles, the snow/ice had cemented these pebbles along with waste of the w/shop. The w/shop area had lot of waste packing material, waste generated from shifting of entire EME stores from within "A" Block W/shop to new W/shop accommodation, unserviceable engines of piston Bully, used up tracks of PB 270, waste tyres and batteries etc. the entire area was cleaned up and unserviceable stores, identified by the EME team, were shifted to a container for backloading. One trailer load of wooden waste and 4 barrel load of waste spares etc were collected from this area.

6. The garbage generated by the Summer camp, in earlier years, used to be incinerated east of kitchen hut, in an open incineration site, enclosed by eight barrels. The burnt waste and ash had been stores in some barrels that were lying there. Quite a lot of incombustible garbage including broken glasses, crushed tins & cans, partially incinerated food waste etc were collected by ETF, packed in the barrels and shifted manually to the open bin-ETF 13 for discharging in the open sea after crossing Antarctic waters. The area was cleaned by scrapping and removing the burnt material. The site was given a clean look by levelling it with boulders and soil.
7. A dump of stores comprising NPL antennae material for 9 m mast, disused NPL stores, wooden planks of Weddel sea type huts, anchoring tools, nuts and bolts, 2" iron pipes, metal scrap generated by fires in incinerator toilets, tangled wires and wooden sleepers were lying in front of the toilet modules at summer camp. The site was cleaned by shifting utility items like pipes and hut panels etc. to a *Construction store yard* near workshop accommodation. Some of the wooden sleepers and damaged panels of Weddel Sea type huts were fruitfully utilised in making a pathway connecting Annapurna, Nandadevi, Mishmi huts with the bath modules. Inmates of the summer huts had a long standing complaint of having to walkover an uneven path covered with boulders. The other unserviceable items were stacked in a container for back loading as junk.
8. NPL had erected a 9 m mast in 1990 to monitor boundary layer programme of atmosphere. A hoisting system with a ladder was added to this during 1992. A sodar shield for another of their experiment was erected during 1991. As both of these experiments have since been closed, it was decided to dismantle the systems, after having obtained the confirmation from DOD. The masts were anchored to the ground with concrete and anchoring pins. It was a tough task to dig the entire thing from a frozen bouldery terrain. The two systems were finally dismantled (the sodar shield components were dismantled by the representative of NPL) and stacked in container No.ETF 9, for handing over to DoD / NPL at Goa.

The stores identified by RDE (E) & Ice core drill equipment (GSI) marked for backloading to India, were loaded into this container. More than 118 fire extinguishers, mostly of helogen type, and others lying in unser-

viceable condition were loaded after obtaining approval of the Fire Officer (DIFR).

9. There are three sites, located west of Maitri Station, where open burning under controlled conditions was resorted to during earlier expeditions for disposing of combustible garbage. An iron enclosure (4'x4'x4') sent earlier for this purpose was not found satisfactory by the successive teams as (a) there was no provision for fresh air inlet, (b) the opening for dropping garbage was too small to let the standard garbage bag in. These sites, therefore had piles of charred material, blackened rocks, burnt tins, broken glasses, partially incinerated food waste and charcoal littered all around. The ETF has collected all these wastes in 11 barrels and loaded them into container ETF - 10 for transporting outside the Antarctic water. The iron enclosure referred above was also brought back.

Four trailer load of wooden cartons, paper waste and other combustible garbage that has been collected from different parts of the station has been stored here for subsequent disposal in the incinerator by the present WOT.

10. Apart from the three earmarked helipads, positioned between Maitri and summer huts, there were four temporary platforms erected on wooden sleeper foundation and covered with MGS panels. These platforms were used earlier for stacking food packets. The XIII WOT had shifted the food dumps from here but the platforms still existed. The ETF, with the help of other members of XVI IAE, dismantled these platforms and shifted the MGS panels to the sector 1 area. The wooden sleepers were shifted to construction material yard while the remaining food packets scattered around these platforms were collected for disposal and the area cleaned. The MGS panels, removed from here, were used in making the platform mentioned at serial No. 1 above.

About 20 iron markers were fixed by earlier expeditioners between station and Nandadevi to serve as a line to be used during blizzards. Since a motorable road has been constructed by the XIII WOT between station and summer huts, this line had become defunct. The ETF was asked to remove these markers anchored to the ground by cement. The dismantling operation was done successfully and markers shifted to container for backloading. There were also some rectangular iron stands existing between green house and rhombic antenna which had become defunct. These too were removed for backloading.

11. The Bhaskara generator complex houses two 62.5KVA gensets, and is operated to supplement the power demands of Maitri and summer huts. The area around this complex, which comprises two standard containers, had a pile of junk material consisting of three full sized iron roof trusses more than 20' long and 8 half trusses, defunct parts of generators, antifreeze capsules, broken gypsum board and asbestos sheets, unerviceable gensets, wooden splinters, PUF, etc. the area was cleaned by segregating the waste

into combustible and noncombustible products. The former was disposed in incinerator while the latter has been stored for backloading.

- 12.** Immediately south of Adilya ad Bhaskara a naturally occurring depression has been utilised for placing filled fuel barrels and oil tankers. Two containers having station stores have also been placed in the same area. The concentration of stores in this depression has resulted in snow accumulation which, after partial melting, has given rise to a huge pond. At the time of arrival of XVI IAE the area presented an ugly sight where fuel barrels and containers appeared to have been partially drowned in the water. The fuel from at least five of the damaged barrels had leaked out in part. The fuel from the damaged barrels was transferred into tankers and the water was pumped out. Empty barrels were removed from this place as also various other types of unserviceable stores. The wooden cartons abandoned after taking out the generator stores were collected for incineration. The ETF assisted the new WOT in rearranging the stores in the two store containers mentioned above.
- 13.** Empty fuel barrels were found stacked near jwala complex. The ETF collected more than 165 empty fuel barrels, scattered all around the station and re-arranged all the barrels in a systematic pattern. These coloured barrel are intended to serve as route markers and hence have been left at Maitri.
- 14 & 15.** Area all around Priyadarshini lake and along Maitri Novo and Maitri - Dozer point was littered with fuel barrels, plastic containers, coloured plastic strips, cartons, tin sheets, etc., Even a boat had drifted far north in the lake and got stuck up in the snow on its western bank. The ETF retrieved the boat after digging it out from the ice and the same was utilised subsequently for transporting about 20 empty barrels, that had drifted to different areas around the lake, to the barrel dump near jwala complex. The litter lying along the lake margin was also collected and disposed off. The ETF also cleaned the area along Maitri - Novo and Maitri - Dozer point roads. Some of the materials, such as part of damaged ice-core shelter and some tin sheets could not be retrieved as these were fastened to the frozen hard ice. The new WOT may attempt to take these stores out during early austral summer next year.
- 16.** The redundant structure of green house dome was erected during X IAE (1991) but it discontinued to serve its purpose just after its construction because of the hostile Antarctic conditions and structural deficiencies which resulted into heavy snow accumulation inside. The green house, therefore, could never be used for the purpose for which it was meant. The X IAE used this slruction for storing chemicals and food stuff which were later lost because of heavy snow ingression.

The ETF dismantled the dome, an operation which involved unscrew-

ing of hundreds of nuts and bolts with bare hands to remove the FRP panels, connecting iron claddings, basic iron framework supporting the panels and shifting entire materials to container - ETF 10, for backloading. The interior of the dome had stores buried in the frozen hard ice. Dozer had to be put to service to break the ice and retrieve the stores comprising chemicals, food stores, plastic containers, etc., The area was levelled so as not to leave any trace of the dismantled structure.

17. The windmill structure came up during V IAE because of BHEL's experimental programme on harnessing Antarctic winds for power generation. The structure was rendered useless in 1987 when the blades broke due to heavy gusty winds. The structure since then had been defunct. After obtaining clearance from DOD the structure was dismantled and components transferred to container for backloading.

Recommendations and conclusion

During past four years, there have been two inspections of our station by two different International Inspection Teams. The Norwegian Inspection Team, which visited Maitri in December 1996, had in its possession the report of Swedish inspection team that had conducted a similar inspection of Maitri during XII Expedition. The station was in a better environmental condition during 1996, as compared to the earlier inspection, a point noted by the Norwegian Inspection Team. XIII Wintering Team had removed the food clumps lying in front of the station and carried out some cleaning operation prior to the inspection. Fortunately, a strong blizzard that hit Maitri a couple of days before the inspection was helpful in beautifying the environs of Maitri by covering the litter under a carpet of snow.

We are happy to remark that as a consequence of massive environmental clean-up operation this year, there has been a growing awareness towards the clean environmental needs. The quantum of the task can be judged by the following statistics.

1. *ETF had to work for 2520 menhours from 9th January to 3rd March 1997, continuously without a break.*
2. *A total of 220 barrels were filled with various type of garbage.*
3. *Eleven standard iso containers and 7 open bins were filled with waste and unserviceable stores (apart from 2 containers filled by XIII WOT) weighing about 250 tonnes, for backloading.*

Following suggestions and remarks are made, which the ETF feels are essential to keep Maitri and its environs ecofriendly .

1. Maitri station needs a better house-keeping where each member should make a concerted effort to adhere to the laid-down norms. No waste, of any type should be thrown in the open. The members dealing with vehicles and fuel,

need to be more conscious.

2. The make-shift vehicle repair shelter, built near the water supply duct, should be dismantled on topmost priority and backloaded. The remaining ponds of lubricant, which might surface during next summer, must be scooped out and appropriately collected for backloading.
3. The soil all around vehicle the site from the western edge of Maitri station to the present site of balloon launching shelter of IMD, has been thoroughly soaked with oil and lubricants, Being located at a higher elevation from the lake, most of it seeps (rather flows) directly into the lake along with the melt water generated from winter snow and ice. The surface channels carrying polluted waste to the lake are too evident to neglect.
4. The present site of vehicle parking near the duct is highly hazardous and unsuitable for this purpose. No repairs of vehicles, fueling, change of oil or Filter should be undertaken here.
5. It is strongly recommended that catalytic convenors and emission filters may be deployed at all the housings where generators are placed. This essential to avoid the accumulation of carbon all around the outer walls as also on the snow around these locations, an observation also made by the inspection Team from Norway.
6. The oil storage, transfer to smaller tanks (weekly tanks) by network of pipes / hoses needs immediate attention. One of the aluminium tank (painted white) was found to be leaking. All the generator sites be it "A" block, Bhaskara, Aditya or German generator container show spots of spillage where used engine oil has been spilt on the ground. The empty cartridges of antifreeze capsules, discarded oil filters, valve packings, unserviceable stores were found scattered all around these sites. It is advisable to keep empty barrels at these location for dumping discarded wastes. The XIII W.O.T has collected 25 barrels of used oils for backloading.
7. The oil tankers stationed behind Maitri in a naturally occurring depression may be suitably relocated so as to avoid snow accumulation. Melting of this snow has given rise to huge pond of water flooding the site of barrel dumps. More than one hundred filled fuel barrels are stored here. At least five of these barrels were found to be leaking because of damage to the barrels. Another six were found to be inverted position. A rough estimate has shown that nearly 800 litres of fuel must have leaked out into the pond. The crew of the helicopters which inspected the fuel, stored here, found it unfit for airworthiness. Subsequent to freeing and lowering of water level in the pond the leaked fuel has left marks all around the pond (about 10cm. higher than the frozen pond level).

Utmost care may be taken while storing the barrels. *It will also be advisable*

to leave the 50 KL tanker behind Maitri and shift all the other tanks to some other suitable location to avoid concentration of huge quantity of oil (300KL) so close to living quarters. There is enough flat ground, at a higher elevation, just 200 meters west of present location, which appears to be satisfactory for this purpose. The 50KL tank could be connected to weekly tanks. This tank would suffice the need of station for about 60 days.

8. The two ISO containers housing station store, placed in this area, may be kept on a higher platform to avoid snow accumulation.
9. *The unsuitable location of IMD balloon launching shelter from environmental point of view, has already been pointed out to DOD.* However, extra care would now have to be taken by the users of this shelter to avoid leaving any light object (paper wastes, wrappings, plastics, PUF beads and materials, spoilt balloons, used chemicals etc.) unattended as the same is bound to find its way into the lake as the structure is nearly on the lake bed. The effects of use of high risk chemical like benzene for treatment of balloons during winter launching) should be ascertained as some quantity of it is likely to pass into the lake because of seepage. After each treatment the used chemicals must be collected and stored, away from the station, for backloading.

Since, construction of the shelter is in progress, lot of stores are still lying scattered in this area the present WOT is requested to shift all the unused material from this place to the construction store yard, after the construction activity is over.

10. The workshop accommodation is located at higher ground overlooking the Priyadarshini lake. Care and caution while unpacking the stores and dealing with lubricants, will have to be exercised so as to avoid any pollution.
11. The ISO container, housing vehicles spares, have their doors on the leeward side of the prevalent wind direction. There are chances of these doors getting blocked due to snow accumulation. It is suggested that these containers be relocated south of the road near workshop.
12. *A layout plan for placement of all the containers may be drawn, as suggested by the present station commander, and all stores (food, construction and station stores) be placed inside these containers.* The practice of keeping stores in the open must be avoided especially as availability of containers has increased considerably.
13. The practice of keeping boxes/spare stores below the station must be avoided as it blocks the passage of blowing air. The foundation stilts must be kept free all the time. There is lot of leakage from the floor of "B" block resulting in formation of ice stalactites and accumulation of ice under the base of floor panels, around the iron stilts. The ice accumulation may threaten the life of these foundation stilts.
14. The two extra toilet modules stationed near Arravalli hut, may be shifted towards east so as to form one compact toilet facility. The two defunct toilet modules may be dismantled if they are not required.
15. The present WOT has commissioned two small capacity garbage incinerators. The same are being used for disposal of daily combustible wastes

- (paper, food etc.) This is a healthy practice. The Garbage must not be allowed to accumulate, as far as possible.
16. The two bath modules being used by the summer members are situated too close to the lake. There is no method of treating the grey liquid generated from these modules. The liquid with high concentration of detergents is getting accumulated and seeps directly into the lake. The unsuitable location of these modules was also highlighted by Norwegian Inspection Team (When the modules were not being used).
 17. *The two urinals at summer camp, also located in the same area, are fitted with barrels placed in dug out pits. Apparently these barrels have never been taken out ever since their placement. The liquid overflows in summer and leaves marks on the morainal ground. The problem deserves a serious thought. It would be advisable, if these barrels are dug out during beginning of summer in 1998 when the contents would still be in a frozen condition.*
 18. *The "B" block of Maitri station can be extended by two bays to accommodate additional bath/urinal facilities. These could be used by summer members during austral summer period while this would act as additional facilities for the wintering members from March to December. The station has only two bath modules which are insufficient to meet the need of 26 WOT members.*
 19. About three trail or load of combustible waste such as wooden junks, paper waste etc. has been collected and dumped east of jwala incinerator. The same may be disposed in a phased manner.
 20. Due to non-availability of containers, ETF could not backload
 - a) 8 barrels filled with waste.
 - b) Two wooden boxes containing waste electrical stores.
 - c) Some distorted barrels.

Persent WOT is requested to place these in a container marked for back loading, next year.
 21. Report on performance and suggestions on functioning of Kiargester and garbage incinerators are being submitted to DOD separately.

Acknowledgements

The Environmental Task Force places on record the help and assistance provided by the Station Commanders, Army team incharges and the members of the outgoing and incoming expeditions in carrying out the massive tasks assigned for the ETF. Without the operation of heavy machinery such as cranes, dozer and transport vehicles, the task could never have been achieved.

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