

## **Helo Maintenance**

**M RAVINDRAN**

**Indian Navy**

Two Chetak helicopters indigenously manufactured at M/S HAL(Bangalore) were selected for flying operations during XIII Antarctica Expedition. The helos were fitted with special equipment like Decca Doppler, Gyro compass CG 512, TAN8 Computer, HF 618, Emergency Flotation Gear (EGF), rescue winch and under slung cargo hoist.

One Air Engineer Officer assisted by four technical crew comprised the maintenance team to represent all trades for electrical, electronics, radio communication and mechanical engineering repair and servicing of helos. This team had worked round the clock to accomplish maximum flying hours on clear weather days as they are to be deployed at landing/take off sites during flying and to come back to the base camps for routine servicing when air crew retire for the rest.

The helo operations were carried out from on board expedition ship M.V. Stepan Krashanennikov, ice shelf at India Bay, Indian Station, "Maitri" and adjacent base Sankalp point, Orwin mountain ranges and many helo pick up points on the ice shelf selected for the scientific works.

The helo starting up in sub-zero Antarctica temperature need extra capacity batteries. Additional batteries are rigged up for this and round the clock battery charging facility was set up. Due to extreme cold weather, rate of discharge is increased,hence the heavy duty chargers are recommended. Refueling of helos were done by use of battery operated portable pumps.

The helo maintenance team had undertaken the task of testing of aviation fuel to monitor fungal growth, probably, first time by any Indian expedition team.

In the absence of microbiological test facilities the aviation fuel held in sealed epicoated drums in Antarctica was not used by the new expedition teams when they arrive. The valuable flying hours were therefore expended in the initial phase of expedition for transferring of fuel drums causing delay for the scientific activities and also restricted the availability of the flying hours for Important tasks.

The microbiological growth in the aviation fuel causing serious maintenance problems is now well known fact. The presence of water in fuel during transportation induces growth of the fungus which will in turn lead to blockage of aircraft fuel filters.

The fuel samples were drawn in sterilized glass bottles from fuel barrels of XII Expedition, kept at Sankalp transshipment point and Maitri helipad in bulk storage tanks. One sample was taken from the refueling nozzle of ship's bulk storage tank.

One liter of fuel sample each was passed through 0.45 micron membrane filter to retain fungal spores, The filter membranes were transferred to petri plates containing growth medium under aseptic conditions. A plate free from fuel sample was also maintained as a control. The petri plates were incubated for germination and growth of spores for 96 hours at 32 deg C. The count of spores/fungi is made under microscope.

No fungal growth was noticed in any of the five petri plates subjected to the tests. The testing apparatus and chemicals were brought by the Naval team. The vacuum pump for filtration of fuel and incubation facilities were arranged from the ship.

The microbiological analysis results indicate that about 20 kl of aviation fuel in epicoated drums available now could be earmarked for the next year flying operations. Similar test can be undertaken by the next expedition team on their arrival and the fuel stock certified fit for use. This would save lot of time and flying hours otherwise needed to transfer the fuel to various fueling points at the initial phase of the expedition. In case the fuel is not used for aircraft, it is still worth conducting these tests to know about the stability of fuel quality.

The helo operations in Antarctica demands dedicated logistics support. Highly qualified technical team had physical and mental tenacity to undertake the tasks right from the time the expedition ship left Goa and from the first reconnaissance sortie when ship approached polynia till the last sortie flown to bid farewell to the wintering members.