

A NOTE ON THE REFRIGERATION SYSTEM AT MAITRI

P.K.Dey and P.Y.Dabeer

Research & Development Establishment (Engineers)

Different types of foodstuff stocked at Maitri require different temperatures for preservation. There are seven deep freezers housed in B-block loft. Two walk-in type deep freezers are housed in the terminal portion of A-block. For the last three winters, it was observed that cooling units of the walk-in type deep freezers malfunction and have to be replaced by new ones. Four such units were backloaded for repairs.

Problem Identified

The deep freezing units, which are fitted with walk-in type cold chamber are housed at the extreme end of the A-block. It was observed that during polar winter, the ambient temperature of cold-chamber surroundings drops below -10°C . The refrigerant R-502 is affected by exposure to the extreme cold, which does not allow it to convert to gas. The behaviour of R-502 at different temperatures is shown in Fig.1. The set temperature of the cold chamber is

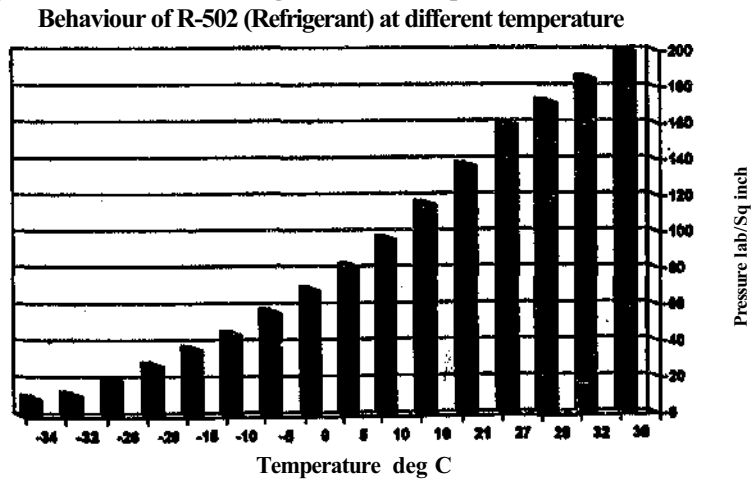


Fig. 1

MODIFICATION ON WALK-IN TYPE DEEP FREEZING UNIT

AT ANTARCTICA

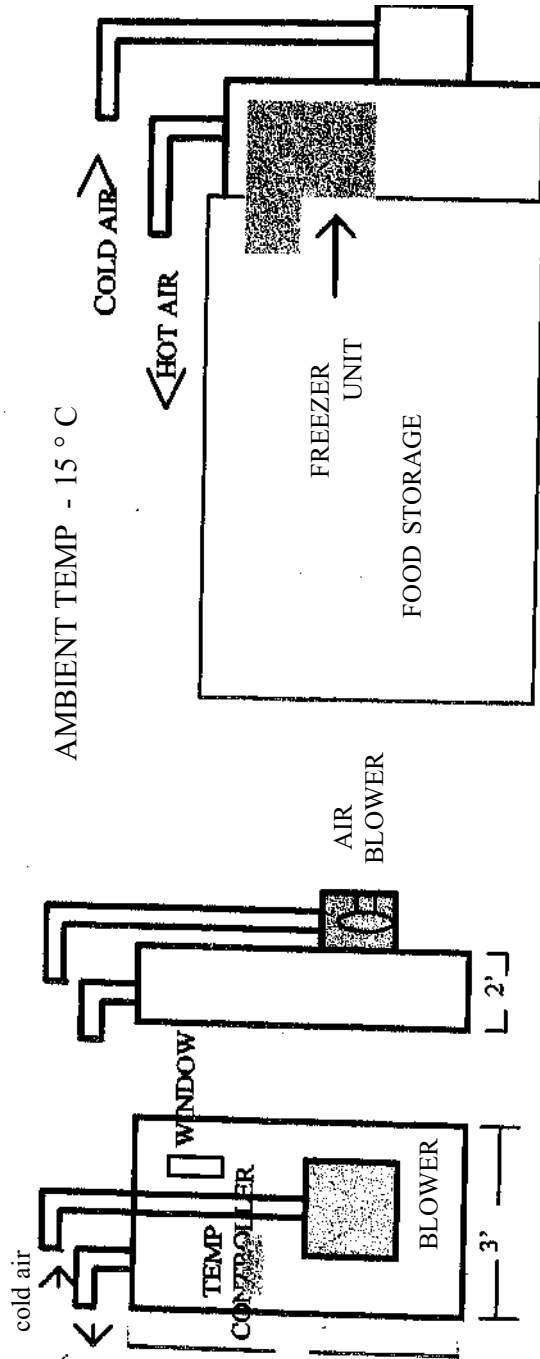


Fig. 2

never attained, so the compressor runs continuously. Thus, the compressor is overloaded and malfunctions.

Rectification

In the month of March 96, a wooden ventilation system (Fig.2) was designed and fabricated, which traps the heat discharged by the compressor of the freezer unit. This way, the dissipated heat is recycled to keep the surrounding temperature of the unit around +15°C to +30°C and any excess heat beyond +30° C is discharged by the ventilation fan. Throughout the year, the functioning of the deep freezer unit was recorded and it worked satisfactorily. The temperature of the unit always remained under control. This modification will increase the life of the walk-in deep freezer unit in A-block.

Acknowledgements

We acknowledge the help and moral support extended by the Leader of the 15th expedition, Shri Arun Chaturvedi and all the members of the team. We also extend our thanks to the logistic team for their help in completing the logistic assignments. We give special thanks to our Director, Shri M.R. Joshi, for his valuable guidance and moral support.