DIURNAL VARIATION OF VISIBILITY AT BOMBAY AIRPORT

1. Visibility pattern over an area, as affected by various factors, such as stability, wind pattern, cloudiness, inversion etc, is determined. The local circulation caused by topography and land and sea breeze also affect the range of visibility. These very factors require consideration of dispersal and stagnation of pollutants, emitted from the industrial complex, in the vicinity of the area.

2. Mean hourly values of visibility were calculated from the eight years data (1967-74) of Bombay Airport for the months of January to May and October to December and are presented in Fig. 1 separately. The mean lowest visibility recorded in the months of January, February and March is of the order of 2 km and generally occurs at 0300, 0230 and 0200 GMT respectively. In April, the lowest mean visibility is 2.7 km and occurs around 0200 GMT. From Fig. 1 (lower part) it can be seen that the lowest mean visibility is about 3 km in December followed by October, November and is highest in May. The times of occurrences are 0230, 0200 and 0130 GMT during December, November and May respectively. The visibility curves in Fig. 1 show that the average duration of visibility less than 3 km is of 2 hr, 1 hr 42 min, 1 hr 36 min and 48 min in January, February, March and April respectively.

It is interesting to note that the mean lowest visibility in October is lower than in November. This can be explained due to the fact that the winds in October, which being transitional month, are
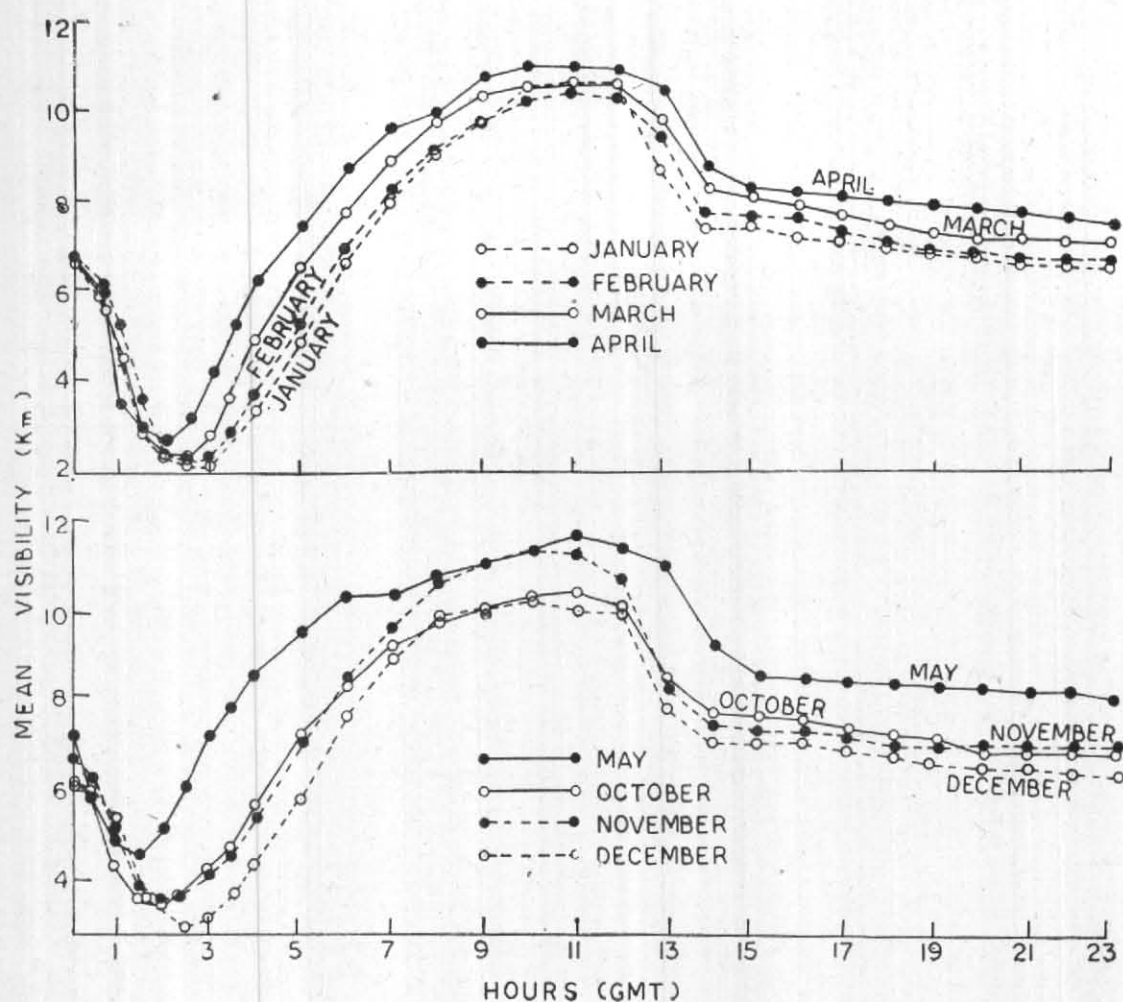
Fig. 1. Mean hourly values of visibility (in km) during January to April and October to December

calm or light variable from NE direction, causing stagnation of pollutants, while in November, the winds are comparatively strong northerly resulting in dispersal of pollution.

3. In order to study the effect of inversion on visibility, inversion data for the years 1972, 1973 and 1974 were tabulated. To get the relationship, correlation coefficients between visibility and inversion thickness (r VTH), between visibility and difference of temperature of inversion top and base (r VTT), and between visibility and height of base of inversion, (r VH) were computed. The correlation coefficients are $-.07, -.18, +.01$ respectively. This shows that the correlation between the visibility and parameters of inversion is negli-

gible. It is also noted that there were a number of cases of poor visibility even when the inversion was not present.

This suggests that the visibility at Bombay Airport does not seem to have a quantitative relationship with inversion.

The condition for occurrence of poor visibility is the stable atmosphere which can take place even in small sub-adiabatic lapse rate.

4. The authors are indebted to Dr. A.K. Mukherjee, Director, Regional Meteorological Centre, Bombay for suggesting the problem and Shri C. E. J. Daniel, Meteorologist-in-Charge for all possible help.

Regional Meteorological Centre, Bombay
7 May 1975

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