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POOR VISIBILITY OVER BOMBAY AIRPORT DUE TO AIR POLLUTION

1. The visibility falls less than 3 kilometres over Bombay Airport in the winter months, December to February in the early morning hours especially after sunrise. Normally the visibility improves after a period of 2 to 3 hours. There are few cases when the visibility improved only around 1100 IST, *i.e.*, after a lapse of 5 to 6 hours. This note discusses the probable cause of this persistant poor visibility.

2. Earlier studies have indicated that the formation of mist or fog over Bombay Airport is due to the favourable synoptic situations. But these are rare occurrences as far as Bombay is concerned. The most common case now-a-days for local deterioration of visibility in the mornings of the cold weather period is the movement of the smoke and suspended particles from the eastern side of the airfield and is usually a day phenomena even with very little moisture present.

3. Table 1 shows the visibility and the surface parameters of wind, temperature and humidity records at the control tower of the new Terminal Building of the Bombay Airport at each hour on three different days, the 11th, 22nd and 29 January 1974. It may be seen that the surface wind was calm in the early morning and a very slight wind started blowing at 0530 IST from north/northeasterly direction and continued till the time the visibility was poor. It may also be noted that *the* humidity does not even reach 90 per cent. Therefore, the phenomena of poor visibility are solely due to the local movement of smoke and suspended particles from the industries and crowded habitants on the eastern side of the aerodrome.

TABLE 1

Visibility and surface meteorological parameters at different hours on 11, 22 and 29 January 1974 at Bombay airport

Time (IST)	Visibility (km)	Wind (kt)	Temperature (°C)	Dew point (°C)	Relative humidity (%)
		11 January 1974			
0430	4·5	Calm	16·2	13·0	81
0530	4·0	060/03	15·0	13·2	89
0630	3·0	060/07	17·0	12·3	74
0730	1·8	070/06	17·4	11·1	67
0830	2·0	Calm	19·0	11·4	61
0930	2·0	Calm	23·0	11·7	49
1030	2·0	Calm	27·0	11·2	37
1130	2·5	070/05	29·8	10·1	29
1230	4·5	280/05	29·0	14·1	40
		22 January 1974			
0530	5·0	300/05	17·6	15·6	88
0630	2·0	Calm	17·6	15·6	88
0730	1·2	330/05	17·6	14·8	84
0830	0·6	360/04	18·6	15·6	83
0930	2·0	360/05	22·4	13·8	58
1030	5·0	330/04	26·6	13·8	35
		29 January 1974			
0530	4·0	Calm	14·8	12·2	84
0630	3·5	Calm	14·6	12·0	84
0730	1·5	100/02	14·0	12·0	87
0830	2·0	070/06	18·6	9·1	54
0930	5·0	070/07	24·8	3·8	26

Further from the tephigram (Fig. 1) it may be seen that there was a marked inversion at 0530 IST observation on these days. This inversion has helped to keep the atmosphere stable upto the height of 930 mb on 11 January and 920 mb each on 22 and 29 January 1974. After the sunrise there was a rise in the surface

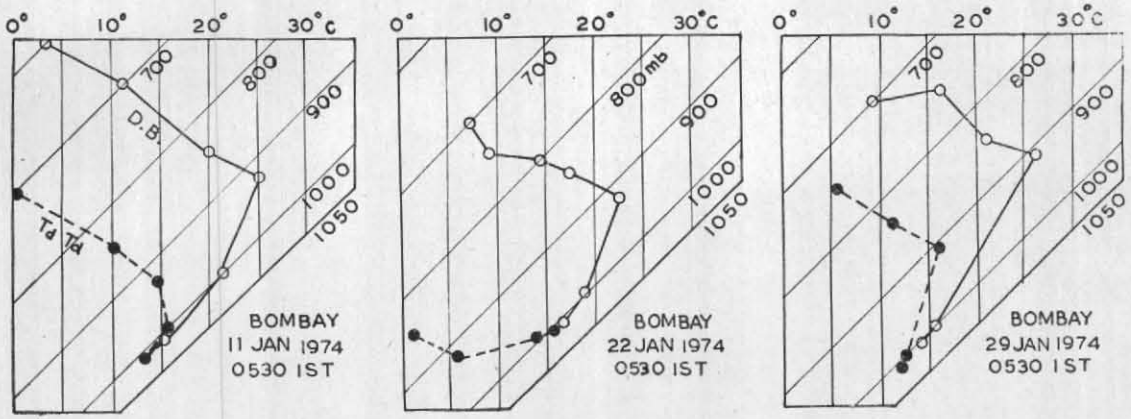

Fig. 1

temperature and it helped in churning up of the air starting from very near the ground. Considering in details the topography of Bombay Airport, it may be seen that in the recent past a large industrial complex has developed to the east/northeast side of the aerodrome. This releases a vast amount of pollutants in the form of smoke, automobile and aircraft exhausts. A slight wind brings all these pollutants to the runway side and the inversion helps in settling these particles in the lower levels causing poor visibility as in the present cases. Only after around 1030 to 1130 IST when the temperature increased by about 2.5°C or more accompanied with wind which in the present cases changed from calm to 5 kt, the visibility started improving.

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