551·575·1 (541·1)

ON THE OCCURRENCE OF FOG OVER GAUHATI AIRFIELD

Forecasting the occurrence of fog over an airfield constitutes an important aspect of our service to aviation. The author had occasion to study the occurrence of fog over Gauhati airfield during the months November-January for three years and some preliminary results of this study are briefly presented here.

The period of study comprised 15 November to 31 January for the years 1967-68, 1968-69 and and 1970-71. Since it is generally believed that the wet bulb depression (difference between dry bulb and wet bulb temperature) is one of the most important parameters to be used in fog forecasting we tabulated this value at 1500 GMT, for every day for the period under study for forecasting fog on the next morning. Frequency of fog at Gauhati airfield is 3 days in February (India met. Dep. 1963). Hence this month was not considered for this study.

The visibility is estimated visually at Gauhati by the current weather assistant. The lowest visibility reached during the early hours of next morning was tabulated for each day. They were then grouped under the following classes — (1) Visibility <400 m, (2) Visibility 400-800 m, (3)

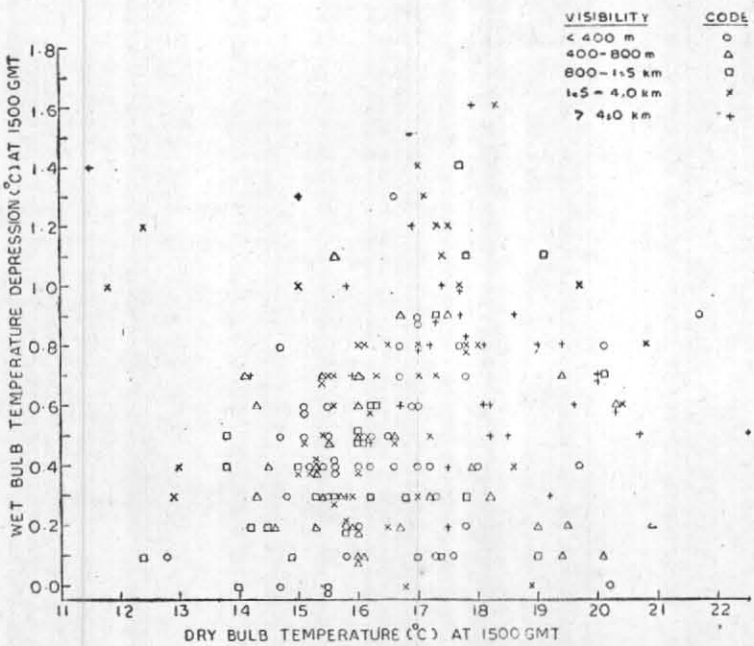

Fig. . 1

Visibility 800 m-1·5 kms, (4) Visibility 1.5-4 km and (5) Visibility > 4 km. The wet bulb depression for each day was then plotted against dry bulb temperature as in Fig. 1. Each point plotted was easily identifiable by using a pictorial code as belonging to a particular class of visibility, as shown in Table 1.

The following features in Fig. 1 are worth noting —

(1) In the dry-bulb temperature range 15-18°C more than 75 per cent values with wet bulb depression of 0·6°C or less correspond to visibility values less than 1·5 km, of these more than 80 per cent belong to visibility values less than 800 m.

(2) In the range 15-18°C more than 65 per cent of visibility values corresponding to wet-bulb depression more than 0·6°C are greater than 1·5 km.

(3) When the dry bulb temperature is above 18°C, the visibility values are predominently less than 800 m, only when the wet bulb depresion is not greater than 0·2°C.

(4) For the dry bulb temperature 14-15°C visibility values are invariably less than 1·5 km even upto wet bulb depression of 1·0 C.

(5) Only in very few cases the dry bulb temperature was less than 13°C and in these cases it is not possible to infer any relation between visibility and wet bulb depression.

From the above it would appear that when the dry bulb temperature is in the range 15-18°C at 1500 GMT and wetbulb depression falls below 0·6°C , poor visibility (around 1 km) can be forecast, for the next morning and in about 75 per cent of the occasions one is likely to be successful. When the temperature is in the range 14-15°C poor visibility can be forecast even for wet bulb depression upto 1°C and one is likely to be successful in about 70 per cent of the occasions. When the dry bulb temperature is above 18°C poor visibility is to be forecast only if the wet bulb depression is 0·2°C or less.

Thus the above method affords a simple working rule for forecasting poor visibility in the airfield in mornings for purposes of issuing terminal forecasts at 1500 GMT.

The results of application of the above rule to independent data will be presented elsewhere.

I take this opportunity to express my sincere thanks to Dr. A.S. Ramanathan, Meteorologist In-charge, Gauhati for suggesting the problem and guiding through it.

M. M. BAGHARE

Meteorological Office, Gauhati
July 27, 1971

REFERENCE

India met. Dep. 1963 *Meteorology for Airmen*, Pt. III, pp. III.19.