

RESTRICTED.N.Z. Meteorological Office Circular Note No.19.NOTES ON FORECASTING TERMINAL CONDITIONS IN
FIJI, NEW HEBRIDES AND NEW CALEDONIA.

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NANDI:

The aerodrome lies in a valley on the West Coast of Viti Levu, the largest island in the Fiji Group. The valley is sheltered to the N, E and S by hills rising almost to 4000 ft. within 12 miles of the aerodrome itself. The aerodrome is consequently well sheltered from the trades and only winds between SW and NNW can blow directly on to the runways.

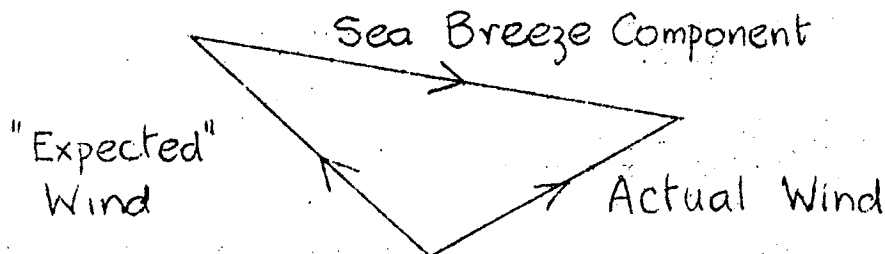
The weather at Nandi may be divided into 3 types:

- A. Stable trade
- B. Unstable trade
- C. Frontal

The first two types can be detected directly by means of Raysonde observations. If these are not available, a study of cloud types, etc. will be sufficient to determine the stability. During the morning there is a very large surface heating effect over the Nandi valley. Nandi being on the "Dry" side of the island, there is little bush growing, most of the land being taken up by dry grass lands, similar to the East Coast of New Zealand - Gisborne district. This surface heating is a dominant factor in the weather and winds at Nandi.

A. Weather in the "Stable Trade."

- (i) Cloud: Between 3-8/10 increasing during afternoon, with bases between 3000 and 5000 ft. Vertical development limited by inversion, which varies between 5000 and 10,000, the average height being 7000 ft.
- (ii) Visibility: 20 to 30 miles on the average, restricted locally by occasional cane fires and dust on the aerodrome.
- (iii) Wind: The surface wind at Nandi can be divided into 3 different periods:
 - (a) Night, i.e. 0600 p.m. - 0600 a.m. (approx). Usually calm, unless gradient very strong.
 - (b) Morning: 0600-1000 a.m. Light winds about $\frac{1}{2}$ gradient value + (approx) 30° in direction.
 - (c) Day: 1000 a.m. - 0600 p.m. Sea breeze comes in regularly at approx. 1000 a.m. and persists for 8 hours. The speed and direction may be forecast approximately using following rules: Add vectorially a "Sea Breeze component" of $280^\circ/14$ kts. to the "expected" surface wind, i.e. $\frac{2}{3}$ gradient wind + 30° .



B. Weather in "Unstable Trade."

- (i) Clouds: Increases rapidly during the day reaching 10/10 with possible thunderstorm development at approx. noon. Thunderstorms are frequently violent, but of short duration, lasting about 1 hour, then moving off. Cloud bases usually 2/3000 ft., lowering to 600 ft. in precipitation. Vertical development usually very great - Cb tops reaching occasionally to 30,000 ft.
- (ii) Visibility: 20-30, except in precipitation, when visibilities lower, depending on intensity of precipitation, to $\frac{1}{2}$ -2 miles. Very low visibilities under these conditions do not persist for any length of time and aircraft wishing to land may do so by waiting around till control tower advises conditions improved.
- (iii) Wind: Calm during night, unless strong pressure gradient. Light during morning between E and SE, variable during remainder of day. The intense convection is liable to give very changeable surface winds.

C. Frontal.

Strong "Meridional" cold fronts produce normal frontal passages at Nandi - giving the usual NW to SW'ly change, with overcast conditions and rain. Cb develop 2-4 hours after the frontal passage and thunderstorms may persist for 4-6 hours. The ceilings are usually 1000-2000 ft. with a drop to 500/600 in heavier showers. Visibility is reduced by precipitation to 1-2 miles, otherwise remains at about 15-20 miles.

NAUSORI AND LAUTHALA BAY:

These bases are situated on the SE side of Viti Levu, with hills rising to 1500-2000 ft. inland. Nausori itself is on the delta formed by the Rewa River. Trade wind conditions persist during most of the year, but fronts and "wet season" weather can cause rapid change. Under such conditions, planes have an alternative landing ground at Nandi, and flying boats, either Suva Harbour or Saweni Bay.

Normal cloud bases are between 1500 and 3000 ft. with visibilities 15-25 miles. During the wet season from December to March, conditions become worse on the average, with bases 1000-2000 ft. reducing to 300-400 ft. in rain; visibilities being 10-15 miles, normally reducing to 1-2 in rain.

Thunderstorms form over the hills during the afternoon when the air is unstable and these can be forecast by study of cloud types, Raysonde data, etc.

Frontal passages give general bad weather for 12 hours at least, with ceilings 300-500 and visibility 1-2 miles.

SANTO:

The landing field used by R.N.Z.A.F. planes at Santo is on the SE tip Espiritu Santo I. The only hills above 300 ft. are to the West and NW, where one hill rises to over 5000 ft. Consequently, the trades are not affected very much and Santo has normal trade weather, i.e. SE to E winds, 5/15, with 5-8/10 of cloud, base mainly 2000-3000 ft. Unstable trade will give showers during the afternoon with visibilities reducing to 1-2 miles and ceilings down to 600 ft.

Quasi-stationary fronts cause considerable deterioration in terminal conditions and this may persist for some time as such fronts are slow-moving. Thunderstorms occasionally occur with fronts moving in from the south, but these are of short duration, lasting only 1-2 hours.

R E S T R I C T E D .

3.

SANTO (CONT'D):

Frontal weather is always overcast with rain for at least 12 hours. Visibility reduces to $\frac{1}{2}$ to 2 miles in the heavier rain, but is otherwise 2-5 miles. Cloud bases, 1000-1500 ft., lowering at times to 600 ft. in heavy rain.

P.D.G.:

Plaine des Gaiacs aerodrome is situated on the southwestern coast of New Caledonia. The hills inland rise to 2000-3000 ft. within 6-10 miles, some peaks being over 3000 ft. There are no hills to the south and southeast, consequently the trade wind is not affected very much. Surface winds seem to be more southerly than would be expected and cloud bases are approx. 3000-5000 ft. Strong meridional fronts cause deterioration of conditions, but visibilities do not reduce much below 2 miles. The aerodrome becomes very muddy in wet weather. Thunderstorms are very infrequent.

TONTOUTA:

Tontouta is approximately 120 miles south of P.D.G. on the same coast and conditions are very similar, the main difference being that fronts give lower ceilings (200-600 ft.) and visibilities between 300 yds. and 1 mile.